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# COMPETITION AND REGULATION IN THE WATER SECTOR

**English/French**

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## FOREWORD

This document comprises proceedings in the original languages of a Roundtable on Competition and Regulation in the Water Sector which was held by the Working Party n°2 of the Competition Committee in February 2004.

It is published under the responsibility of the Secretary General of the OECD to bring information on this topic to the attention of a wider audience.

This compilation is one of a series of publications entitled "Competition Policy Roundtables".

## PRÉFACE

Ce document rassemble la documentation dans la langue d'origine dans laquelle elle a été soumise, relative à une table ronde sur la concurrence et la réglementation dans le secteur de l'eau, qui s'est tenue en février 2004 dans le cadre du Groupe de Travail n°2 du Comité de la concurrence.

Il est publié sous la responsabilité du Secrétaire général de l'OCDE, afin de porter à la connaissance d'un large public les éléments d'information qui ont été réunis à cette occasion.

Cette compilation fait partie de la série intitulée "Les tables rondes sur la politique de la concurrence".

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# EXECUTIVE SUMMARY

***By the Secretariat***

In light of the written submissions, the background note and the oral discussion, the following points emerge:

**Inefficiency**

*(1) Inefficiencies in water allocation are common. In situations of plentiful supply, water typically has relatively low costs. However, in situations of scarcity, water can have high costs, particularly in opportunity costs of using limited water supply for one use when another use might assign a higher value to the water.*

Agricultural accounts for the majority of water use in OECD members while household use is a relatively modest minority. Not all OECD members face water shortages. For those that do face shortages, the problem of how to allocate water between different user groups has often been solved by regulatory or judicial processes rather than by markets. In many cases, the prices charged for water use, particularly agricultural water use, reflect neither the costs of producing and delivering water nor the opportunity costs of water use. This means that farmers make production decisions that may differ from those they would make were they facing "commercial" prices for water. These decisions can include using less efficient irrigation techniques (ditches vs. drip irrigation) and selecting crops that are especially water intensive.

Regulatory limits are often placed on farmers so that they cannot trade their existing water rights to either other farmers or other types of users, such as utilities that provide water to households. These types of regulations can lead to particularly large waste because, while farmers may have relatively elastic demand for water, since they can change their crops and irrigation techniques, households have much less elastic demands, so that shortages substantially impact household welfare.

When governments clearly control water rights, they may be able to reallocate them more easily from agricultural uses to other uses, as in Chinese Taipei. However, artificially low water prices may be incorporated into agricultural land values, so that when water prices rise, land values fall and farmers are left with assets that cannot cover the costs of mortgages. The future path of prices paid to the water distribution authority is important for determining the value of water rights. To the extent that water authority prices are expected to rise in the future, the value of the resold water rights will be smaller, since the resold rights would typically include an obligation to pay the water authority's price in order for the water rights acquirer to receive delivery. In order to reduce risk for purchasers, the water distribution authority or an appropriate government body should provide guidance about the expected future path of water prices.

**Trading**

*(2) When water is scarce, more trading of water rights would help solve the problem of allocating water between different users. But trading is rare, partly for reasons of infrastructure, partly for reasons of regulation, and partly for reasons of historical property rights. As a result, water rights are typically locked into rigid regimes that do not permit buyers to purchase water from those who place a low value on water.*

*Notably, when water basins are international, international water rights trading could help solve difficult international political problems via a market mechanism. However, the underlying physical system and human uses of this system would have to be assessed and described with appropriate precision, and international water trading would also require the creation of an international body for a given water basin to govern water rights, register trades, and resolve disputes.*

*A number of conditions need to be met for trading to be most successful, including:*

- *Attribution of water rights must be clear*
- *Ability to enforce rights must exist*
- *Rights must be tradable and independent of land rights*
- *A trading system should exist that would reduce transaction costs*
- *Transport from sellers to buyers must be feasible*

When trading occurs, typically the sellers are those who place the lowest value on their water rights, such as farmers with low quality land or excess supply, and the buyers are those who place the highest value on the rights. But ensuring that trading can occur is complicated. Water rights are not inherently simple and are not always based on pre-assigned volumes. For example, farmers may have the right to a given quantity of water when there is no drought, but in a time of drought, they may have the right to less water. Thus, were they to trade their water rights, they would trade a volume that was not fully specified in advance. Variation in water supply quantities in times of drought is common to many OECD countries that face scarcity. When water pollution is an issue, trading can become especially complex, particularly when the origin of pollution is not point-source and the impact of the pollution is difficult to assess.

Certain schemes for apportioning rights to water are not consistent with trading. For example, under a “Riparian” scheme, water users immediately adjacent to a river may have the right to extract water, as long as they return it to its source, while water consumers not adjacent to the river have no rights to supply. In order for trading to develop in such areas, the Riparian scheme would have to be replaced by another scheme. A modified scheme was developed for the Sacramento River in the U.S. with the California Water Project.

Particularly in times of scarcity, it is important for rights to be enforceable. Otherwise theft at some points in the system may prevent supply in other parts of the system. But even when rights are defined and enforceable, they are not always tradable. In some countries, such as Spain, land rights are closely linked to water rights. It may be, for example, that water rights can only be exercised for water that is used on the matching land. Such rules restrict the ability to move water to the location of greatest need and inhibit trading. Where the beneficial effects of trading are sought, such land-use rules would require modification. Australia has recently moved to increase separation of water rights from land rights.

Market mechanisms help ensure a low-cost means for potential buyers to communicate with potential sellers, set terms of a trade, and assure the legitimacy of transactions. Governments need not set up market mechanisms themselves, but should be careful to develop rules that are consistent with market mechanisms and that would not make such mechanisms unduly costly.

Transport of water may be necessary for the sellers to purchase water from an otherwise distant source. Methods of transport include canals, pipes and aqueducts. These facilities may need to be created to enable trades from least-valued areas to most-valued areas. Governments can help to build such facilities directly or through aiding in the permit and land requisition process. Long-distance transport was built by the U.S. for supply to Los Angeles, for example.

For overall governance of water use, Italy has created authorities, originally meant to optimally replicate water basins because water regulation occurs most reasonably at the level of the water basin. But ultimately pre-existing political boundaries were largely followed. The UK has national regulation but regional water companies that largely correspond to water basins. International disputes typically have no natural arbiter except the International Court in the Hague, when its jurisdiction is recognized. But for reasons of cost, lack of expertise, and undesirability of administrative solutions, such an international dispute resolution mechanism is far from ideal.

**Opportunity costs**

*(3) Opportunity costs of water need to be taken into account when establishing the prices that users pay for marginal water consumption. These costs include the value of the highest value uses for which water could be used. However, even when the value of alternative commercial users is well understood, it may be challenging to state the value of environmental use.*

In practice, markets are the best way to identify alternative commercial values of use. EC water regulations will soon require that prices reflect the cost of providing water, at least by group, for the three main consumer groups, namely agriculture, industry, and households. Some OECD members, such as Ireland, have previously placed limited reliance on prices, especially for household users. Where water scarcity is not a problem, the allocative importance of reflecting production costs and opportunity costs in pricing is less critical, because user groups will not prevent others from receiving water by their own use.

Including opportunity costs within the price of water can be important when one user group will cover the cost of extracting and supplying water but where another group would value the water at a higher level. Such costs are most easily calculated within a commercial setting. However, commercial settings are not always possible, especially for environmental values. Surveys intended to estimate values of environmental uses may generate results that are biased, depending on how many factors are included as survey options. In practice, little guidance is provided by many governments on how to value alternative environmental uses. The EC notes that when mitigation measures to restore water quality are developed, these may provide a basis for incorporating resource costs into the cost figures for water. But assigning a value to pollution with high confidence may not be practicable when it is not possible to describe the underlying physical system appropriately, as Austria has suggested.

**Efficient supply**

*(4) Substitutes to active competition, such as benchmark competition and private concessioning, can improve efficiency of operations. These modes of second-degree competition are most likely in an environment with private sector participation.*

Not all OECD countries have extensive private sector participation in water supply. Switzerland, in particular has limited participation because water is viewed as a special natural resource that must remain under state control. In other OECD members, notably France and the UK, private activity in water supply is prevalent. This does not always mean that private entities own the

sources of water or the infrastructure for distributing the water. In Denmark, private companies have the right to challenge government providers for delivery of water services.

In the case of benchmarking, the objective is to hold all water suppliers to the standard of the most efficient supplier. This means that many suppliers must exist, for statistical analyses, so that one (or more) firm(s) must be identified as the most efficient and then the efficient costs are imputed to the other providers for calculation of an appropriate regulated price. Since benchmark competition has been introduced to the UK, efficiency in UK water provision has increased substantially. Other countries engage in less economically stringent forms of benchmarking, such as Australia and the Netherlands, while Germany recently passed a resolution calling for broad benchmarking.

In the case of private concessions, permitting public sector management as well as private sector management is critical for maintaining the negotiating ability of the public sector. When bidding deadlines are announced publicly and when details of offers and of winning contracts are available for public inspection, contract terms appear to improve for localities, as seen in France. Other OECD countries that use concessions for at least some of their water provision include Germany, Hungary, Mexico, Portugal and Spain.

Tenders are sometimes open to all comers initially, or open by invitation. The tender is not always awarded to the lowest bidder, because the authorities may judge that the tendered price would be insufficient to cover the real costs of investment that would have to accompany the tender, as in Hungary. Thus accepting such an offer may require later renegotiation.

Even when water utilities remain publicly operated, the possibility of private alternatives can motivate improved performance by public utilities.

**Wastage and metering**

*(5) The problem of how to discourage excessive use of water involves at least two elements: avoiding waste and encouraging judicious use of water. Waste occurs both through spillage in the water distribution system and, at the household level, from dripping taps. Judicious use of water may involve reducing consumption in times of drought. Methods to reduce excessive usage include rationing and raising of water prices. Rationing of externally visible usage is commonly used in times of drought, such as restricting high-use applications like water sprinklers. More economic methods are increasingly common, such as increasing the price of water in times of scarcity. One of the most basic ways to provide incentives for careful use of water is the imposition of a charge on marginal usage, at least above certain "basic" levels. Increasingly, price mechanisms for reducing demand are being adopted, but they depend on the presence of water meters. Historically, many households in some OECD countries have not had water meters.*

Water system spillage can be reduced by taxing water utilities on their spillage, as in Denmark. When quantity-based pricing is used, water meters are an important tool for increasing the incentive for consumers to reduce waste by measuring water usage. Some policy makers are concerned that water meters might discourage the use of water for cleaning and hygiene, thus decreasing cleanliness and increasing the spread of disease. This concern is important because water constitutes a non-trivial percentage of household spending among poorer households in some OECD members. One possible approach to introducing consumption charges that takes this concern into account is a progressive tariff, in which marginal price increases with the quantity consumed, as in Poland. In times of high scarcity, seasonal tariffs may be applied.

Water meters may not be appropriate in all situations, because the cost of installing new meters in pre-existing buildings and of reading those meters is substantial (up to 10-15% of the monthly bill). In the UK, water meters are not encouraged in all localities because of these costs, especially when the localities are not subject to frequent shortages. Metering is most likely to cover its costs where water is scarce, there is luxury consumption (such as garden sprinklers), or in new home construction where installation costs are low. Universal requirements for metering, as in EC regulations, may not satisfy cost-benefit principles.

**Economies of scale and scope**

*(6) Fixed costs are very high in the construction of a water distribution network. As a result, there is often little room for multiple operators over multiple infrastructures within the same territory. It may make sense for very small water suppliers to merge or join their activities, while mergers may deliver few size-based economies for larger water companies. There are few economies of scope between treating wastewater and operating a water distribution company. However, there are significant economies of scope between abstracting water, treating water, and distributing it. Thus vertical integration of water companies should not be discouraged.*

Some OECD countries contain more than 10,000 water companies, such as France and the U.S., while others contain fewer than 50, such as Netherlands and the UK. Research suggests that there may be economies of scale that can be achieved by small water company consolidation. However, for larger water companies, increasing size may not decrease marginal or average costs of production very much. In Switzerland, associations of several municipalities have increasingly been formed to achieve such economies of scale. Italy is encouraging the development of larger water suppliers within its historically fragmented supply community. A recent study for the water regulator in the UK found that economies of scale were not present in the UK water companies, and that economies of scope between wastewater treatment and distribution were not substantial.

**Third-party access**

*(7) A relatively untested approach to enhancing competition for water supply is the use of customer switching away from the former monopolist water supplier. Two primary approaches exist for providing such switching, namely the building of new infrastructure to move water from an existing supplier to a customer in another supplier's "territory" (inset appointments) and the actual opening of a supplier's pipes to other suppliers (common carriage) through a form of access pricing.*

Inset appointments are particularly reasonable when a large water consumer lies close to the boundary of two supplier's networks. Permitting the consumer to choose suppliers can provide significant benefits to the consumer. For example, one town in Poland lies at the border of the Czech Republic and has chosen to contract with a Czech water supplier rather than the Polish wholesale supplier because the prices were significantly lower from the Czech supplier.

Care must be taken that investments by the incumbent water supplier to serve a particular customer are not unduly stranded. The UK permits only the very largest customers (over 100 m litres per year at one location) to use the inset appointment regime.

Common carriage is now starting in the UK, allowing large customers (over 50 m litres per year at one location) to contract with other providers besides their former supplier, and guaranteeing these alternative suppliers access to the former supplier's physical facilities. Difficulties of negotiating access to the incumbent network have led to the introduction of standard rules for access

conditions and pricing. As yet, there is little experience with the success of this experiment and the UK is only gradually introducing access pricing, by limiting the number of customers with such contracting flexibility to the very largest customers.

# SYNTHÈSE

***Par le Secrétariat***

Les points suivants ressortent des contributions écrites, du document de référence et des discussions orales :

**Inefficience**

*(1) Les inefficiences dans l'allocation de l'eau sont fréquentes. Dans les situations où l'offre est abondante, les coûts de l'eau sont généralement faibles. Toutefois, en situation de rareté, l'eau peut avoir des coûts élevés, en particulier des coûts d'opportunité liés à l'utilisation d'une eau en offre limitée pour une usage donné alors qu'un usage différent aurait conféré à cette eau une valeur plus élevée.*

L'agriculture représente l'essentiel de l'utilisation de l'eau dans les pays Membres de l'OCDE, la part des ménages étant plus modeste. La pénurie d'eau ne concerne pas tous les pays de l'OCDE. Dans les pays qui connaissent une telle situation, le problème de l'allocation de l'eau entre les différents groupes d'utilisateurs est souvent tranché par des processus réglementaires ou judiciaires, et non par le jeu du marché. Autrement dit, il se peut que les agriculteurs fassent des choix de cultures différents de ceux qu'ils auraient fait si les prix de l'eau étaient fixés par le jeu du marché. Par exemple, il arrive qu'ils utilisent des techniques d'irrigation moins efficientes (irrigation par canaux plutôt que par goutte à goutte), ou qu'ils optent pour des cultures particulièrement exigeantes en eau.

Les agriculteurs sont souvent confrontés à des restrictions d'ordre réglementaire leur interdisant de revendre leurs droits sur l'eau à d'autres agriculteurs ou à d'autres types d'utilisateurs, notamment les opérateurs qui fournissent de l'eau aux ménages. Ce type de réglementation peut être source de beaucoup de gaspillage car, si la demande d'eau des agriculteurs est relativement élastique - dans la mesure où ils peuvent changer de culture ou de technique d'irrigation - celle des foyers l'est beaucoup moins ; par conséquent, les pénuries sont particulièrement pénalisantes pour le bien-être des ménages.

Lorsque les pouvoirs publics contrôlent clairement les droits à l'eau, comme c'est le cas au Taipei chinois, ils peuvent les réaffecter plus facilement des utilisations agricoles vers les autres utilisations. Toutefois, si le prix de l'eau est artificiellement bas, les prix du foncier agricole sont plus élevés qu'ils ne le devraient, et lorsque le tarifs de l'eau augmente, les prix du foncier baissent, laissant les agriculteurs face à des actifs souvent achetés à crédit et dont les mensualités de remboursement sont trop lourds par rapport aux revenus générés. Les perspectives d'évolution future des tarifs payés à l'entité de distribution d'eau conditionnent étroitement la valeur des droits à l'eau. Dans la mesure où l'on s'attend à une augmentation des tarifs de la distribution d'eau, la valeur de revente des droits à l'eau peut diminuer, puisqu'à ces droits sera généralement associée l'obligation pour l'acheteur de payer les prix demandé par l'autorité s'il veut être alimenté en eau. Pour réduire le risque de l'acheteur, l'autorité de distribution de l'eau, ou tout autre organisme public compétent, doit donner des orientations sur l'évolution future des prix de l'eau.

**Marché secondaire**

*(2) Lorsque l'eau est rare, il serait utile de développer le négoce de l'eau, pour résoudre le problème de l'allocation de l'eau entre les différents utilisateurs. Mais ce négoce est peu pratiqué, notamment pour des raisons d'infrastructure, de réglementation, et de droits de propriété historiques. Par conséquent, les droits à l'eau sont souvent enfermés dans des régimes rigides ne permettant pas de racheter de l'eau à des utilisateurs pour lesquels la valeur de cette ressource est plus faible.*

*En particulier, dans le cas des bassins hydrographiques internationaux, le négoce international de droits pourrait contribuer à résoudre des problèmes délicats de politique internationale grâce à un mécanisme de marché. Cela étant, il conviendrait d'évaluer et de décrire avec suffisamment de précision le système physique et les utilisations humaines de ce système, et l'existence d'un marché international des droits à l'eau nécessiterait également la création d'un organisme international pour chaque bassin afin de régir les droits à l'eau, de comptabiliser les échanges et de résoudre les différends.*

*Pour que les échanges marchands se déroulent le mieux possible, plusieurs conditions doivent être réunies :*

- *L'attribution des droits à l'eau doit être claire*
- *Il doit exister des moyens de faire respecter ces droits*
- *Les droits doivent être négociables et distincts des droits territoriaux*
- *Il doit exister un système de négoce qui minimise les coûts de transactions*
- *L'eau doit pouvoir être acheminée du vendeur jusqu'à l'acheteur.*

Lorsqu'il y a négoce de droits, les vendeurs sont généralement ceux qui valorisent le moins leurs droits à l'eau - il peut s'agir par exemple d'agriculteurs dotés de terres de piètre qualité ou d'excédents d'eau – et les acheteurs sont ceux qui attachent à ces droits la plus grande valeur. Cela étant, il est compliqué de réunir les conditions nécessaires au fonctionnement d'un tel marché. Les droits à l'eau présentent une certaine complexité intrinsèque et ne correspondent pas toujours à des volumes préattribués. Par exemple, il arrive que les agriculteurs aient droit à une quantité d'eau donnée en temps normal, mais qu'en période de sécheresse ils aient droit à une quantité moindre. Par conséquent, s'ils revendaient leurs droits à l'eau, il s'agirait d'un volume non complètement fixé à l'avance. La variabilité de l'offre en période de sécheresse est fréquente dans de nombreux pays de l'OCDE confrontés à la rareté de cette ressource. Lorsque la pollution de l'eau est un paramètre, le négocie peut devenir extrêmement complexe, surtout si l'origine de la pollution n'est pas ponctuelle et que son impact est difficile à évaluer.

Par ailleurs, certains systèmes de répartition des droits à l'eau ne sont pas compatibles avec le fonctionnement d'un marché. Par exemple, dans les régimes dits « ripariens », les usagers de l'eau dont le territoire jouxte un cours d'eau peuvent avoir le droit d'y faire des prélèvements à condition de rejeter l'eau à sa source, alors que les usagers non riverains n'ont pas ce privilège. Pour qu'un système marchand fonctionne dans ces régions, il faudrait remplacer le régime riparien par un autre système. Pour le fleuve Sacramento aux États-Unis, il a fallu élaborer un système adapté dans le cadre du California Water Project.

En période de rareté, l'existence de moyens de faire respecter les droits est particulièrement cruciale. A défaut, des prélèvements illicites à certains points du système peuvent remettre en cause

l'approvisionnement d'autres parties du système. Mais même lorsque les droits sont définis et qu'il existe des moyens de les faire respecter, ils ne sont pas toujours négociables. Dans certains pays comme l'Espagne, les droits à l'eau sont étroitement liés aux droits territoriaux. Il se peut, par exemple, que les droits à l'eau ne puissent être exercés que si l'eau est utilisée sur la terre auxquels ils sont attachés. De telles règles limitent la possibilité de déplacer l'eau vers l'endroit où le besoin en est le plus pressant et empêche que les droits soient négociables. Lorsque l'on souhaite bénéficier des avantages de ce négoce, il convent de modifier ces règles qui lient le territoire et l'usage. L'Australie a récemment pris des mesures pour accroître la séparation entre droits à l'eau et droits territoriaux.

Des mécanismes de marché permettraient de mettre en relation à moindre coût les acheteurs potentiels avec des vendeurs potentiels, de déterminer les termes de l'échange et d'assurer la légitimité des transactions. Il ne faut pas que ces mécanismes de marché soient mis en place par les pouvoirs publics eux-mêmes, mais ceux-ci veilleront à ce que les règles qu'ils édictent soient compatibles avec les mécanismes de marché et à ce que ces mécanismes ne soient pas excessivement coûteux.

Des infrastructures de transport de l'eau peuvent être nécessaires pour permettre aux revendeurs de se procurer de l'eau provenant de sources distantes. Il existe plusieurs types d'ouvrages de transport, parmi lesquels les canaux, les canalisations et les aqueducs. Il peut être nécessaire de construire de telles installations pour permettre le transport de l'eau des zones de faible valorisation de l'eau aux zones de plus forte valorisation. Les pouvoirs publics peuvent agir, soit directement, soit en facilitant le processus d'obtention des permis de construire, et de réquisition des terrains. Par exemple, les États-Unis ont construit des systèmes de transport longue distance pour l'alimentation en eau de la ville de Los Angeles.

Concernant la structure générale de gouvernance de l'usage de l'eau, l'Italie a créé des agences qui, à l'origine coïncidaient avec les différents bassins versants car c'est à ce niveau qu'il est le plus logique de réguler l'usage de l'eau, mais en fin de compte ce sont surtout les limites des circonscriptions politiques préexistantes qui ont été retenues. Au Royaume-Uni, il existe une régulation au niveau national, mais aussi des compagnies des eaux régionales coïncidant en grande partie avec les bassins versants. Quant aux litiges internationaux, il n'existe pour les régler pas d'autre arbitre naturel que la Cour internationale de la Haye, si toutefois sa compétence est reconnue. Mais pour des raisons de coût, d'expertise technique insuffisante et d'inadaptation des solutions administratives, ce mécanisme de résolution des litiges internationaux n'est pas du tout idéal.

**Coûts d'opportunité**

(3) *Dans la fixation des tarifs pratiqués aux différents usagers pour leur consommation marginale, il convient de tenir compte des coûts d'opportunité de l'usage de l'eau. Ces coûts tiennent compte de l'usage le plus valorisant de l'eau. Toutefois, si la valeur des autres usages commerciaux est bien prise en compte, il peut être difficile d'évaluer celle de l'usage environnemental.*

En pratique, les marchés constituent le meilleur moyen de faire ressortir les autres usages commerciaux valorisants. D'ici peu, la réglementation de la CE concernant l'eau imposera que les tarifs reflètent le coût de la fourniture d'eau, au moins au niveau des différents groupes, pour les trois principaux groupes d'usagers, à savoir les agriculteurs, les industriels et les ménages. Jusqu'à présent un certain nombre de Membres de l'OCDE comme l'Irlande, n'attachaient pas une grande importance aux tarifs. Lorsque l'eau est abondante, l'importance allocative d'une tarification reflétant les coûts de production et les coûts d'opportunité est moins cruciale car la consommation d'eau d'un groupe d'usagers ne risque pas de priver d'autres groupes.

Si un groupe d'usagers supporte les coûts de prélèvement et de fourniture d'eau mais qu'un autre valoriserait l'eau à un niveau plus élevé, il faut que les tarifs reflètent les coûts d'opportunité.

C'est dans une logique commerciale qu'il est le plus facile de calculer ces coûts, mais cette logique n'est pas toujours possible à établir, en particulier s'agissant de valeurs environnementales. Les enquêtes visant à estimer les valeurs des usages environnementaux peuvent produire des résultats biaisés, selon le nombre de facteurs proposés dans les enquêtes. En pratique, beaucoup de gouvernements ne donnent guère d'indications sur la manière dont il faut évaluer les autres usages environnementaux. La CE note que lorsque des mesures sont prises pour atténuer les conséquences de la pollution et rétablir la qualité de l'eau, cela peut constituer une base pour la prise en compte des coûts de revient dans le calcul du coût de l'eau. Cela étant, comme le suggère l'Autriche, il n'est pas toujours possible en pratique de déterminer avec certitude la valeur de la pollution si l'on ne peut pas décrire avec suffisamment de précision le système mis en œuvre concrètement.

**Efficience de l'offre**

*(4) Les substituts à une concurrence active – mise en concurrence par étalonnage des performances, concessions privées - peuvent conduire à une plus grande efficience au niveau de l'offre. Ces modes de concurrence au deuxième degré sont surtout possibles dans les marchés comprenant des acteurs privés.*

Le secteur privé n'est pas un acteur à part entière de la fourniture d'eau dans tous les pays de l'OCDE. En Suisse, par exemple, sa participation est limitée parce que l'eau est considérée comme une ressource naturelle très particulière qui doit rester sous le contrôle de l'État. Dans d'autres pays de l'OCDE, notamment en France et au Royaume-Uni, le secteur privé est prédominant dans la fourniture d'eau. Cela ne signifie pas forcément que les sources d'eau ou l'infrastructure de distribution soient aux mains d'entités privées. Au Danemark par exemple, des entreprises ont la possibilité de concurrencer les fournisseurs publics de services liés à l'eau.

Dans le cas de la mise en concurrence par étalonnage, l'objectif est de faire en sorte que tous les fournisseurs soient astreints au niveau du fournisseur le plus efficient. Cela signifie qu'il doit exister plusieurs fournisseurs, de manière à ce que des analyses statistiques soient possibles et que l'on puisse distinguer l'entreprise ou les entreprises les plus efficientes, et imposer aux autres acteurs ces coûts d'efficience dans la fixation du tarif régulé. Depuis que la mise en concurrence par étalonnage a été instaurée au Royaume-Uni, la fourniture de l'eau est devenue sensiblement plus efficiente. D'autres pays, comme l'Australie et les Pays-Bas, mettent en œuvre des formes d'étalonnage économiquement moins rigoureuses ; l'Allemagne a récemment une résolution appelant à la généralisation de l'étalonnage.

Dans le cas des concessions privées, il est essentiel de maintenir des entités gérées par des entités publiques à côté des acteurs privés, de manière à ce que le secteur public conserve une faculté de négociation. Lorsque les dates limites de dépôt des offres sont annoncées publiquement et que les modalités des offres et des contrats sélectionnés peuvent être inspectées par le public, les termes des contrats sont plus avantageux pour les municipalités, comme on a pu le constater en France. Parmi les autres pays de l'OCDE qui recourent, au moins en partie, à des concessions privées pour la fourniture d'eau, citons l'Allemagne, la Hongrie, le Mexique, le Portugal et l'Espagne.

Dans certains cas, les soumissions sont ouvertes à tous les candidats, dans d'autres elles le sont sur invitation. Les contrats ne sont pas systématiquement attribués au soumissionnaire moins-disant, car il se peut que, comme cela s'est produit en Hongrie, les autorités jugent le prix annoncé insuffisant pour couvrir les coûts réels des investissements qui devraient accompagner l'offre. Le choix d'une telle soumission pourrait alors se solder par une renégociation ultérieure.

Même si l'eau reste aux mains du secteur public, le seul fait qu'il existe des alternatives privées peut motiver l'opérateur public à être plus performant.

**Gaspillage et compteurs**

*(5) Le choix des moyens employés pour dissuader les usagers de consommer trop d'eau comporte au moins deux dimensions : empêcher le gaspillage, et encourager une utilisation judicieuse de l'eau. Le gaspillage provient, d'une part des rejets accidentels au niveau du système de distribution, et d'autre part, au niveau des ménages, des robinets qui fuient. L'utilisation judicieuse de l'eau peut se traduire par une réduction de la consommation en période de sécheresse. Les méthodes permettant de lutter contre une consommation excessive sont notamment le rationnement et le relèvement du prix de l'eau. En période de sécheresse, il est souvent fait recours au rationnement des utilisations visibles extérieurement, notamment en limitant les utilisations très dispendieuses comme les arroseurs. Les méthodes plus économiques sont de plus en plus fréquemment utilisées, comme le relèvement des tarifs de l'eau en période de rareté. L'une des techniques les plus évidentes pour inciter à une utilisation parcimonieuse consiste à imposer une surtaxe pour l'utilisation marginale d'eau au-delà d'un certain niveau « de base ». On utilise de plus en plus des mécanismes tarifaires pour réduire la demande, mais ces mécanismes nécessitent la présence de compteurs d'eau. Or, dans certains pays de l'OCDE, de nombreux foyers n'en ont pas et n'en ont jamais eu.*

Les rejets accidentels d'eau peuvent être réduits en taxant les opérateurs sur l'eau ainsi perdue. Quant au gaspillage chez les ménages, les compteurs et la tarification à la consommation constituent un outil important pour inciter davantage les usagers à limiter leur consommation. Certains décideurs publics redoutent que la présence de compteurs ne dissuade certains usagers d'utiliser l'eau pour le nettoyage et l'hygiène, d'où un recul de la propreté et un risque infectieux accru. Ce souci n'est pas à prendre à la légère car l'eau peut constituer une portion non négligeable du budget des ménages les plus pauvres de certains pays de l'OCDE. Pour imposer des surtaxes tout en tenant compte de ce problème, il est possible d'instaurer des tarifs progressifs, dans lesquels le tarif marginal augmente avec le volume d'eau consommé, comme c'est le cas en Pologne. En période de forte sécheresse, on peut appliquer des tarifs saisonniers.

Les compteurs d'eau ne sont pas adaptés à toutes les situations, car le coût de la pose de compteurs dans des constructions déjà existantes et le coût des relevés n'est pas négligeable (il peut atteindre jusqu'à 10 à 15 % de la facture mensuelle). Du fait de ces coûts les compteurs ne sont pas encouragés dans toutes les localités du Royaume-Uni, surtout dans les régions où les pénuries sont rares. La pose de compteurs a plus de chances d'être rentable là où l'eau est rare, là où il existe une consommation de luxe (arroseurs de jardin) et dans les nouvelles constructions car les coûts d'installation sont alors plus faibles. La généralisation des compteurs obligatoires préconisée dans les règlements de la CE n'est pas forcément indiquée dans le cadre d'une analyse coûts-avantages.

**Économies d'échelle et de gamme**

*(6) Dans la construction d'un réseau de distribution d'eau, les coûts fixes sont extrêmement élevés. Il n'y a donc généralement pas la place pour plusieurs opérateurs et plusieurs infrastructures sur un même territoire. Il peut être judicieux pour les petits opérateurs de fusionner ou de regrouper leurs activités, alors que pour de plus grosses entreprises de distribution d'eau, les fusions seront moins porteuses d'économies d'échelle. Entre une entreprise de traitement des eaux usées et une entreprise de distribution d'eau, les économies de gamme sont limitées. En revanche, il existe*

*d'importantes économies de gamme entre le prélèvement, le traitement et la distribution d'eau. Par conséquent il ne faut pas décourager les concentrations verticales dans le secteur de l'eau.*

Quelques pays de l'OCDE, comme la France et les États-Unis, comptent plus de 10 000 entreprises spécialisées dans l'eau, alors que d'autres comme le Royaume-Uni et les Pays-Bas en comptent moins de 50. Certaines études suggèrent que les concentrations entre petits opérateurs pourraient dégager des économies d'échelle. En revanche, pour les plus grands opérateurs, l'augmentation de leur taille ne diminuerait probablement pas beaucoup leurs coûts marginaux ni leurs coûts moyens de production. En Suisse, des municipalités se sont regroupées pour réaliser des économies d'échelle. L'Italie, historiquement caractérisée par une offre fragmentée, encourage le développement de gros opérateurs. Une étude récente réalisée pour le régulateur de l'eau au Royaume-Uni a établi que les opérateurs d'eau ne réalisaient pas d'économies d'échelle et que les économies de gamme entre le traitement et la distribution de l'eau n'étaient pas très élevées.

**Accès des infrastructures à des tiers**

*(7) Il existe une méthode encore relativement peu usitée pour développer la concurrence dans la fourniture de l'eau : donner aux consommateurs la possibilité d'opter pour un autre fournisseur que le monopole historique. Deux approches de base sont possibles : la construction de nouvelles infrastructures pour amener l'eau depuis un fournisseur existant jusqu'à un consommateur situé dans le « territoire » d'un autre fournisseur (contrats « inset » ou enclavés), et l'ouverture des canalisations d'un fournisseur à d'autres fournisseurs (contrats « common carriage » de transport pour le compte d'autrui) donnant lieu à une forme de tarification de l'accès.*

Les contrats enclavés sont indiqués lorsqu'un gros consommateur d'eau est situé à la limite entre les réseaux de deux fournisseurs. La possibilité de choisir son fournisseur peut procurer d'importants avantages à cet usager. Par exemple, une ville de Pologne située à proximité de la frontière avec la République tchèque a choisi de passer contrat avec un fournisseur d'eau tchèque plutôt qu'avec le distributeur en gros polonais, car les tarifs du fournisseur tchèque étaient nettement plus bas.

Il faut veiller à ce que les investissements déployés par l'opérateur historique pour un client particulier ne soient pas absurdement perdus. Le Royaume-Uni n'autorise que les très gros consommateurs (plus de 100 m litres par an sur un site donné) à utiliser le régime de contrat enclavé.

Le transport pour le compte d'autrui vient d'être autorisé au Royaume-Uni. Il permet aux gros consommateurs (plus de 50 m litres par an sur un site donné) de passer contrat avec d'autres opérateurs que leur ancien fournisseur et garantit à ces opérateurs l'accès aux infrastructures physiques de l'ancien fournisseur. Les négociations avec les opérateurs historiques n'ont pas été sans difficultés, ce qui a conduit à l'instauration de règles standard pour les conditions et les tarifs de l'accès. Il ne s'agit pour l'instant que d'une expérience qui n'a pas encore de résultats concluants et le Royaume-Uni n'instaure que progressivement la tarification de l'accès, en réservant cette possibilité aux seuls gros consommateurs d'eau.

# BACKGROUND NOTE

***By the Secretariat***

## 1. Introduction

The supply of water and the treatment of wastewater are often considered as natural monopolies.[1] In the past, the role of competition in these sectors has been very limited, not only because of the natural monopoly characteristics of the industry, but also because of government regulations and artificially low pricing that would deter entry. Governments at local and sometimes national levels made decisions that led to substantial inefficiencies in the allocation of water and to inefficiencies in water company operation. However, there is now an increasing recognition that, while competition may not be feasible in many areas of water operation, there are areas of the water allocation, supply and processing chain in which efficiency can be improved and in which competition can play an important role. The possibilities for such competition are coming to the fore as water and water treatment move toward privatization and prices rise to reflect costs. Regulators, operators, and customers should seriously consider at least some of these options because they can enhance efficiency.

Subsidization has deterred competition in many cases because the cost of water supply and of water treatment has been greater than prices charged. Subsidization existed initially because urban water and sanitation systems were built to increase public health, even though individuals would not have chosen to pay for these systems themselves. The ongoing subsidization has both created a number of chronic inefficiencies in the water distribution and cleaning system as well as deterring entry. In the OECD countries, incomes are now large enough that the costs of water systems can be borne directly by users. As a result, after many years of low maintenance under public governance and of inefficient provision, countries are choosing to privatize operations and to increase prices to reflect the infrastructure costs of water provision, the opportunity costs of the water source, and the infrastructure and treatment costs of wastewater. (OECD (1999))

Clearly, water policy is most complex when supplies are scarce. If supplies are plentiful, the economic problems related to water are primarily (1) making sure an appropriate consumer price is set that will cover fixed costs, extraction and maintenance and (2) enhancing productive efficiency. However, when supplies are scarce, the allocation problem of determining who will receive water is very difficult. Providing a particular user with additional water means depriving another user of that water. Markets are a standard way of allocating a resource in the presence of this kind of scarcity, but they will not always work well with water. There are at least four reasons that pure market allocations will not always work. First of all, rights must be allocated clearly for rights to work and this clear allocation does not always exist. Second, the number of water owners and buyers is limited, so perfect competition will not arise. Third, the social costs of water may not coincide with private costs.[2] Fourth, the social benefits may not coincide with private benefits.[3] These reasons for market failure need not suggest that trading of water rights, for example, would not improve water allocation from its current state. Rather, they suggest that appropriate price or value of water should be based on its value upstream, downstream, and with different users, including the environment. Most importantly, the opportunity cost of water should be taken into account in allocation decisions. (Fisher et al (2000))

Despite the likelihood of at least partial market failure in the water sector, it is worth considering how competition and markets might play a helpful role in increasing efficiency in water provision. There are at least six possible ways of introducing competition that could prove helpful. Some of these are

becoming well-established, while others are more theoretical. Two can help with increasing efficiency in water allocation problem (trading of water rights, competition between water sources) while the others focus more on increasing productive efficiency:

- Trading of water rights
- Competitive incentives for operators (yardstick, concession)
- Competition between water sources
- Competition for processing of wastewater
- Opening pipes to competing water suppliers via access pricing
- Rights to self-operate

Clearly, not all users have an equal ability to benefit from each of these types of competition. For example, individual urban consumers are likely captive to the incumbent firm, so allowing them to extract their own water may not yield significant benefits. In contrast, for example certain large industrial or agricultural users can afford to build their own waste processing facilities.[4]

Some of the methods of increasing competition, such as opening pipes to alternative water suppliers, require active regulatory scrutiny. Therefore the potential for competition should not be used to justify eliminating regulation but could justify changing regulatory schemes and rules.

While this note focuses on competition in water systems, its conclusion is not that competition will solve all supply problems in the water industry. Rather, especially because of the relatively limited experience with many forms of competition, policymakers should carefully balance the costs and benefits of implementing competition schemes prior to large changes. Some methods of injecting competition may prove useful in particular local circumstances, while others may not.

## 2. Political and social objectives

Water supply and wastewater operations are often local issues with limited central government oversight, except with respect to water quality and pollution regulation. But the political sensitivities touched by the organization of water delivery and by the pricing of water are serious. In certain developing countries, price increases have led to social unrest. This is not surprising because even in OECD countries, such as Hungary, Portugal and the Czech Republic, the price of household water can be as much as 3% of average per capita income, and thus considerably more as a percentage for a low-income individual. (p.150, OECD (1999))

While the water facility operations are typically local, the allocative decisions often cover a water basin that crosses many local areas. In conditions of scarcity, allocation decisions must be made between different local areas. When these areas all lie within one country, a national authority can make the decisions, at least prior to trading of water rights. However, when the local areas are found in multiple countries, as with rivers such as the Danube, the Rio Grande and the Euphrates, no international authority exists to allocate the water and resolve disputes.[5, 6] In absence of such an authority, one problem that may arise is that a country will allocate river water to low-value uses in its own country, while creating shortages downstream for high-value users. If water is treated as a good that can be traded, and tradable permits are given to all users, then the water will tend to migrate towards a more efficient distribution in which upstream users will take account of downstream needs. The legal and organizational basis for

allocating rights and resolving international water disputes, though, needs to be improved in order for such permit-trading to have its full effect. (Fisher (2002)) International water regulatory authorities could be desirable for water basins that cross international boundaries. To the extent these can fall under other pre-existing supranational authorities with established legal systems, implementation could be easier.

The three primary consumers of water are households, industry and agriculture. In a sample of OECD countries, consumers represent just 5% of water use, with agriculture representing 30% and industrial use representing 65%. (p.15, OECD (1999)) Estimates for worldwide water usage are quite different, with agriculture responsible for 69% of total withdrawals and industry for 23%. What is common to both estimates is that household use represents the smallest share, with between 5-8%. One important point about these averages is that national or international averages do not provide a good estimate of local water consumption patterns, local costs, or local scarcity. Local conditions govern the water markets throughout the world, and if prices go up in one area, drawing water from a nearby area is often very difficult.

The water sector has a complex set of demands and outputs. The different consumers of water demand different qualities of water. For example, households are generally connected to a provider of potable water. (Potable water can be drunk safely, with bacterial and sedimentary content below certain levels often determined by national law.) This water must be treated before distribution and then distributed, under pressure, through a clean pipe system prior to reaching homes. In contrast, industrial users often do not need potable water for their main applications, although they are often connected to the same water system as consumers and may receive potable water as a result. At other times, industrial users will extract and treat their own water for use. Finally, agricultural users often do not need treated water at all.

Most users of water produce wastewater as a result of their activities. For example, households produce sewage, industrial users often contribute chemicals, power plants may produce water at non-ambient temperatures, and farmers may release pesticides, fertilizers and animal waste into the water system.

It is difficult to devise a regulatory and pricing scheme for (1) delivering water of the quality desired to those who demand it and (2) ensuring that polluters face the costs of keeping the water environment clean. These difficulties are exacerbated by the fact that multiple objectives drive government policy in the water sector. (See p.3, Smith and Hannan (2003).):

- Public health
- Environmental protection
- Affordability for households, particularly low-income households
- Reliability in times of drought
- High productive and allocative efficiency

These objectives sometimes conflict with each other. For example, allocative efficiency may be maximized when every user pays the full delivered cost and opportunity cost of their water use, but this may deter low-income households from using public water, leading to a decline in sanitary standards. Similarly, charging industrial users the full cost of cleaning their wastewater may lead them to dump their waste illegally, reducing environmental quality. To the extent that competitive mechanisms are used, care should be taken to ensure that appropriate weight is given to the objectives. Ways can often be found to

increase efficiency through competition while maintaining other objectives. However, the role for competition in the water sector is probably relatively limited.

## 3. Pro-competitive demand side reforms

In order for the water sector to benefit from competition and market forces, a number of pre-conditions must be met. These conditions are worth implementing even in the absence of active competition between firms providing water because they can help prod the water sector towards more efficient outcomes.

When undertaking supply-side oriented reform, policy makers often neglect the demand side. Two demand-side alterations that would be particularly valuable helpful in the water sector are metering (to increase price sensitivity) and retail water and treatment prices that reflect costs.

### *3.1 Metering*

Where water is scarce, metered pricing is an important mechanism for reducing the use of water. Metering is important for industrial, agricultural and household uses. One of the most politically sensitive areas for metering is household usage. In most OECD countries, the vast majority of single-family homes have been subject to metering, while apartments have typically had very low metering penetration.(p. 46, OECD(1999)) While metering is common in a number of OECD countries, such as Iceland, Ireland, New Zealand, Norway and the UK, metering levels have been very low.

The objective of metering is to ration water by price in periods of scarcity rather than by regulatory fiat.[7] Metering allows consumers to face different payments for different quantities of usage, permitting water companies to raise the price of water during periods of scarcity in order to decrease consumption. One objection to metering that makes it controversial is the fear that low-income households will be deterred from using water if they are metered.

Most water meters are simple, but optimal pricing may require more sophisticated meters. For example, in order to set high volumetric prices in periods of scarcity, information about the dates of usage are important. (Volumetric pricing is based on the quantity of water used. For example, a volumetric price could be expressed as a price/$m^3$ of water.) In fact, water authorities in the UK have even experimented with time-of-day pricing, in which prices increased significantly during a the three-hour peak period each evening in order to reduce system costs, rather than to deal with scarcity. (p.135, OECD (1999))

Metering is costly because of installation and maintenance costs as well as meter reading costs. As a result, metering is most appropriate in localities that are subject to shortages. If supply is always plentiful, the costs of metering may actually outweigh the benefits. The European Commission may be seeking universal household metering even though the costs of metering may not always be justified by local conditions. Britain's water regulator, Ofwat, is opposed to universal domestic metering but in favor of compulsory selective metering when (1) new water resources are scarce, (2) households are consuming significant amounts of "luxury" water (such as for garden sprinklers) and (3) new homes are built because installation costs are modest. (p. 47, OECD (1999))

### *3.2 Retail prices that reflect costs*

Policymakers are increasingly taking the position that water consumers should pay for the full costs of their use, often including pollution as one of these costs, and OECD countries have increasingly started to adopt charging schemes that raise the price to users to a level that is closer to a reasonable measure of costs. In the past, most users have paid prices for water that reflect neither the long-run facility

costs nor the opportunity and externality costs. One example of the changed objectives is found in the European Union's Water Framework Directive. The directive states that by 2010, Member States must ensure an adequate contribution of different water user groups to the recovery of the costs of water service, disaggregated to at least agricultural, household, and industry users.[8]

**Box 1: European Union's Water Framework Directive**

Essentially, the Directive's underlying philosophy is that costs should be transparent and that any failure to make water users responsible for the complete costs generated by their use is a source of water misallocation – one which seriously jeopardizes future generations' access to water. It follows, then, that the implementation of a better level of cost recovery from all water users – including capital costs, environmental damages costs and scarcity rent components – would represent a significant step towards a more sustainable exploitation of water resources.

Although the Directive clearly states that cross-subsidization between sectors should be avoided where it would create misallocation, it would allow Member States to guarantee access to basic volumes of household water at "social" charge rates. Likewise, Member States would be permitted to grant some exemptions based on justified social and environmental objectives, as well as for projects developed in regions entitled to Structural Funds. On the other hand, the Directive also states that any deviations from full cost recovery pricing should be explicit and transparent. (Adapted from p.34, OECD (1999))

One reason for the increasing popularity of the cost-recovery approach is that, in times of budget shortages, the costs of providing water are rising, especially as a result of the introduction of stricter water quality regulations and the need for significant maintenance on existing infrastructure. It is increasingly accepted that, as long as a safety net exists for the low-income households, variable costs should be recovered from the users and fixed costs should be recovered from users as well. An ideal system of water rates for existing customers may provide a fixed monthly charge for connection, to recover fixed costs arising primarily from infrastructure costs, complemented by charges for marginal use that reflect marginal costs of supply. Table 1 shows the household tariff structure in place in most OECD countries.

**Table 1. Public water supply: household tariff structure**

**(% of utilities [U] or population [P] with a given structure)**

| | Year | No. utilities in sample (and % of pop. represented | Unit | Flat fee | CONSTANT VOLUMETRIC RATE | | | INCREASING-BLOCK SCHEDULE | | | DECREASING-BLOCK SCHEDULE | | | Normal number of blocks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No fixed charge | Plus fixed charge | Plus fixed + min. | No fixed charged | Plus fixed charged | Plus fixed + min. | No fixed charge | Plus fixed charge | Plus fixed + min. | |
| Australia | 2000-1 | 17 (72%) | P (U) | - | - | 73%(12) | - | - | 27%(5) | - | - | - | - | 2 |
| Austria | 1999 | 71 | U | 1 | 5 | 65 | - | - | - | - | - | - | - | - |
| Belgium | | | | | | | | | | | | | | |
| Brussels | 2001 | 2 | U | - | - | 1 | - | - | 1 | - | - | - | - | 2 |
| Flanders | 2001 | 17 | U | - | - | - | - | - | 17 | - | - | - | - | 2 |
| Wallonia | 2001 | 46 | U | - | 4 | 21 | - | - | 17 | - | - | 4 | - | 2 |
| Canada | 1999 | 1214 (77%) | P | 43% | ← | 36% | → | ← | 9% | → | ← | 12% | → | 2 |
| Denmark | 2000 | | U, P | rural | ← | most | → | | | | | | | - |
| Finland | 2000 | | U, P | - | - | 100% | - | - | - | - | - | - | - | - |
| France | 1990 | 500 | U | 2% | 5% | 46% | 47% | - | - | - | - | - | - | - |
| Germany | 2001 | 1030 | U, P | - | <5% | >95% | - | - | - | - | - | - | - | - |
| Greece | 2002 | | U | rural | | | | - | ← most → | | | | | 5 |
| Hungary | 1997 | 268 | U | - | 95% | - | - | 5% | - | - | - | - | - | 2 |
| Iceland | 2002 | | U, P | all | - | - | - | - | - | - | - | - | - | - |
| Ireland | 2002 | All domestic water charges have been consolidated into general taxation since 1 January 1997 | | | | | | | | | | | | |
| Italy | 1998 | | P | - | - | - | - | | - | 100% | - | - | - | 3-5 |
| Japan | 1998 | 1900 | U | - | - | - | 42% | - | | 57% | - | - | 1% | 2-7 |
| Korea | 1998 | | P, U | - | - | - | - | ← | 100% | → | - | - | - | 6-10 |
| Luxembourg | 1997 | 118 | U | - | ← | some | → | ← | some | → | ← | some | → | 2-3 |
| Mexico | 2002 | | U | - | - | - | - | ← | most | → | ← | most | → | 6-7 |
| N. Zealand | 1998 | | P | 75% | - | 25% | - | - | - | - | - | - | - | - |
| Netherlands | 1998 | 18 | U | - | 1 | 16 | - | - | 2 | - | - | - | - | 2 |
| Norway | 2002 | 23 | P | 87% | - | 13% | - | - | - | - | - | - | - | - |
| Poland | 1998 | | P, U | - | - | most | | | | | | | | |
| Portugal | 2002 | 23 | U | - | - | - | - | - | 23% | - | - | - | - | 3-5 |
| Spain | 2001 | 700 | P (U) | - | ← | 10%(<200) | → | ← | 85%(<500) | → | ← | 5%(15) | → | 2-5 |
| Sweden | 2000 | 288 | U | - | - | 100% | | - | - | - | - | - | - | - |
| Switzerland | 1998 | All | P (U) | - | - | 95%(235) | - | - | 5%(1) | - | - | - | - | 2 |
| Turkey | 1998 | | P | Rural | - | - | - | ← | 100% | → | - | - | - | 3 |
| UK | 1998 | | | | | | | | | | | | | |
| Eng. And Wales | 2002 | All(26) | P | 77% | - | 23% | | - | - | - | - | - | - | - |

| | Year | No. utilities in sample (and % of pop. represented | Unit | Flat fee | CONSTANT VOLUMETRIC RATE | | | INCREASING-BLOCK SCHEDULE | | | DECREASING-BLOCK SCHEDULE | | | Normal number of blocks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No fixed charge | Plus fixed charge | Plus fixed + min. | No fixed charged | Plus fixed charged | Plus fixed + min. | No fixed charge | Plus fixed charge | Plus fixed + min. | |
| Scotland | 2000 | All (3) | P | >99% | - | 0.014% | - | - | - | - | - | - | - | - |
| N. Ireland | 2002 | All(1) | P | 100% | All domestic charges met from general taxation | | | | | | | | | |
| US | 2002 | 145 | U | 1% | 1% | ←35% | → | 1% | ←33% | → | ← | 29% | → | 2-4 |

Australia: Tariff structure applies to year to 30 June 2001.
Austria: Raw tariff data for 71 municipalities was provided by Federal Ministry of the Environment.
Belgium: Tariff structures with free allowances per household or per capita designated as increasing block.
Canada: Figures refer to % of population sample (=75% of national population) served by each tariff type.
France: Old survey data. Water law of 1992 ruled out (minor exceptions) i) flat-fee and ii) const. vol. rate+fixed+min.charge, which are now in decline
Germany: At most, 5% of utilities apply a linear tariff with no fixed element.
Italy: A very small fixed charge (meter rent) is applied, and often a free minimum allowance as well. The minimum charge, which constitutes the first (lowest-priced) block, charged at the basic rate, is being phased out over four years, from April 2001.
Japan: Water utilities levy a minimum charge but generally do not impose a separate fixed charge.
Netherlands: One utility (Wgron) offers domestic consumers a free allowance of 25 or 28 $m^3$/year/household, and another (Brabant Water) gives household consumers in one of its four districts a free allowance of 15$m^3$/year/household.
Portugal: Information applying to 23 larger water supply utilities.
United Kingdom: In all parts of the UK except Northern Ireland, a choice of domestic metering (and volumetric charging) is available to all households, except those living in new houses (which are generally metered when they are built); and i) users of garden sprinklers and swimming pools and ii) certain other selected groups of high-use houses or households are also compulsorily metered.

Source: OECD (2003a)

Historically, general funds paid for most water infrastructure and maintenance rather than user fees. Collecting general funds, however, actually creates significant deadweight losses because people become less inclined to supply work and to save as income tax rates increase. There is thus a cost of collecting each unit of general revenue from income taxation that can amount to 26% to 126% of the revenue. (See OECD (2003b).) When a product has highly inelastic demand, such as monthly water subscription, user payments can create less deadweight loss than income taxes, because raising the tax payment from a water charge will not discourage very many people from subscribing to water services.[9] For example, under reasonable assumptions, with highly inelastic demand for monthly water subscription, a doubling of the monthly water subscription charge will lead to no more than a 15% deadweight loss from the charge.[10] Creating a monthly charge when none exists will lead to only a 5% deadweight loss for each unit of revenue raised.[11] Comparing the deadweight losses from monthly charges to those from income taxes, monthly charges have lower deadweight losses than income taxes. A more extensive analysis would be required to compare the deadweight losses from monthly water charges to the losses that arise from all the forms of national and local taxation.

Not all member countries have moved in the direction of cost-based charging. For example, in Ireland, water charging was historically left to the discretion of local authorities. While poorer municipalities (typically rural) imposed charges, wealthier cities such as Dublin and Limerick did not. (p.161, Owen (2002)) Since Jan 1, 1997, Ireland has abolished all water charges. (OECD (1999))

Charging prices for marginal usage that are based on marginal costs of production may not always be feasible because of the inflexibility of supply. That is, at times there may be no additional marginal supply. Identifying a relevant marginal cost in this situation is not possible, but finding a price that would equate supply and demand is possible. Thus it is very important to know about the features of the demand curve for water when setting prices during scarcity. (See Hanemann (1993).) Price rationing will normally yield superior efficiency outcomes than physical rationing of water. But for reasons of distributional equity, physical rationing is sometimes chosen to as a preferred option for dealing with scarcity.

Note that the economic losses from below-cost pricing are substantial, especially in situations of shortage. Water may be used for purposes which the consumer has a value below the actual cost of the water, such as intensive irrigation on arid land, while other consumers with much higher values for water are left in a position of shortage. For example, when farmers receive water at prices below cost, they may both (1) adopt an inefficient mix of crops and (2) adopt an inefficient irrigation technology, such as open-field irrigation as opposed to trickle irrigation.

Arguments have been made that farmers should not face cost-based pricing when they have historically received water at prices significantly below the variable costs and at prices that would not recover infrastructure investments. The reason is that the value of “under-priced” water has been capitalized in the acquisition price of the farmland. The “water value” of a farm can be quite significant. A study of similar farmland with and without water rights in New Mexico, Oklahoma, Colorado, Kansas and Nebraska shows that “water value” makes up 30-60% of the farm sale price. (Torrell et al (1990)). If water prices went up suddenly, farmers would not be able to pay their mortgages. Even though farmers often do not have permanent and guaranteed legal rights to subsidized water, it may be difficult to change existing practice for equity and political reasons. Increasing the extent to which all water users, including farmers, face appropriate incentives to use water carefully is nonetheless of critical importance for long-term water supply in arid and semi-arid areas. A number of practical solutions to the problem of “water capitalization” exist including gradual (but predictable) increases in prices over a long term so that farmers would be able to meet mortgage obligations, direct capital payments to farmers, and allowing farmers to better treat their asset by giving them the right to trade their water asset.

**Box 2: Australian water reform**

One of the best example of implementing water reform has been provided by Australia. As reported in OECD (1999) "Australia has gone further than most countries in reforming its agricultural water pricing arrangements. Some of the most important structural aspects of these reforms have included:

- Further abstractions in over-appropriated basins were capped. (An abstraction is the act of drawing water from a water source, such as a river or aquifer.) Water could no longer be made available to any applicant who wanted access to the resource. In general, environmental quality enhancement became one of the government's top priorities.
- The new pricing criteria could not discriminate among farmers, land quality, or any other factors. Prices would henceforth be set in line with estimated water supply costs. The estimation procedure was designed at the Federal level, following lengthy negotiations, and was set in such a way that each water user of sector should cover the costs it generated on its own.
- The procedures used to estimate water service costs should be respected by individual States, so that price distortions across borders would not exist.
- Water entitlements were converted into tradable property rights. Those farmers who do not generate enough net returns to pay the new water prices are allowed to sell their entitlements. Because of the difficulties of implementing such a system, trading of water entitlements is being introduced progressively."

## 4. Market-oriented mechanisms

In order to favour competition, a number of supply-oriented rules and regulations may require implementation. These include:

- Clear and enforceable allocation of water rights for trading
- Construction of long distance water transport to enhance trading and supply competition
- Competitive incentives for operators
- Mandated interconnection between water systems with access pricing
- Permitting multiple firms to abstract water and treat wastewater
- Permission for self-abstraction and self-processing of wastewater where there are limited externalities from multiple abstractions from the same source

These elements are all discussed below as options for increasing competition.

### *4.1 Trading of water rights*

In the conditions of scarcity common in arid and semi-arid climates, the problem of allocating water between different users is substantial and politically charged. Often, the scarcity arises from the combination of usage by agricultural, industrial and household users. The distribution of water rights to these users is one of the most difficult problems that faces policymakers because of both political lobbying and insufficient information to decide on efficient allocations. Enabling the trading of water rights would improve the efficiency of the allocation and reduce political complexity.

The allocation of water rights has often been accomplished by a political process in which the division of these rights between different groups fails to achieve a high-welfare allocation. Often, for

example, the agricultural sector has received rights that it values at a lower level than the urban water sector. This inefficiency can be particularly substantial in the water industry. (See Box 3 below.)

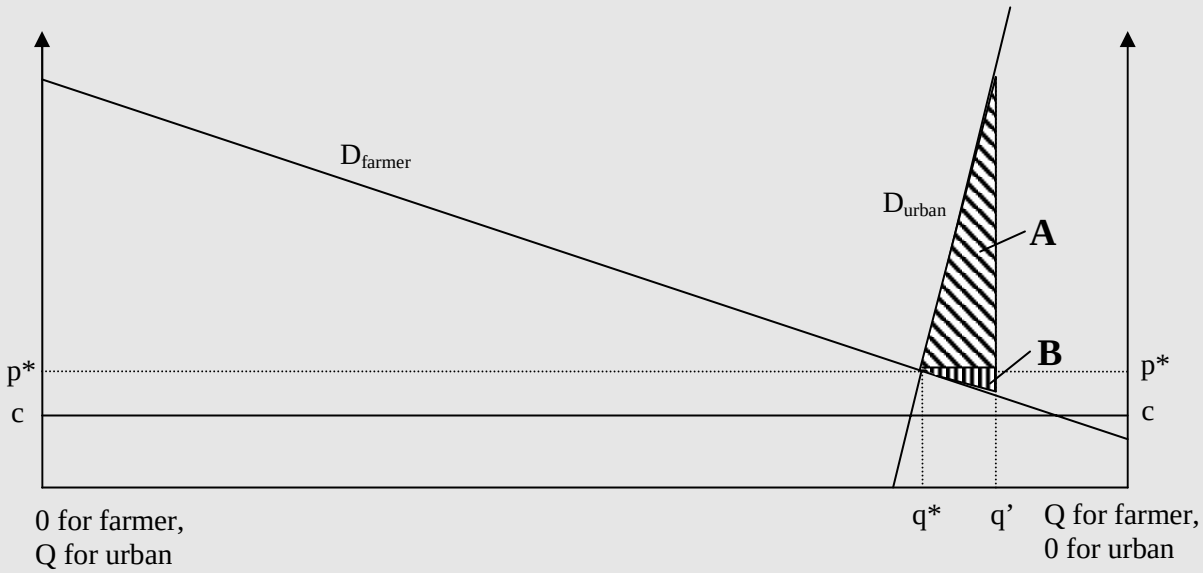
**Box 3: Problem of Allocative Efficiency Between Farmers and Households**

Most observers agree that significant misallocation of water exists between different user groups. In particular, in some arid climates, farmers receive sufficient water to grow tropical and sub-tropical crops while urban water systems face significant and permanent water shortages. The cost of these misallocations can be estimated using a model that calculates the potential gains to urban areas for more water, the potential losses to farmers from less water, and assumes that the "correct" allocation equates the marginal value of water for farms with that for urban areas.[12]

This calculation is rarely made and, as a result, the benefits of water trading are rarely calculated correctly. For example, studies exist of the benefits to farmers of making trades, which may show that existing water rights owners receive only modest benefits from trades. But the benefits of trade to farmers who sell are likely to be very modest compared to the benefits of trade to urban users who buy. This is because farmers have relatively elastic water demand curves while urban users have relatively inelastic water demand curves. These relative elasticities are not surprising since, for farmers, water is just one input into a business process that permits technological substitution between different crops and irrigation methods. In contrast, people need water to survive and keep clean, so at least at a basic level, demand will undoubtedly be highly inelastic.

The figure below provides a basic illustration of how to calculate the potential social welfare in a system with fixed production of a water *Q*, due to scarcity, and two different types of consumers (farmers and households).[13]

The farmer's demand curve ($D_{farmer}$) is overlaid with the household demand curve ($D_{urban}$), but on different sides of the scale. As usual, social welfare is maximized where the marginal value to different users is




equivalent. (We show demand curves in which existing and equilibrium prices are greater than costs.)

Suppose the initial allocation was determined by political allocation, yielding a quantity for farmers of *q'* and a quantity for urban users of *Q-q'*. Then a trade from the existing allocation of *q'* to the social maximizing point of *q** would occur at the price *p**. At *p**, farmers and urban users value marginal consumption to the same degree.

However, note the effect of the elastic demand by farmers. The farmers have a very modest benefit from trade, represented by the triangle *B*. In contrast, the urban users have an inelastic demand, represented by a very steep demand curve. The urban users gain *A* by moving from the initial political allocation to a market-based allocation. The area of urban gain (*A*) is many times greater than *B*. Thus calculations of the social benefits of trade that are based on the benefits to the farmer alone will yield large underestimates of the total gains of trade.

This figure suggests that with

- an estimated demand curve for farmers and
- an estimated demand curve for urban users, and
- knowledge of total potential output,

a rough estimate can be made both of the price that would make urban users and farmers value water equally and the benefits to each category of user from trading their water rights.

The best way to ensure that water reaches its highest value users is to allow users to trade rights between them. (Thobani (1997)) Those who choose to trade water will typically be those who receive relatively modest direct benefits from the water, such as farmers with unproductive soils and uncertain water supplies. (Taylor (1995)) The purchasers of water rights may be others within the sector (intrasectoral trades from farmers with poor soil to farmers with good soil) or other sector's users (such as intersectoral trades from farmers to urban water companies.) Five prerequisites must be met before trading can occur:

- attribution of water rights must be clear,
- ability to enforce these rights must exist,
- rights must be tradable,
- trading system for connecting buyers to sellers must reduce transaction costs, and
- transport from sellers to buyers must be feasible.

These conditions are discussed below.

### *4.1.1 Rights attribution*

Water rights are more complex to define than might initially appear. A farmer, for example, may normally have the right to a certain quantity of water during a time of plenty, but will often have the right to less water in a time of drought.[14]

There are three primary schemes of apportioning rights to water: riparian, priority rights and proportionate rights. Under a riparian setting, water consumers who are immediately adjacent to a river have the right to extract water, as long as they return the water to its source. Water consumers who are not adjacent to a river have no rights to its supply. With priority rights, each new user is given a priority, with the last users receiving lowest priority to water. Thus in times of scarcity, the last to receive a grant of a water right within a water basin will have their right curtailed the most. In contrast, under a proportionate rights system, each user is given a right to a share of the available water in a basin for a given period of time. Thus, in times of water shortage, all users will lose an equivalent percentage of their "non-scarcity" water. The "quantity", under an established right, will often be variable.

The riparian legal doctrine of water rights is not consistent with the free trade of water. The legal basis for water allocation has been altered in some cases where a riparian doctrine was the initial legal setting. For example, in the Sacramento River basin, a riparian doctrine operated until the California Water Project was developed. This project takes water from the Oroville dam and releases it to the Sacramento River in northern California from where it is diverted to central and southern California. (p. 29, Simpson and Ringskog (1997).)

In defining the water right, the delivery point of the water will be specific to a given location. Current rights may include delivery to the farm. But tradable rights could include locations at the point of origin of the water or anywhere along its present path. Moreover, the rights include an obligation to make a payment to the water distribution authority and the future payment levels are unknown.

These prices paid to the water distribution authority may be subject to variation. Especially if water rights have been priced below cost in the past, the prices may rise in the future. In that instance, the value of the water right would fall dramatically. In order to ensure that investors and other purchasers are most willing to purchase water rights, it is important for government and regulators, at all levels from local to national, to clarify the expected path of charges over time as well as expected changes to regulatory regime.

The rights can either be short-term or long-term rights. Some urban water authorities are interested in making advance purchases of options to purchase water in times of scarcity rather than purchasing absolute free and clear ownership rights.

#### *4.1.2 Rights enforceability*

Rights must be enforceable, otherwise water theft or non-supply will prevent system equilibrium. For example, small farmers could trade their irrigation rights to urban users but, in a low-enforcement environment, they might be able to draw water from irrigation canals even after trading their official rights. Enforcement depends critically on two factors: reliable measurement of usage and prompt and appropriate penalties for non-permitted users.

#### *4.1.3 Rights tradable*

Even when rights are clearly defined and enforceable, they are not necessarily tradable. In Spain, for example, water use rights are clearly defined and are strongly connected to land use rights. As a result, water markets are not permitted because of the linkage between land and water rights. In countries with such systems, it is worth considering a change in the property legislation so that water rights become distinct and separable rights.

#### *4.1.4 Market mechanism exists*

A market mechanism must exist for trading to operate well. The mechanism will ideally allow a buyer to meet sellers in a low-cost environment and quickly and cheaply assure the legitimacy of transactions.[15] It is not necessarily the role of the government to set up the market mechanism, but the legal system will have to be sufficiently developed to provide the necessary support for potential disagreements within such a market.

#### *4.1.5 Feasible transport*

Feasible transport from the seller to the purchaser is a necessity for active trading. The complexities of organizing access to long-distance paths owned by a water company may mean that individual sellers, such as farmers, face only one buyer. More generally, when sellers and buyers are

arrayed along a common water path, such as a canal, it is important that buyers be able to negotiate reasonable terms of access to the canal. When such transport mechanisms do not exist, the government can play an important role in making new facilities possible by aiding in the permit and land requisition process for building new water transport infrastructure.

*4.1.6 Benefits of trading*

When trading is introduced, substantial improvements in social welfare can occur. The most likely form of trading would be between agricultural and urban users in contexts with a limited supply. Often, agricultural users pay prices that are far below cost-recovery and thus even further below the "optimal" price. In contrast, urban users are increasingly paying prices the more closely approximate cost-recovery. More importantly, urban users place a higher value on water than agricultural users, but they are not typically allowed to buy the rights of the agricultural users. Water sales by farmers would require part of a farmer's land to go fallow, a crop change, or an improved irrigation method. Selling of water rights can offset the losses incurred from these changes in a farmer's approach to water use. In the absence of trading, the costs of this misallocation are very substantial.

To illustrate the benefits and problems in trading, examples are helpful. For this purpose, we examine trading of water rights in California and Chile.

In response to a drought in 1976 and 1977, the US Bureau of Reclamation established a water bank in the Central Valley Project. This organization bought more the 57 million cubic meters of water within the system for an average price of $40 per thousand cubic meters. The water bank then sold this water to agricultural users with "critical needs" for an average price of $41 per thousand cubic meters. The water bank primarily provided water to perennial crops, such as orchards, that might have been lost otherwise. (p. 30, Simpson and Ringskog (1997)) The water bank operated exclusively within the agricultural sector and urban users were not permitted to purchase water.

The state of California established a water bank to help with the drought of 1987 to 1992. The Department of Water Resources purchased more than 975 million cubic meters of water for an average price of $102.50 per thousand cubic meters, for a total investment of about $100m. The water was then sold for $144 per thousand cubic meters, plus the cost of transportation. The purchasers were primarily high value-agricultural users and urban water systems, with municipal users in Southern California and the San Francisco Bay area purchasing 80% of the water. The government operation of the system led it to purchase water before buyers were found, and ultimately, only half of the purchases water was sold, because the drought ended. (pp.31-32, Simpson and Ringskog (1997))

These are examples of government-organized trading. One reason for government intermediation has been to avoid the claim that water sellers are receiving unmerited gains from the sale of their rights. In the 1976-77 case, water was purchased from agricultural users and sold only to agricultural users, reflecting a political decision about water use rather than an economic decision. In the second case, water was sold in a more economically rational way, but the government accumulated water supplies without trying to ensure that there were sufficient buyers for its stake. It is unlikely that a profit-oriented intermediary would have bought so much surplus water.

For an example of a real free market in water supplies, in which water rights were traded without a government intermediary, Chile merits examination. It has been a leader in adopting free markets for water rights. Active trading has not developed in all areas of the country. But in the Limarí Valley, buyers purchased at least 7.2m cubic meters of water per year. In addition to permanent sales of rights, there is an active spot market in drought years. (pp.32-33, Hearne and Easter (1995)) The conditions for trade in the Limarí Valley have been eased by the existence of reservoir storage in the valley, adjustable canal gates

with flow meters, and access by purchasers to the canal system. Social gains have amounted to about $25m USD.

### *4.2 Competitive incentives for operators*

Private operation in an unregulated natural monopoly such as water distribution could lead to excessively high prices. Thus regulation of prices is typical for water supplies. In an effort to achieve private sector competitive incentives under regulated prices, two primary types of solutions have been adopted in the water sector. The first solution is concession operation, in which the local government or combination of local government maintains ownership of the infrastructure of a water supplier while a concessionaire operates the system and maintains the infrastructure. Potential concessionaires compete with each other to offer the best deal to the local government(s) (and consumers) and the potential concessionaire who offers the best deal to the local government(s) is chosen. Concession operation has existed in France and Spain for much of the 20th century.

The second solution is "benchmark" competition, as described in Shleifer (1985) and Littlechild (1986) in which a series of natural monopolies are compared to each other, with the most efficient operator being identified and allowed to earn a very healthy profit on its activities. The prices for the other operators are linked to the price and markup of the efficient operator, so that their inefficiencies are subtracted directly from their profits.[16] "Benchmark" competition is a recent concept and strongly associated with the UK's regulatory reforms of the 1980s and 1990s. We proceed to discuss concession operation methods first and then benchmark competition.

These semi-competitive solutions rely on private sector operation and effectively presume that government operation of water infrastructure leads to inefficient operations. Some evidence suggests that public water companies are actually more efficient than private companies on average but that public operations have a broader range of efficiency levels. (Battacharyya (1994)) An estimate comparing public and private US water companies suggests that government operation is 23% less costly than private operation (Bruggink (1982). But others argue that private companies tend to be asked to run the more difficult utilities and that this explains the difference between the public and private companies. Table 2 outlines the water supply ownership, management and regulatory structures adopted in most OECD countries.

**Table 2. Institutional arrangements in OECD countries**

| | Public supply | Ownership[1] | Management | Economic Regulator | Environmental Regulator |
|---|---|---|---|---|---|
| Australia | Regional/Municipal | Both | Both | Regional/indepen. | Provincial govts. |
| Austria | Municipal | Public | Public | Municipal | Central govt. |
| Belgium | Intermunicipal | Both | Both | Federal govt. (prices) | Regional |
| Canada | Regional | Public | Public | Provincial govt. | Provincial govt. |
| Czech Republic | Municipal | Private | Both | Central govt. | Central govt. |
| Denmark | Municipal | Public | Public | Municipal | Central govt./municipalities |
| Finland | Municipal | Public | Public | Municipal | Central govt. |
| France | Municipal | Public | Both | Municipal | Central govt. |
| Germany | Inter-municipal/ Municipal/Regional | Both | Both | Municipal/Region | Regional |
| Greece | Municipal | Public | Public | Central govt. | Central govt. |
| Hungary | Municipal | Public | Both | Central govt. | Central govt./independent |
| Iceland | Municipal | n.a. | n.a. | n.a. | Central govt. |
| Ireland | Regional | Public | Public | Regional | Central govt. |
| Italy | Municipal | Public | Public[2] | Central and region. Govts. | Central and regional govts. |

| | Public supply | Ownership[1] | Management | Economic Regulator | Environmental Regulator |
|---|---|---|---|---|---|
| Japan | Municipal | Public | Public[2] | Central govt. | Central govt. |
| Korea | National/Regional | Public | Public | Central govt./regional | Central govt. |
| Luxembourg | Municipal | Public | Public | Municipal | n.a. |
| Mexico | Municipal | Public | Both | Central govt. | n.a. |
| Netherlands | Municipal | Public | Both | Central govt./regional | Central govt./ regional |
| New Zealand | Municipal/Regional | Public | Both | Central govt. | Central govt. |
| Norway | Municipal | Both | Both | Central govt. | n.a. |
| Poland | Municipal | Public | Public | Municipal | Municipal |
| Portugal | Municipal/Regional | Public | Both | Central govt. | Central govt. |
| Spain | Municipal | Public | Both | Central govt. | Central govt./independent |
| Sweden | Municipal | Public | Public | Municipal | Regional |
| Switzerland | Municipal | Public | Public | Central govt. | n.a. |
| Turkey | Municipal | Public | Public | Central govt. | Central govt./Regional |
| United Kingdom (England and Wales) | Regional | Private | Private | Independent | Independent |
| United States | Municipal | Both | Both | Independent | Independent |

n.a. not available

1. "Both" means public and private ownership structures co-exist.

2. Private management exists but is marginal.

Source: OECD (2003a).

### *4.2.1 Concession*

Under a concession system, the concessionaire operates, manages, maintains and takes the commercial risks associated with the operation of the water utility, while a local government or group of local governments own the underlying assets. Competition can occur when the government decides which concessionaire to select. The concessionaire will usually either have the service delegated to them, and receive remuneration based on customer bills, or enter into a service agreement in which the company is paid directly by the local authority.

Two large potential problems with concession competition arise: the first is from long-term contracts (that yield infrequent competitions) and the second is from post-signature renegotiation (that may distort competition ex post.) Long concessions are important for creating incentives for the concessionaire to invest in maintenance, while short concessions yield more frequent competitive tendering. There is thus a trade-off between maintaining investment incentives and maintaining effective competition.

Post-signature renegotiations are likely to have more significant impacts when contracts are long. Williamson (1976) provides a good example of the impacts of renegotiation in a concession environment. In Williamson's example, a cable operation was tendered in Oakland, California. The winning tender involved a very low price to the community and high level of service. However, after the winner was chosen, the winner quickly began to argue that its price offer was too low and its promised level of service too high. The local government ultimately agreed to revise the conditions of the contract, so that the initial bidding through tendering was actually not a real competition, because the terms of the contract were not binding.

There is substantial evidence that in a concession environment, public and transparent tendering yields better conditions for consumers. In France prior to 1993, open announced tenders were relatively rare for water concessions. Rather, the same concessionaire almost universally remained as manager of a local water company from one contract expiration to another. In France, three large multinational

companies have the largest market shares, Vivendi Water, Suez-Ondéo and SAUR-Bouygues. (p.115, OECD (2002)) During the ten years before 1993, "The rapid rise in the price of water….and the consequences of the lack of transparency made the general public suspicious about the management of water services in France." (Brunet et al (2002)) A number of corruption scandals at the municipal water level involving water operators put pressure on the central government to take action. Since January 29, 1993, the *loi Sapin* has required an open tendering process for water management contracts and has limited the length of contracts.

Open tendering has led to a dramatic shift in the French industry.[17] The act required that a tendering process be used that begins with a public notice of the tender and an evaluation of all offers. Based on the evaluation of hundreds of contract renegotiations, the average length of contracts has fallen from 17 to 11 years. In 80-90% of cases, the existing operator has still won the contract, but an average of 2.4 bids were received for each opportunity. However, smaller independent operators are increasingly acquiring contracts. Prices have fallen by 10% compared to the average pre-tender price.[18]

### *4.2.2 Benchmark competition*

Benchmark competition establishes an ideal performance cost level known as a benchmark and then applies prices that return reasonable profits for this cost level to *all* firms in the sector. Each firm may receive a different benchmark price because the efficient costs attempt to account for the heterogeneity of cost structures across firms. Therefore price regulation must occur at a level broader than the local level. The most prominent example of benchmark competition is in the UK, where the regulation for England/Wales has been overseen by the Office of Water Services (Ofwat), initially with 39 different water companies. (Sawkins (2001)) The water companies submit their operating data to Ofwat which analyzes the data in two stages. In the first stage, Ofwat develops an econometric model to identify the relative efficiency of each water company compared to the industry average. In the second stage, Ofwat uses the model to estimate which of the companies is most efficient, or furthest ahead of the industry average. These few companies (or this company) are then used as the benchmark for competition.[19]

The new price for the industry is then set based on the former price, adjusted for inflation and set to ensure the benchmarked firm receives a high return.[20] The theoretical value of benchmarking lies in a firm not being able to influence the price it is allowed to set, so regulatory manipulation is not possible. The incentives to operate efficiently, over the short-run, are thus high, because the firm will be allowed to keep the profits from its efficiency. The incentive to invest excessively (as would exist in a rate-of-return regulation) is absent, because most firms do not see any relationship between their price and their investment levels. (See Shleifer (1985).) Benchmark competition is further explained in Box 4.

**Box 4: Benchmark competition**

The most basic problem in regulated industries is how regulators can determine appropriate prices to ensure that regulated firms will choose to invest appropriately and operate efficiently. The most simple form of regulation, in which firms are denied monopoly profits by ensuring that their prices do not exceed their costs, is cost-of-service regulation. In cost-of-service regulation, while the regulator ensures that a regulated firm's costs are covered by the compensation scheme, the firm receives no reward for cutting costs. Thus the incentive to achieve productive efficiency is weak.

How can these incentives be strengthened? One of the key observations supporting benchmark competition is that if a regulator does not base an inefficient firm's compensation on the firm's own costs, then the firm will have strong incentives to lower costs immediately, because lower costs will lead directly to increased profits.[21] (See Shleifer (1985).) In contrast, under cost-of-service regulation, lower costs will not necessarily lead to higher profits. The idea of benchmark competition is that the regulator would use the costs of comparable firms as a basis for estimating the attainable cost of the regulated firm.

The benchmark model assumes that firms maximize profits but that, as long as profits are not at stake, managers exert as little effort as possible. Reducing costs from the current (inefficiently high) level requires investment by the firm. The regulator has no information about how the firm could reduce its costs, but does have a price-setting rule. The regulator must establish a rule for compensating the firm. In benchmark competition, the price-setting rule states that the "allowed costs" of a given firm are based on the observed costs of other firms. If there are multiple identical firms, operating in distinct markets so that they do not interact with each other, then the rule may also simply state that the allowed costs will be those of the lowest cost firm. When there are multiple heterogeneous firms, the regulator gathers information to estimate, by regression, the allowed costs to a firm based on its combination of characteristics. As long as the regression equation is an appropriate characterization of how the possible differences between firms affect their attainable costs, the regression can yield an estimate for a given firm's attainable cost that is independent of the firm's own behaviour.[22]

By ensuring that prices are at the minimum level, consumer's will pay the appropriate price for the product, whether that is marginal cost (assuming a government transfer to the regulated firm) or average cost.

The great advantage of benchmark competition is that regulators are not required to estimate what a firm should do in order to operate efficiently. Thus informational requirements for the regulator are not great. However, regulators must have a stern will. Shleifer says, "It is essential for the regulator to commit himself not to pay attention to the firms' complaints and to be prepared to let the firms go bankrupt if they choose inefficient cost levels." (p323, Shleifer (1985)). For water companies, we might wonder whether it is appropriate for a regulator to allow a water company to go bankrupt, because the social value of regular, stable water supply outweighs the benefits that could arise from the disciplining effect of potential bankruptcy. The "stern will" must apply not only to firms' complaints but also to mergers, as suggested in Box 5.

**Box 5: Benchmark competition and merger policy**

Benchmark competition has direct relevance to merger policy. If a benchmark system has been adopted, then financial and performance data for each firm is provided to a central authority for establishing the benchmarks. The central authority needs observations from a large number of water companies in order to produce a statistically reliable estimate of the efficient production frontier. Horizontal mergers can dangerously reduce the already limited quantity of independent observations available to regulators. This merger problem has occurred in the UK, which has seen its initial 39 vertically integrated water companies fall to as few as 24, as of 2002.

In the long-running Vivendi Water UK plc and First Aqua merger case, the issues of observational independence served as the primary basis for Ofwat and the OFT to object to the merger and for the Competition Commission to require remedies. In this instance, Vivendi owned three water companies (Three Valleys Water, Tendring Hundred and Folkestone & Dover) and held partial ownership stakes in two others (Bristol Water and South Staffordshire.) First Aqua owned Southern Water, which was Ofwat's leading comparator and thus the most important company for setting the benchmark efficiency level that would influence the prices that other utilities could charge.

In 1995, a merger filing was made between Vivendi and First Aqua. Two distinct problems could arise from such a transaction: first, the number of independent observations would fall, as common ownership clouded the distinction between different regional water companies. Second, Southern Water would lose some of its incentive to operate at the efficiency frontier, because if it were to reduce its efficiency, other firms in the Vivendi network could benefit from the reduction in "comparative" competition because they would be allowed to have a higher markup over their costs.

The European Commission derogation of the case to the UK authorities, in March of 1995, required that "the minimum number of independent water companies should not be higher than is necessary to ensure the effective operation of the regulatory regime." (OFT (2003b)) Ofwat and the OFT ultimately judged that the decline in the number of independent firms would be significant and that while the harm arising from this decline in accuracy would be difficult to estimate empirically, it could be substantial. Ultimately, The Competition Commission published its report on the transaction on 8 November 2002 (Cm 5681) which was somewhat sceptical about the size of remedy that would be required in a water merger transaction. Ofwat states, "there is no objectively identifiable 'minimum number' of comparators required to ensure that the models are effective as suggested by the EC decision." (p.5, OFT (2003b))

In order to preserve independence in comparative competition regimes, it is important to limit or entirely prevent horizontal mergers. This may be particularly reasonable when (1) there are few economies of scale and scope from joining together different utilities (particularly adjacent ones), (2) managerial expertise from outside the system is allowed to enter through acquisition, as has in fact been the case in the UK water systems, and (3) continued efficiency gains are possible for water companies.[23]

The concerns of Ofwat may have been particularly strong because Southern Water was the leading comparator. Ofwat estimated that the lost ability to use Southern Water as a benchmark could result in social losses, in net present value, between £330m and £1.330m. Ultimately, on 5 February, 2003 Vivendi announced its intention to sell the majority of the stake in Southern Water to the Royal Bank of Scotland, retaining 19.9% with an option to increase its stake to 25%. In addition, Vivendi sold some of its minority interests and created a new data-reporting entity for the Hampshire part of its license. Evaluating this remedy required the OFT to decide on the extent to which control would rest with Vivendi, in a minority ownership environment. Vivendi planned to maintain 3 of 11 board seats on Southern Water and Royal Bank of Scotland would be required to vote its interest, however held, as a block. The OFT judged that this arrangement, in combination with sales of minority stakes elsewhere and corporate governance arrangements could adequately remedy the problem of lost efficiency. (OFT, 2003a)

### *4.3 Competition between water sources*

While regional operation of a distribution system is appropriately considered a natural monopoly, there is no natural monopoly on the sources of water. Thus it is conceivable to divide the sources within a given region and allocate them to different operators for the provision of water. (See Noll et al, 2000.) Potential water sources include rivers, lakes and aquifers. That is, in a given region, a river might have one abstracter while an aquifer might have another. To the extent that negative externalities would not arise from giving the rights of mass abstraction to the same aquifer to two or more different companies, it may also be appropriate for multiple firms to abstract from the same source and compete between them to sell water to the distribution network.[24]

Since the costs of abstraction and environmental impacts for different sources are distinct, it is particularly likely that, as with electricity, one source type, such as river, will be the main source until its capacity is exhausted, at which point another source, such as aquifer, may become the next most economical means of providing water, unless the quality of surface water requires significant (and thus costly) treatment to meet required water quality standards.[25] Competition between sources is not likely to operate well, however, unless there is access to the natural monopoly network for multiple providers.

Competition between water supplies could work either with the “water pipe” company purchasing water from its filial source company and other source companies, or via structural separation between the water pipe company and all source companies (OECD, 2001). Note that if a water company is facing the decision between either building abstraction facilities or purchasing water from a neighboring water company, the company will have the incentive to purchase the water from the neighboring company if the neighbor’s prices are below those that would result from its own building project. There is little reason to believe, however, that structural separation would work well in the water industry.

Competition between water supplies should not be considered as a purely local phenomenon. While the costs of long-distance water movement are very substantial as a percentage of total costs of water, compared to other sectors such as electricity and gas in which such transport costs are relatively low, the potential for competition between supplies very distant from consumption has been explored, particularly as a way to avoid persistent shortages. For long range water transport, supply competition is already a reality in some places, such as California, and is anticipated as a future consequence of water usage patterns in the UK. The southeast of England is prone to water shortages, because of the dense population and limited water supply, while the north of England has plentiful water supply. British Waterways aims to develop water transfer schemes to bring water from the water-rich north to the water-poor Anglian and Thames regions. (p. 172, Owen (2002)) The Spanish drought in 1999 led Spain to seek a long-term solution to its water problems in the south by implementing a 18B EUR hydrological plan that

would include a series of dams that would allow it to bring water to the south from water-rich areas in the north.[26]

Long-distance water delivery can, in theory, cross international borders. However, this type of trade has, so far, been limited. For example, in May 1998, a Canadian company (Nova Group) received a provisional permit to extract 10m litres per day for export to Asia. However, if the transaction were completed, it could have led to water being classed as a good by NAFTA and the WTO, which would have opened Canada's water resources to foreign companies on an equal basis. Canada has sought to ban the export of bulk water. (p.173, Owen (2002))

Both the UK and Spanish plans for long-distance water transport will typically only make economic sense to cover peak demand, which is the water that should have the highest prices. However, the existence of long-distance connections does not necessarily mean that there will be competition on base-capacity water, which still can often be provided much more cheaply from local sources. Thus the level of competition may increase during times of scarcity.

### *4.4 Competition for treating wastewater*

Wastewater treatment plants take dirty water and sewage and clean it so that it can be released back into the environment without significant harm. Wastewater treatment and water supply functions are clearly separable. Wastewater is often treated by a separate firm from the water company and many water bills include separate charges for potable water provision and for wastewater processing. Vertical separation is already common between water supply and wastewater treatment, suggesting that there is often an absence of significant economies of integration between water provision and wastewater processing.

Is there a possibility for multiple firms to compete for wastewater processing? Competition is already common for the wastewater concession. This frequently takes the form of a competitive tender with a build-operate-transfer (BOT) contract. In BOT contracts, the winning company builds and operates a facility for a set period of time and according to a set of performance objectives in order to allow the company to pay off its investment and make a profit. Following this period, the facility is transferred fully to the municipal authority.

However, this concession competition does not generally create horizontal treatment competition. Is such competition possible? The pipes that take water from an urban area to a wastewater treatment area may limit the number of potential locations for wastewater treatment. But they do not inherently limit the number of possible firms that could treat water at the termination point of the pipes. At the moment, many localities have sufficient processing capacity for existing wastewater, so introducing competition would require the construction of excess treatment capacity or the division of capacity between distinct firms. The construction of excess capacity is probably not reasonable, so the introduction of competition would be problematic in such localities. However, there are other localities that currently have minimal wastewater treatment. As new water standards are applied, these other localities often need to build significant wastewater treatment plants. If economies of scale in treatment are small beyond a minimum volume, multiple treatment firms could reasonably compete with each other at the termination point. Such competition would require the existence of significant excess capacity in order to be effective. Noll (2002) suggests that such competition should be considered, although very few examples, if any, of such competition actually exist.

### *4.5 Interconnection and access pricing*

A combination of interconnection and access pricing could help to ensure that customers have alternative supplier sources when they are negotiating with their incumbent supplier. But the difficulties of implementing access pricing in the sector will be profound. The movement of water is a costly process. Thus long-distance movements of water from a source to a user, such as those that occur with electricity or gas, are not generally reasonable. Ofwat, for example, has calculated that the transport add-on cost for 100km of water movement add 50% to the cost of the good, compared to 5% for electricity and 2.5% for gas (see Table 3).[27] Nonetheless, particularly for users at the margin of an operator's area, the costs of moving water may not be very high. In support of broad network access, the UK has recently decided to mandate access to the infrastructure of one water supplier by another water supplier.

**Table 3. Indicative Add-on Transport Costs**

| | Electricity P/kWk (400KV) | Gas P/therm (24" pipe) | Water P/m$^3$ |
|---|---|---|---|
| Bulk cost | 3.0 | 20 | 30 |
| Transport cost | 0.15 | 0.5 | 15 |
| Transport % of cost per 100 km | 5% | 2.5% | 50% |

Figures in UK sterling, pence. Source: Ofwat, UK from WRC and Ecologic (2002)

The possibilities for opening water to access from others, or "inset appointments," have existed through private contract in the UK for many years. (An inset appointment is the appointment of a water or sewerage company for an area previously forming part of the area of supply of another water company.) One of the values of this entry may lie in providing an incentive for water to move from area of plenty to areas of scarcity. However, the high costs of water transportation and the high level of fixed costs mean that the consequences of mis-pricing access, particularly under-pricing access, could be very substantial for operators. For a detailed discussion of the complexity of access pricing, see the publication Access Pricing in Telecommunications (OECD (2004)). Therefore great care must be taken in determining reasonable access prices. The UK acknowledges the need for care by saying, "it is appropriate to take a cautious approach to opening the market to competition to enable a thorough assessment of how the competitive framework operates in practice and the implications for its public health, social, and environmental goals." (Paragraph 25, p 12, DEFRA (2002)) With the combination of high transport costs and high fixed costs in the water sector, the potential for access pricing to inject competition into the water sector remains unclear.

### *4.6 Rights to self-operate*

One competitive alternative for customers faced with prices that are too high is self-operation. There are three main options for self-operation that should be considered for enhancing competition:

- government self-operation as an alternative to concession operation
- customer self-provision of water and wastewater treatment
- customer self-lay of infrastructure.

These three options are considered below.

#### *4.6.1 Government self-provision*

Self-operation is an important element in the arsenal of local authorities when negotiating with concessionaires. Self-provision is particularly important for governments when only one concessionaire

bids on a tender because even with only one bidder, there are really two potential providers – the bidder and the government. Whether the threat of the government to self-operate is effective in constraining the negotiations of the potential concessionaires depends very much on the information and capabilities of the municipality.

In order for governments with limited information to make effective threats of self-provision, they may need to rely either on benchmarking of their expected operating costs or on the advice of consultants. In France, the role of consultants as information providers is growing increasingly important in these negotiations because the benefits from a better understanding of potential costs of self-operation can yield substantial benefits for municipalities in their negotiations with potential concessionaires. It is important for governments to avoid mandating private provision because such a mandate would eliminate the threat of self-operation in negotiations.

### *4.6.2 Customer self-provision*

Customers can self-provide both water supplies and wastewater treatment. Many industrial customers, for example, already self-provide. For customers who currently work with a water and treatment company, though, the threat to abstract water independently or treat independently is important both for increasing the incentive of the water companies to maintain reasonable prices and for ensuring that water of the appropriate quality level is provided. We consider both self-provision of water supplies and of wastewater treatment.

#### 4.6.2.1 Water

How does the potential for self-provision affect the incentives of the water company in setting prices? The threat of customers to abstract water on their own is an important element in their arsenal for dealing with monopolist water companies. Clearly, the abstraction regulations that are often implemented by water basin regulators can play a particularly important role in determining the feasibility of self-provision.

Abstraction is often regulated in order to preserve the water source and its geological characteristics. However, if (1) access to the water source for one consumer (such as an industrial customer) does not damage the water source for another (such as the water company) and (2) the customer's switching from the water company to self-provision will have a neutral effect on total water abstractions from a basin, there are few reasons to prevent individual customers from accessing the water source, apart from the difficulty of limiting abstraction quantities from multiple private abstraction sites as opposed to one central abstraction site.[28] Water abstraction regulators need to be conscious of the potential competitive impacts of their actions and act to limit the negative competitive impact of their regulations.

How can the potential for self-provision ensure appropriate water quality for the use? An important additional reason to allow independent abstraction is that many customers receive higher quality water from the water company than they need. For example, industrial customers frequently do not need potable water, but must use potable water if it is delivered by the water company. Through self-abstraction, they can ensure that water is not treated to an overly-high standard for the uses envisioned. Since treatment is costly, self-provision can yield efficiency benefits.

#### 4.6.2.2 Wastewater

As with abstraction, large customers already often engage in self-provision of wastewater treatment. Industrial customers often do this in order to abide by water quality regulations or to prevent paying high centralized treatment charges for their waste. In particular, as treatment charges approach cost, it is important to allow customers a self-processing option in order to limit their reliance on the central

treatment network. The problem that could arise is that treatment could be overpriced because of poor quality cost estimates.

Regulators and treatment companies should ensure that the costs are better measured and that customers are billed appropriately, otherwise customers for whom self-treatment would be the least-cost option for society may choose to treat centrally, because of artificially low prices. Similarly, customers for whom central treatment would have the lowest costs to society may choose to self-treat if prices for central treatment are too high.

*4.6.3 Customer self-lay of infrastrucure*

Until recently, the incumbent water utility has typically controlled the whole of the water network, including the laying of new water mains and pipes. In new developments in the UK, developers would typically pay a fee to the water company for designing and building new infrastructure. However, in new residential and industrial developments, developers often would like the option of laying pipes with skilled contractors of their own. Allowing customers the right to lay their own mains and pipes (self-lay) could improve the quality and prices of services available to developers.

Water companies are often reluctant to give developers these rights, both because of concerns about quality and because the developer payments provide water companies with profits. Developers typically have to pay a considerable fee to the water company for building out the mains and pipes. Developers often complain about the high charges by water companies for designing and laying mains and about the length of time water companies take to complete the work. Therefore, the UK has recently asked water companies to streamline and standardize the procedures for allowing third parties to lay extensions to their water systems, as long as appropriate quality considerations are respected. While many water companies object to allowing developers to act in this area, water companies in fact often hire third-party contractors themselves to perform work. (OFWAT (2001))

Ofwat has judged that the areas of main laying in which self-lay operators should have the right to operate include:

- Design and installation of on-site mains
- Connection of service pipes to new mains
- Pressure testing and disinfection process
- Procurement of materials

Ofwat has found that water companies should retain control over:

- Connection of new mains to existing mains
- Quality testing

After new facilities are prepared, the water company takes them over. Ofwat has judged that water companies should pay a fee to the entity that owns the self-laid mains and pipes when this takeover occurs. However, this fee should not amount to the developer's full cost of laying pipe. Rather, in order to maintain the incentive for the lowest cost supplier to build the new mains and pipes, the fee should take into account the expected profits from the pipes, just as with payments from the developer to the water company, as explained in Box 6 below.[29]

**Box 6: Payments for Self-Laid Mains and Pipes**

Ofwat wants to ensure that the most efficient builder for a given set of mains and pipes will carry out the design and construction. However, it cannot establish who will be the most efficient builder. Typically, once new mains and pipes are constructed, they are handed over to the relevant water company that will provide the water through those mains and pipes. The developer that requisitioned the mains and pipes must pay the water company a fee that reflects the cost of building the pipes, minus an amount that is intended to represent the future profitability of the pipes. Imagine that the water company charges £8m for the pipes and mains, but gives the developer a rebate of £2m. Then the developer will have net cost for the mains of £6m.

With the development of a self-build option, the developer can choose between building the mains and pipes and having the water company build the mains and pipes. In order to increase the likelihood that the most efficient designer and builder will be chosen, Ofwat wants the water company to continue to be obliged to pay a fee for pipes that would reflect their future profitability, even for pipes that have been self-laid.

If the fee were not paid, then the developer could, for example, face a building fee of £7m, but choose to commission the more expensive water company project, because the net cost with the water company actually carrying out the building would be £6m, or £1m less than the self-build cost.

Under Ofwat's direction, with a self-lay option, the developer would invest £7m and then receive a payment of £2m from the water company. Thus the developer would face a net self-build cost of £5m, and in this instance would choose the more efficient option of "self-lay."

In contrast, if the developer's cost were greater than the water company's announced cost of £8m, the developer would choose to ask the water company to build the mains and pipes. This illustrates how the regulator can ensure competitive neutrality of payment regimes in the presence of self-provision of infrastructure.

## 5. Universal service

One of the main reasons for subsidized water provision in the past has been the desire to ensure that low-income customers had access to fresh, potable water. However, this "generalized" subsidy to water users provides poor marginal incentives, leading to likely over-consumption. There are well-recognized methods for ensuring that low-income consumers receive support, such as low rates for self-declared low-income consumers, with standard marginal rates after "normal" consumption is exceeded. (See OECD (2002).) The Lifeline support program in California is an example of this. The program provides low rates for basic service to those who declare their incomes below a certain level, thus ensuring that low-income customers have low-cost access to water while maintaining higher prices for customers with a greater ability to pay.

**Table 4. Comparison of water charge burdens**

| | Year | Percentiles of number of classes | Disposable income as a basis for measurement of water charge burden | |
|---|---|---|---|---|
| | | | Burden of lowest income group | Ratio of lowest income group burden to average burden |
| England and Wales | 1999-00 | Deciles | 3.75%[1] | 3.1[2] |
| Mexico[3] | 2000 | Deciles | 3.84% | 3.0 |
| Hungary | 1999 | Deciles | 2.53% | 1.4 |
| Scotland | 1999-00 | Deciles | 2.24%[1] | < 2.9 |
| France[4] | 1995 | Nine | 2.18% | 2.5 |
| Netherlands | 1999 | Quartiles | 2.38% | 1.7 |
| Denmark | 1998 | Six | 1.93% | 1.7 |
| Italy | 1995 | Six | 0.90%[5] | > 2.1 |
| United States[6] | 2000 | Quintiles | 0.66% | 1.3 |

1. Average gross and average net incomes for the lowest income group are assumed to be equal.
2. Separate data provided by the UK Office of National Statistics enabled this figure to be estimated directly.
3. Data are believed to refer only to public water supply.
4. "Income" measures used in the sample survey are assumed to refer to disposable income.
5. For the lowest income groups total expenditure is assumed to equal net income.
6. Communications with the Federal Bureau of Labour Statistics let to an assumption that in the case of the two lowest income quintiles the reporting of incomes was so incomplete that total average household expenditure for those groups would be a better guide to average disposable income.

Source: OECD (2003a).

There are two types of affordability that matter for universal service: first, the cost of a new connection to the system and second, the ongoing cost of belonging to the system and using water. Many water companies are required by regulation to connect all customers for the same price. This leads to a cross-subsidization, typically from densely-populated customer groups to less-densely populated groups. Similarly, many water companies are required by regulation not to disconnect existing customers except for reasons of non-payment. Table 4 illustrates the water burden for customers from the lower income class for some OECD countries.

In addition to low-income consumers, rural household consumers are often another major political concern in the water. The costs of serving them are often considerably in excess of the costs of serving urban consumers. In geographically "broad" water companies that cover both urban and rural areas, rural customers often pay equal connection and water rates to urban consumers, despite their higher costs. However, in "narrow" water companies, rural consumers often do, as appropriate, pay higher rates for service that reflect the higher costs of service. Higher rates for rural consumers, in conjunction with income-based rate plans for low-income rural consumers, are often the best methods for serving rural areas and providing low-income support. Note that laying pipes to homes only makes financial sense given a certain density of consumers. As a result, many rural customers "self-provide" (via wells) and "self-process" (via septic tanks).

When low-income customers receive a subsidy, as with a low-cost plan, how should the subsidy be financed? Three primary possibilities exist. These are

- Implicit cross-subsidies
- Industry-specific taxes
- General taxes

Implicit cross-subsidies arise when other customers pay a higher rate than they otherwise would but are not aware that they are paying a higher rate. Implicit cross-subsidies may be difficult to implement in a competitive environment, because the incumbent utility would typically have responsibility for servicing low-income customers and new entrants would not. The other options would include a tax on all users or companies in the defined area, regardless of their water company (industry-specific taxes). Finally, funds can come from a general tax. The decision between the appropriate payment structure for raising a given level of funds should take into account the deadweight losses that arise from each type of payment, as explained above and, in greater detail, in OECD (2003b). Because of the inelasticity of demand for household users, taxes on household users to support universal access to water and water treatment will likely serve as a more efficient means of paying for the access than general taxes.

The most important point to draw about universal access is that even with increased competition in (or privatization of) service provision to low-income consumers can thrive.

## 6. Conclusion

The water sector is characterized by:

- inelastic water demand of customers
- inelastic supply
- high fixed costs
- high transport costs
- economies of scale up to a fixed point

The combination of these factors yields limited opportunities for standard forms of horizontal competition. In absence of price regulation, prices could rise to very high levels, as in electricity markets when the supply constraints bind. Price regulation is therefore likely to stay in place.

Probably the most important economic problem that exists in the water sector is allocation of water under scarcity, both between different user groups and between different localities. For this purpose, the creation of tradable water rights and tradable water pollution rights may help to solve the problem of allocation between different user groups, different countries, and different localities. The creation of efficient, low-transaction-cost water markets is difficult and requires:

- Attributed rights
- Enforceable rights
- Tradable rights
- Market mechanism
  - Centralized trading location
  - Public information about agreed prices
- Feasible transport

Implementing water trading in basins that involve multiple countries (as in the Danube basin) is extremely difficult. Unless a method can be found to convince upstream countries to value the water and low pollution further down the river, water is likely to be wasted and over-polluted in upstream countries compared to the needs and values of downstream countries. Introducing tradable water rights with an international arbitrator that could ensure the terms of trade were respected would be one way to convince upstream countries and users in those countries to value water more appropriately and would allow a basic economic process to solve a complicated political problem.

The two main alternatives for injecting competition into the market are aimed primarily at increasing productive efficiency, rather than solving the allocation problem in the water sector. The alternatives are concession competition and benchmark competition. Concession competition is increasingly common throughout Europe, although there is currently little firm evidence of improved operational behaviour from concession operation. However, many governments are unwilling to allocate the necessary funds for maintenance to old water systems, so private sector operation and maintenance is preferred.

Benchmark competition, exemplified by England and Welsh regulation, has led to significant declines in operating costs in England and Wales during its first five year period, but since then has had relatively modest effects. It involves a non-public system of deciding efficiency levels and comparing operations and costs in regions with very different hydrological and customer distribution conditions. Its methods have been criticized.

Overall, competitive models have had relatively limited effects on the operation of water companies. The combination of natural monopoly and high transport costs for water suggest that competitive models will remain difficult to implement in the future.

## GLOSSARY

| | |
|---|---|
| Aquifer: | An underground, water-bearing layer of earth, porous rock, sand, or gravel, through which water can seep or be held in natural storage. Aquifers generally hold sufficient water to be used as a water supply. |
| Abstraction: | The act of taking water from a natural source, such as a river or aquifer. Abstraction is the first step in the process of producing water for households, followed by treatment and then distribution. |
| Hydrological plan: | An overall water usage plan that often integrates concerns of water users as well as concerns of water sources, such as dams, and the environment. |
| Inset appointments: | Appointment of a water or sewerage company for an area *previously* forming part of the area of supply of another water company. |
| Potable: | Water that people can drink safely, with bacterial and sedimentary content below certain levels often determined by national law. |
| Volumetric: | Volumetric pricing is pricing that is based on the quantity of water used. For example, a volumetric price could be expressed as a price/$m^3$ of water. |
| Wastewater: | Wastewater is the non-potable, used water, including sewage and other wastes, which often is treated to reduce its negative environmental effects prior to release into the environment. |

## NOTES

1 Wastewater is the undrinkable water, including sewage and other wastes, that often is treated to reduce its negative environmental effects prior to release into the environment. See Glossary for definitions of key terms related to the water sector.

2 For example, if one person extracts water from an aquifer, that may increase the cost for others to extract from that same aquifer. (An aquifer is an underground, water-bearing layer of earth, porous rock, sand, or gravel, through which water can seep or be held in natural storage. Aquifers are often a source of water. )

3 For example, environmental effects of an industrial user's consumption of water are not typically taken into account by industrial users.

4 In the agricultural sector, pig and chicken farms may be better able to tend to their waste than crop-based farms that use chemicals.

5 The Danube River Basin includes at least Germany, Austria, Slovak Republic, Hungary, Yugoslavia, Croatia, Bosnia-Herzegovina, Romania, and Bulgaria. The Rio Grande includes the United States and Mexico. The Euphrates includes Turkey, Syria and Iraq.

6 The International Court of the Hague can resolve disputes between countries that submit to its water jurisdiction. But the International Court is likely not the most appropriate locale for solving economic allocation problems.

7 If consumer demand is completely inelastic to price, then metering is not worthwhile. In fact, many studies have found that while consumer demand is not completely inelastic, it is highly inelastic for purposes such as normal household use, possibly with an elasticity of about -0.10 and considerably more elastic, though still inelastic, for home garden watering. (p.134, OECD (1999)) Thus metering has the most value for "luxury" uses. To the extent that apartment dwellers do not have many "luxury" uses such as garden watering, metering apartments may not be cost-effective.

8 European Water Framework Directive (2000/60/EC) (CEC 2000)

9 See Hausman (1996) for a description of the relative deadweight losses that arise from each form of taxation.

10 This analysis assumes that customers cannot easily bypass the water company.

11 Assume an elasticity of demand of -0.1 or smaller, as has been supported by much of the literature. Note that this is the elasticity of demand for increased quantities of water from a given level. However, the elasticity of demand for subscription will in fact

12 The model abstracts away from transportation costs.

13 For simplicity, we do not consider externalities and opportunity costs in other parts of the system.

14 When dams are present, their operators may have water in times of scarcity but hold it back for reasons of dam management, such as guaranteeing electricity flow. (Brennan and Scoccimarro (1999))

15 The requirements for a low transaction-cost market mechanism would include a centralized trading location (that could be electronic) and public information about agreed prices. The natural locale for reporting water prices would be the appropriate water distribution body that registered trades. (Carey et al (2002))

16 Benchmark competition is sometimes called yardstick competition, to suggest that one firm is measured using a "yardstick" against others, or comparative competition.

17 Local city halls or municipal authorities often do not feel they are technically qualified to evaluate the terms of an offer and determine an appropriate price level, given the cost conditions in their area. As a result, and in order to overcome the problem of asymmetric information between the municipal authorities and the companies, the tendering process has led 90% of local authorities to seek out consulting organizations to help them to run the tendering process and evaluate different offers. The preferred consultants for local authorities have been central government, with a small minority seeking out private consultants. In a further effort to overcome the information asymmetry problem, France is currently considering a law that would involve setting up a benchmarking system to provide municipal authorities with better information about appropriate costs, rates and terms.

18 The study by Brunet et al (2002) notes that the source of their data is surveys of municipal authorities. It is possible that later amendments to the initial agreements, which do not bring in competition, may result in price increases.

19 The size of the "benchmark" company is also taken into account.

20 So far, Ofwat has performed a 1994 and 1999 review. It was criticized for setting too low an efficiency standard in 1994, which led to high returns in water companies between 1994 and 1999.

21 Baumol (1970) and Bailey (1974) make similar observations with their lagged price-adjustment models, in which a regulator sets a price for a long period of time before setting a price again. In the periods between price-settings, firms can earn full profits on their earnings above costs, and thus have strong incentive to reduce costs.

22 One example of benchmark competition occurred in the US hospital industry with the introduction of diagnostic-related-group (DRG) reimbursement for Medicare hospital patients. Under the DRG system, a payment rate was set for each condition treated, and that rate was based primarily on treatment norms in other hospitals like the one being paid, rather than in a given hospital. In this sector, the problems of diverse conditions and of unmeasured hospital differences have created accusations of unfairness and also led hospitals to game the system in ways that were not predicted prior to the DRG implementation. The most dramatic impacts of this pricing system probably occurred in the first five years of its implementation. That is, most of the achievable efficiencies are found early on during the price-setting schemes operation. This could suggest the pricing scheme could be changed again after five years, but this conclusion is not appropriate. One of the key motivators for cost reductions is the expectation that the system will continue to operate in the future and that those firms that have made appropriate cost reductions will benefit on an ongoing basis.

23 An Ofwat consultant produced an analysis of economies of scale in the UK water industry that finds no economies of scale for the companies at their current size. (Stone and Webster (2004)) This does not mean there are no economies of scale at smaller sizes than the UK firms. For example, Bruggink (1982) finds significant economies of scale in water operation up to 160,000 million gallons of water per year, and after that point no clear economies or diseconomies of scale. More importantly, economies of scale are the basis for the commonly accepted natural monopoly claim that justifies regulation in the sector.

24 It may be the case that allowing a second company to abstract from an aquifer will increase the costs of abstraction to the first company. That is, significant externalities may exist.

25 Aquifer drainage requires vertical pumping of water and is thus typically more expensive than other sources of water.

26 A hydrological plan is an overall water usage plan that often integrates concerns of water users as well as concerns of water sources, such as dams, and the environment. See Glossary.

27 For an exception, consider the Los Angles Aqueduct that draws water from Mono Lake and the Owens Valley and takes it as much as 338 miles to Los Angeles.

28 Private abstractions could reduce water company abstractions by more than a factor of 1:1 because water company abstractions are then followed by wastage from leaky pipes on the way to the end customer, whereas private abstractions will often have less wastage.

29 The UK Water Act of 2003 received Royal Assent on Nov 20, 2003 and its language covering self-lay is expected to go into force in the spring of 2004.

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# NOTE DE RÉFÉRENCE

***Par le Secrétariat***

## 1. Introduction

La distribution d'eau et le traitement des eaux usées sont souvent considérés comme des monopoles naturels[1]. Dans le passé, la concurrence n'a joué qu'un rôle très limité dans ces domaines, non seulement du fait des caractéristiques des monopoles naturels, mais aussi à cause des réglementations officielles et des prix pratiqués, artificiellement bas, qui décourageaient les entreprises de s'implanter dans le secteur. Les pouvoirs publics, à l'échelon local et, parfois, national, menait une politique qui se traduisait par des inefficiences substantielles dans la répartition de la ressource et empêchait les entreprises de fonctionner avec efficience. Néanmoins, on s'accorde de plus en plus à penser que, même si la concurrence est inapplicable dans de nombreux domaines de l'exploitation de l'eau, il existe des maillons de la chaîne de la répartition de la ressource, de sa distribution et de son traitement où l'efficience peut être renforcée et où la concurrence peut jouer un rôle important. Cette concurrence a de plus en plus de possibilités de se manifester à mesure que la distribution et l'assainissement sont privatisés et que les prix sont majorés de manière à ce qu'ils reflètent les coûts. Les régulateurs, les exploitants et les clients devraient considérer avec attention au moins certaines de ces possibilités, car elles peuvent déboucher sur une amélioration de l'efficience.

Dans de nombreux cas, les subventions découragent la concurrence, car le coût de la distribution et de l'assainissement est supérieur au prix pratiqué. A l'origine, elles ont été créées parce que la construction des réseaux de distribution et d'assainissement, en ville, était nécessaire pour améliorer l'hygiène publique, et que les individus n'auraient pas fait le choix de la financer eux-mêmes. Le maintien de ces subventions a engendré un certain nombre d'inefficiences chroniques dans la distribution d'eau et l'assainissement, et, en même temps, a dissuadé les entreprises de s'implanter sur ce marché. Dans les pays de l'OCDE, les revenus sont désormais suffisamment élevés pour que les coûts des réseaux soient assumés directement par leurs utilisateurs. Par conséquent, après de nombreuses années d'entretien médiocre, sous la responsabilité des pouvoirs publics, et de prestations inefficientes, certains pays choisissent de privatiser ces activités et d'augmenter les prix de manière à refléter les coûts des infrastructures de distribution, les coûts d'opportunité et les coûts des infrastructures d'assainissement [OCDE (1999)].

A l'évidence, la politique de l'eau est d'autant plus complexe les ressources sont peu abondantes. Dans le cas contraire, les problèmes économiques liés à l'eau sont essentiellement les suivants : 1) veiller à ce que le prix à la consommation couvre les coûts fixes, d'extraction et d'entretien et 2) améliorer l'efficience productive. Cependant, lorsque les ressources sont rares, il se pose également un problème de répartition, très difficile à résoudre. Dans ce cas, en effet, fournir davantage d'eau à un consommateur particulier prive un autre consommateur de la quantité correspondante. Les marchés constituent une manière classique de répartir une ressource peu abondante, mais ils ne donnent pas toujours des résultats satisfaisants dans le cas de l'eau, et ce pour quatre raisons au moins. Premièrement, pour remplir leur office, les droits doivent s'appuyer sur une répartition claire, ce qui n'est pas toujours le cas. Deuxièmement, le nombre de propriétaires et d'acheteurs d'eau est limité, de sorte que la concurrence ne peut pas être parfaite. Troisièmement, les coûts de l'eau pour la collectivité ne coïncident pas nécessairement avec ses coûts privés[2]. Quatrièmement, les avantages pour la collectivité peuvent ne pas coïncider avec les avantages privés[3]. Quoi qu'il en soit, les raisons qui expliquent les défaillances du marché ne signifient pas que les échanges de droits sur l'eau, par exemple, n'amélioreraient pas la répartition des ressources par rapport à la situation actuelle. Elles donnent plutôt à penser que le prix ou la

valeur de l'eau devrait être fondé sur sa valeur en amont, en aval et selon les utilisateurs, sans faire abstraction de l'environnement. Surtout, le coût d'opportunité doit être pris en compte dans les décisions relatives à la répartition de la ressource [Fisher *et al.* (2000)].

Bien que le marché soit susceptible de présenter des lacunes, au moins partielles, dans le secteur de l'eau, le rôle que la concurrence et les marchés pourraient jouer dans le renforcement de l'efficience de la distribution d'eau mérite d'être étudié. Au moins six manières d'introduire la concurrence sont envisageables et pourraient se révéler utiles. Certaines sont de plus en plus répandues, tandis que d'autres demeurent plus théoriques. Deux d'entre elles peuvent contribuer à accroître l'efficience dans la répartition de la ressource (échanges de droits sur l'eau, concurrence entre sources d'approvisionnement), alors que les autres sont davantage axées sur le renforcement de l'efficience productive :

- échanges de droits sur l'eau
- incitation à la concurrence en direction des exploitants (étalonnage concurrentiel, concessions)
- concurrence entre sources d'approvisionnement
- concurrence au stade du traitement des eaux usées
- ouverture des réseaux à des fournisseurs concurrents moyennant la tarification de l'accès
- droits d'autoprestation

A l'évidence, toutes les catégories d'utilisateurs ne peuvent pas bénéficier à part égale de chacune de ces formes de concurrence. Par exemple, en zone urbaine, les particuliers sont en général les clients captifs de l'entreprise en place, et les autoriser à prélever eux-mêmes leur eau ne se traduirait probablement pas par des avantages marquants. A l'inverse, par exemple, certains grands consommateurs industriels ou agricoles disposent des moyens financiers nécessaires pour construire leur propre installation d'épuration[4].

Certaines des méthodes envisagées pour accroître la concurrence, comme l'ouverture des réseaux à d'autres distributeurs, nécessite une surveillance réglementaire active. A cet égard, le potentiel de concurrence ne doit pas servir à légitimer l'élimination de la réglementation, même s'il peut justifier une refonte du dispositif et des prescriptions réglementaires.

La présente note porte sur la concurrence dans le secteur de l'eau, mais sa conclusion n'est pas que la concurrence résoudra tous les problèmes de distribution. A ce titre, sachant en particulier que notre expérience de nombreuses formes de concurrence est limitée, les responsables de l'action publique doivent soupeser avec soin les avantages et les inconvénients de la mise en œuvre de mécanismes de concurrence avant de procéder à des modifications importantes. Certaines façons d'introduire de la concurrence peuvent se révéler utiles dans des situations locales particulières, et d'autres pas.

## 2. Objectifs politiques et sociaux

Abstraction faite de la réglementation sur la qualité et la pollution de l'eau, les activités de distribution d'eau et d'assainissement relèvent souvent des collectivités locales, les autorités centrales n'y intervenant que de façon limitée. Néanmoins, l'organisation de l'approvisionnement en eau et sa tarification constituent des sujets politiques sensibles. Dans certains pays en développement, il est arrivé que l'augmentation des prix entraîne des troubles sociaux. Cela n'est pas surprenant puisque même dans certains pays de l'OCDE comme la Hongrie, le Portugal ou la République tchèque, le prix de l'eau pour les

ménages peut représenter jusqu'à 3 % du revenu moyen par habitant, et donc beaucoup plus, en pourcentage, pour un particulier à faible revenu [p. 170, OCDE (1999)].

Bien que les activités des services de l'eau n'aient en général qu'une dimension locale, les décisions relatives à la répartition des ressources concernent souvent un bassin hydrographique englobant de nombreuses localités. En cas de rareté, des arbitrages doivent être opérés entre ces différentes localités. Lorsque celles-ci se trouvent toutes dans un même pays, une autorité nationale peut se charger des décisions, au moins préalablement à l'instauration d'échanges de droits sur l'eau. Cependant, quand elles sont distribuées entre plusieurs pays, comme c'est par exemple le cas dans les bassins du Danube, du Rio Grande ou de l'Euphrate, il n'existe pas d'autorité internationale à même de répartir les ressources et de résoudre les litiges[5, 6]. En l'absence d'une autorité de ce type, il n'est pas exclu qu'un pays affecte l'eau à des usages de peu de valeur sur son territoire, tout en entraînant des pénuries en aval pour d'autres usages de valeur supérieure. Si l'eau est considérée comme un bien qui peut faire l'objet d'échanges et si des permis échangeables sont délivrés à tous les utilisateurs, la répartition tendra à devenir de plus en plus efficiente et les utilisateurs en amont tiendront compte des besoins en aval. Il convient néanmoins de renforcer les bases juridiques et organisationnelles de la répartition des droits et de la résolution des différends internationaux relatifs à l'eau pour qu'un tel système d'échanges exerce pleinement ses effets [Fisher (2002)]. Des autorités internationales de régulation seraient sans doute souhaitables dans le cas des bassins qui baignent plusieurs pays. Si elles pouvaient être placées sous la tutelle d'autres institutions supranationales préexistantes dotées d'un système juridique établi, la mise en œuvre s'en trouverait certainement facilitée.

Les trois principaux consommateurs d'eau sont les ménages, l'industrie et l'agriculture. Dans un échantillon de pays de l'OCDE, les ménages représentent seulement 5 % de la consommation, l'agriculture 30 % et l'industrie 65 % [p. 15, OCDE (1999)]. Les estimations concernant les usages à l'échelle mondiale sont très différentes, puisqu'elles imputent 69 % de l'ensemble des prélèvements à l'agriculture et 23 % à l'industrie. Dans les deux cas, néanmoins, les ménages forment le groupe qui utilise le moins d'eau (5 à 8 %). En tout état de cause, il importe de signaler que ces moyennes nationales et internationales reflètent mal les réalités à l'échelon local, qu'il s'agisse du profil de la consommation, des coûts ou de l'abondance de la ressource. Dans le monde entier, les marchés de l'eau sont régis par les circonstances locales. Or, si les prix augmentent dans une région donnée, s'approvisionner dans une région proche est souvent très difficile.

Les besoins et la production, dans le secteur de l'eau, revêtent des caractéristiques complexes. Ainsi, tous les consommateurs n'ont pas besoin de la même qualité. Par exemple, les ménages sont en général raccordés à un fournisseur d'eau potable (laquelle peut être consommée en toute sécurité car sa teneur en bactéries et en matières solides est inférieure à un niveau donné, souvent déterminé par la réglementation nationale). Cette eau doit avant tout être traitée, puis distribuée sous pression par un réseau de canalisations saines aboutissant chez les particuliers. Les industriels, quant à eux, n'ont généralement pas besoin d'eau potable pour leurs principaux usages, mais ils sont souvent raccordés au même réseau de distribution que les particuliers et, par conséquent, reçoivent eux aussi de l'eau potable. Parfois, les industriels assurent eux-mêmes le pompage et le traitement de l'eau qui leur est nécessaire. Enfin, souvent, les agriculteurs n'ont pas du tout besoin d'eau traitée.

La plupart des consommateurs produisent des eaux usées dans le cadre de leurs activités. Par exemple, les ménages produisent des eaux d'égout, les industries libèrent des produits chimiques, les centrales électriques peuvent rejeter de l'eau à des températures différentes de la température ambiante et les agriculteurs sont susceptibles d'introduire des pesticides, des engrais ou des effluents d'élevage dans le cycle de l'eau.

Il est difficile de concevoir un système de réglementation et de tarification qui permette 1) de fournir de l'eau de la qualité requise à ceux qui en ont besoin et 2) de faire en sorte que les pollueurs assument les coûts de la préservation de la pureté du milieu aquatique. Cette difficulté est exacerbée par le fait que la politique publique de l'eau obéit à plusieurs objectifs [voir p. 3, Smith and Hannan (2003)] :

- santé publique
- protection de l'environnement
- accessibilité économique pour les ménages, notamment pour les ménages à faible revenu
- fiabilité de l'approvisionnement en cas de sécheresse
- fortes efficiences productive et allocative

Il arrive que ces objectifs ne soient pas compatibles entre eux. Par exemple, l'efficience allocative peut être optimisée dès lors que chaque usager paie l'intégralité du coût de la fourniture et du coût d'opportunité qui lui incombent, mais cela peut dissuader les ménages à faible revenu d'utiliser l'eau courante, au détriment de l'hygiène publique. De même, faire payer aux industriels l'intégralité du coût de l'épuration de leurs eaux usées risque de les inciter à rejeter leurs effluents illégalement, ce qui est préjudiciable à la qualité de l'environnement. Dans l'hypothèse où des mécanismes de concurrence sont mis en place, il convient de soupeser avec attention les différents objectifs. Souvent, la concurrence peut contribuer à renforcer l'efficience sans qu'il faille renoncer aux autres objectifs, mais quoi qu'il en soit, son rôle dans le secteur de l'eau est sans doute relativement limité.

## 3. Réformes relatives à la demande favorables au renforcement de la concurrence

Pour que le secteur de l'eau tire parti de la concurrence et des forces du marché, plusieurs conditions doivent être remplies au préalable. Ces conditions méritent d'être réunies même en l'absence d'une réelle concurrence entre distributeurs d'eau, car elles peuvent contribuer à améliorer les performances du secteur.

Lorsqu'ils soumettent l'offre à des réformes, les responsables des politiques négligent souvent la demande. Deux modifications concernant cette dernière seraient particulièrement utiles, à savoir l'utilisation de compteurs (pour accroître la sensibilité aux prix) et la prise en compte des coûts réels dans les prix de détail de l'eau et de l'assainissement.

### *3.1 Utilisation de compteurs*

Lorsque les ressources sont peu abondantes, la tarification au volume contribue nettement à réduire la consommation, que ce soit celle de l'industrie, celle de l'agriculture ou celle des ménages. En l'occurrence, l'une des questions les plus sensibles du point de vue politique est la consommation des ménages. Dans la plupart des pays de l'OCDE, les habitations individuelles sont dans leur vaste majorité équipées d'un compteur, alors que c'est rarement le cas des appartements [p. 51, OCDE (1999)]. Certes, le comptage s'est développé dans plusieurs pays de l'OCDE tels que l'Irlande, l'Islande, la Norvège, la Nouvelle-Zélande et le Royaume-Uni, mais les taux de pénétration y restent très faibles.

L'objectif du comptage est de rationner l'eau en agissant sur le prix, en période de pénurie, plutôt qu'en recourant à la réglementation[7]. Le comptage permet de moduler le prix en fonction de la consommation, ce qui permet aux compagnies de le majorer en période de pénurie, de manière à faire

diminuer la consommation. L'un des reproches dont le comptage fait l'objet est qu'il risque de dissuader les ménages à faible revenu d'utiliser de l'eau.

Les compteurs sont pour la plupart simples, mais une tarification optimale peut nécessiter des appareils plus complexes. Par exemple, afin de fixer des prix au volume élevés en période de pénurie, il faut disposer des dates de consommation. (La tarification au volume s'appuie sur la quantité d'eau consommée. Par exemple, le prix peut être exprimé au mètre cube consommé.) Au Royaume-Uni, l'autorité de l'eau a expérimenté la tarification horaire, en vertu de laquelle le prix était sensiblement majoré pendant les trois heures de pointe de la soirée, non pas dans l'optique de résoudre des problèmes de pénurie, mais pour réduire les coûts des réseaux [p. 152, OCDE (1999)].

Etant donné les frais d'installation et d'entretien, ainsi que le coût des relevés des compteurs, le comptage est onéreux. Par conséquent, il est surtout adapté dans les localités soumises à des pénuries. Dès lors que l'offre est abondante, les coûts induits peuvent en fait annuler les avantages. La Commission européenne pourrait pencher en faveur du comptage universel de la consommation des ménages, même lorsque son coût n'est pas justifié compte tenu des conditions locales. Ofwat, le régulateur britannique, est opposé au comptage universel, mais favorable au comptage obligatoire : 1) lorsque les nouvelles sources d'approvisionnement possibles sont rares ; 2) lorsque les ménages consacrent des volumes considérables aux usages « de luxe » (arrosage des jardins, par exemple) ; et 3) dans les logements neufs, où les coûts d'installation des compteurs au cours de la construction sont modestes [p. 51, OCDE (1999)].

### *3.2 Prix de détail reflétant les coûts*

Les dirigeants sont de plus en plus favorables à ce que les consommateurs paient l'intégralité des coûts imputables à leur consommation, y compris ceux qu'entraîne la pollution, et les pays de l'OCDE sont de plus en plus nombreux à mettre en place des systèmes de tarification qui rapprochent le prix dû par les utilisateurs d'une évaluation plus plausible des coûts. Auparavant, les consommateurs acquittaient dans leur majorité des prix qui ne reflétaient ni les coûts des installations à long terme, ni les coûts d'opportunité, ni les coûts des externalités. La directive cadre sur l'eau de l'Union européenne est une illustration de cette réorientation des objectifs. Elle stipule que d'ici 2010, les Etats membres devront avoir fait en sorte que les différentes catégories d'usagers, décomposés en distinguant au moins le secteur industriel, le secteur des ménages et le secteur agricole, contribuent de manière appropriée à la récupération des coûts des services de l'eau[8].

**Encadré 1 : Directive cadre de l'Union européenne sur l'eau**

Fondamentalement, la directive s'appuie sur deux principes : premièrement, les coûts doivent être transparents et deuxièmement, dès lors que les utilisateurs n'ont pas à assumer la totalité des coûts induits par leur consommation, il existe un risque de mauvaise répartition des ressources, laquelle compromet l'accès des générations futures aux ressources en question. Il s'ensuit qu'une récupération plus complète des coûts (tenant compte des équipements, des préjudices à l'environnement et de la rente de rareté) représenterait un grand progrès dans le sens de la pérennisation de l'exploitation des ressources en eau.

La directive stipule clairement que les subventions croisées entre secteurs doivent être évitées dès lors qu'elles sont susceptibles de provoquer une mauvaise répartition des ressources, mais elle permettrait aux Etats membres de garantir aux ménages l'accès à un volume élémentaire à un prix « social ». De même, les Etats membres seraient autorisés à accorder des dispenses sur la base d'objectifs sociaux ou environnementaux justifiés, ainsi que dans le cadre des projets mis en œuvre dans les régions admises au bénéfice des fonds structurels. Quoi qu'il en soit, la directive stipule également que toutes les dérogations au principe de la tarification fondée sur la récupération de l'intégralité des coûts doivent être explicites et transparentes [à partir de OCDE (1999)].

L'une des raisons pour lesquelles le principe de la récupération intégrale des coûts remporte de plus en plus de suffrages est que, outre les contraintes budgétaires, les coûts de la distribution d'eau augmentent, notamment à cause de l'entrée en vigueur de normes de qualité plus strictes et de l'entretien

qu'exigent les infrastructures existantes. Il est de plus en plus admis que, pour autant qu'il existe un filet de sécurité protégeant les ménages à faible revenu, les coûts variables doivent être récupérés auprès des usagers, de même que les coûts fixes. Dans l'idéal, le système de tarification applicable aux clients existants devrait comporter une redevance mensuelle fixe de raccordement, destinée à financer les frais fixes imputables principalement aux coûts d'infrastructures, complétée par des redevances sur l'utilisation marginale reflétant les coûts marginaux de distribution. Le tableau 1 décrit les structures tarifaires applicables aux ménages à l'heure actuelle dans la plupart des pays de l'OCDE.

**Tableau 1. Distribution publique de l'eau : structure tarifaire applicable aux ménages**

**(% des sociétés publiques de distribution [S] ou de la population [P] concerné par une structure donnée)**

| | Année | Nombre de sociétés de l'échantillon (et % de la population représentée | Unité | Redevance forfaitaire | TARIF VOLUMETRIQUE CONSTANT | | | SYSTEMES A TRANCHES PROGRESSIVES | | | SYSTEMES A TRANCHES DEGRESSIVES | | | Nombre normal de tranches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Pas de redevance fixe | Plus redevance fixe | Plus minimum fixe | Pas de redevance fixe | Plus redevance fixe | Plus minimum fixe | Pas de redevance fixe | Plus redevance fixe | Plus minimum fixe | |
| Australie | 2000-1 | 17 (72%) | P (S) | - | - | 73%(12) | - | - | 27%(5) | - | - | - | - | 2 |
| Autriche | 1999 | 71 | S | 1 | 5 | 65 | - | - | - | - | - | - | - | - |
| Belgique | | | | | | | | | | | | | | |
| Bruxelles | 2001 | 2 | S | - | - | 1 | - | - | 1 | - | - | - | - | 2 |
| Flandre | 2001 | 17 | S | - | - | - | - | - | 17 | - | - | - | - | 2 |
| Wallonie | 2001 | 46 | S | - | 4 | 21 | - | - | 17 | - | - | 4 | - | 2 |
| Canada | 1999 | 1214 (77%) | P | 43% | ← | 36% | → | ← | 9% | → | ← | 12% | → | 2 |
| Danemark | 2000 | | S, P | rural | ← | la plupart | → | | | | | | | - |
| Finlande | 2000 | | S, P | - | - | 100% | - | - | - | - | - | - | - | - |
| France | 1990 | 500 | S | 2% | 5% | 46% | 47% | - | - | - | - | - | - | - |
| Allemagne | 2001 | 1030 | S, P | - | <5% | >95% | - | - | - | - | - | - | - | - |
| Grèce | 2002 | | S | rural | | | | - | ← la plupart → | | | | | 5 |
| Hongrie | 1997 | 268 | S | - | 95% | - | - | 5% | - | - | - | - | - | 2 |
| Islande | 2002 | | S, P | tous | - | - | - | - | - | - | - | - | - | - |
| Irlande | 2002 | Toutes les redevances sur l'eau à usage domestique ont été regroupées avec la fiscalité générale le 1er janvier 1997 | | | | | | | | | | | | |
| Italie | 1998 | | S | - | - | - | - | | - | 100% | - | - | - | 3-5 |
| Japon | 1998 | 1900 | S | - | - | - | 42% | - | | 57% | - | - | 1% | 2-7 |
| Corée | 1998 | | P, S | - | - | - | - | ← | 100% | → | - | - | - | 6-10 |
| Luxembourg | 1997 | 118 | S | - | ← | certains | → | ← | certains | → | ← | certains | → | 2-3 |
| Mexique | 2002 | | S | - | - | - | - | ← | la plupart | → | ← | la plupart | → | 6-7 |
| N-Zélande | 1998 | | P | 75% | - | 25% | - | - | - | - | - | - | - | - |
| Pays-Bas | 1998 | 18 | S | - | 1 | 16 | - | - | 2 | - | - | - | - | 2 |
| Norvège | 2002 | 23 | P | 87% | - | 13% | - | - | - | - | - | - | - | - |
| Pologne | 1998 | | P, S | - | - | la plupart | | | | | | | | |
| Portugal | 2002 | 23 | S | - | - | - | - | - | 23% | - | - | - | - | 3-5 |
| Espagne | 2001 | 700 | P (S) | - | ← | 10%(<200) | → | ← | 85%(<500) | → | ← | 5%(15) | → | 2-5 |
| Suède | 2000 | 288 | S | - | - | 100% | | - | - | - | - | - | - | - |
| Suisse | 1998 | Tous | P (S) | - | - | 95%(235) | - | - | 5%(1) | - | - | - | - | 2 |
| Turquie | 1998 | | P | rural | - | - | - | ← | 100% | → | - | - | - | 3 |
| Royaume-Uni | 1998 | | | | | | | | | | | | | |
| Angleterre et Pays de Galles | 2002 | Tous (26) | P | 77% | - | 23% | | - | - | - | - | - | - | - |

| | Année | Nombre de sociétés de l'échantillon (et % de la population représentée | Unité | Redevance forfaitaire | TARIF VOLUMETRIQUE CONSTANT | | | SYSTEMES A TRANCHES PROGRESSIVES | | | SYSTEMES A TRANCHES DEGRESSIVES | | | Nombre normal de tranches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Pas de redevance fixe | Plus redevance fixe | Plus minimum fixe | Pas de redevance fixe | Plus redevance fixe | Plus minimum fixe | Pas de redevance fixe | Plus redevance fixe | Plus minimum fixe | |
| Ecosse | 2000 | Tous (3) | P | >99% | - | 0.014% | - | - | - | - | - | - | - | - |
| Irlande du N. | 2002 | Tous (1) | P | 100% | Toutes les redevances sur l'eau à usage domestique reprises dans la fiscalité générale | | | | | | | | | |
| Etats-Unis | 2002 | 145 | S | 1% | 1% | ←35% | → | 1% | ←33% | → | ← | 29% | → | 2-4 |

Australie : Structure tarifaire appliquée pendant l'exercice prenant fin le 30 juin 2001.
Autriche : Les données tarifaires brutes pour 71 municipalités ont été communiquées par le ministère fédéral de l'Environnement.
Belgique : Les structures tarifaires avec volumes gratuits par ménage ou par habitant sont considérées comme « à tranches progressives ».
Canada : Les chiffres indiquent le pourcentage de l'échantillon (= 75 % de la population nationale) desservi pour chaque type de tarif.
France : Données de l'ancienne enquête. La loi sur l'eau de 1992 a interdit (sauf exceptions mineures) i) le forfait et ii) le tarif vol. constant + redevance fixe + redevance minimum, actuellement en recul
Allemagne : 5 % des sociétés de distribution au plus appliquent un tarif linéaire sans élément fixe.
Italie : Une redevance fixe très réduite (loyer du compteur) est appliquée ainsi que, souvent, un volume minimum gratuit. La redevance minimum, qui constitue la première tranche (la moins chère), facturée au tarif de base, sera abandonnée progressivement en quatre ans, à compter d'avril 2001.
Japon : Les sociétés de distribution d'eau prélèvent une redevance minimum mais n'appliquent généralement pas de redevance fixe distincte.
Pays-Bas : Une seule société de distribution (Wgron) offre aux consommateurs domestiques un volume gratuit de 25 ou 28 $m^3$/année/ménage, et une autre (Brabant Water) accorde aux consommateurs de ses quatre districts un volume gratuit de 15 $m^3$/année/ménage.
Portugal : Les renseignements concernent 23 grandes sociétés de distribution d'eau.
Royaume-Uni : Dans toutes les régions du Royaume-Uni à l'exception de l'Irlande du Nord, tous les ménages peuvent choisir le comptage domestique (et la tarification au volume), sauf ceux qui occupent un logement neuf (généralement équipé d'un compteur au moment de la construction) ; de plus i) pour les utilisateurs de systèmes d'arrosage des jardins et propriétaires de piscines et ii) pour certaines autres catégories d'habitations ou de ménages à forte consommation, le comptage est obligatoire.

Source : OCDE (2003a)

Historiquement, ce sont les budgets généraux et non les redevances des utilisateurs qui ont financé la construction et l'entretien des infrastructures. Cependant, la collecte de ces fonds engendre en fait des pertes sèches importantes du fait que l'incitation au travail et à l'épargne diminue à mesure que le taux de l'impôt sur le revenu augmente. Le coût par unité de recettes de l'impôt sur le revenu collectée peut ainsi représenter de 26 % à 126 % des recettes [voir OCDE (2003b)]. Lorsque la demande d'un produit est très inélastique, comme la demande d'abonnements mensuels aux services de l'eau, le paiement par le consommateur engendre une perte sèche moindre que l'impôt sur le revenu, car l'acquittement de la taxe associée à la redevance sur l'eau ne dissuade pas beaucoup d'usagers de souscrire un abonnement aux services de l'eau[9]. Par exemple, sur la base d'hypothèses crédibles, en présence d'une forte inélasticité de la demande d'abonnements mensuels aux services de l'eau, un doublement de la redevance d'abonnement entraînera une perte sèche ne dépassant pas 15 % de la redevance en question[10]. Créer une redevance mensuelle, lorsqu'elle n'existe pas, se traduit par des pertes sèches limitées à 5 % de chaque unité de recette perçue[11]. Ainsi, si l'on compare les pertes sèches engendrées par des redevances mensuelles et celles qui sont associées à l'impôt sur le revenu, les premières sont moins importantes. Une analyse plus approfondie serait nécessaire pour comparer les pertes sèches imputables aux redevances mensuelles et celles qui découlent de toutes les formes locales et nationales de prélèvements fiscaux.

Tous les pays Membres ne vont pas dans le sens de la facturation fondée sur les coûts. Par exemple, en Irlande, la facturation de l'eau relevait depuis toujours des autorités locales. Tandis que les municipalités pauvres (pour la plupart rurales) prélevaient des redevances, les villes riches telles que Dublin et Limerick s'en abstenaient (p. 161, Owen (2002)]. Or, depuis le 1er janvier 1997, l'Irlande a aboli toutes les redevances sur l'eau [OECD (1999)].

Facturer la consommation marginale sur la base des coûts marginaux de production n'est pas toujours faisable compte tenu de la rigidité de l'offre. En effet, parfois, il n'y a pas d'offre marginale supplémentaire. Dans ces circonstances, il est impossible de déterminer un coût marginal, mais il est envisageable de définir un prix qui équilibrerait l'offre et la demande. Il est donc très important de connaître les caractéristiques de la courbe de la demande d'eau pour fixer les prix en période de pénurie [voir Hanemann (1993)]. Normalement, le rationnement par les prix doit donner de meilleurs résultats, en termes d'efficience, que le rationnement physique. Néanmoins, pour des raisons d'équité dans la répartition du revenu, le rationnement physique est parfois privilégié pour répondre aux problèmes de pénurie.

Il convient de noter que les pertes économiques dues à une tarification qui ne tient pas compte de l'intégralité des coûts sont substantielles, notamment lorsque les ressources sont insuffisantes. L'eau peut être consacrée à des usages qui ne la valorisent pas à hauteur de son coût effectif, par exemple à l'irrigation intensive sur des terres arides, alors que d'autres usages susceptibles de donner beaucoup plus de valeur à la ressource en manquent. Ainsi, lorsque les agriculteurs sont approvisionnés en eau à un prix inférieur au coût, ils peuvent à la fois 1) adopter des combinaisons de cultures inefficientes et 2) adopter une technique d'irrigation inefficiente (irrigation à ciel ouvert à la place de l'irrigation au goutte à goutte, par exemple).

Certains estiment que les agriculteurs, même lorsqu'ils ont toujours été approvisionnés à un prix nettement inférieur aux coûts variables et qui ne permet pas de récupérer les investissements dans les infrastructures, ne devraient pas être facturés sur la base des coûts. Cette argumentation s'appuie sur le fait que la « sous-facturation » de l'eau représente une valeur qui est capitalisée dans le prix d'acquisition de la terre agricole. Or, la « valeur hydrologique » d'une exploitation agricole peut être très élevée. Une étude de terres agricoles similaires avec et sans droits sur l'eau du Nouveau-Mexique, de l'Oklahoma, du Colorado, du Kansas et du Nebraska montre que cette valeur représente entre 30 % et 60 % du prix de vente d'une exploitation [Torrell, *et al.* (1990)]. Si le prix de l'eau augmentait subitement, les agriculteurs se trouveraient dans l'incapacité de rembourser leurs emprunts fonciers. Bien qu'aucun droit ne garantisse légalement aux agriculteurs un approvisionnement en eau permanent et subventionné, il est difficile de

modifier la situation existante pour des raisons politiques et d'équité. Il est pourtant essentiel que tous les usagers de l'eau, y compris les agriculteurs, soient incités à utiliser l'eau avec parcimonie, pour garantir la pérennité des approvisionnements dans les zones arides et semi-arides. Il existe plusieurs solutions concrètes pour résoudre le problème de la « capitalisation de l'eau », notamment l'augmentation progressive (mais prévisible) des prix sur le long terme, de manière à permettre aux agriculteurs d'honorer leurs emprunts, le versement de paiements directs aux exploitants et la mise en place d'un système d'échanges permettant aux agriculteurs de mieux gérer leur actif.

**Encadré 2 : La réforme du secteur de l'eau en Australie**

L'Australie fournit l'un des meilleurs exemples de réforme du secteur de l'eau. Comme l'indique OCDE (1999), elle est allée plus loin que la plupart des pays dans la réforme des mécanismes de tarification de l'eau à usage agricole. Parmi les aspects structurels les plus importants de ces réformes, citons les suivants :

- Les nouveaux prélèvements dans les bassins déjà surexploités ont été plafonnés (un prélèvement consiste à extraire de l'eau dans le milieu, par exemple dans une rivière ou un aquifère). L'eau ne peut plus être systématiquement mise à la disposition des candidats qui demandent un accès à la ressource. Globalement, l'amélioration de la qualité de l'environnement est devenue l'une des priorités absolues des pouvoirs publics.

- Les nouveaux critères de tarification ne doivent pas engendrer de discriminations entre agriculteurs, entre terres de qualités différentes ou de quelque autre nature. Les prix doivent donc être fixés en fonction du coût estimé de la fourniture de l'eau. La procédure d'évaluation a été élaborée à l'échelon fédéral à la suite de longues négociations. Elle est conçue de telle sorte que chaque usager ou secteur doit couvrir les coûts qu'il génère.

- Les procédures utilisées pour estimer les coûts des services relatifs à l'eau doivent être respectées par chaque état de façon à empêcher une distorsion des prix entre eux.

- Les droits sur l'eau ont été convertis en droits de propriété négociables. L'exploitant dont le résultat net est insuffisant pour acquitter le nouveau prix de l'eau est ainsi autorisé à vendre ses droits. Cette mesure fait l'objet d'une mise en œuvre progressive en raison des difficultés d'application.

## 4. Mécanismes de marché

Pour encourager la concurrence, plusieurs règles et mesures concernant l'offre doivent parfois être appliquées. Figurent parmi celles-ci :

- l'affectation claire de droits sur l'eau qu'il est possible de faire respecter et pouvant être échangés
- la construction d'ouvrages de transport de l'eau à grande distance pour stimuler les échanges et la concurrence entre fournisseurs
- des incitations à la concurrence entre exploitants
- l'interconnexion obligatoire entre réseaux, avec tarification de l'accès
- permettre à plusieurs entreprises de prélever de l'eau et de traiter les eaux usées
- autoriser l'auto-approvisionnement et l'autotraitement lorsque les externalités négatives susceptibles de découler de captages multiples dans une même source d'approvisionnement sont limitées

Ces éléments sont examinés ci-après en tant que moyens de renforcement de la concurrence.

### *4.1 Echanges de droits sur l'eau*

Dans les situations de pénurie communes sous les climats arides et semi-arides, la répartition de l'eau entre les différents utilisateurs pose un problème important et politiquement sensible. Souvent, la pénurie est imputable à la fois à l'agriculture, à l'industrie et aux ménages. La distribution de droits sur l'eau aux utilisateurs est l'un des problèmes les plus épineux auxquels sont confrontées les autorités, en raison des pressions politiques et de l'insuffisance des informations nécessaires pour arrêter une répartition performante. Autoriser les échanges de droits sur l'eau améliorerait l'efficience de la répartition et atténuerait les difficultés politiques.

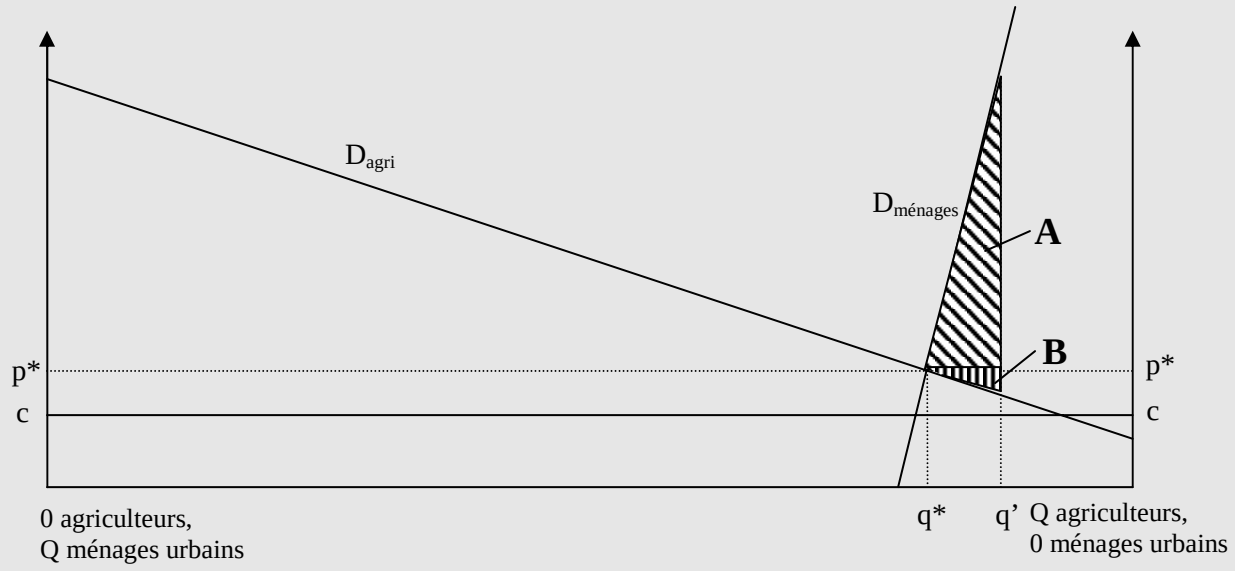
L'attribution de droits sur l'eau se déroule fréquemment dans le cadre d'un processus politique qui aboutit à une répartition entre différents groupes ne permettant pas d'assurer un bien-être social élevé. Souvent, par exemple, le secteur agricole reçoit des droits qui ont pour lui une valeur inférieure à celle que leur attribuent les distributeurs d'eau en milieu urbain. Cette inefficience peut être particulièrement sensible dans le secteur de l'eau (voir encadré 3 ci-après).

**Encadré 3 : Problèmes d'efficience allocative entre agriculteurs et ménages**

De nombreux observateurs s'accordent à penser que les ressources en eau sont mal réparties entre les différentes catégories d'utilisateurs. En particulier, sous certains climats arides, les agriculteurs reçoivent suffisamment d'eau pour cultiver des plantes tropicales ou subtropicales alors qu'en zone urbaine, les réseaux de distribution sont confrontés en permanence à des pénuries importantes. Le coût de cette répartition inadaptée peut être estimé au moyen d'un modèle qui calcule les gains que les zones urbaines pourraient retirer d'un supplément d'eau et les pertes que risqueraient d'enregistrer les agriculteurs du fait d'une diminution des volumes qui leur sont affectés, et qui part du principe que la répartition « correcte » est celle qui équilibre la valeur marginal de l'eau pour les exploitations agricoles et sa valeur marginale pour les zones urbaines[12].

Ce calcul est rarement effectué, en conséquence de quoi les avantages des échanges de droits sur l'eau ne sont pas souvent évalués avec exactitude. Par exemple, selon certaines études des avantages que les agriculteurs retirent des échanges, les titulaires existants de droits sur l'eau ne font souvent qu'un bénéfice modeste en les cédant. Mais ces avantages paraîtraient sans doute encore plus modestes si on les comparait à ceux que retirent des échanges les utilisateurs urbains qui achètent les droits en question. Cela est dû au fait que la courbe de la demande des agriculteurs est relativement élastique, alors que celle des utilisateurs urbains est relativement inélastique. Il ne faut pas s'étonner de ces écarts d'élasticité car, pour les agriculteurs, l'eau n'est qu'un intrant dans un processus de production où des substitutions technologiques entre différentes cultures et méthodes d'irrigation sont possibles. Inversement, les particuliers ont besoin d'eau pour survivre et se laver, de sorte que, au moins au niveau le plus élémentaire, la demande est immanquablement très inélastique.

La figure ci-dessous illustre de manière synthétique le calcul du bien-être social potentiel dans un système où la production d'eau $Q$ est fixe en raison de la rareté de la ressource et où cohabitent deux types de consommateurs (agriculteurs et ménages) [13]. Les courbes de la demande des agriculteurs ($D_{agri}$) et de la demande des ménages ($D_{ménages}$) se croisent à une extrémité de l'échelle. Comme à l'accoutumée, le bien-être est optimal lorsque la valeur marginale pour les différents utilisateurs est la même (dans les courbes de la demande tracées ici, les prix existants et d'équilibre sont supérieurs aux coûts).




Supposons que la répartition initiale ait résulté d'un processus administratif attribuant un volume *q'* aux agriculteurs et un volume *Q-q'* aux ménages urbains. Ensuite, à partir du point existant *q'*, les échanges déplacent le point de répartition jusqu'au point optimal pour la société *q** et au prix *p**. A ce prix *p**, les agriculteurs et les ménages urbains attribuent la même valeur à la consommation marginale.

Cependant, l'élasticité de la demande des agriculteurs n'est pas sans effet. Cette catégorie bénéficie peu des échanges, comme le montre le triangle *B*. Inversement, les ménages urbains affichent une demande inélastique, comme le révèle leur courbe de la demande très abrupte. En passant de la répartition administrative initiale à la répartition résultant des échanges de droits, les ménages urbains obtiennent un gain représenté par le triangle *A*. Or, la surface du triangle *A* est plusieurs fois supérieure à celle du triangle *B*. On constate donc que les calculs des avantages des échanges pour la collectivité qui se fondent uniquement sur les gains obtenus par les seuls agriculteurs aboutissent à une sous-estimation des bénéfices totaux retirés des échanges.

Cette figure indique qu'à partir

- d'une estimation de la courbe de la demande des agriculteurs,
- d'une estimation de la courbe de la demande des ménages urbains
- et de la détermination de la production potentielle totale,

il est possible d'estimer approximativement le prix auquel les ménages urbains et les agriculteurs attribueraient la même importance à l'eau et les avantages que chacune de ces deux catégories d'utilisateurs retireraient de la possibilité d'échanger les droits sur l'eau.

Le meilleur moyen de faire en sorte que l'eau parvienne aux consommateurs pour lesquels elle a le plus de valeur est de permettre aux utilisateurs d'échanger des droits sur l'eau (Thobani (1997)]. Ceux qui procèdent à des échanges de droits sur l'eau sont en général ceux qui ne retirent directement que des bénéfices relativement modestes des ressources dont ils disposent, par exemple les agriculteurs dont les terres ne sont pas productives et dont les approvisionnements en eau sont aléatoires [Taylor (1995)]. Les acheteurs de droits peuvent appartenir eux aussi au secteur (échanges intrasectoriels entre agriculteurs

disposant de sols peu fertiles et agriculteurs exploitant des sols riches) ou à un autre (échanges intersectoriels entre agriculteurs et distributeurs d'eau en zone urbaine). Cinq conditions doivent être remplies pour que les échanges puissent avoir lieu :

- l'attribution des droits sur l'eau doit être claire,
- il doit être possible de faire respecter ces droits,
- les droits doivent être échangeables,
- le système mettant en rapport les acheteurs et les vendeurs doit réduire les coûts de transaction,
- le transport entre vendeurs et acheteurs doit être possible.

Ces conditions sont examinées ci-après.

### *4.1.1 Attribution des droits*

Les droits sur l'eau sont plus difficiles à définir qu'il n'y paraît à première vue. Un agriculteur, par exemple, peut avoir le droit d'utiliser un volume donné pendant une période d'abondance, et un volume moindre en période de sécheresse[14].

Il existe trois grands systèmes de répartition des droits sur l'eau : droits des riverains, droits prioritaires et droits proportionnels. Dans le système des droits des riverains, les consommateurs qui se trouvent juste à côté d'une rivière ont le droit d'en extraire de l'eau à la condition de la restituer à cette rivière. Les consommateurs qui ne se trouvent pas à côté d'une rivière donnée n'ont pas le droit de s'y approvisionner. Dans le cas des droits prioritaires, chaque nouvel utilisateur se voit attribuer un degré de priorité, le dernier d'entre eux ayant le degré de priorité le plus bas. Par conséquent, les derniers qui se sont vu accorder des droits dans un bassin hydrographique donné sont aussi ceux dont les droits sont les plus restreints en période de pénurie. Inversement, dans un système proportionnel, chaque utilisateur a droit à une part de l'eau disponible dans un bassin pendant une période donnée. Ainsi, en cas de pénurie, tous les utilisateurs sont privés du même volume d'eau. Le volume attribué au titre d'un droit établi est souvent variable.

La doctrine juridique des droits des riverains n'est pas compatible avec le libre échange des ressources en eau. Dans certains cas où ce système prévalait initialement, le fondement juridique de la répartition des ressources a été modifié. Par exemple, dans le bassin hydrographique de Sacramento, c'est un système de cette nature qui était appliqué jusqu'à ce que soit mis en place le California Water Project. Ce dispositif consiste à prélever de l'eau dans la retenue du barrage d'Oroville pour la déverser dans le Sacramento, dans le Nord de la Californie, d'où elle est déviée vers le centre et le Sud de l'état [p. 29, Simpson and Ringskog (1997)].

Dans la définition du droit sur l'eau, le point d'approvisionnement correspond à un lieu précis. Dans les droits actuels, ce lieu peut être l'exploitation agricole. Toutefois, les droits échangeables pourraient le localiser à l'origine de l'eau ou n'importe où sur le trajet qu'elle parcourt. En outre, les droits sont assortis de l'obligation de verser une cotisation financière à l'autorité chargée de superviser la distribution de l'eau et le montant de cette cotisation à l'avenir est inconnu.

Ce montant pourrait faire l'objet de fluctuations. En particulier, dans les cas où les droits sur l'eau ont été tarifés en deçà de leur coût dans le passé, il risque d'augmenter dans le futur. Dans ce cas, la valeur des droits sur l'eau chuterait vertigineusement. Pour faire en sorte que les investisseurs et les autres

acheteurs potentiels soient disposés à acquérir les droits sur l'eau, il importe que les pouvoirs publics et les régulateurs, de l'échelon local à l'échelon national, précisent l'évolution que les redevances ont des chances de suivre au fil du temps, ainsi que les modifications qu'il est prévu d'apporter au régime réglementaire.

Les droits peuvent avoir une validité plus ou moins longue. Certains organismes responsables de l'eau en zone urbaine souhaiteraient pouvoir acquérir des options d'achat d'eau en prévision des périodes de pénurie, au lieu d'acheter des droits de propriété définis proprement dits.

*4.1.2 Capacité à faire respecter les droits sur l'eau*

Il doit être possible de faire respecter les droits, faute de quoi les vols d'eau ou les défauts d'approvisionnement déséquilibrent le système. Par exemple, de petits agriculteurs ayant cédé leurs droits au titre de l'irrigation à des utilisateurs urbains risqueraient, s'il était difficile de faire respecter la loi, de continuer de puiser de l'eau dans les canaux d'irrigation. La capacité à faire respecter les droits sur l'eau est fonction de deux facteurs cruciaux : une mesure fiable de la consommation et la répression prompte et immédiate des utilisations non autorisées.

*4.1.3 Echangeabilité des droits*

Même lorsque les droits sont clairement définis et qu'il est possible de les faire respecter, ils ne sont pas nécessairement échangeables. En Espagne, par exemple, les droits d'utilisation de l'eau sont définis sans ambiguïté et sont très étroitement associés aux droits d'utilisation des terres. La création de marchés de l'eau n'est donc pas autorisée, compte tenu du lien entre les deux types de droits. Dans les pays où prévaut un tel système, il conviendrait d'envisager une modification de la réglementation sur la propriété, de manière à ce que les droits sur l'eau soient séparés des autres.

*4.1.4 Mécanismes de marché*

Il doit exister un mécanisme de marché pour que les échanges puissent s'opérer dans des conditions satisfaisantes. Dans l'idéal, ce mécanisme doit permettre aux acheteurs de rencontrer les vendeurs dans un environnement à faibles coûts et assurer rapidement et à bon marché la légitimité des transactions[15]. Ce n'est pas nécessairement aux pouvoirs publics qu'il appartient de mettre en place le mécanisme de marché, mais le système juridique doit être suffisamment développé pour que les différends susceptibles de survenir sur les marchés en question puissent être réglés.

*4.1.5 Faisabilité du transport*

Pour que les échanges soient dynamiques, il doit être possible de transporter l'eau entre le lieu où se trouve le vendeur et celui où se trouve l'acheteur. L'organisation de l'accès à une voie de transport à longue distance détenue par une compagnie des eaux soulevant de nombreuses difficultés, les vendeurs individuels, comme les agriculteurs, peuvent n'avoir à faire qu'à un seul acheteur. Plus généralement, lorsque vendeurs et acheteurs sont reliés à une même voie de transport, telle qu'un canal, il importe que les acheteurs puissent négocier des conditions d'accès raisonnables à ce canal. Lorsqu'il n'existe pas de tels mécanismes de transport, les pouvoirs publics peuvent jouer un rôle important en facilitant la construction de nouveaux ouvrages moyennant leur participation au processus de délivrance des permis et de réquisition des terrains nécessaires à l'aménagement de nouvelles infrastructures de transport.

*4.1.6 Avantages des échanges*

La mise en place d'un système d'échanges peut se traduire par une nette amélioration du bien-être social. C'est entre les agriculteurs et les usagers urbains que les échanges ont le plus de chances

d'avoir lieu, dans les contextes où les ressources sont limitées. Souvent, les agriculteurs acquittent un prix très en deçà de celui qui permettrait de récupérer les coûts, et donc plus éloigné encore du prix « optimal ». En revanche, les prix payés par les usagers urbains se rapprochent de plus en plus des coûts. Surtout, ces consommateurs accordent une valeur plus importante à l'eau que les agriculteurs, mais ils ne peuvent généralement pas acheter les droits dont sont titulaires les usagers du secteur agricole. La vente d'eau par un agriculteur lui imposerait de mettre une partie des terres de son exploitation en jachère, de changer de culture ou d'améliorer son système d'irrigation. La vente des droits sur l'eau peut compenser les pertes subies par l'agriculteur du fait de ces changements. En l'absence d'échanges, le coût de la mauvaise répartition des ressources est très élevé.

Pour illustrer les avantages des échanges et les problèmes qu'ils soulèvent, quelques exemples ne sont pas inutiles. C'est pourquoi nous examinons ci-dessous les échanges de droits sur l'eau en Californie et au Chili.

A la suite d'une sécheresse survenue en 1976 et 1977, le Bureau of Reclamation des Etats-Unis a créé une banque de l'eau dans la région du Central Valley Project. Cet organisme a acheté plus de 57 millions de mètres cubes dans cette zone, au prix moyen de 40 USD par millier de mètres cubes. Il a ensuite revendu ces réserves aux agriculteurs qui en avaient impérativement besoin, au prix moyen de 41 USD par millier de mètres cubes. Il a dans un premier temps privilégié les cultures pérennes, qui risquaient d'être détruites [p. 30, Simpson and Ringskog (1997)]. La banque de l'eau a limité ses interventions au secteur agricole, les usagers urbains n'étant pas autorisés à acheter de l'eau.

L'état de Californie a quant à lui mis en place une banque de l'eau pour lutter contre les effets de la sécheresse qui a sévi de 1987 à 1992. Le ministère des Ressources en eau a acheté plus de 975 millions de mètres cubes au prix moyen de 102.50 USD par millier de mètres cubes, soit un investissement de quelque 100 millions d'USD. Cette eau a ensuite été vendue 144 USD par millier de mètres cubes, non compris les frais de transport. Les principaux acheteurs étaient des agriculteurs pour lesquels l'eau est vitale et les réseaux de distribution urbains. Les compagnies de distribution des agglomérations du Sud de la Californie et de la baie de San Francisco ont acheté 80 % de cette eau. Le système étant géré par les pouvoir publics, l'eau était achetée avant que les acquéreurs ne se déclarent et, finalement, seule la moitié de l'eau achetée a été revendue, car la sécheresse a pris fin [pp. 31-32, Simpson and Ringskog (1997)].

Les exemples qui précèdent illustrent des mécanismes d'échanges organisés par les pouvoirs publics. L'une des raisons pour lesquelles ceux-ci sont intervenus était d'éviter qu'on ne reproche aux vendeurs de tirer un profit immérité de la vente de leurs droits. Dans le cas de la sécheresse de 1976-1977, l'eau a été achetée à des agriculteurs et vendue exclusivement à d'autres agriculteurs, ce qui répond à une analyse d'ordre politique quant au bon usage de l'eau et non pas à un raisonnement économique. Dans le deuxième cas, l'eau a été vendue de manière plus rationnelle du point de vue économique, mais les pouvoirs publics ont constitué des réserves sans chercher à s'assurer que les acheteurs seraient suffisamment nombreux pour les écouler. Il est peu probable qu'un intermédiaire privé aurait accumulé un tel excédent.

Pour trouver un exemple de vrai marché libre, sur lequel les droits sur l'eau sont échangés sans la médiation des pouvoirs publics, il faut se rendre au Chili. Ce pays a été l'un des premiers à mettre en place des marchés libres des droits sur l'eau. Les échanges ne sont pas aussi dynamiques dans toutes les régions du pays. Cependant, dans la vallée du Limarí, les acheteurs acquièrent au moins 7.2 millions de mètres cubes par an. Outre les ventes régulières, il existe un marché spot particulièrement actif les années de sécheresse (pp. 32-33, Hearne and Easter (1995)]. Plusieurs facteurs sont favorables aux échanges dans cette vallée : des réservoirs permettent de stocker l'eau, les canaux sont équipés de vannes avec débitmètres et les acheteurs ont accès au réseau de canaux. La collectivité a ainsi réalisé un gain de 25 millions d'USD.

### *4.2 Incitations à la concurrence en direction des exploitants*

L'exploitation privée d'un monopole naturel non réglementé tel celui de la distribution d'eau pourrait donner lieu à des prix excessivement élevés, c'est pourquoi les prix de l'eau sont généralement réglementés. Pour tenter de donner au secteur privé des incitations à la concurrence alors que les prix sont réglementés, les solutions adoptées dans le secteur de l'eau entrent dans deux grandes catégories. La première est celle de la concession, formule selon laquelle une collectivité locale ou un regroupement de collectivités locales reste propriétaire de l'infrastructure du fournisseur d'eau tandis que le concessionnaire gère le réseau et assure l'entretien de l'infrastructure. Les concessionnaires potentiels sont en concurrence pour faire des offres à la (ou aux) collectivité(s) locale(s) et celui qui propose l'opération la plus intéressante est retenu. Pendant une bonne partie du XXème siècle, la France et l'Espagne ont appliqué ce régime de concessions.

La seconde solution est celle de l'étalonnage concurrentiel (« benchmarking »), tel que le décrivent Shleifer (1985) et Littlechild (1986), consistant à comparer une série de monopoles naturels entre eux, à trouver l'exploitant le plus efficient et à lui permettre de réaliser des bénéfices très intéressants dans l'exécution de ses activités. Les prix des autres exploitants sont liés au prix et à la marge bénéficiaire de l'exploitant efficient, de sorte que leurs contre-performances se traduisent par une réduction correspondante de leurs bénéfices[16]. L'étalonnage concurrentiel est une notion récente, étroitement associée aux réformes de la réglementation mises en oeuvre au Royaume-Uni dans les années 1980 et 1990. Nous commencerons par analyser les méthodes d'exploitation des concessions, pour ensuite nous pencher sur l'étalonnage concurrentiel.

Dans ces solutions semi-concurrentielles, l'exploitation est confiée au secteur privé, en partant de l'hypothèse selon laquelle l'exploitation des infrastructures du secteur de l'eau par le secteur public entraîne des inefficiences. Certaines constatations donnent à penser que les compagnies publiques des eaux sont en réalité plus efficientes que les compagnies privées en moyenne, mais qu'elles affichent une fourchette plus large de niveaux d'efficience [Battacharyya (1994)]. Selon une comparaison d'estimations des performances des compagnies des eaux publiques et privées aux États-Unis, les coûts d'exploitation des premières seraient inférieurs de 23 % à ceux des compagnies privées [Bruggink (1982)]. D'autres auteurs font valoir toutefois que les compagnies privées sont généralement appelées à gérer les entreprises de service public les plus difficiles à exploiter et que cela explique la différence entre les résultats du secteur public et du secteur privé dans ce secteur. Le tableau 2 résume les régimes de propriété, de gestion et de réglementation adoptés dans le secteur de l'eau de la plupart des pays de l'OCDE.

**Tableau 2. Mécanismes institutionnels dans les pays de l'OCDE**

| | Distribution publique | Capital[1] | Gestion | Régulateur économique | Régulateur environnemental |
|---|---|---|---|---|---|
| Australie | Régionale/Municipale | Mixte | Mixte | Régional/indépendant | Adm. provinciales |
| Autriche | Municipale | Public | Publique | Municipal | Adm. centrale |
| Belgique | Inter-municipale | Mixte | Mixte | Adm. fédérale (prix) | Régional |
| Canada | Régionale | Public | Publique | Adm. provinciales | Adm. provinciales |
| République tchèque | Municipale | Privé | Mixte | Adm. centrale | Adm. centrale |
| Danemark | Municipale | Public | Publique | Municipal | Adm. centrale/municipalités |
| Finlande | Municipale | Public | Publique | Municipal | Adm. centrale |
| France | Municipale | Public | Mixte | Municipal | Adm. centrale |
| Allemagne | Inter-municipale/ Municipale/Régionale | Mixte | Mixte | Municipal/Régional | Régional |
| Grèce | Municipale | Public | Publique | Adm. centrale | Adm. centrale |
| Hongrie | Municipale | Public | Mixte | Adm. centrale | Adm. centrale/indépendant |
| Islande | Municipale | n.d. | n.d. | n.d. | Adm. centrale |
| Irlande | Régionale | Public | Publique | Régional | Adm. centrale |
| Italie | Municipale | Public | Publique[2] | Adm. centrale et régionales | Adm. centrale et régionales |
| Japon | Municipale | Public | Publique[2] | Adm. centrale | Adm. centrale |
| Corée | Nationale/Régionale | Public | Publique | Adm. centrale/régionales | Adm. centrale |
| Luxembourg | Municipale | Public | Publique | Municipal | n.d. |
| Mexique | Municipale | Public | Mixte | Adm. centrale | n.d. |
| Pays-Bas | Municipale | Public | Mixte | Adm. centrale/régionales | Adm. centrale/ régionale |
| Nouvelle-Zélande | Municipale/Régionale | Public | Mixte | Adm. centrale | Adm. centrale |
| Norvège | Municipale | Mixte | Mixte | Adm. centrale | n.d. |
| Pologne | Municipale | Public | Publique | Municipal | Municipal |
| Portugal | Municipale/Régionale | Public | Mixte | Adm. centrale | Adm. centrale |
| Espagne | Municipale | Public | Mixte | Adm. centrale | Adm. centrale/indépendant |
| Suède | Municipale | Public | Publique | Municipal | Régional |
| Suisse | Municipale | Public | Publique | Adm. centrale | n.d. |
| Turquie | Municipale | Public | Publique | Adm. centrale | Adm. centrale/régionales |
| Royaume-Uni (Angleterre et Pays de Galles) | Régionale | Privé | Privée | Indépendant | Indépendant |
| États-Unis | Municipale | Mixte | Mixte | Indépendant | Indépendant |

n.d. non disponible

1. "Mixte" signifie que les structures de capital publiques et privées coexistent.

2. La gestion privée existe, mais elle est marginale.

Source: OCDE (2003a).

### *4.2.1 Concessions*

Dans un régime de concessions, le concessionnaire assure l'exploitation et la gestion de la compagnie des eaux, entretient ses installations et assume les risques commerciaux associés à son activité, tandis qu'une collectivité locale ou un groupe de collectivités locales possède les actifs sous-jacents. La concurrence peut jouer lorsque les autorités choisissent le concessionnaire. Ce dernier se verra normalement déléguer la prestation du service et sera rémunéré sur la base des factures acquittées par les

clients, ou bien il signera un contrat de service aux termes duquel la compagnie sera payée directement par l'administration locale.

La concurrence dans un régime de concessions peut poser deux problèmes importants : le premier tient aux contrats à long terme (qui ne permettent que rarement la mise en concurrence) et le second à la renégociation après la signature (qui risque de fausser le jeu de la concurrence a posteriori). Les concessions de longue durée ont de l'importance en ce qu'elles créent des incitations pour que le concessionnaire investisse dans l'entretien des installations, tandis que les concessions de courte durée donnent lieu à des appels d'offres plus fréquents. Il y a donc un choix à opérer entre le maintien des incitations à l'investissement dans l'entretien ou d'une concurrence réelle.

Les renégociations des contrats après la signature sont susceptibles de produire des effets plus sensibles lorsqu'ils sont en vigueur pendant longtemps. Williamson (1976) présente un bon exemple des répercussions de la renégociation dans un régime de concessions : il s'agissait d'un appel d'offres pour une activité de câblodistribution à Oakland, Californie. L'offre qui l'a emporté proposait un prix très faible pour la collectivité et des prestations très intéressantes. Or, peu de temps après avoir été retenu, l'adjudicataire a commencé à prétendre que son offre de prix était trop faible et que le niveau de service sur lequel il s'était engagé était excessif. L'administration locale ayant finalement accepté de revoir les clauses du contrat, l'appel d'offres initial n'était pas véritablement une mise en concurrence, puisque les modalités contractuelles n'étaient pas contraignantes.

Il y a de bonnes raisons de croire que, dans un régime de concessions, des appels d'offres publics et transparents améliorent les conditions faites aux consommateurs. En France, avant 1993, les services de l'eau donnaient rarement lieu à des appels d'offres annoncés et ouverts à tous ; le même concessionnaire restait presque toujours gestionnaire de la compagnie locale des eaux à l'expiration de la convention, celle-ci étant reconduite. En France, trois grandes sociétés multinationales (Vivendi Water, Suez-Ondéo et SAUR-Bouygues) détiennent les plus fortes parts de marché [p. 131, OCDE (2002)]. Au cours de la décennie précédant 1993, la hausse rapide du prix de l'eau et les conséquences du manque de transparence ont suscité la défiance de la population à l'égard de la gestion des services de l'eau en France [Brunet *et al.* (2002)]. Plusieurs scandales de corruption au niveau municipal, dans lesquels étaient impliqués des exploitants de services de l'eau, ont poussé l'État à prendre des mesures en ce domaine. Depuis le 29 janvier 1993, en vertu de la *loi Sapin*, les conventions de délégation de la gestion de l'eau doivent faire l'objet d'une procédure d'appel d'offres ouvert et leur durée est limitée.

L'appel d'offres ouvert a radicalement modifié le fonctionnement du secteur en France.[17] La loi stipule que soit lancé un appel d'offres, commençant par une procédure de publicité qui permet la présentation de plusieurs offres concurrentes, suivie de l'évaluation de toutes les offres soumises. A partir de l'évaluation de centaines de renégociations de conventions, la durée moyenne des conventions a été ramenée de 17 à 11 ans. Dans 80 à 90 % des cas, l'exploitant en place l'a tout de même emporté sur les autres, mais il a été reçu, en moyenne, 2.4 offres à chaque occasion. Néanmoins, ces conventions de délégation de service public sont de plus en plus souvent passées avec de petits exploitants indépendants. Les prix ont diminué de 10 % par rapport au prix moyen pratiqué avant la mise en place de cette procédure.[18]

### *4.2.2 Étalonnage concurrentiel*

L'étalonnage concurrentiel définit un niveau idéal des coûts à engager pour l'exécution de l'activité considérée, ou niveau de référence, et applique ensuite, à *toutes* les entreprises du secteur, les prix qui permettent d'obtenir des bénéfices raisonnables compte tenu du niveau de coûts retenu. Chaque entreprise peut se voir attribuer un prix-repère différent parce que les coûts jugés efficients sont définis en cherchant à tenir compte de l'hétérogénéité des structures des coûts des différentes entreprises. Par

conséquent, la réglementation des prix peut intervenir à un échelon plus général que le local. C'est au Royaume-Uni que l'on trouve l'exemple d'étalonnage concurrentiel le plus remarquable : la réglementation en Angleterre et dans le Pays de Galles était supervisée par l'Office of Water Services (Ofwat), et le secteur comptait initialement 39 compagnies des eaux [Sawkins (2001)]. Ces entreprises soumettent leurs données d'exploitation à l'Ofwat, qui les analyse en deux étapes. Dans la première, il construit un modèle économétrique pour établir le rendement relatif de chacune d'elles par rapport à la moyenne du secteur. Dans la deuxième étape, l'Ofwat utilise ce modèle pour déterminer laquelle est la plus efficiente ou la plus avancée par rapport à la moyenne du secteur. Les rares entreprises retenues (il se peut qu'une seule le soit) servent alors de référence pour la concurrence.[19]

Le nouveau prix pour le secteur est ensuite calculé sur la base de l'ancien prix, corrigé de l'inflation et compte tenu d'une rentabilité élevée pour l'entreprise prise pour repère.[20] L'intérêt théorique de l'étalonnage concurrentiel tient au fait que l'entreprise n'est pas en mesure d'influencer le prix qu'elle est autorisée à fixer, aussi la manipulation de la réglementation est-elle impossible. Les incitations à l'efficience sont donc importantes à court terme, car l'entreprise sera autorisée à garder les bénéfices imputables à son efficience. Il n'y a pas d'incitation au surinvestissement (ce qui serait le cas si la réglementation était fondée sur le taux de rentabilité), parce que la plupart des entreprises ne voient aucun rapport entre le prix qu'elles pratiquent et leur volume d'investissement [voir Shleifer (1985)]. L'encadré 4 explicite davantage l'étalonnage concurrentiel.

**Encadré 4. Étalonnage concurrentiel**

Le problème fondamental, dans les secteurs soumis à réglementation, concerne la façon dont les régulateurs peuvent déterminer des prix de nature à inciter les entreprises réglementées à opter pour investir comme il convient et à opérer de manière efficiente. La forme de réglementation la plus simple, qui consiste à empêcher les entreprises de s'approprier les bénéfices découlant du monopole qu'elles détiennent en veillant à ce que leurs prix ne dépassent pas leurs coûts, est celle du coût des services. Dans ce régime, le régulateur prend des dispositions pour que les coûts de l'entreprise réglementée soient couverts par un mécanisme de subventionnement, mais l'entreprise n'est pas récompensée si elle réduit ses coûts. Il en résulte donc une faible incitation à rechercher l'efficience productive.

Comment renforcer ces incitations ? L'un des principaux constats favorables à l'étalonnage concurrentiel est le suivant : si le régulateur ne calcule pas le subventionnement d'une entreprise inefficiente en fonction des coûts qu'elle affiche, l'entreprise sera fortement encouragée à réduire immédiatement les coûts, puisqu'elle en tirera directement des bénéfices accrus[21] [voir Shleifer (1985)]. En revanche, dans la réglementation au coût des services, une baisse des coûts ne se traduit pas systématiquement par une augmentation des bénéfices. L'idée qui sous-tend l'étalonnage concurrentiel est que le régulateur utilise les coûts enregistrés par des entreprises comparables comme base d'estimation des coûts que l'entreprise réglementée peut atteindre.

Le modèle de régulation par comparaison postule que les entreprises maximisent les bénéfices mais que les gestionnaires déploient un minimum d'efforts tant que des bénéfices ne sont pas en jeu. Afin de réduire des coûts qui sont trop élevés pour favoriser l'efficience, l'entreprise doit investir. Le régulateur ne dispose pas d'informations sur les moyens par lesquels l'entreprise pourrait dépenser moins, mais il est en son pouvoir d'appliquer une règle de fixation des prix et il doit définir celle qui régira le subventionnement de l'entreprise. Dans l'étalonnage concurrentiel, la règle de fixation des prix stipule que les « coûts autorisés » d'une entreprise donnée doivent être fondés sur les coûts constatés des autres entreprises. S'il existe plusieurs entreprises identiques opérant sur des marchés distincts et sans interaction entre elles de ce fait, la règle peut simplement spécifier que les coûts autorisés seront ceux de celle qui affiche les moindres coûts. Lorsque les entreprises sont multiples et hétérogènes, le régulateur rassemble des informations pour estimer, par régression, les coûts autorisés d'une entreprise en fonction de l'ensemble de ses paramètres. Du moment que l'équation de régression permet de caractériser de façon appropriée comment les différences entre les entreprises influent sur les coûts qu'elles sont susceptibles d'atteindre, la régression peut aboutir à une estimation du coût qu'une entreprise donnée peut atteindre quel que soit son comportement. [22]

Si les prix sont fixés à leur niveau minimum, le consommateur payera le produit au juste prix, que ce prix soit fondé sur le coût marginal (dans l'hypothèse d'un transfert du secteur public vers une entreprise réglementée) ou sur le coût moyen.

Le grand avantage de l'étalonnage concurrentiel tient au fait que le régulateur n'est pas tenu de porter d'appréciation sur les mesures que devrait prendre une entreprise pour fonctionner de manière efficiente. En conséquence, il n'a pas grand besoin d'informations, mais il doit en revanche être animé d'une détermination sans faille. Shleifer affirme : « Il est essentiel que le régulateur s'engage à ne pas prêter attention aux doléances des entreprises et soit prêt à les laisser faire faillite si elles optent pour des niveaux de coûts contraires à l'efficience » [p. 323, Shleifer (1985)]. Dans le secteur de l'eau, nous pourrions nous demander s'il est indiqué que le régulateur permette la faillite d'une compagnie des eaux, compte tenu de l'intérêt pour la collectivité d'un approvisionnement en eau régulier et stable, qui l'emporte sur les avantages éventuels de la discipline induite par une menace de faillite. Le régulateur doit faire preuve d'une volonté sans faille, non seulement devant les revendications des entreprises, mais aussi en cas de fusions, comme le montre l'encadré 5.

**Encadré 5. Étalonnage concurrentiel et politique en matière de fusions**

L'étalonnage concurrentiel intéresse directement la politique en matière de fusions. En cas d'adoption d'un mécanisme d'étalonnage des performances, les données financières et celles qui concernent les résultats de chaque entreprise sont communiquées à une autorité centrale pour établir les repères. L'autorité centrale a besoin de données concrètes provenant d'un grand nombre de compagnies des eaux pour pouvoir produire des estimations du seuil d 'efficience de la production qui soient fiables du point de vue statistique. Les fusions horizontales risquent de réduire dangereusement la quantité, d'ores et déjà limitée, d'observations indépendantes dont dispose le régulateur. Ce problème lié aux fusions s'est posé au Royaume-Uni, où les compagnies des eaux verticalement intégrées n'étaient plus que 24 en 2002, contre 39 à l'origine.

Dans le long processus qui a conduit à la fusion de Vivendi Water UK plc et de First Aqua, les raisons invoquées au premier chef par l'Ofwat et l'Office of Fair Trading (OFT) pour s'opposer à la fusion, ainsi que par la Competition Commission pour exiger des mesures correctrices, étaient liées au principe d'indépendance des observations. En l'occurrence, Vivendi possédait trois compagnies des eaux (Three Valleys Water, Tendring Hundred et Folkestone & Dover) et détenait des participations dans deux autres (Bristol Water et South Staffordshire). First Aqua était propriétaire de Southern Water, or cette dernière était la principale entreprise retenue par l'Ofwat aux fins de la comparaison pour établir le niveau d'efficience de référence, appelé à influencer les prix que pourraient percevoir les autres compagnies des eaux.

La notification de la fusion de Vivendi et de First Aqua a été faite en 1995. Cette opération risquait de soulever deux problèmes distincts : tout d'abord, le nombre d'observations indépendantes diminuerait dès lors que le contrôle conjoint estomperait la différence entre les diverses compagnies régionales des eaux. Ensuite, Southern Water aurait moins intérêt à opérer dans des conditions correspondant au seuil d'efficience ; en effet, si elle était amenée à devenir moins efficiente, d'autres entreprises du réseau de Vivendi pourraient en tirer profit en cas de concurrence « comparative », parce qu'elles seraient autorisées à avoir une marge bénéficiaire plus élevée.

La dérogation accordée en mars 1995 aux autorités du Royaume-Uni par la Commission européenne stipulait que « le nombre minimum de compagnies des eaux indépendantes ne devait pas dépasser le nombre nécessaire pour garantir l'efficacité du régime réglementaire. » [OFT (2003b)]. L'Ofwat et l'OFT ont finalement jugé que la diminution du nombre d'entreprises indépendantes serait sensible, et peut-être assez important, bien qu'il soit difficile d'évaluer empiriquement à quel point cette perte de précision serait préjudiciable. Enfin, la Competition Commission a publié le 8 novembre 2002 son rapport sur l'opération (Cm 5681) : elle s'y montrait quelque peu sceptique quant à l'ampleur des mesures correctrices qui s'imposeraient dans le cas d'une fusion dans le secteur de l'eau. L'Ofwat affirme qu' « il n'y a pas de 'nombre minimum' objectivement définissable d'entreprises à comparer pour garantir l'efficacité des modèles, comme le donne à penser la décision de la CE. » [p. 5, OFT (2003b)].

Pour préserver l'indépendance dans les régimes de concurrence comparative, il importe de fixer des limites aux fusions horizontales, ou de les empêcher complètement. Il serait peut-être particulièrement judicieux de le faire dans les cas de figure suivants : (1) lorsque les économies d'échelle et de gamme résultant du regroupement de différentes entreprises de service public (surtout quand elles desservent des zones adjacentes) sont faibles ; (2) lorsqu'il est permis d'intégrer par le biais de l'acquisition des experts en gestion extérieurs au système, comme cela s'est effectivement produit dans les réseaux britanniques de distribution d'eau et d'assainissement ; et (3) lorsque les compagnies des eaux peuvent continuer à réaliser des gains d'efficience.[23]

Les craintes de l'Ofwat étaient peut-être particulièrement sérieuses parce que Southern Water était l'entreprise la plus représentative aux fins de la comparaison. L'Ofwat a estimé que le fait de ne plus pouvoir l'utiliser comme référence risquait d'entraîner des pertes pour la collectivité comprises entre 330 millions de GBP et 1 330 millions de GBP en valeur actuelle nette. En fin de compte, le 5 février 2003, Vivendi a annoncé son intention de céder à la Royal Bank of Scotland la participation majoritaire qu'elle détenait dans le capital de Southern Water, en ne conservant qu'une part de 19.9 % assortie d'une option lui permettant de la porter à 25 %. En outre, Vivendi a cédé une partie de ses intérêts minoritaires et créé une nouvelle entité de notification de données pour le champ de la licence couvrant le Hampshire. Afin de déterminer si ces mesures correctrices étaient suffisantes, l'OFT a été obligé de décider quel serait le pouvoir de contrôle de Vivendi dans un contexte de participations minoritaires. Vivendi prévoyait de conserver 3 sièges sur 11 dans le conseil d'administration de Southern Water, tandis que la Royal Bank of Scotland serait tenue d'utiliser ses voix en bloc, quelles que soient les modalités de détention de sa participation. L'OFT a jugé que cet arrangement, conjugué aux cessions d'autres intérêts minoritaires et aux dispositions de gouvernement d'entreprise, règlerait convenablement le problème de la perte d'efficience (OFT, 2003a).

### *4.3 Concurrence entre sources d'approvisionnement*

Bien que l'on considère à juste titre qu'un réseau de distribution d'eau fonctionne à l'échelon régional comme un monopole naturel, il n'existe aucun monopole naturel sur les sources d'approvisionnement en eau. Il est par conséquent concevable de répartir les sources à l'intérieur d'une région donnée et de les attribuer à des exploitants différents afin qu'ils assurent la fourniture d'eau (se reporter à Noll *et al.*, 2000). Les cours d'eau, les lacs et les aquifères font partie des sources possibles d'approvisionnement. Autrement dit, dans une région donnée, il peut arriver que l'eau soit prélevée dans un cours d'eau par un exploitant et dans un aquifère par un autre. Tant que l'octroi de droits de prélèvement dans la même nappe aquifère à deux ou plusieurs compagnies différentes n'entraîne pas d'externalités négatives, il peut être justifié que plusieurs entreprises prélèvent de l'eau de la même source et soient ensuite en concurrence pour vendre l'eau au réseau de distribution.[24]

Étant donné que les coûts des prélèvements et des incidences environnementales ne sont pas les mêmes selon la source d'approvisionnement, il est très probable que, comme il en va de l'électricité, un type de source – un cours d'eau, par exemple – soit la première source d'approvisionnement jusqu'à son épuisement, moment où une autre source – un aquifère, notamment – deviendra le moyen les plus rentable après le premier de se procurer de l'eau, sauf s'il faut procéder à un traitement important (et donc onéreux) de l'eau de surface pour assurer sa conformité aux normes de qualité.[25] La concurrence entre sources d'approvisionnement risque toutefois de ne pas bien fonctionner, sauf si plusieurs fournisseurs ont accès au réseau détenteur du monopole naturel.

La concurrence au niveau de l'approvisionnement en eau pourrait fonctionner si la compagnie exploitant le réseau achetait l'eau à sa filiale procédant à l'extraction ainsi qu'à d'autres entreprises de captage, ou bien si l'on réalisait une séparation structurelle entre la compagnie exploitant le réseau et toutes les entreprises de captage (OCDE, 2001). Il est à noter qu'une compagnie des eaux appelée à décider si elle construit des installations d'extraction ou achète l'eau à une compagnie des eaux desservant une zone adjacente aura intérêt à opter pour cette deuxième solution si les prix de la compagnie voisine sont inférieurs à ceux que son projet de construction entraînerait. Il y a cependant peu de raisons de penser que la séparation structurelle donnerait de bons résultats dans le secteur de l'eau.

Il ne faudrait pas considérer la concurrence au niveau de l'approvisionnement en eau comme un phénomène purement local. Certes, le coût de l'acheminement de l'eau sur une grande distance représente un pourcentage considérable du coût total de l'eau si on compare cette ressource à d'autres, par exemple l'électricité ou le gaz, qui affichent des coûts de transport relativement faibles, mais les possibilités de concurrence entre sources d'approvisionnement très éloignées du lieu de consommation ont fait l'objet d'études, en particulier parce que c'était un moyen de remédier à des pénuries persistantes. Cette concurrence est déjà une réalité en certains endroits, notamment en Californie, et c'est une conséquence envisageable à l'avenir au Royaume-Uni, compte tenu de la répartition géographique de la consommation

d'eau : le sud-est de l'Angleterre est exposé au risque de pénurie en raison de sa forte densité de population et de l'offre limitée, tandis que le nord dispose d'eau en abondance. British Waterways projette de concevoir des systèmes de transfert d'eau pour en amener du nord riche en eau jusqu'aux régions d'Anglia et de la Tamise qui en sont faiblement dotées [p. 172, Owen (2002)]. En Espagne, la sécheresse de 1999 a conduit le gouvernement à rechercher une solution durable aux problèmes d'eau que connaît le sud du pays par la mise en oeuvre d'un plan hydrologique prévoyant un investissement de 18 milliards d'EUR, pour financer notamment la construction d'une série de barrages qui permettraient d'amener dans le sud de l'eau provenant des régions septentrionales qui en disposent en abondance.[26]

En théorie, la fourniture d'eau à grande distance en traversant des frontières nationales est possible. Néanmoins, jusqu'à ce jour, les échanges de cette nature ont été rares. Par exemple, en mai 1998, une entreprise canadienne (Groupe Nova) a reçu une autorisation provisoire de prélèvement de 10 millions de litres par jour pour les exporter à destination de l'Asie. Si cette transaction s'était finalement concrétisée, elle aurait toutefois pu conduire à considérer l'eau comme une marchandise dans le cadre de l'ALENA ou de l'OMC, ce qui aurait permis à des entreprises étrangères d'exploiter les ressources en eau du Canada dans les mêmes conditions que les entreprises nationales. C'est pourquoi le Canada s'est efforcé d'interdire l'exportation d'eau en vrac [p. 173, Owen (2002)].

Les plans britannique et espagnol de transport d'eau sur de grandes distances ne se justifieront, d'un point de vue économique, que pour répondre aux pointes de la demande, c'est-à-dire dans les situations où les prix de l'eau devraient atteindre leur maximum. L'existence de liaisons de transport à grande distance n'implique pas nécessairement l'ouverture à la concurrence au niveau de la fourniture de base, qui peut tout de même souvent être assurée à bien moindre coût par des sources d'approvisionnement locales. De là la possibilité que la concurrence s'intensifie en période de rareté.

### *4.4 Concurrence au stade du traitement des eaux usées*

Les stations d'épuration des eaux usées assainissent les eaux sales ou usées afin que leur rejet dans l'environnement ne produise pas de dommages importants. Il est à l'évidence possible de séparer les fonctions de traitement des eaux usées et de distribution d'eau. Les eaux usées son souvent traitées par une entreprise distincte de la compagnie des eaux et, dans la facturation de l'eau, les redevances au titre de la fourniture d'eau potable et de l'assainissement sont très fréquemment indiquées séparément. La séparation verticale entre la distribution d'eau et l'assainissement des eaux usées est déjà largement répandue, ce qui laisse à penser que les économies d'intégration ne sont guère sensibles dans les activités de distribution et d'assainissement.

Plusieurs entreprises peuvent-elles être en concurrence au stade du traitement des eaux usées ? La concurrence s'est déjà imposée en ce domaine par le biais de concessions, souvent obtenues dans le cadre d'appels d'offres pour la passation de contrats de construction-exploitation-tranfert (CET). L'adjudicataire de ce type de contrat construit et exploite un installation pendant une durée déterminée et en suivant une série d'objectifs de résultats afin de pouvoir recouvrer son investissement et faire un bénéfice. Au terme de cette période, l'installation est entièrement transférée à l'autorité municipale.

Toutefois, cette concurrence dont les concessions sont l'enjeu n'entraîne pas, en général, de concurrence horizontale au stade de l'assainissement. Cette dernière est-elle possible ? Les conduites reliant une zone urbaine à une station d'épuration des eaux usées peuvent restreindre le nombre de lieux d'implantation potentiels de ces stations, mais ne limitent pas nécessairement le nombre d'entreprises qui pourraient traiter l'eau en bout de canalisation. Pour l'heure, de nombreuses collectivités locales disposent d'une capacité de traitement suffisante pour assainir les eaux usées existantes, de sorte que l'ouverture à la concurrence obligerait à construire des capacités excédentaires ou à répartir la capacité en place entre plusieurs entreprises distinctes. Étant donné que la construction de capacités excédentaires ne se justifie

sans doute pas, la concurrence à ce niveau poserait des problèmes dans ces collectivités. Il existe cependant d'autres endroits où la capacité d'épuration des eaux usées est minime. L'application de nouvelles normes de qualité de l'eau nécessite souvent, dans ces localités, la construction d'importantes installations d'assainissement. Si les économies d'échelle sont faibles au-delà d'un volume minimum au stade du traitement des eaux usées, plusieurs entreprises de traitement des eaux pourraient logiquement rivaliser en bout de canalisation. Pour que s'instaure une concurrence réelle, il faudrait une capacité excédentaire assez importante. Noll (2002) propose de réfléchir à cette possibilité, même si les exemples concrets de ce type de concurrence sont très rares, à supposer qu'il y en ait.

### *4.5 Tarification de l'interconnexion et de l'accès*

Une tarification combinée de l'interconnexion et de l'accès contribuerait à donner le choix aux clients entre différents distributeurs d'eau lorsqu'ils négocient avec le distributeur historique, mais la tarification de l'accès est très difficilement applicable dans ce secteur. Comme le transport de l'eau est onéreux, il n'est pas raisonnable, en général, d'effectuer des transferts de la source à l'utilisateur sur de grandes distances, comme dans le cas de l'électricité ou du gaz. L'Ofwat, par exemple, a calculé que le surcoût lié au transport de l'eau sur 100 km représente 50 % du coût du produit, contre 5 % pour l'électricité et 2.5 % pour le gaz (voir tableau 3).[27] Néanmoins, en particulier pour les utilisateurs situés en bordure de la zone de desserte d'un exploitant, le coût du transport de l'eau peut ne pas être très élevé. Pour favoriser un large accès aux réseaux, le Royaume-Uni a récemment décidé de rendre obligatoire l'octroi de l'accès d'un distributeur d'eau à l'infrastructure d'un autre distributeur.

**Tableau 3. Surcoût indicatif du transport**

| | **Électricité P/kWk (400KV)** | **Gaz P/100 000 Btu (conduite de 24")** | **Eau P/m$^3$** |
|---|---|---|---|
| Coût global | 3.0 | 20 | 30 |
| Coût de transport | 0.15 | 0.5 | 15 |
| Transport en % du coût par 100 km | 5% | 2.5% | 50% |

Chiffres en pence de GBP. Source: Ofwat, Royaume-Uni, tiré de WRC and Ecologic (2002)

Les possibilités d'accorder l'accès de tiers aux réseaux dans le secteur de l'eau sous la forme de « désignations d'entrants » (« inset appointments ») existe depuis de nombreuses années au Royaume-Uni en vertu de conventions privées. (Ce dispositif octroie à une compagnie des eaux ou d'assainissement des eaux usées la possibilité de desservir une zone qui, auparavant, faisait partie de la zone de desserte d'une autre compagnie des eaux). L'un des atouts de cette possibilité d'accès est l'incitation qu'elle peut offrir à transporter l'eau d'une région où la ressource est abondante vers une autre où elle est rare. Cependant, vu que le coût du transport de l'eau et les coûts fixes sont élevés, une tarification mal conçue de l'accès, et en particulier une sous-tarification, pourrait avoir de graves conséquences pour les opérateurs. Pour un examen approfondi de la complexité de la tarification de l'accès, le lecteur peut consulter la publication intitulée La tarification de l'accès dans le secteur des télécommunications [OCDE (2004)]. Il faut donc user d'une grande prudence pour définir des prix raisonnables de l'accès. Le Royaume-Uni en a bien conscience, puisqu'il en est fait mention dans un document du ministère de tutelle : « il est à conseiller d'adopter une attitude prudente à l'égard de l'ouverture du marché à la concurrence pour permettre une évaluation approfondie du fonctionnement pratique du contexte concurrentiel et des conséquences à en tirer du point de vue de ses objectifs en matière de santé publique, ainsi que sur les plans social et environnemental. » [paragraphe 25, p. 12, DEFRA (2002)]. Compte tenu de l'importance du coût de transport et des coûts fixes dans le secteur de l'eau, on ne voit pas encore bien comment la tarification de l'accès en vue d'y introduire la concurrence pourrait se concrétiser.

### *4.6 Droits d'autoprestation*

L'autoprestation est une solution concurrentielle de rechange pour les clients lorsque les prix sont excessivement élevés. Les principales possibilités d'autoprestation à envisager pour intensifier la concurrence sont au nombre de trois :

- l'autoprestation par les pouvoirs publics, ou régie directe, en lieu et place de l'exploitation sous concession
- l'autoprestation par le client, c'est-à-dire qu'il assure lui-même son approvisionnement en eau et l'assainissement des eaux usées
- l'auto-installation de l'infrastructure par le client.

Ces trois formules possibles sont examinées ci-après.

#### *4.6.1 Autoprestation par les pouvoirs publics*

L'autoprestation est un élément important dans l'arsenal d'instruments dont disposent les autorités locales lorsqu'elles négocient avec les concessionnaires. Elle présente un intérêt particulier pour les pouvoirs publics quand un seul concessionnaire soumet une offre parce, même s'il y a un seul soumissionnaire, il existe en fait deux prestataires possibles – le soumissionnaire et les pouvoirs publics. L'efficacité de la menace de recourir à la régie directe pour influer sur les négociations avec les éventuels concessionnaires dépend, dans une large mesure, de l'information et des moyens dont dispose la collectivité locale concernée.

Pour pouvoir effectivement faire valoir la régie directe comme moyen de pression, les autorités qui disposent de peu d'informations devront éventuellement s'appuyer sur une évaluation comparative de leurs coûts de fonctionnement prévus ou faire appel à des experts-conseils. En France, les cabinets d'études jouent un rôle de plus en plus grand en tant que sources d'information dans ce type de négociations, car une meilleure connaissance des coûts possibles de l'autoprestation peut être très bénéfique pour les communes dans leurs négociations avec les concessionnaires potentiels. Il est fondamental que les pouvoirs publics s'abstiennent de rendre obligatoire la prestation par le secteur privé, car cette exigence les priverait, dans les négociations, du moyen de pression que représente l'éventualité de la régie directe.

#### *4.6.2 Autoprestation par le client*

Les clients peuvent assurer eux-mêmes leur approvisionnement en eau et l'assainissement des eaux usées. Nombre de clients industriels, par exemple, pratiquent d'ores et déjà l'autoprestation. Pour les clients déjà desservis par une compagnie des eaux et d'assainissement, la menace d'effectuer des prélèvements d'eau ou de traiter les eaux usées eux-mêmes a beaucoup de poids, à la fois pour inciter davantage les compagnies des eaux à continuer de pratiquer des prix raisonnables et pour s'assurer que l'eau fournie est de la qualité voulue. Nous examinerons tour à tour l'autoprestation en ce qui concerne la fourniture d'eau et l'assainissement des eaux usées.

##### 4.6.2.1 Eau

En quoi la possibilité d'autoprestation influe-t-elle sur les incitations qu'aurait la compagnie des eaux lorsqu'elle fixe les prix ? La menace d'extraire eux-mêmes l'eau dont ils ont besoin est l'un des arguments de poids que font valoir les clients quand ils négocient avec des compagnies des eaux monopolistiques. Il est évident que la réglementation en matière de prélèvements d'eau, souvent mise en

oeuvre par les agences de bassin, peut jouer un rôle décisif en ce qu'elle conditionne la faisabilité de l'autoprestation.

Les prélèvements sont souvent réglementés pour préserver la ressource et protéger les caractéristiques géologiques du site d'extraction. Néanmoins, si (1) l'accès à la ressource d'un client (notamment, un client industriel) ne compromet pas l'accès d'un autre acteur (par exemple la compagnie des eaux) et que (2) le recours à l'autoprestation par le client pour remplacer la fourniture assurée par la compagnie des eaux a un effet neutre sur le total des prélèvements effectués dans un bassin, il existe peu de motifs d'empêcher les clients d'accéder à la ressource, abstraction faite de la difficulté à limiter les volumes des prélèvements dans plusieurs sites privés, alors qu'il est aisé d'y parvenir dans un seul site centralisé.[28] Les agences de bassin doivent être conscientes des effets possibles de leurs actions sur la concurrence et prendre des mesures pour réduire les incidences négatives de la réglementation à cet égard.

Comment l'autoprestation peut-elle faire en sorte que la qualité de l'eau corresponde à celle que nécessite l'usage qui en sera fait ? Un argument supplémentaire important plaide en faveur de l'autorisation des prélèvements autonomes : de nombreux clients reçoivent de la compagnie des eaux une eau de qualité supérieure à celle dont ils ont réellement besoin. Par exemple, il est fréquent que les clients industriels n'aient pas besoin d'eau potable, mais ils doivent en utiliser si c'est celle que leur fournit la compagnie des eaux. Grâce à l'autoprestation, l'eau qu'ils consommeront ne sera pas excessivement traitée compte tenu de l'usage envisagé. Dans la mesure où le traitement est onéreux, l'autoprestation donnera lieu à des gains d'efficience.

#### 4.6.2.2 Eaux usées

De même que pour les prélèvements, il est déjà fréquent que les gros clients assurent eux-mêmes l'assainissement de leurs eaux usées. Les clients industriels s'engagent souvent dans cette activité pour se conformer à la réglementation sur la qualité de l'eau ou pour éviter d'avoir à acquitter des redevances d'assainissement élevées pour l'épuration de leurs effluents dans des stations centralisées. On observe qu'il importe de laisser aux clients la latitude de recourir à l'autoprestation si les redevances d'assainissement s'approchent des coûts afin qu'ils utilisent moins le réseau centralisé d'assainissement. Le problème qui risque de se poser tient à la surévaluation éventuelle du prix de l'assainissement par suite d'estimations peu fiables des coûts.

Les régulateurs et les entreprises d'assainissement devraient veiller à mieux mesurer les coûts et à facturer les montants appropriés ; dans le cas contraire, les clients qui, en recourant à l'autoprestation, supposeraient le moindre coût pour la collectivité risquent d'opter pour l'épuration centralisée, parce que les prix sont artificiellement bas. De même, les clients dont l'épuration centralisée des effluents serait la solution la moins coûteuse pour la collectivité peuvent se tourner vers l'autoprestation en cas de prix trop élevés de l'assainissement centralisé.

### *4.6.3 Auto-installation de l'infrastructure par le client*

Jusqu'à une date récente, l'entreprise de service public qui était l'opérateur historique dans le secteur de l'eau contrôlait généralement tout le réseau de distribution, y compris la pose de nouvelles conduites principales et canalisations. Au Royaume-Uni, les maîtres d'ouvrage des nouveaux aménagements devraient payer une redevance à la compagnie des eaux pour la conception et la construction des nouvelles infrastructures, mais ceux qui opèrent dans les secteurs résidentiel et industriel souhaiteraient souvent confier la pose des canalisations à leur propre maître d'oeuvre. En octroyant aux clients le droit de poser leurs propres conduites principales et canalisations (auto-installation), la qualité et les prix des services offerts aux maîtres d'ouvrage pourraient s'améliorer.

Les compagnies des eaux répugnent souvent à accorder ce droit aux maîtres d'ouvrage, dans le souci de préserver la qualité et en raison des bénéfices qu'elles peuvent tirer de cette activité. En effet, les maîtres d'ouvrage acquittent généralement des redevances considérables au titre de la construction des conduites principales et des canalisations, et se plaignent fréquemment des redevances élevées que les compagnies des eaux perçoivent pour la conception et la pose des conduites principales, ainsi que de la longueur des délais d'exécution des travaux. En conséquence, le Royaume-Uni a récemment demandé aux compagnies des eaux de rationaliser et de normaliser les procédures permettant à des tiers de poser des extensions de leurs réseaux de distribution, à condition de respecter les impératifs de qualité appropriés. Beaucoup de compagnies des eaux s'y opposent, mais sous-traitent souvent elles-mêmes auprès de tiers la réalisation des ouvrages. [OFWAT (2001)].

L'Ofwat a estimé que les domaines dans lesquels des exploitants devraient bénéficier du droit d'auto-installation sont notamment les suivants :

- Conception et installation de conduites principales sur site
- Raccordement des canalisations de service aux nouvelles conduites principales
- Essais de pression et procédés de désinfection
- Achat de matériaux

L'Ofwat est arrivé à la conclusion que les compagnies des eaux devraient continuer à contrôler :

- Le raccordement des nouvelles conduites principales aux existantes
- Les essais de qualité

Une fois les nouvelles installations prêtes, la compagnie des eaux en reprend le contrôle. L'Ofwat a jugé que cette dernière devrait rétribuer l'entité propriétaire des conduites et canalisations auto-installées lors de la reprise, mais que le montant acquitté ne devrait pas correspondre à l'intégralité du coût engagé par le maître d'ouvrage pour les poser. En revanche, afin de maintenir l'incitation à ce que le fournisseur au moindre coût construise les nouvelles conduites et canalisations, ce montant devrait tenir compte des gains escomptés de la pose de nouvelles canalisations, tout comme les paiements versés par le maître d'ouvrage à la compagnie des eaux décrits dans l'encadré 6 ci-dessous. [29]

**Encadré 6. Paiements au titre des conduites principales et canalisations auto-installées**

L'Ofwat veut faire en sorte que ce soit le constructeur le plus efficient qui effectue la conception et la construction d'un ensemble donné de conduites principales et de canalisations. Néanmoins, il n'a pas la possibilité de savoir lequel sera le plus efficient. D'une manière générale, les conduites et canalisations une fois construites sont reprises par la compagnie des eaux qui les utilisera pour distribuer l'eau. Le maître d'ouvrage qui réquisitionne les conduites et canalisations doit verser à la compagnie des eaux une rétribution correspondant au coût de leur construction, déduction faite d'un montant censé représentatif de la rentabilité future de l'infrastructure en question. Imaginons que la compagnie des eaux fait payer 8 millions de GBP pour la construction de ces installations et qu'elle accorde une réduction de 2 millions de GBP au maître d'ouvrage, le coût net des conduites principales et canalisations pour ce dernier sera de 6 millions de GBP.

La possibilité de l'auto-installation permet au maître d'ouvrage de choisir de construire lui-même les conduites et canalisations ou d'en laisser le soin à la compagnie des eaux. Afin d'augmenter les chances de retenir le concepteur et constructeur le plus efficient, l'Ofwat tient à ce que la compagnie des eaux reste obligée de verser un montant reflétant la rentabilité future, même pour les canalisations auto-installées.

Si ce paiement n'avait pas lieu, le maître d'ouvrage pourrait, par exemple, devoir acquitter un montant de 7 millions de GBP au titre de la construction, mais choisir le projet plus onéreux de la compagnie des eaux, parce que le coût net serait de 6 millions de GBP si la compagnie des eaux se chargeait de ces travaux, soit 1 million de GBP de moins qu'en cas d'auto-installation.

Sous la direction de l'Ofwat, avec la formule de l'auto-installation, le maître d'ouvrage investirait 7 millions de GBP et recevrait un paiement de 2 millions de GBP de la part de la compagnie des eaux. Le coût net d'auto-installation s'élèverait donc, pour le maître d'ouvrage, à 5 millions de GBP : dans ce cas, ce dernier retiendrait l'option la plus rentable, c'est-à-dire l'« auto-installation ».

Par contre, si le coût pour le maître d'ouvrage était supérieur aux 8 millions de GBP annoncés par la compagnie des eaux, le maître d'ouvrage choisirait de demander à la compagnie des eaux de construire les conduites principales et les canalisations. Cet exemple montre comment le régulateur peut assurer la neutralité concurrentielle des régimes de paiement en cas d'auto-installation de l'infrastructure.

## 5. Service universel

L'une des principales raisons qui justifiait par le passé le subventionnement de la fourniture d'eau était la volonté de s'assurer que les consommateurs à faible revenu aient accès à l'eau potable et à l'eau douce. Or, cette subvention « généralisée » aux consommateurs d'eau n'incite guère à l'économiser et entraîne sans doute une surconsommation. Il existe des méthodes bien établies permettant d'aider les consommateurs à faible revenu, notamment les bas tarifs applicables en cas de déclaration par le consommateur de son faible revenu, la tarification ordinaire s'appliquant aux dépassements du niveau « normal » de consommation [se reporter à OCDE (2002)]. Le programme d'aide Lifeline mis en oeuvre en Californie est un exemple de ce type de dispositif : il assure à des tarifs peu élevés la fourniture du service de base aux consommateurs qui déclarent des revenus inférieurs à un certain niveau, ce qui garantit leur accès à l'eau à bas coût, tout en appliquant des prix plus élevés aux clients qui ont la possibilité de les payer.

**Tableau 4. Comparaison du poids relatif des redevances sur l'eau**

| | Année | Centiles ou nombre de classes | Revenu disponible servant de référence pour la mesure du poids relatif des redevances sur l'eau | |
|---|---|---|---|---|
| | | | Poids pour la catégorie de revenus inférieure | Ratio poids pour la catégorie inférieure de revenus/poids moyen |
| Angleterre et Pays de Galles | 1999-00 | Déciles | 3.75%[1] | 3.1[2] |
| Mexique[3] | 2000 | Déciles | 3.84% | 3.0 |
| Hongrie | 1999 | Déciles | 2.53% | 1.4 |
| Écosse | 1999-00 | Déciles | 2.24%[1] | < 2.9 |
| France[4] | 1995 | Neuf | 2.18% | 2.5 |
| Pays-Bas | 1999 | Quartiles | 2.38% | 1.7 |
| Danemark | 1998 | Six | 1.93% | 1.7 |
| Italie | 1995 | Six | 0.90%[5] | > 2.1 |
| États-Unis[6] | 2000 | Quintiles | 0.66% | 1.3 |

1. Les revenus moyens bruts et nets sont supposés égaux dans la catégorie de revenus inférieure.
2. Des données distinctes fournies par l'Office of National Statistics du Royaume-Uni permettent d'estimer directement ce chiffre.
3. On estime que les données concernent uniquement la distribution publique d'eau.
4. On considère que les mesures du "revenu" utilisées dans l'enquête par sondage concernent le revenu disponible
5. Pour les catégories de revenus inférieurs, on considère que les dépenses totales sont égales au revenu net.
6. Les communications avec le Federal Bureau of Labour Statistics permettent de supposer que, dans le cas des deux quintiles inférieurs de revenus, la déclaration des revenus était si incomplète que les dépenses moyennes totales des ménages dans ces catégories seraient une meilleure indication du revenu moyen disponible.

Source: OCDE (2003a).

L'accessibilité financière qui importe dans l'optique du service universel concerne deux aspects : d'une part, le coût de raccordement au réseau, de l'autre, le coût récurrent du service assuré par le réseau et celui de la consommation proprement dite. Nombre de compagnies des eaux sont tenues, en vertu de la réglementation, de raccorder tous les clients pour le même prix. Il en résulte un subventionnement croisé, en règle générale de la clientèle des zones à faible densité de population par celle des zones densément peuplées. De même, de nombreuses compagnies des eaux sont obligées par la réglementation de ne pas couper l'eau chez des clients existants, sauf en cas de non-paiement. Le tableau 4 présente le poids relatif des redevances sur l'eau pour les consommateurs appartenant à la catégorie de la population à revenus inférieurs dans certains pays de l'OCDE.

Outre les consommateurs à faible revenu, les ménages en zones rurales posent souvent un problème politique grave dans le secteur de l'eau. Il est fréquent, dans leur cas, que le coût du service dépasse considérablement celui de la desserte en zones urbaines. Les compagnies des eaux dont la zone de desserte est vaste et recouvre à la fois des zones urbaines et rurales font souvent payer les mêmes tarifs de raccordement et de consommation aux consommateurs ruraux et urbains, en dépit des coûts plus élevés associés à la desserte des premiers. Or, il arrive souvent que les consommateurs des zones rurales desservis par des compagnies des eaux dont le territoire de desserte est peu étendu acquittent des tarifs supérieurs tenant compte du coût plus élevé du service assuré. Une tarification supérieure en zones rurales, assortie de programmes de tarification en fonction des revenus pour les consommateurs ruraux démunis, est dans nombre de cas la méthode optimale pour desservir les zones rurales et aider les ménages à faible revenu. Il est à noter que la pose de canalisations reliant les logements au réseau n'a de sens, en termes financiers, qu'au-delà d'une certaine densité de population. En conséquence, de nombreux consommateurs ruraux recourent à l'« auto-approvisionnement » (en puisant dans des puits) et à l'« assainissement autonome » (au moyen de fosses septiques).

Comment financer l'aide lorsque des consommateurs à faible revenu sont subventionnés, par exemple dans le cadre d'un programme de fourniture peu coûteuse ? Pour l'essentiel, trois solutions sont possibles :

- le subventionnement croisé implicite
- les taxes propres au secteur
- la fiscalité générale.

Il se produit un subventionnement croisé implicite lorsque des consommateurs acquittent des tarifs plus élevés qu'en l'absence de subvention croisée, mais sans le savoir. Dans un contexte de concurrence, il peut s'avérer difficile de mettre en place des subventions croisées implicites, car l'opérateur public historique serait responsable de la desserte des clients à faible revenu, alors que les nouveaux entrants ne seraient pas tenus de l'assurer. Parmi les autres solutions possibles, on peut citer l'instauration d'une taxe à laquelle tous les usagers ou entreprises d'une zone déterminée seraient assujettis, quelle que soit leur compagnie des eaux (taxe propre au secteur). Enfin, le financement peut provenir de la fiscalité générale. Toute décision quant au mode de financement approprié d'un montant d'aide déterminé devrait tenir compte de la perte sèche découlant de chaque type de paiement, expliquée ci-après et plus en détail dans le document OCDE (2003b). En raison de l'inélasticité de la demande des ménages, les taxes frappant cette catégorie d'usagers pour financer l'accès universel à l'eau et à l'assainissement constitueront probablement un moyen plus efficient que la fiscalité générale.

A propos de l'accès universel, ce qu'il importe le plus de souligner est la possibilité de bon fonctionnement de la prestation du service aux consommateurs à faible revenu, même si la concurrence s'intensifie (ou si le service en question est privatisé).

## 6. Conclusion

Le secteur de l'eau se caractérise par :

- l'inélasticité de la demande
- l'inélasticité de l'offre
- des coûts fixes élevés
- des coûts de transport élevés
- des économies d'échelle jusqu'à un certain point

Tous ces facteurs conjugués laissent peu de possibilités de faire régner des formes courantes de concurrence horizontale. Faute de réglementer les prix, ceux-ci peuvent flamber, comme sur les marchés de l'électricité en cas de contraintes d'approvisionnement. Il est par conséquent vraisemblable que la réglementation des prix soit maintenue.

Le problème économique probablement le plus important dans le secteur de l'eau est celui de la répartition de l'eau en cas de rareté de la ressource, aussi bien entre différentes catégories d'usagers qu'entre localités. La création de droits sur l'eau et de droits de pollution de l'eau négociables peut contribuer à remédier aux difficultés de la répartition entre catégories d'usagers, entre pays et entre

collectivités locales. La mise en place de marchés de l'eau à faibles coûts de transaction ne va pas sans mal et nécessite :

- des droits attribués
- des droits exécutoires
- des droits négociables
- un mécanisme de marché
  - une bourse d'échanges centralisée
  - l'information du public sur les prix convenus
- la faisabilité du transport

La mise en oeuvre d'échanges de droits sur l'eau dans des bassins qui s'étendent sur plusieurs pays (comme celui du Danube) est extrêmement difficile. A moins de trouver une méthode pour convaincre les pays en amont de déterminer la valeur de la ressource et d'une faible pollution en un point plus en aval du fleuve, l'eau risque d'être gaspillée et excessivement polluée dans ces pays, par rapport aux besoins de ceux qui se trouvent en aval et à la valeur qu'ils attachent à la ressource et à sa pureté. L'adoption de droits sur l'eau négociables assortis d'un mécanisme d'arbitrage international pouvant assurer le respect des termes de l'échange serait un moyen de persuader les pays et les usagers en amont d'évaluer l'eau de manière plus satisfaisante et permettrait de résoudre un problème politique complexe à l'aide d'un processus économique classique.

Les deux principales solutions envisageables pour insuffler la concurrence sur le marché visent essentiellement à accroître l'efficience productive, et non à résoudre le problème de la répartition dans le secteur de l'eau : il s'agit de la concurrence dans un régime de concessions et de l'étalonnage concurrentiel. La concurrence introduite par le biais de concessions est de plus en plus largement répandue en Europe, bien que rien ne prouve de façon concluante, pour l'heure, que les caractéristiques du service s'améliorent de leur fait. Nombre de gouvernements sont cependant peu enclins à affecter les crédits nécessaires à l'entretien des réseaux de distribution d'eau vétustes et préfèrent que le secteur privé prenne en charge l'exploitation et l'entretien.

L'étalonnage concurrentiel, selon le modèle de réglementation en vigueur en Angleterre et dans le Pays de Galles, a entraîné des baisses notables des coûts d'exploitation pendant les cinq premières années de sa mise en oeuvre, mais des effets relativement faibles par la suite. Ce modèle de concurrence fait intervenir un mécanisme qui ne relève pas des pouvoirs publics pour décider des niveaux d'efficience ainsi que pour comparer les activités et les coûts dans des régions où les conditions hydrologiques et la répartition géographique des clients sont très différentes. Les méthodes employées à cet effet ont été en butte à des critiques.

Dans l'ensemble, les différents modèles de concurrence ont eu relativement peu d'influence sur le fonctionnement des compagnies des eaux. Il y a tout lieu de penser que la difficulté à appliquer dans le secteur de l'eau diverses formules d'ouverture à la concurrence persistera, en raison de la situation de monopole naturel qui le caractérise et du fait que le transport de l'eau est onéreux.

## GLOSSAIRE

| | |
|---|---|
| Aquifère | Formation souterraine faite de terre, de roches poreuses, de sable ou de gravier, où l'eau peut circuler ou être retenue naturellement. En général, les aquifères contiennent assez d'eau pour servir de source d'approvisionnement. |
| « Désignation d'entrants » | Désignation d'une compagnie de distribution ou d'assainissement lui permettant de desservir une zone qui faisait partie *auparavant* du territoire de desserte d'une autre compagnie. |
| Eaux usées | Les eaux usées sont des eaux déjà utilisées et non potables, comprenant, entre autres effluents, les eaux d'égout. Elles sont souvent épurées avant d'être rejetées dans l'environnement de manière à réduire leurs effets négatifs sur ce dernier. |
| Plan d'aménagement hydrologique | Plan général de gestion des eaux qui, souvent, prend en compte les problèmes des usagers et les difficultés d'approvisionnement (retenues, par exemple), ainsi que l'environnement. |
| Potable | Eau qu'il est possible de boire en toute sécurité, dont la teneur en bactéries et en matières solides est inférieure à un niveau donné, en général déterminé par la réglementation nationale. |
| Prélèvement d'eau | Fait d'extraire de l'eau du milieu naturel, par exemple d'une rivière ou d'un aquifère. Le prélèvement est la première étape du processus de production d'eau destinée aux ménages. Viennent ensuite le traitement de potabilisation, puis la distribution. |
| Tarification au volume | La tarification au volume consiste à facturer l'eau sur la base du volume consommé. Elle peut prendre la forme d'un prix par mètre cube d'eau, par exemple. |

## NOTES

1 Les eaux usées sont des eaux non potables, y compris les eaux d'égout et autres effluents, qui sont souvent traitées avant d'être rejetées dans l'environnement de manière à réduire leurs effets négatifs sur ce dernier. Voir dans le glossaire la définition des termes clés relatifs au secteur de l'eau.

2 Par exemple, si une personne prélève de l'eau dans un aquifère, cela peut faire augmenter les coûts de prélèvement d'autres personnes (un aquifère est une couche souterraine de terre, de roches poreuses, de sable ou de graviers contenant de l'eau, au travers de laquelle l'eau peut s'écouler ou dans laquelle elle peut être retenue naturellement. Les aquifères constituent souvent une source d'approvisionnement.)

3 Par exemple, les conséquences environnementales de la consommation d'eau des utilisateurs industriels ne sont généralement pas prises en considération par ces utilisateurs.

4 Dans le secteur agricole, les éleveurs de porcs et de volailles sont peut-être davantage à même de s'occuper des effluents de leurs exploitations que les grands cultivateurs qui emploient des produits chimiques.

5 Le bassin du Danube s'étend au moins sur l'Allemagne, l'Autriche, la République slovaque, la Hongrie, la Yougoslavie, la Croatie, la Bosnie Herzégovine, la Roumanie et la Bulgarie. Celui du Rio Grande baigne les Etats-Unis et le Mexique et celui de l'Euphrate la Turquie, la Syrie et l'Irak.

6 La Cour internationale de justice de La Haye peut résoudre les différends entre des pays qui reconnaissent sa compétence dans le domaine de l'eau. Néanmoins, elle n'est probablement pas l'institution la mieux placée pour résoudre les problèmes économiques de répartition.

7 Si la demande des ménages est totalement inélastique par rapport au prix, le comptage est inutile. En fait, de nombreuses études montrent que si cette demande n'est pas complètement inélastique, elle l'est en grande partie en ce qui concerne les usages normaux des ménages, qui affichent une élasticité de -0.10 grosso modo, et nettement moins, tout en le demeurant, pour ce qui de l'arrosage des jardins [p. 150, OCDE (1999)]. C'est donc pour les usages « de luxe » que le comptage a le plus de sens. Dans la mesure où ces usages « de luxe », tels que l'arrosage des jardins, sont peu nombreux dans les appartements, il n'est pas nécessairement rentable d'y installer des compteurs.

8 Directive 2000/60/CE du Parlement européen et du Conseil établissant un cadre pour une politique communautaire dans le domaine de l'eau.

9 Voir dans Hausman (1996) une description des pertes sèches relatives découlant de chacune de ces formes d'imposition.

10 Cette analyse part du principe que les clients peuvent difficilement court-circuiter la compagnie des eaux.

11 Sur la base d'une élasticité de la demande de -0.1 ou moins, comme le suppose la majeure partie de la littérature. Notons qu'il s'agit de l'élasticité de la demande pour une augmentation des volumes d'eau à partir d'un niveau donné.

12 Le modèle ne tient pas compte des coûts de transport.

13 Dans un souci de simplicité, nous ne prenons pas en considération les externalités et les coûts d'opportunité dans les autres parties du système.

14 S'agissant des barrages, leurs exploitants peuvent disposer d'eau en période de pénurie mais ne pas la libérer pour des raisons de gestion qui leur sont propres, par exemple pour garantir l'approvisionnement en électricité [Brennan and Scoccimarro (1999)].

15 Un mécanisme de marché à faibles coûts de transaction nécessite un site d'échanges centralisé (qui peut être électronique) et la publication d'informations sur les prix convenus. L'autorité de supervision de la distribution de l'eau qui enregistre les transactions est naturellement l'organisme le mieux placé pour communiquer les prix de l'eau [Carey, et al. (2002)].

16 Ce concept d'étalonnage concurrentiel, appelé aussi parfois concurrence par comparaison, consiste à évaluer les performances d'une entreprise par rapport à celles des autres sur la base d'un « étalon » ; autrement dit, il s'agit d'une évaluation comparative de la concurrence.

17 Il arrive souvent que les mairies ou les autorités communales ne s'estiment pas techniquement compétentes pour évaluer les termes et conditions d'une offre et décider quel est le niveau de prix approprié compte tenu des conditions de coûts dans leur juridiction. En conséquence, et pour surmonter le problème d'asymétrie de l'information entre les autorités communales et les entreprises, la procédure d'appel d'offres a conduit 90 % des collectivités locales à s'adresser à des cabinets d'experts-conseils pour les aider à gérer le processus et à évaluer les différentes soumissions. De préférence, les autorités locales ont fait appel à des experts de l'administration centrale, une faible minorité ayant eu recours à des bureaux d'études privés. Dans une nouvelle tentative visant à régler le problème d'asymétrie de l'information, la France envisage actuellement une loi qui créerait un système d'évaluation comparative afin de mieux renseigner les autorités communales sur les coûts, les tarifs et les modalités appropriés.

18 L'étude de Brunet et al. (2002) signale qu'elle repose sur des données tirées d'enquêtes menées par les autorités communales. Il est possible que des modifications ultérieurement apportées aux conventions initiales n'ayant pas entraîné de concurrence se traduisent par des hausses de prix.

19 La taille de l'entreprise de référence est prise en considération également.

20 Jusqu'à présent, l'Ofwat a procédé à ces analyses en 1994 et 1999. Il lui a été reproché de fixer une norme de rendement trop faible en 1994, à la suite de quoi les compagnies des eaux ont affiché des rentabilités élevées entre 1994 et 1999.

21 Baumol (1970) et Bailey (1974) constatent un phénomène analogue avec leurs modèles d'ajustement différé de prix, dans lesquels il s'écoule une longue période entre la fixation du prix par le régulateur et sa révision. Dans l'intervalle, les entreprises peuvent engranger la totalité des bénéfices résultant des recettes supérieures aux dépenses, d'où elles retirent une forte incitation à réduire leurs coûts.

22 Un exemple d'étalonnage des performances est celui de l'adoption, dans le secteur hospitalier aux États-Unis, du système des groupes homogènes de malades (GHM) pour le remboursement des patients hospitaliers couverts par Medicare. Le système de classification des patients hospitalisés en fonction des pathologies a fixé une tarification pour chaque pathologie, essentiellement sur la base des normes de traitement appliquées dans d'autres établissements hospitaliers comparables, et non une tarification applicable dans un établissement donné. Dans ce secteur, la diversité des pathologies et les écarts non mesurés d'un hôpital à l'autre ont donné lieu à des accusations d'inéquité ; elles ont aussi conduit certains établissements à contourner le système par des voies imprévues avant la mise en place des GHM. C'est probablement dans les cinq premières années où il a été appliqué que ce système de tarification a eu les incidences les plus spectaculaires. Autrement dit, la plupart des gains d'efficience réalisables se concrétisent à un stade précoce de mise en oeuvre des régimes de fixation des prix. Cette expérience pourrait laisser à penser que le mécanisme de tarification pourrait être modifié au bout de cinq ans, mais ce ne serait pas une conclusion pertinente. L'un des facteurs clés qui poussent à réduire les coûts est la

perspective de pérennité du système et l'idée que les entreprises ayant procédé aux réductions de coûts qui s'imposaient continueront à en bénéficier.

23 Un cabinet d'experts-conseils a analysé pour le compte de l'Ofwat les économies d'échelle dans le secteur de l'eau au Royaume-Uni et il en a conclu que, compte tenu de leur taille actuelle, les compagnies des eaux n'en enregistrent guère [Stone and Webster Consulting (2004)]. Cela ne signifie pas pour autant que des entreprises plus petites que les compagnies britanniques ne peuvent pas en réaliser. Par exemple, Bruggink (1982) obtient, dans les activités du secteur de l'eau, d'importantes économies d'échelle pouvant atteindre 727 360 millions de litres d'eau par an et, au-delà de ce volume, ni économies ni déséconomies d'échelle perceptibles. Chose plus importante encore, c'est au nom des économies d'échelle que l'argument selon lequel le monopole naturel justifie la réglementation du secteur est couramment admis.

24 Il est possible qu'en cas d'octroi à une deuxième compagnie du droit de prélever dans un aquifère, les coûts de prélèvement de la première augmentent. Cela signifie qu'il existe peut-être des externalités importantes.

25 Dans un aquifère, il faut recourir au pompage vertical de l'eau, procédé généralement plus coûteux que les moyens de prélèvement dans d'autres sources d'approvisionnement.

26 Un plan hydrologique est un plan global concernant l'utilisation de l'eau qui tient souvent compte des problèmes des consommateurs et des sources, notamment les barrages, ainsi que de l'environnement. Se reporter au glossaire.

27 Pour citer une exception, l'aqueduc de Los Angeles transporte sur 338 miles jusqu'à Los Angeles l'eau prélevée du lac Mono et de la vallée de l'Owens.

28 Les prélèvements privés risquent de réduire d'un facteur supérieur à 1 : 1 les quantités que doivent prélever les compagnies des eaux en raison des fuites, en aval, dans les canalisations de distribution aux clients finals de ces dernières, alors que les pertes sont souvent moins importantes quand les prélèvements sont effectués par des entreprises privées.

29 Le Water Act de 2003 du Royaume-Uni a reçu la sanction royale le 20 novembre 2003 et les dispositions énoncées concernant l'auto-installation devraient entrer en vigueur au printemps 2004.

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# QUESTIONNAIRE SUBMITTED BY THE SECRETARIAT

These questions are designed to better understand the features of your regulatory regime related to the provision of water and sewage treatment in a competitive framework. (Henceforth the term "water" describes both water and sewage treatment.) While the water sector is often considered as a natural monopoly, there are a number of areas in which competition has the potential to operate to improve quality and lower costs. Water services are often provided by publicly owned utilities and customers are frequently charged prices that do not reflect all the costs of water provision. This can lead to waste and shortages. At the same time, when changes are considered either to select a private supplier and or to change the pricing regime, political opposition can be substantial.

These questions are intended to provide a guide for how you might present your approach to water supply and competition. I recognize that central governments often do not manage local water provision and that within a given country, regulation and competition approaches may be different in some jurisdictions from others. I therefore invite you to focus on the most interesting and best-known examples from your country.

The primary issue underlying these questions is how to ensure that water of desired quality is produced and distributed in the most efficient ways possible, while taking into account externalities and opportunity costs as appropriate. In particular, I would like to focus on how competition may help to provide part of the answer to this question. While this is the focus of the questions, it is important not to forget that water supply decisions are often closely related to a number of environmental issues and that increasing the amount of water taken from some sources, such as rivers, may have harmful environmental effects if there is reduced river flow downstream.

Important topics include:

Supplier Selection and Incentives

- How is the water supplier chosen?
- Is competition possible between different water suppliers in the same geographic area?
- How is an incentive provided to increase productive efficiency?

Consumer Pricing and Access

- What is the structure of retail water prices?
- How can one ensure that water is provided to the highest value users?
- How can access to water be ensured for low-income consumers?

Quality and Environment

- How can water quality be assured within a competitive framework?
- How can water use be combined with environmental objectives?

Clearly, different approaches may be appropriate in different countries because water cost and demand characteristics may differ significantly from one country to another.

I would like to draw your attention to the following documents prepared by the OECD's Environment Directorate:

- Improving Water Management: Recent OECD Experience (2003) available electronically from OLIS under Publication Locator.
- Social Issues in the Provision and Pricing of Water Services (2002) available electronically from OLIS under Publication Locator
- The Price of Water: Trends in OECD Countries (1999) available electronically from OLIS under Publication Locator.

**General**

We may roughly distinguish two distinct segments of water supply: supply and processing of water for agricultural and industrial purposes (including irrigation) and supply and processing of water for drinking, bathing and household uses. These segments are not completely distinct because water can often be used either for agricultural purposes or for other purposes. In your responses, please feel free to address either or both segments, as well as the relations between them.

As background, please describe the roles and responsibilities of the regulatory and water service institutions in your country. If there have been any changes to increase competition in recent years, please explain the nature of these changes. Please identify any positive or negative effects arising from the competition.

**Supplier Selection and Incentives**

**How is the water supplier chosen?**

In some countries, water systems are locally franchised. At other times, a private manager is selected for a water system. At other times, the government operates the water system.

When a franchise is established, please describe the main terms of the franchise? What are the terms in a bid? Does the water supplier make a bid to pay for the exclusive right to provide or does the supplier bid the rates it will charge for water supply?

Please discuss how an incentive is provided to maintain the fixed assets, especially the pipes? Is competition between potential franchisees important?

Please state what criteria are used for selecting private managers chosen for government-owned systems? Do most employees continue to work for the government after conversion to a private manger?

**Is competition possible between different water suppliers in the same geographic area?**

It is commonly believed the competition between water suppliers is not possible. But is this necessarily the case? While it is likely that distribution may be characterized by natural monopoly, when there are multiple possible sources of water, such as an aquifer and a river, supply by multiple providers may be possible (such as one supplier from the aquifer and another from the river). Similarly, one might argue that competition is possible between adjacent water treatment plants. Please describe whether these types of competition appear feasible and whether they have been implemented.

**How is an incentive provided to increase productive efficiency?**

One mechanism for increasing incentives to produce efficiently is often privatization. Please discuss whether this is regarded as a sufficient step for increasing efficiency of provision of water services.

When prices are based on costs, the incentive to increase productive efficiency can be muted by the knowledge that higher costs may serve as a basis for higher prices. Thus many policy makers choose to set prices by a mechanism that has a limited relation to the actual costs of a given utility. Yardstick competition is one example of a pricing mechanism that can provide firms with a strong incentive to lower costs. Another example of a mechanism that provides such an incentive is a simpler price index that is adjusted annually by an inflation factor. Please discuss how these mechanisms work and what types of problems/advantages arise in different systems.

Many water systems are characterized by leakage or spillage. This may occur from the main delivery pipes and even with the end user. While metered pricing may provide an incentive to the consumer not to waste water, what kind of incentives to avoid spillage exist for the water provider? Please discuss whether spillage is perceived as a problem and what types of solutions, if any, are envisaged.

**Consumer Pricing and Access**

**What is the general structure of retail water prices?**

Whether a water system is operated in a public or private framework, customers are normally charged for water usage. In the absence of charges, consumers face little incentive to avoid waste. These charges should reflect the physical costs of water provision but such charges should also reflect the externalities imposed by the use of water and the opportunity costs involved in choosing to use a water for one purpose (such as agricultural irrigation) as opposed to another (such as domestic usage.)

Please discuss how water prices are regulated when water systems are operated privately. Please explain how assurance can be provided to private operators that the value of their investments and franchise payments will not be reduced after the acquisition of the water system by regulating lower prices, regulating higher quality standards, or otherwise limiting the investor's ability to maintain profits.

Because the water system consists mostly of long-lived infrastructure, many observers would suggest that prices should take on a two-part structure, with a fixed charge combined with a metered charge. Please state whether two-part pricing is common in your country. Please discuss how large the fixed charge is compared to the metered charge for most users.

While a two-part tariff makes sense when metering is not costly, metering can be expensive. So some operators, especially those with no prospect of shortage, may choose to implement only a fixed charge. Please discuss whether the benefits of metering exceed the costs.

When there is a shortage of water, as with a drought, rationing or higher prices can both be used to provide consumers with an incentive to reduce consumption. Please discuss what solutions to shortage are adopted and, if price solutions are not adopted, please explain why.

**Is water provided to the highest value users?**

While in many locations water may be plentiful, in others, it may constitute a scarce resource that requires some form of allocation between users. In some countries, customers are accustomed to paying artificially low fees for water. In such an environment, shortages may develop and in such a circumstance, the users

who place a highest value on water may not use it. Please discuss whether water is treated as a scarce resource in its pricing. Please describe whether water rights are clearly established and whether these rights are enforceable. If rights are clearly established, can they be traded? If trading has occurred, please describe the results on the distribution of water. Please describe how trading has influenced the distribution of water between different users.

**How can access to water be ensured for low-income consumers?**

Historically, one of the most important reasons for building centralized water treatment and distribution systems has been to maintain health and reduce the spread of disease. If positive prices are charged for water (reflecting the costs of water supply), low-income users may be excluded from the water system. Given that significant positive externalities can arise from providing low-income users with access to water and that access to water is often considered a basic right, are there any ways of providing low-income consumers with a subsidy that nonetheless maintains a marginal incentive to avoid waste of water? Please describe the approaches that can be adopted to providing water to low-income consumers.

**Quality and Environment**

**How can water quality be assured within a competitive framework?**

A commonly expressed concern is that water quality cannot be assured in a framework of private operation of water services. Please discuss how the regulation of water quality is governed to avoid problems with low-quality or excess-quality water provision.

**How can water use be combined with environmental objectives?**

Water resource decisions can have profound environmental effects. Wildlife habitats and downstream users may be affected by the actions of upstream users. While downstream users might be able to intervene financially if water rights are clearly distributed in a market setting, the environment (or its representatives, such as government ministries of environment and environmental groups) are less able to intervene by a direct financial mechanism. Please comment on how to reflect environmental concerns arising from water usage in a market allocation system.

# QUESTIONNAIRE SOUMIS PAR LE SECRÉTARIAT

Les questions ci-après ont été conçues pour mieux comprendre les caractéristiques de votre régime réglementaire relatif à la fourniture de l'eau et à l'assainissement des eaux usées dans des conditions de concurrence. (Dans la suite du texte, le terme « eau » est utilisé pour désigner à la fois l'eau et l'assainissement des eaux usées). Bien que l'on considère souvent le secteur de l'eau comme un monopole naturel, la concurrence peut jouer dans un certain nombre de domaines pour améliorer la qualité et réduire les coûts. Les services de l'eau sont souvent assurés par des entreprises publiques et il est fréquent que les clients acquittent des prix qui ne tiennent pas compte de la totalité des coûts de la fourniture d'eau. Il peut en découler gaspillage et pénuries. Dans le même temps, lorsque des changements sont envisagés en vue de choisir un fournisseur privé ou de modifier le régime de tarification, ils peuvent susciter une forte opposition politique.

Ces questions entendent vous guider dans la présentation de votre politique en matière de distribution d'eau et de concurrence. Je sais que, fréquemment, les administrations centrales ne gèrent pas la fourniture d'eau au niveau local et que les stratégies en matière de réglementation et de concurrence peuvent varier d'une juridiction à l'autre à l'intérieur d'un même pays. Par conséquent, je vous invite à privilégier les exemples les plus intéressants et les mieux connus à relever dans votre pays.

La problématique première qui motive ces questions est celle de déterminer comment faire en sorte de produire et distribuer l'eau de la qualité souhaitée par les moyens les plus efficients possible, en tenant compte comme il convient des externalités et des coûts d'opportunité. En particulier, je souhaiterais insister sur la façon dont la concurrence peut contribuer à y répondre. Les questions sont certes axées sur cet aspect, mais il importe de ne pas oublier que les décisions relatives à la distribution d'eau sont souvent étroitement liées à un certain nombre de problèmes d'environnement et que l'augmentation des quantités d'eau prélevées de certaines sources, les cours d'eau par exemple, risque de produire des effets préjudiciables à l'environnement si le débit fluvial est réduit en aval.

Les thèmes qui revêtent de l'importance sont notamment :

Choix du fournisseur et incitations

- Comment procède-t-on au choix du fournisseur d'eau ?
- La concurrence est-elle possible entre différents fournisseurs d'eau dans une même région géographique ?
- Comment inciter à améliorer l'efficience productive ?

Tarification et accès

- Quelle est la structure des prix de détail de l'eau ?
- Comment s'assurer que l'on subvient aux besoins des usagers pour qui l'eau est une ressource essentielle ?
- Comment garantir l'accès à l'eau des consommateurs à faible revenu ?

Qualité et environnement

- Comment garantir la qualité de l'eau dans des conditions de concurrence ?
- Comment concilier l'utilisation de l'eau et les objectifs d'environnement ?

A l'évidence, des approches différentes peuvent se prêter aux conditions régnant dans tel ou tel pays, parce que le coût de l'eau et les caractéristiques de la demande sont susceptibles de varier considérablement d'un pays à l'autre.

Je souhaiterais attirer votre attention sur les documents suivants, préparés par la Direction de l'environnement de l'OCDE :

- Améliorer la gestion de l'eau : l'expérience récente de l'OCDE (2003), accessible par voie électronique sur OLIS, dans le localisateur de publications.
- Social Issues in the Provision and Pricing of Water Services (2002), accessible par voie électronique sur OLIS, dans le localisateur de publications.
- Le prix de l'eau : les tendances dans les pays de l'OCDE (1999), accessible par voie électronique sur OLIS, dans le localisateur de publications.

**Généralités**

En gros, on peut distinguer deux segments dans la distribution d'eau : la fourniture et le traitement de l'eau à des fins agricoles et industrielles (y compris pour l'irrigation) ainsi que la fourniture et le traitement de l'eau à usage domestique (boisson, bains, etc.). Ces segments ne sont pas totalement distincts car l'eau à usage agricole est souvent utilisée à d'autres fins aussi. Dans vos réponses, vous avez toute latitude pour aborder l'un ou l'autre de ces segments, ou les deux, ainsi que les relations entre eux.

Pour situer les choses dans leur contexte, veuillez décrire les rôles et les responsabilités des institutions réglementaires et de celles qui sont chargées de services de l'eau dans votre pays. Si des changements sont intervenus ces dernières années pour accroître la concurrence, veuillez en expliquer la nature. Nous vous prions également de mentionner les éventuels effets positifs ou négatifs de la concurrence.

**Choix du fournisseur et incitations**

**Comment procède-t-on au choix du fournisseur d'eau ?**

Dans certains pays, les réseaux d'eau font l'objet de concessions au niveau local. Dans d'autres cas de figure, un gestionnaire privé est choisi pour un réseau donné et, dans d'autres encore, c'est l'État qui exploite le réseau de distribution d'eau et d'assainissement.

En cas d'octroi d'une concession, veuillez en décrire les conditions principales. Quelles sont les clauses énoncées dans la soumission ? Le fournisseur d'eau doit-il proposer de payer pour obtenir l'exclusivité de la desserte ou faire une offre indiquant les tarifs de distribution d'eau qu'il pratiquera ?

Veuillez préciser comment sont données les éventuelles incitations à entretenir les actifs fixes, en particulier les canalisations ? La concurrence entre concessionnaires potentiels a-t-elle de l'importance ?

Veuillez mentionner les critères utilisés pour choisir les gestionnaires privés des réseaux de l'État. La plupart des salariés restent-ils employés de l'administration publique après le passage sous la houlette d'un gestionnaire privé ?

**La concurrence est-elle possible entre différents fournisseurs d'eau dans une même région géographique ?**

Selon une opinion répandue, la concurrence entre fournisseurs d'eau n'est pas possible. Or, est-ce forcément le cas ? On peut sans doute affirmer que la distribution est un monopole naturel, mais lorsqu'il y a plusieurs sources possibles d'approvisionnement en eau, notamment un aquifère et un cours d'eau, la

distribution par plusieurs prestataires serait envisageable (par exemple, un fournisseur puisant dans l'aquifère, un autre dans le cours d'eau). De même, on pourrait alléguer que la concurrence est possible entre des usines de traitement des eaux implantées à proximité l'une de l'autre. Veuillez préciser si ces formes de concurrence sont possibles et si elles ont été mises en oeuvre.

**Comment inciter à améliorer l'efficience productive ?**

La privatisation est souvent de nature à renforcer les incitations à produire de manière efficiente. Veuillez indiquer si elle est jugée suffisante pour améliorer l'efficience de la prestation des services de l'eau.

Lorsque les prix sont fondés sur les coûts, l'incitation à accroître l'efficience productive peut être affaiblie parce que l'on sait qu'une hausse des coûts risque d'entraîner une hausse des prix. C'est pourquoi de nombreux décideurs optent pour fixer les prix à l'aide d'un mécanisme ayant peu de rapport avec les coûts effectifs de l'entreprise de service public. L'étalonnage concurrentiel est un exemple de mécanisme de fixation des prix qui peut donner aux entreprises une forte incitation à réduire les coûts. Un autre exemple de mécanisme offrant ce type d'incitation est un indice de prix plus simple, corrigé annuellement de l'inflation. Veuillez décrire le fonctionnement de ces mécanismes et les types de problèmes/avantages qu'ils entraînent sous différents régimes.

Les fuites ou déperditions qui se produisent dans nombre de réseaux d'eau peuvent survenir dans les grandes canalisations de distribution, voire chez l'usager final. Si la facturation de l'eau en fonction de la consommation enregistrée au compteur peut offrir une incitation au consommateur à ne pas la gaspiller, des incitations de quelle nature conduiraient le fournisseur d'eau à éviter les fuites ? Veuillez préciser si les fuites sont perçues comme un problème et les éventuelles solutions envisagées.

**Tarification et accès**

**Quelle est la structure des prix de détail de l'eau ?**

Qu'un réseau d'eau soit exploité dans un cadre public ou privé, l'eau consommée est normalement facturée au client. En l'absence de tarification, ce dernier n'a guère d'incitation à éviter de la gaspiller. Le tarif qu'il acquitte devrait tenir compte des coûts concrets de la fourniture d'eau, mais aussi des externalités imposées par l'utilisation de l'eau et des coûts d'opportunité en jeu lors du choix entre un usage (l'irrigation dans l'agriculture, par exemple) et un autre (usage domestique, notamment).

Veuillez préciser les modalités de réglementation des prix de l'eau en cas de gestion privée des réseaux, et expliquer comment on peut donner à l'exploitant privé l'assurance que son investissement et les paiements effectués au titre de la concession ne se dévalueront pas après l'acquisition du réseau d'eau par suite d'une réglementation imposant la baisse des prix, des normes de qualité plus stricte, ou d'autres facteurs qui restreignent la possibilité de maintien des bénéfices de l'investisseur.

Les réseaux d'eau étant composés d'équipements qui sont, pour la plupart, à longue durée de vie, de nombreux observateurs estiment que les prix devraient avoir une structure binôme, comportant une prime fixe et un terme variable en fonction de la consommation enregistrée au compteur. Veuillez indiquer si la tarification binôme est une pratique courante ou non dans votre pays, en précisant dans l'affirmative l'importance de la prime fixe par rapport au terme variable dans les tarifs acquittés par la plupart des usagers.

Il est logique d'appliquer un tarif binôme lorsque le comptage de la consommation n'est pas coûteux, mais en fait il peut l'être. C'est pourquoi certains exploitants, surtout ceux qui ne sont pas menacés de manquer d'approvisionnement en eau, peuvent choisir de ne percevoir qu'une somme forfaitaire quel que soit le

volume consommé. Veuillez préciser si le comptage de la consommation présente des avantages qui l'emportent sur son coût.

Lorsque l'approvisionnement en eau est insuffisant, notamment en cas de sécheresse, on peut encourager le consommateur à réduire sa consommation par le rationnement ou une hausse de prix. Veuillez décrire les solutions adoptées en cas de pénurie et expliquer pourquoi elles ne passent pas par les prix, si tel est le cas.

**Peut-on subvenir aux besoins des usagers pour qui l'eau est une ressource essentielle?**

Si, en nombre d'endroits, l'eau est disponible en abondance, dans d'autres elle peut constituer une ressource rare qui exige une forme ou une autre de répartition entre les usagers. Dans certains pays, les consommateurs sont habitués à payer des redevances sur l'eau artificiellement faibles. Dans ce contexte, il peut survenir des pénuries, auquel cas il existe le risque de ne pas pouvoir subvenir aux besoins des usagers pour qui l'eau est une ressource essentielle. Veuillez indiquer si la tarification de l'eau prend en considération le fait qu'il s'agit d'une ressource rare. Veuillez préciser si les droits sur l'eau sont clairement définis et s'il existe des moyens d'en assurer le respect. Si ces droits sont clairement définis, peuvent-ils faire l'objet d'échanges ? Si des échanges de cette nature ont d'ores et déjà eu lieu, veuillez décrire les résultats de cette pratique du point de vue de la répartition de l'eau et l'influence de ces échanges sur la répartition de l'eau entre les différents usagers.

**Comment assurer l'accès à l'eau des consommateurs à faible revenu ?**

De tout temps, la construction de réseaux centralisés de traitement et de distribution de l'eau était principalement motivée par le souci de préserver la santé et d'endiguer la propagation des maladies. L'application à l'eau du principe de 'vérité des prix' (c'est-à-dire des prix reflétant le coût de l'approvisionnement) risque de priver de cette ressource les usagers à faible revenu. Étant donné que l'accès à l'eau des usagers à faible revenu peut entraîner d'importantes externalités positives et que l'accessibilité de l'eau est par ailleurs souvent considérée comme un droit fondamental, existe-t-il des moyens d'allouer aux consommateurs à faible revenu une subvention qui ne supprime pas pour autant une incitation marginale à éviter le gaspillage ? Veuillez décrire les démarches qu'il est possible d'adopter pour fournir de l'eau aux consommateurs à faible revenu.

**Qualité et environnement**

**Comment garantir la qualité de l'eau dans des conditions de concurrence ?**

Une crainte manifestée d'une manière générale concerne la qualité de l'eau et l'éventualité qu'elle ne soit pas garantie dans un cadre de gestion privée des services de l'eau. Veuillez décrire comment s'applique la réglementation de la qualité de l'eau pour éviter des problèmes de qualité – insuffisante ou excessive – de l'eau fournie.

**Comment concilier l'utilisation de l'eau et les objectifs d'environnement ?**

Les décisions concernant les ressources en eau peuvent avoir un impact considérable sur l'environnement. En outre, ce que font les usagers en amont risque de nuire aux habitats naturels et aux usagers en aval. Ces derniers auraient éventuellement la capacité d'intervenir financièrement, à condition que les droits sur l'eau soient clairement répartis dans un contexte marchand, mais les acteurs dans le domaine de l'environnement (ou leurs représentants, c'est-à-dire le ministère de l'Environnement et les groupes de défense de l'environnement, entre autres) ont moins de possibilités de recourir à un mécanisme financier direct. Veuillez faire part de vos observations au sujet des moyens permettant de prendre en compte les problèmes écologiques dus à l'usage de l'eau dans un système de répartition obéissant aux lois du marché.

# AUSTRALIA

## I. Summary

The achievement of an efficient water industry is crucial to Australia's economic and ecological future, and hence to the future wellbeing of Australians. Australia's dry climate and the need to allocate limited water resources efficiently led Australian governments to establish a framework for water reform in 1994. The framework includes pricing reform, requirements for new rural water infrastructure to be economically viable and ecologically sustainable, the establishment of water entitlements separate from land title, the allocation of water to the environment, the facilitation of trading of water entitlements, reform of water industry institutions, measures to improve water quality, coordinated administration of natural resource management functions, and enhanced public education and consultation.

## II. Australia's Water Resources

Australia is characterised by extreme climatic variability and the lowest average rainfall of any inhabited continent. Despite this, for decades Australia's water resources have been treated as abundant, ignoring Australia's unique climate and ecology. Years of extensive development of water resources and lack of attention to environmental needs have left Australians with a legacy of over-allocated water systems and environmental degradation. Rising water tables, salinisation and declining river quality are some of the visible costs of past choices.

Water is an important input into economic activities in Australia, with irrigated agriculture contributing around $A7.3 billion towards the Australian economy; this represents 25 per cent of the gross value of agricultural production.[1] However, many of Australia's water resources are now under significant pressure, with water extraction and use growing by 65 per cent since 1985.

The agricultural sector accounts for around 70 per cent of water use in Australia, followed by households (8 per cent) and mining and manufacturing (each around 6 per cent).[2] Whilst Australia's per capita water supply is higher than most other countries, Australia also has a relatively high per capita consumption level. In addition to this, water supplies are limited in the areas of highest demand. Given the scarcity of water in Australia, to ensure the future wellbeing of Australians through economic and ecological sustainability, Australia must achieve efficient allocation and management of its water resources.

## III. Australia's Water Reform Program

Australia has a federal system of government comprising a national government, eight state and territory governments and about 700 local governments. In 1994 the water reform framework was established by the Council of Australian Governments (COAG), the primary inter-governmental forum for policy development across these levels of government. The water reform framework includes a wide range of detailed reform commitments including pricing water for full cost recovery, establishing secure property rights separate from land titles and providing for water trading, allocating water for environmental needs, requiring water service providers to operate on commercial principles and improving public consultation and education processes. These reforms were scheduled progressively until 2005.

In 1995, governments adopted the National Competition Policy (NCP) reforms, and water reform was incorporated into this process. Under the NCP, payments are provided as a financial incentive to governments to implement their NCP reform obligations. In cases where reform commitments have not been met, the Australian Government has imposed payment suspensions and penalties, thus preserving these incentives.

## IV. Pricing and Access

Prior to the reform process, urban and rural water pricing practices provided little incentive for efficient water use. Urban pricing approaches were based on property values rather than consumption, and there were large cross-subsidies. In rural areas, production and consumption decisions were distorted and resulted in adverse resource allocation outcomes.

Due to water reform policy actions, most metropolitan and regional urban water businesses now charge for water on the basis of the amount of water used. Water prices are required to fully recover efficient business and resource management costs, including the cost of appropriate asset refurbishment and augmentation. Prices are generally set as a two-part tariff (comprising a fixed access component and a volumetric or long run marginal cost use component). An example is the Sydney Water Corporation, which provides water and wastewater services to more than 4 million residential customers. The corporation's 2002-03 residential tariff for water supply comprised a fixed charge of A$75 and a volumetric (per kilolitre) charge of A$0.94. In that year, the average water consumption by each residential property was 255 kilolitres.

As customers move to volumetric pricing they tend to reduce their water consumption to reflect the value they obtain from each unit of water. The experience of New South Wales with the introduction of two-part tariffs for regional urban water customers has been a reduction of about 20 per cent in total demand.

Some smaller water service providers do not apply volumetric tariffs on the ground that metering is not cost effective. These providers use tariff structures such as property value-based tariffs, uniform annual charges (independent of water consumption) and water allowances (thresholds below which there is no use charge). These tariff structures are less efficient than volumetric tariffs because they do not provide pricing signals that enable customers to balance the benefits and costs of using water.

Governments are currently investigating the scope for changing the structure of retail prices to further encourage water conservation and the use of alternative water supplies such as rainwater, grey water and recycled water. Governments are also exploring the potential to adjust prices to reflect seasonal supply constraints. To date, governments have tended to manage periods of peak demand or low supply by imposing restrictions on water use.

Charges for domestic and small commercial wastewater services are generally not usage-based because most of the cost of providing the service is fixed. There are use-based charges for high volume or high toxicity waste dischargers.

Australia's water reform program aims to establish water trading as the vehicle to improving the efficiency of water use by ensuring that water is able to flow to higher value users. Water entitlements may be traded temporarily (for an agreed number of seasons) or permanently, and it is also possible to lease entitlements. Governments are encouraging the expansion of water markets and trading across and between districts and states and territories (where water systems are physically shared), including clear rules for trading and robust water accounting arrangements. Work is underway on several issues including consistency in the specification of tradeable water entitlements across supply systems, robust environmental clearance processes and reliable and accessible water entitlement registers.

There are some remaining barriers to the permanent trade of entitlements out of irrigation districts, often reflecting socioeconomic concerns. Governments are considering alternatives to these restrictions under the NCP process, to promote greater competition in Australia.

All governments require the provision of services to certain classes of customers at a price below full cost. Some governments operate a uniform pricing policy for household consumption such that all households pay the same price for water regardless of their location. Where such measures are in place, governments disclose the cost and pay it to the service provider as a non-commercial service obligation. Governments also assist some low-income consumers through pensioner concession schemes for water and sewerage services and, in some cases, water suppliers operate hardship funds to assist low-income consumers. Phasing in water pricing reforms can mitigate the impact on low income consumers.

## V. Regulatory Framework

Domestic water and wastewater services in Australia are generally provided by state and local government utilities, which provide services to users within their geographic areas. Prior to the water reforms, the allocation of water and the wholesale and retail provision of water was typically the responsibility of the same agency. With no direct competition, economic regulation was used to prevent monopoly pricing.

Under the reforms, prices charged by the largest monopoly utilities are set either by independent regulators or by governments taking account of the recommendations of regulators. By 2005, independent economic regulators are expected to be setting or recommending on prices in all but one Australian jurisdiction.

As significant government-owned businesses, many water businesses are also required to apply *competitive neutrality* principles, which aim to ensure that government businesses do not enjoy net competitive advantages over their private sector competitors simply by virtue of their government ownership[3]. This separation of service provision from the roles of water resource management, standard setting and regulatory enforcement provides an efficient, transparent and accountable institutional structure.

Economic regulators set water prices to deliver an appropriate level of revenue for an efficiently operated water and wastewater service business, without compromising the quality of water services. Incentive-based regulation is common, where the regulator determines maximum allowable revenue with adjustments for price inflation and efficiencies over time. Australian data indicate that the businesses exposed to independent economic regulation have reduced their per unit operating costs while improving service standards.

Water and wastewater businesses are the only providers of domestic water and wastewater services in a given geographic area. There is yardstick competition, however, achieved via benchmarking of the larger service providers.

Use of irrigation water, including the trading of water entitlements, is managed via legislative systems of water entitlements in each state and territory. In most states and territories, there are geographic water authorities which hold water licences and administer water entitlements, including the transfer of those entitlements. The authorities are generally privately owned companies (including cooperatives), privately managed statutory authorities or government bodies.

In terms of the delivery of water services, the reforms aim to achieve efficient service delivery on a commercial basis, with comparisons of interagency performance to ensure that water providers make use of new technology and practices. This also enhances the accountability and transparency of the system.

## VI. Quality and Environment

Australia's National Water Quality Management Strategy incorporates regulatory and market-based approaches aimed at protecting and improving water quality. The strategy is based on principles of ecologically sustainable development, an integrated approach to water quality management and community involvement in setting water quality objectives. It involves each state and territory adopting an overarching water quality management plan, supported by arrangements governing particular water bodies, catchments or uses. This includes setting discharge fees based on pollutant loads to create incentives to perform above minimum compliance requirements.

Australia's water management arrangements recognise the environment as a legitimate user of water by implementing regulated systems of water allocations, including environmental allocations based wherever possible on the best available science, for surface water and groundwater resources. A key objective is to achieve a better balance in water use in rivers that are over-allocated or deemed to be stressed (by reallocating water where necessary) to restore/enhance the health of river systems.

Land and water management is integrated, as water-related outcomes cannot be achieved in isolation. The integrated approach is generally achieved via catchment level resource management plans.

Water management planning is a public process involving community consultation and feedback from interested parties in the local, regional and wider community. This increases stakeholder commitment to the process and outcome.

The separation of responsibility for providing water and wastewater services from the responsibility for regulation, water resource and environmental management and standards-setting is important in achieving water quality outcomes.

Water trading arrangements are subject to robust environmental clearance processes to ensure that trading does not have adverse environmental impacts. Governments are currently investigating the scope to use pricing as a means of managing externalities.

## VII. Other Reforms

Decisions made regarding investment in new rural schemes have also been improved, with approval of investment in rural water provision limited to economically viable and ecologically sustainable projects. The removal of government subsidies for uneconomic projects reduces nonviable investment, with subsidies provided only where government assistance will provide net benefits to the community (after accounting for environmental impacts).

## VIII. Future Reforms

Reform of urban water markets is largely complete. In rural areas, all governments have established reform paths to efficient water pricing, to ensure adequate environmental allocations and to provide clear water property rights, separate from land title. Irrigators are charged for water use by volume, where it is feasible to do so, and cross subsidies are being eliminated or made more transparent. Water trading arrangements are expanding.

To further progress water reform and to deal with concerns over structural adjustment, the Australian Government is considering strategies to ensure that affected communities are treated fairly, to increase water trading and to ensure that access rights are secure. Reforms targeting rural water pricing, interstate trading arrangements, the conversion of existing water allocations to new water rights systems and environmental water allocations are scheduled as priorities in 2004-05.

Following on from this, the Australian Government announced the details of the National Water Initiative (NWI) which aims to continue the water reform process. The NWI includes plans to return over-allocated surface and groundwater systems to environment sustainability and to guarantee access entitlements perpetually for a share of the available water resources, in order to ensure nationally compatible water access entitlements. It also aims to encourage nationally functioning water markets, to integrate management of environmental water, and to reinforce the need for urban and rural water users to use water efficiently by promoting water reuse and recycling, more efficient technologies and a review of the effectiveness of urban water pricing.

## NOTES

1 ABS (Australian Bureau of Statistics) 2001, Australia's Environment: Issues and Trends 2001, cat. no. 4613.0.

2 WSAA (Water Services Association of Australia) 2001, Urban Water Use and Management in Australia, Submission to the Senate Standing Committee on the Environment, Communications, Information Technology and The Arts, Melbourne.

3 In Australia, the objective of competitive neutrality policy is to eliminate potential resource allocation distortions arising from the public ownership of significant business activities. The Australian Government has noted that this will help ensure that government businesses compete on their own merits and not through advantages resulting from public ownership. In the Australian context, competitive neutrality policy is neutral with respect to the nature and form of ownership of business enterprises. Further information, including the Australian Government's policy on competitive neutrality, as outlined in the Commonwealth Competitive Neutrality Policy Statement, is available at http://www.ccnco.gov.au/publications/index.html.

# DENMARK

## 1. Introduction

An extensive analysis of the need for a restructuring of the water sector in Denmark is currently being carried out. A task force has been established to perform the analysis and the task force consists of the Environmental Protection Agency, the Danish Competition Authority, the National Agency for Enterprise and Housing, and the Ministry of Finance. The results from the analysis of the task force will be published during 2004.

The task force will follow up on an analysis recently published by the Danish Competition Authority (2003). This analysis concluded that the water sector in Denmark is characterised by a large price differential between utilities, many quite small common utilities, and a price regulation that does not minimise costs (cost-plus-regulation). Moreover, the accounting principle mostly used (based on expenditures instead of costs) mean that the sector has an opaque price structure. There is no direct competition in the sector. Indirect competition such as invitations for tenders or the use of benchmarking is only used to a limited extent. By means of a benchmark analysis, a considerable efficiency potential among the sewage disposal plants and the water utilities was established.

The recommendations from the Danish Competition Authority are the following:

- To replace the existing price regulation with a regulation that contains incentives to stimulate efficiency
- To implement the principles of the Danish Company Accounts Act (including common preliminary statement of accounts) in order to create improved transparency and comparability
- To establish direct competition by allowing certain types of third party access to water utilities
- To facilitate the possibility to abstract water on your own
- To make it easier for the larger users to leave the wastewater utility by specifying rules for maturity periods and rules of payment in connection with withdrawal

## 2. General Background of the Water Sector

### *2.1 Description of the Danish Water Sector*

The Danish water supply is different from the supply in other countries in two important areas: it uses groundwater and the structure of the water supply is decentralised.

In Denmark approximately 99 percent of the abstraction of drinking water is based on groundwater. The main part of the groundwater is of a good quality, which means that the water only has to undergo a simple treatment, before it can be used as drinking water. Locally, situations can occur where this is not the case (e.g. as a result of pollution).

There generally exists sufficient groundwater of good quality. The yearly stock of water consists of 1.8 billion $m^3$ groundwater, of which only approx. 1 billion $m^3$ is used. However, the water resource is

not equally spread between the different parts of the country. In the future a shortage of groundwater of a good quality can arise in local areas due to pollution. In order to avoid this shortage, it can be necessary to connect the existing pipes, carry out preventive abstractions, use advanced water treatment or to affect the water consumption through environmental taxes.

There are approx. 2,718 common water utilities of which 166 are municipal utilities. Yet the municipal utilities abstract 61 percent of the water in Denmark. The many private water utilities are typically small consumer owned local cooperatives. However, the trend is that private water utilities are slowly getting less every year. The fact that the government is now planning a national structural reform where the municipalities and counties will be merged into larger municipalities and regions will enforce this trend.

There are approx. 1,363 wastewater utilities (1,100 are municipal utilities or owned jointly by several municipalities). The wastewater area consists of many small utilities and a few large utilities. The large utilities purify most of the total amount of the wastewater (280 utilities purify 85 percent). The total area of the sewer systems accounts for five percent of the total area of Denmark. Only approx. 11 percent of the Danish population lives in housing outside the area of the sewer systems. These areas are typically sparsely populated areas, where there do not exist central wastewater utilities. The central wastewater utilities are generally assessed as being in a good condition, while it is believed that investments in the sewer system have a lag behind.

### *2.2 Roles and Responsibilities of the Regulatory Institutions*

The regulation of the water sector is generally carried out by the counties and the municipalities and includes the issuing of licences, planning and supervision.

A licence must be issued for the abstraction of water and for the establishment of a water abstraction utility. The structure of the licensing system is that the municipalities handle small approvals while the counties handle large approvals (large water utilities, industries, fish farms and farms). The approval is being issued for a 30-year period. The water utilities are subject to a general supply obligation. The county decides which area the individual water utility has obligation to supply.

Each county maps the water resources of the region and the pollution threats that can influence the quality of the water resources. The municipalities in each county are responsible for the planning, administrative and supervisory duties with regard to all water suppliers and to the water supply infrastructure.

The municipality sets the fees for the municipal water utilities and approves the fees for the private utilities.

The utilities must obtain permission to discharge wastewater as is the case with water abstraction. The licence is given by the municipality for the small wastewater utilities and by the county for the large wastewater utilities. The capacity of the utility is determined at the same time as the license. There are certain demands to the discharge of substances (e.g. organic matter, phosphorus and nitrogen).

A landowner is obligated to lead his wastewater into the public sewers, if his land is within the sewer system area of the utility.

## 3. Supplier Selection and Incentives

Previously, the invitations for tenders of the municipalities were not registered in the municipal accounting system; however, it is possible to indicate the extent of the purchase of external services of the

municipalities. The indicator also includes services, which are contracted out without a real invitation for tender.

The ratio of services that are contracted out is generally high. Almost 90 percent of municipal construction work in the water sector are contracted out, while the ratio for the municipal operational services is considerably lower (less than 20 percent for the water supply and less than 40 percent for the wastewater supply). The ratio of the services that have been contracted out through the invitations of tenders is believed to be less than the above-mentioned ratios.

During the last couple of years some general measures have been taken in order to increase the use of tenders and the involvement of private market players. A law on municipal service strategy has been implemented which states that the municipalities must give an account of their tender policy (including an account of new areas which can be contracted out through tenders). At regular intervals the municipalities must give a statement on whether they meet this policy. Furthermore, a so-called right to challenge public services was implemented, where private players can challenge municipal tasks by making an offer on that task. The municipality must then decide whether they should still carry out the task. The public authority tasks of the municipality will not be included.

No direct competition or third party access exist between the water suppliers. An unknown number of water utilities have connected their pipes due to insufficient water resources or to secure the reliability of supply in case of pollution. Especially around the large cities import of water from other utilities occur.

The Danish Competition Authority has recommended the introduction of some form of third party access on either pipes that are already connected or by connecting pipes with new pipes.

## 4. Consumer Pricing and the Tax System

The method of price regulation in the Danish water sector is based on full cost recovery (a cost-plus-regulation). This means that the price of the services must meet the actual cost of producing and distributing the service (within a short number of years).

The Danish Competition Authority has pointed out that the inefficiency of the water sector is partly due to well known flaws of this kind of price regulation. Even though there are some positive effects of this price regulation (e.g. easy to administrate and consumer protection against abuse from the natural monopolist) there are also some negative consequences as regards to cost efficiency and investment decisions. As the price of the services is set equal to the cost, regardless of the size of the cost, there is no incentive for the utilities to minimise their costs and use their resources effectively. Moreover, it is risk free for the utilities to invest without ensuring that the investment is profitable which can lead to over investment. Either kind of behaviour can lead to increased prices, which is in contradiction to the intentions behind this method of price regulation.

The Danish Competition Authority has recommend that the current regulation is replaced by a price regulation which gives the utilities the proper incentive for ongoing efficiency, which is easy for the authorities and the utilities to administrate, which prevents the abuse of a dominant position, and which creates transparency for the benefit of the users. The task force analyses how the current price regulation can be replaced by a regulation, which takes the abovementioned points into account.

Generally the consumers receive one bill for drinking water, wastewater, environmental taxes, and VAT. On average a consumer pays approx. € 5/m$^3$ water (incl. taxes and VAT) for the consumption of water and the discharge of the wastewater. Of the total water price the fee for drinking water amount to 21

percent, while the fee for wastewater represents 43 percent. The remaining is VAT and taxes. The fees vary considerable from municipality to municipality.

The fee for drinking water can be divided into a variable and a fixed fee. Since 1998 water metering has been a requirement for every branch connection. The wastewater utilities also have the possibility to divide their fees into a variable and a fixed fee. The charge of a fixed fee will result in a more cost real fee, as most of the costs in the water sector are capacity costs. However, there are limitations to the fixed fee for wastewater, as it must not exceed a certain yearly amount. One of the reasons for this limitation is to ensure low prices for household consumers. The charge of a variable fee also gives some incentive to reduce the consumption of water.

Moreover, a special fee can be levied on industries for heavily polluted wastewater, however it is left to the individual municipalities to charge the special fee.

In 1994 it was decided to impose a variable environmental tax on distributed water. The purpose of the tax was to reduce the consumption of water. This was followed by the introduction of a variable tax on wastewater in 1998.

The relative large decrease in the water consumption over the last decade indicates that price increases does reduce water consumption, although water consumption is relatively inelastic (the price elasticity was estimated to -0.2).

Spillage on the water distribution is relatively low and has been decreasing the last couple of years. In 2002 the spillage was 6 percent of the abstracted amount of water, which is relatively low internationally. The reason for this low percentage is among other things the arrangement of the tax system, where water utilities have been levied a tax on spillage over 10 percent since 1994.

# GERMANY

## 1. Legal framework

### *1.1 The role of the Federal Government, the federal Länder and the municipalities in the federal system*

The most distinctive feature of the German water industry (water supply and waste water management) in international comparison is probably the central role of the municipalities. The federal separation of powers into three levels of government, i.e. the Federal Government, the federal states (*"Länder")* and the municipalities, is provided for in the constitution (so-called Basic Law, "Grundgesetz"). The municipalities' right of self-administration laid down in Article 28 (2) of the Basic Law also covers the areas of water supply and waste water management. While the Federal Government has the framework competence, the direct competence for water supply lies with the federal *Länder* and the municipalities.

The municipalities have the administrative powers for water supply and waste water management. As a result of municipal self-government, cities and municipalities are free to choose between self supply and third-party supply and different legal forms of the own water supplying entity (publicly-owned companies, municipal utilities, public-law institutions, special-purpose associations, water and land associations, commercial and mixed-economy companies). In addition they are free to choose between public-law and private-law contractual relationships between suppliers and customers and to determine supply conditions.

Under the municipal codes of the *Länder*, municipalities can impose general connection and usage obligations on households and commercial enterprises if the municipalities have the decisive influence on the water supply facilities. Due to the so-called locality principle, municipal water suppliers are as a rule not allowed to supply to neighbouring areas.

### *1.2 Exemption under competition law*

Public water supply continues to be an exemption under German competition law. Contrary to the general prohibition of cartels and price-fixing arrangements, it is possible in the water supply sector to conclude demarcation and exclusive franchise agreements (Section 131 (8) of the Act Against Restraints of Competition (GWB) in conjunction with Section 103 of the ARC$^{old}$). Under a franchise with an exclusive dealing clause, the municipality commits itself to grant the franchisee exclusive use of public ways for laying and operating pipes for the direct water supply of end customers in its area. Under a demarcation agreement, the water suppliers geographically divide the market between them by means of one of the contracting parties committing itself to refrain from the public supply of water via fixed pipelines in particular areas. In practice, however, demarcation agreements are so far only of limited significance: Irrespective of economic and technological conditions (such as insufficient network interconnection), the territorial monopolies are already secured by the law, i.e. through municipal connection and usage obligations, the so-called locality principle and exclusive franchises.

Nevertheless the prohibition of abusing a dominant position under Sections 19 et seqq. of the ARC and Article 82 of the EC Treaty and the specific control of abusive practices under Section 103 (5-7) of the ARC$^{old}$ also apply to the water supply sector. In addition, demarcation and franchise agreements may be subject to the prohibition under Article 81 of the EC Treaty if cross-border trade is affected.

### *1.3 Price surveillance*

Depending on whether the contractual relationship between the water supplier and the customer is a public-law or private-law relationship, a different type of price surveillance applies. Currently each of these two types accounts for around 50 per cent of water consumption nation-wide.

In the case of a public-law contractual relationship, charges are levied under the municipal charges acts of the *Länder*. As a rule water prices are determined by the water supply companies, which take into account the principles of fee law (in particular cost recovery and equal treatment), and decided on by municipal representatives. The level of charges is subject to the supervision of local authorities by the *Länder*. Consumers can complain against notices of charges from public providers before the administrative courts.

Prices by private providers on the other hand are subject to the competition authorities' control of abusive practices (Section 19 of the ARC, Section 103 (5-7) of the ARC$^{old}$), which includes punishment for excessive pricing. Since in most cases the abusive conduct does not reach beyond the territory of a federal *Land*, such abuse proceedings are as a rule not conducted by the Bundeskartellamt, but by the competition authorities of the *Länder*. For the purpose of price-level control, the so-called comparable markets concept has been mainly applied in practice. Currently, research is being conducted on how to carry out abuse control using appropriate benchmarking models. Price differences between comparable supply areas serve as indications of excessive prices. They can, however, be justified by special hydrogeological and geographic characteristics of the supply area. Consumers can take legal action before the civil courts.

### *1.4 Health and water protection*

On the basis of European law the German drinking water ordinance („Trinkwasserverordnung") sets the framework for microbiological, chemical and other qualities of drinking water. It includes furthermore general requirements such as the German minimization rule which stipulates that the concentration of contaminants in drinking water shall be kept as low as possible on the basis of state-of-the-art technology, within the framework of justifiable expenses and considering the circumstances of each individual case. In particular drinking water must be free from pathogens, fit for human consumption and pure. The ordinance sets limit or reference values for about 50 microbiological, chemical and physical parameters. The provision of water which does not meet these requirements is punishable as a criminal offence in some cases, in others it is classified as an administrative offence. The public health offices of the federal *Länder* are responsible for the hygienic supervision of drinking water as well as water collection and supply facilities. Apart from the drinking water ordinance the water laws of the federal *Länder* also include health protection provisions.

Water protection results from the interaction of a whole range of federal laws and laws of the *Länder*. As a federal framework act the water management act ("Wasserhaushaltsgesetz", WHG) is of particular importance in this respect. Section 7(a) WHG regulates inter alia the conditions for discharging waste water on the basis of the waste water ordinance which includes specific regulations for various industries.

In order to protect water in the direct surroundings of water collection facilities, water protection areas are designated which are subject to constraints limiting their exploitation. These currently cover about 15 per cent of Germany's territory.

The amount of water abstracted by the supply companies is limited by means of authorisations for water abstraction granted by the water authorities. Many federal *Länder* levy fees amounting from

0.015 to 0.31 Euro/m³. As a rule the water supply companies themselves also assume water protection tasks.

## 2. Market structures and results

Due to the fact that competence for water supply and waste water management in Germany lies with the local authorities the sector is characterised by the existence of relatively few major, but a large number of smaller supply companies (approx. 60 per cent of the total water amount is in the hands of 3.6 per cent of the companies) with various legal forms. Water supply and waste water management are generally still carried out by separate companies. Approx. 7000 companies are active in the water supply sector, likewise approx. 7000 companies are active in the sector of waste water management.

These companies are primarily owned by the municipalities. Approx. 85 per cent of the water supply companies are operated in a public-law form of organisation and 15 per cent in a private-law form of organisation. Only 1.6 per cent of the companies are entirely privately owned. Municipalities increasingly conclude management or operator contracts with outside third parties. After the conclusion of management contracts ownership of the facilities required for the supply of drinking water remains with the local authorities, whereas it is generally transferred to private parties after the conclusion of operator contracts. In accordance with the provisions of public procurement law under the ARC the award of management and operator contracts by public contracting entities to outside third parties must be put out to tender at European level if the EU thresholds are exceeded, and at national level if the EU threshold is not reached.

According to a study in Baden-Württemberg the costs of the water supply companies are roughly broken down into the following drinking water supply services: transport, pressure adjustment, storage, local distribution 56 per cent, extraction, procurement, treatment 33 per cent and administrative costs and miscellaneous costs 11 per cent. The fixed cost share in the water sector is high, ranging from 75 per cent up to 90 per cent.

Around 76 per cent of the water supplied to the end consumer by the public water supply companies is for private households and small businesses, approx. 16 per cent for industrial customers and 8 per cent for other institutions (schools, hospitals, etc.). Bulk consumers such as breweries or farmers have their own special rights for abstracting water granted on the basis of the water management act which implements Directive 2000/60/EEC of 23 October 2000. 95 per cent of the German industry is self-sufficient. A mere 5 per cent, mainly food companies which require a high quality of water, are supplied by public water suppliers.

Most large industrial companies which discharge waster water have their own sewage plants used for the treatment of their waste water. In some cases cooperation agreements exist between large industrial companies discharging waste water and municipalities regarding the joint use of sewage plants to clean industrial and domestic waste water. Taking into account the provisions relating to the award of public contracts both municipal and industrial sewage plants are used on a mutual basis. If management and operator contracts in the waste water sector are awarded by municipalities to outside third parties, and if EU thresholds are exceeded, these contracts must also be put out to tender Europe-wide and in accordance with the provisions of public procurement law under the ARC.

The comparably high quality of services provided by German water supply and waste water management companies is acknowledged worldwide. This applies to the high water quality and supply security as well as the high rate of connection (approx. 98.6 per cent). From an ecological point of view the low leakage level (approx. 9 per cent) and low per-capita consumption should be emphasized which are achieved among others by uniform metering and consumption-based billing by means of household water

meters and the trend among consumers and industry to economize. Charges for waste water disposal are based on drinking water consumption and rainwater and, to an increasing degree, on a split charge system.

In the past few years there were carried out several price comparisons in Europe taking account of different influential factors such as company structures, cost cover percentages, charges, taxes, the proportion of subsidies, environmental and hygiene requirements. These revealed on the one hand the actual relation between prices and charges in different states and on the other important indicators for potential cost-cutting capacities.

## 3. Discussion on improving efficiency and service through modernisation and more competition

In recent years "sustainable water management" and "water competition" and ways to solve global water problems became the focal themes of politics, industry and mapped-out examinations. It became evident from the outcome of this discussion that the German water industry is intended to be modernised in terms of efficiency and competitiveness rather than fully liberalised. This strategy is in keeping with the resolution of the European Parliament (EP) of 14.1.2004 on the so-called "Green Paper on Services of General Interest". The EP takes the view that due to the different characteristics of this sector and the localized competence for the supply of drinking water as well as other preconditions water supply including waste water disposal should not be liberalized. On the other hand it calls for modernisation.

In Germany a conflict with the traditional competencies of municipalities for providing services of general interest has played a significant role in the discussion about introducing more competition to the water sector (drinking, waste water.) In 2002 the German Bundestag passed a resolution on "Sustainable water management in Germany" which calls for the preparation of a modernisation strategy for the water sector. This includes in particular

- introduction of a uniform benchmarking system in the water sector as a competition surrogate,
- examination of the equal tax treatment of drinking water and waste water in order to encourage the operational concentration of supply and disposal services and development of synergistic potential and to create equal conditions for competition in the market as well as
- further changes to the legal framework in order to raise the scope of action of municipal companies and in particular to facilitate their participation in competition already in place in the market for water services.

<u>Competition potential for and within the market in the water sector:</u>

In Germany the possibilities of opening up the water supply market further have been widely discussed. Theoretically there are two approaches to this. The first is to intensify competition within the market, i.e. competition for the end consumer by means of joint network use by several providers (common carriage) similar to the model chosen for opening up the electricity and gas markets, and secondly, to intensify competition for the market, i.e. competition for the right to supply water in a supply area for a limited period.

The potential for competition within the market is considered to be relatively little compared with other network industries (e.g. electricity, telecommunications), the reasons for this being the economical and technical features of water supply: high transport costs, little opportunity of common carriage due to hygienic and water chemical limits and inadequate connections between the networks, etc. In Germany the

autonomy rights of municipalities as laid down in the Basic Law also stand in the way of a common carriage model.

However, some practical experience has been gained in Germany as regards competition for the market. This can be achieved, for example, by assigning water supply rights to a third party for a limited period (based on an operator or cooperation model) on a tender basis. A number of municipalities are already making successful use of competition for the market in order to achieve higher productive efficiency and ultimately lower water prices in water supply.

# HUNGARY

## General situation of the market

Water supply in Hungary could generally be described as a sector characterised by a large number of natural monopolies including certain elements of non-commercial services. However this situation is not applicable to the whole of the sector. In certain cases taking into account to the availability of alternative sources and the specific needs not appropriately satisfied by the existing infrastructure, water may be self-supplied. Rights and obligations relating to self-supply, including rules of the availability of licences are laid down by Acts and government or municipal regulations.

The present submission covers only water supply regulated as a natural monopoly (including sewage treatment) and does not analyse the rules for self-supply.

The supply of healthy drinking water and the treatment of sewage is an obligation of municipalities. This obligation is fulfilled mainly through the previously state owned public utilities transferred to the municipalities during the political changes at the beginning of the 1990's. The negotiability of these properties is restricted. Certain assets such as those which are necessary for supplying more than one municipality, e. g. regional utilities, remained in the property of the state and were declared non disposable.

State owned property (the regional public utilities and the assets which the municipalities were not willing to take over) is operated by five state owned property-managing undertakings. Their activity is supervised by the Ministry of Environment and Water. Municipal property is managed mainly by the legal successors of the previous incumbent firms while smaller villages set up jointly controlled undertakings to assume this responsibility.

Water supply and sewage treatment is often provided by one and the same undertaking. Around 32% and 15% of the competent undertakings deal solely with water and with sewage, respectively. Combined services are provided by 53% of the market actors. The share of the state of the overall assets used in the sector is 9.2% while municipalities have 74.7% of them. Other kind of ownership represents 16.1%. There is a variety in the form of the operation with 8% being operated by state owned and 61% by municipal firms. In 31% of the cases the activity of the service provider is based on a contract concluded with the municipality.

## Supplier Selection and Incentives

### *How is the water supplier chosen?*

The possible alternatives for the selection of a service provider are regulated by the Act on Water and the Act on Public Procurement. The state or the municipality may manage its own assets or may select a private firm to provide services. In the case of the latter solution a public tender is announced for the management or rent of the public utilities. If the municipality forms its own undertaking to provide the service than the undertaking is exempt from the obligatory tendering.

### *Is competition possible between different water suppliers in the same geographic area?*

In general it can be established that there is no space for competition between the suppliers of water. However in marginal circumstances, certain users may have the possibility to apply for a licence for

self-supply. Such a possibility might have influence on the behaviour of the incumbent. Otherwise competition is restricted to the tender.

***How is an incentive provided to increase productive efficiency?***

Yardstick competition is not applied, municipalities conclude their contracts independently or supply through their own undertakings. The only incentives for more efficient supply are firstly the tendering system, which is not applied by each of the municipalities and secondly the official price setting, which has a slight influence on the profit margin and through it on efficiency.

**Consumer Pricing and Access**

***What is the general structure of retail water prices?***

In the case of private suppliers prices are determined in the concession contracts. Other prices are established by legal acts of the municipalities. The price setting of certain services of minor importance is free.

As the Act on Prices establishes only a general framework of the rules for the pricesetting of water supply, a great variety of price schemes are applied in Hungary. A significant part of these schemes limits the calculation of the price to one factor, namely the actual consumption of the user. In the other cases the price consists of a fixed fee, which is designed to cover the maintenance of the infrastructure and another amount proportionate to the consumption is added. The fixed fee is often established in places where small users would not otherwise contribute to the maintenance of the infrastructure to an appropriate extent through the price of the small amount of water they consume.

Depending on the objectives followed by the municipality a differentiation can be made between the unitprice of water for households and that for industrial users in both price schemes.

The amount of the fix fees is 86 to 360 HUF per month for households and 86 to 3.120.000 HUF per month for industrial users, while the price of a cubic meter of water for these two groups varies between 22 to 316 HUF and 82 to 2018 HUF, respectively.

Peek hours and shortage periods are charged at unchanged prices. However a limitation on the amount of water available is possible. The relevant Act determines a sequence of priority for such restrictions.

***Is water provided to the highest value users?***

Access to water is regulated on the basis of social priorities. Competition and market principles are not taken into account at this level.

***How can access to water be ensured for low-income consumers?***

Prices may differ according to the price scheme applied by the municipality or the stipulations of the concession contract. In certain areas where the price of water exceeds a certain amount per cubic meter the state contributes to the costs of consumers. An additional contribution may also be provided for people with an income below a certain level. This latter contribution is defined as a fixed amount.

**Quality and Environment**

***How can water quality be assured within a competitive framework?***

The minimum quality of drinking water is specified by legal provisions regardless of the form of service providing. The issue of excess quality has never arisen.

***How can water use be combined with environmental objectives?***

Water supply is subject to official licences. The authorities may revoke such licences in the case of undue impact on the environment. While the issuance and revocation of licences might have an impact on competition the two objectives were not taken into account parallelly in the past.

# ITALY

## 1. Foreword

The Italian system of water services has recently undergone an important reform process. The first round of reforms, accomplished in the early 1990s, represented a remarkable change of the management practice in water services. The new legislation was specifically designed to cut costs and reduce deficits. A second round of reforms introduced important innovations in the regulation of the sector.

Article 35 of the 2002 Financial Law was the first step in a comprehensive reform of local public utilities. Article 35 introduced the general rule of competitive tendering for awarding service provision contracts. However, Article 35 introduced an important exception for water services, allowing, as an alternative to competitive bidding, local administrations to directly appoint for a maximum of five years a local government entirely controlled joint-stock company. After a criticism by the European Commission, law 24 November 2003, n. 326, constrained the entirely controlled joint stock company, should it also be directly appointed, not to tender for services outside the area.

Before examining in detail the regulation of water services, it should be pointed out that the threat of competitive tendering appear to be having an effect, forcing many water utilities to become more efficient.

## 2. The legislative framework: the regulation of water services

The Italian system of water supply has recently undergone an important reform process. The system, at the beginning of the nineties, was extremely inefficient mainly for two reasons. Water utilities, faced with a pricing structure of water which was more of less independent of their costs, had not taken particular care to balance their budgets. At the same time the structure of the sector was characterized by too many firms: each municipality was providing its own water services, with ample room for improving productivity.

The first reform of water services, achieved by law 36/1994, introduced a remarkable change in the organization and management of water services. The main objective of the reform was the introduction of a national management system for water services, the abandoning of fragmentation, the industrial formulation of the activity and the consequent separation of the tasks of planning and control from service provision.

Legislation, that was specifically designed also to cut costs and reduce deficits, was based on the concept of 'integrated water services' which included the supply of drink-able water, sewerage and depuration. Furthermore, the law established a broader territory within which service had to be provided in a coordinated way – the so called Optimal Territory (ATO) – which is defined with respect of the water basin. Service integration and broader markets would have allowed greater efficiency in supply. The organization of these integrated water services was delegated to municipalities, associated within a proper organisms, the so called Territorial Authorities.

Territorial Authorities are entrusted with a complex activity of planning, development and control.. Moreover, Territorial Authorities have the strategic task to approve the territorial plan which defines the modalities of the rate structure and imposes constrains with respect to efficiency, quality and profitability.

The final step of the reform of water services is contained in Article 35 of the 2002 Financial Law (L. 448/01), as amended by the Law 24 November 2003 n. 326. The main innovations affecting water services is that the responsibility for the provision of water is given, alternatively, to: a joint stock companies selected by competitive bidding; b)a mixed companies, if the private member has been selected through a competitive system; c) to local authorities owned companies, on the condition that the local authority exercises over the company a control similar to the control exercised over services supplied by the local authority itself and that the company performs the most important part of its activity with the same local authority.

The law introduced a limitation on the firms allowed to participate to the bidding process. In particular firms that have not participated to a bidding process in order to be allowed to operate a public utilities at the local level (both in Italy and abroad) will not be allowed to bid..

## 3. An assessment of what has been achieved so far

At present, 84 Optimal Territories have been officially set up out of the 91 in which the national territory was divided; 47 of these Territories approved their territorial plan and 25 appointed a provider of integrated water services. Only in 1 case, a competitive tender for awarding service provision contracts was carried out. In the remaining 24 cases, municipalities appointed as water service providers an entirely controlled joint stock companies (8) or a mixed companies (15).

## 4. Water tariffs

Over the last few years the water tariff structure has been undergoing relevant changes, brought about by an effort to cover the costs of service provision. Law n. 36/94 ensures that tariffs are determined by the Territorial Authority. In particular most Authorities have established a variable tariff for the consumption of drinking water, a fixed charge for the rent of the water meter and for the treatment of water.

Since water is paid by consumption water companies have a built in incentive to reduce water losses. Furthermore tariffs can be increased because of quality improvements.

The problem is that the price of water does not reflect scarcity neither structural, nor seasonal scarcity. The management of seasonal scarcity is mostly done by exhorting the public not to consume too much water. Only in a few local areas seasonal scarcity actually led to interruptions of supply. However as a solution, the discussion has been mainly oriented to improve efficiency and water losses. Very little attention has been given to tariff reform and to savings from a lower demand.

As for industrial and agricultural use, non drinkable water can beused only after have obtained an authorization to draw it from the rivers and there are moreover provisions on the quality of the water discharged in the environment after use. Only the picking up of the rainwater is totally free.

## 5. Conclusions

The Italian system of water services must bear the consequences of heavily fragmented supply and few enterprises can guarantee an efficient supply at low costs.

Recent reform is trying to provide an incentive to local enterprises to reach their optimal size, exploiting scale economies. Furthermore the new legislation has created a situation of uncertainty where local utilities are no longer sure that they will be able to maintain their franchise. Although the probability of being ousted is extremely low, such uncertainty reinforces the incentive for grater efficiency and profitability.

In fact, as a consequence of new legislation, multi-utilities units are becoming more common and the more profit oriented local public utilities are trying to expand their range of activity beyond city limits. In a good number of cases agreements have been reached to create joint ventures. Major multi utility providers, such as ACEA in Rome, AEM in Milan and AEM in Turin have tended to form alliances among themselves and with big national and international groups and they have tried to extend their activities to become electricity and water providers at a national level. They have even extended their operation to other countries. Their strategy seems aimed at both enlarging their field of activities in their own city limits and also to expand their operations beyond their city limits.

A second pattern of behavior is observable among medium size multi-utilities: they have tried not so much to engage and to expand to a national level but to enlarge their range of action to the provincial or regional level. This is usually done trough agreements with other public local utilities of smaller size. This development has sometimes met obstacles where rivalry among different municipalities has prevented rationalization of supply.

The size of the operating unit is going to grow in the water sector, because the legislation has divided the territory into districts where just one unit is generally to manage the whole production cycle. The new legislation entered into force in 1994, but only a few districts have been created: rivalry among municipalities has prevented faster implementation. In recent years however there seems to be a faster compliance to the new regulatory structure and also small municipalities are gradually benefiting from the reform.

# MEXICO

Over the last two decades, the Mexican government has implemented reforms to separate the regulatory and operative functions of water utilities. It has also promoted the participation of private companies in providing water supply services. This document presents some key aspects of water supply in Mexico.

## 1. Regulatory framework

Article 27 of the 1917 Constitution states that surface and ground water is Nation's property. This article also empowers the Federal Government to: regulate water extraction and use; determine where water cannot be extracted; and, grant the rights for the use and exploitation of water to Mexican private agents.[1] These powers of the Federal Government were reaffirmed and regulated by the National Water Law of 1972, which establishes that private individuals might exploit, use or profit national waters through a concession or license granted by the authority. In 1992, a new National Water Law (LNA) was enacted to regulate constitutional Article 27 of the Constitution. The new LNA had the explicit purpose of strengthening property rights and furthering private management for water. This law pursues a greater participation of users in the policy-making process, one single federal authority in charge of water (the CNA), and legal certainty for water use and rights that enable private entities to strategically plan their activity for the long run.

While the federal government is in charge of water management, article 115 of the Constitution[2] establishes that Municipalities are responsible for providing and regulating their own public services, including water and sewage. Recognizing different capacities and capabilities, this article allows Municipalities to share or transfer this responsibility to the State government.

In 1989, the National Water Commission (CNA) was created as a decentralized administrative agency responsible for the formulation of hydraulic plans and programs, the construction and preservation of hydraulic infrastructure, and in some particular cases of hydraulic systems management. The CNA also plays the role of regulator and assistant in the management of water supply and sanitation systems. Under the 1992 LNA, the CNA is the only authority responsible of water management, including water allocation and distribution among users, collection of federal water rights for water use and effluent discharge; hydraulic infrastructure planning, construction, and operation; and regulation of private participation in the construction and operation of water facilities.

In 1990, the CNA issued the National Program of Water Supply, Sewage and Sanitation (PNA) that sets out the key policy guidelines for local water system management, focusing on strengthening management autonomy and expertise; encouraging customer representation and participation; and assuring self-financing though adequate tariff structures and administrative skills.

In addition to Federal laws, there are many State laws regulating the provision of water and sewage services. In most states the responsibility of managing water supply and sewage service has been transferred to municipalities, but there are some cases where this is a joint or mixed responsibility. Most state laws allow private participation through service contracts or concessions (see Annexes 1 and 2), and the creation of one supplier for several municipalities in the same state. [3]

Regarding prices, the 2003 Federal Levy Law (FLL) defines the tariffs for using public goods or services provided by the State, including charges for abstraction, wastewater and bulk water. State laws and regulations establish tariffs for service provision.

## 2. Distribution of Water Resources and needs

Mexico has a per capita water availability of 4,685 cubic meters per year, which is above the international scarcity standard of 1,000 cubic meters. However, water is generally scarce in Mexico, because of the uneven geographical distribution of water resources and needs. Thus, for example, the Southeast has 72 percent of the total water resources, but this region represents only 23 per cent of the population and 16 per cent of the GDP. This uneven distribution implies a significant challenge for supplying water to final users. This situation is further complicated by excessive exploitation of many aquifers: there are 633 identified groundwater aquifers in the country, 96 of which are over- exploited. Furthermore, 50% of the consumed ground water comes from overexploited basins.

The scarce water resources problem is aggravated by deficient distribution and non-payment. Existent water delivery systems do not reach adequate maintenance levels, lose a considerable percentage of produced water, keep price schemes that do not encourage conservation, and result costly in terms of public funding. According to the CNA, at national level the amount of unaccounted water loss due to leaks within the distribution system reached 39 percent, and only 71% of the billed consumption is collected. These figures vary widely between States.

The provision of water and wastewater service for the growing population of Mexico presents a formidable challenge. Continued urban growth along with a poor financing system have limited the government's ability to expand the water supply network to under-served areas, repair leaks, and provide wastewater treatment. Thus, the basic problem in water provision is how to effectively change and transform old water systems into a new type of arrangement that brings about operational effectiveness and self-sufficiency and, at the same time, fosters acceptable levels of welfare for the population, at reasonable costs.

In Mexico, governments at all levels are exploring increased private investment in water and wastewater services. By doing so, they are trying to expand their access to new financial resources, as well as to new technical and managerial skills.

## 3. Private participation in water supply

Under the 1992 LNA, the CNA has encouraged private participation mainly in financing, construction and management of hydraulic infrastructure, under the Built-Operate-Transfer (BOT) scheme. Under this scheme, private companies, hired through public contests, fund the construction of infrastructure in exchange for managing it for a predefined period so as to recover and pay up their investment. Another area that has attracted private participation is the construction of aqueducts for supplying water in large Municipalities.

Private participation in the operation and management of water supply and sanitation systems has been more cautious and slow. The most relevant cases where private participation has been introduced are Aguascalientes in 1994, Cancun in 1995, and the Federal District in Mexico City in 1995.

The main reasons for these cities to incorporate the private sector in water management have been: 1) lack of government resources to finance the required infrastructure; 2) the need to improve the financial performance of water utilities; 3) pressure from final users regarding low quality or poor coverage of services; and 4) technical knowledge to provide water supply services.

In Aguascalientes and Cancun, Municipalities granted concessions through public auctions, which vary between 20 and 30 years (see Box 1). Under these concessions, the private parties are responsible for operating and maintaining the infrastructure, undertaking the necessary investments, and at the end of the concession, revert to the government all its rights and facilities. In the Federal District

private participation is based on service contracts where ownership of infrastructure and responsibility for charging are withheld by the government (see Box 2).

Unfortunately, there is not data available to directly compare the performance of private and publicly owned water systems. Indirect information indicates that private systems improved coverage and metering, but these improvements are generally more modest that originally expected.

## 4. Access and Consumer prices

CNA allocates and manages water rights, and promotes efficient water use by imposing with due sanctions to users who waste water. Under the LNA both, public and private agents must obtain abstraction concessions[4] or wastewater discharge permits.

Concessions establish specific use (irrigation, water supply, sewerage & wastewater treatment, power generation, or other productive uses); volume limits to abstraction; time limits between the range of five and fifty years, commonly of 10 years; and the obligation to revert to the government facilities and other fixed assets related to the concession operation. Concessions may be revoked if; the concessionaire does not exploit the concessioned rights for three consecutive years (to avoid speculation and monopolization); allocates surpluses to different uses or users than those authorized; abstracts water from unauthorized geographical areas; and at request of the Ministry of Agriculture based on public interest or force majeure considerations.

Permit for wastewater disposal also specify use and volume limits, and include the obligation to comply with specified discharge standards and to inform the CNA how they are complying with.

Concessions and permits are tradable subject to maintaining the originally granted characteristics. However, there is not a market for water rights.

Through concessions and permits, the CNA can control ground water abstraction and make better decisions to improve water use in over-exploited or polluted basins by limiting the maximum amount that a user can extract from the basin or discharge to the system and limiting the number of licenses.

## 4. Prices

**Abstraction and disposal tariffs.** Are defined in the FLL at federal level and approved by the Congress, previous negotiation with users' organizations, production chambers and capital investment associations. Tariffs for water abstraction depend on the specific use and the relative scarcity, and the water source (surface or ground). Tariffs for wastewater disposal depend on the pollutants load and the amount and a fine is imposed in event of non-performance. Users who do not pay the specified charges are subject to cancellation of their concessions and permits.

Charges on water abstraction and wastewater disposal establish an incentive to encourage more efficient water use and a disincentive for polluters, by imposing high fines for returning untreated wastewater to the drainage system.

**Water tariffs for service**. Are defined by the water system managers and approved by local authorities–either state or Municipal, thus tariff structures vary between Municipalities. Currently, irrigated areas are exempted from payment and the tariff structures for public water services are established either on fixed or volumetric basis.

Fixed charges commonly apply in absence of metering, but sometimes distinguishes between socioeconomic areas. Volumetric charges adopt an increasing-block scheme[5]: the first tariff block for

domestic use (or lowest tariff block) sets a maximum consumption volume at the lowest amount possible, and often subsidized; and a tariff for the last block (or highest consumption block) applies to industrial use and is set at an amount that provides resources to increase the capacity of the water supply infrastructure to meet an incremental growth in demand.

Broadly speaking, tariff collection is affected by unwillingness to pay and weak enforcement mechanisms. Domestic users are the most irregular payers and industry has been regularly paying, amounting to more than 95% of tariffs collection.

In order to increase billing recovery, 15 states establish service suspension in non-payment event and 29 states consider water debts as fiscal debts, so that they might be recovered through fiscal action by the public treasury. To be effective, service suspension provision must be included into the state law because article 121 of General Health Law (GHL) forbids service suspension except for those cases explicitly established in a law or other legal regulation.

According to the PNA and with the CNA assistance, local managers are considering increasing efficiency and productivity of the water supply system by adopting tariff structures based on costs, including opportunity costs (closely linked to water rights) that could also be a useful tool to moderate users consumption. Tariff restructuring has taken a key role because in a water scarcity scenario, which is expected to worsen, there is no place for subsides in the long run.

## 5. Quality and Environment

Water quality and environmental protection are mainly regulated through standards established in accordance with federal legislation on environment protection, health, standards, and water. The Ministry of Social and Economic Development, the CNA and to the Ministry of Health and local or state agencies share responsibility on this matter. Current standards are imposed on all suppliers and apply to water supply systems, transportation of drinking water, sampling procedures, and water disposal, among others.

Standards are established based on cost-quality tradeoff and therefore encourage utilities to improve. However enforcement is weak because the oversight capacities of sector authorities are surpassed.

## 6. The role of competition in water supply

Competition for the market exists in hydraulic infrastructure and Municipal services supply, where private parties compete to obtain a concession or a contract, but the extent of competition varies among different auction processes. In water rights there is some sort of competition between users based on the compliance with concession and permit obligations in order to renew their rights. However, competition in the market has not occurred.

The contract and concession design and allocation mechanisms offer a great opportunity for competition advocacy, which has showed positive results in fostering efficiency in other network utilities, such as telecommunications. In water supply the Federal Competition Commission (CFC) under the Federal Law of Economic Competition (FLEC) could play, at the request of the sector authorities, an important role in fostering competition for the market in water systems management by assuring that bidders effectively compete for a concession or contract, and that standards are competitive-neutral.

**Box 1. Aguascalientes: concession**

Aguascalientes state was the pioneer in allowing for private participation in the overall operation and management of water supply in Mexico.

In 1993, the municipal government called for a contest to allocate the Title of Concession of Water Supply, Sewage, Wastewater Treatment, and its Reuse Services of the Municipality of Aguascalientes. Concesionaria de Aguas de Aguascalientes, SA (CAASA) presented the best proposal and proofs of their technical and economical capabilities.

The concession covered the provision of the water supply, sewage, and sanitation services, including billing and charging, as well as planning, designing and construction of infrastructure in the municipality of Aguascalientes, including both urban and rural areas for 20 years, renewable by a similar period. The concessionaire was allowed to propose price changes and to freely hire its operative personnel and directive staff, as well as to lay them all off at the end of concession period.

According to the concession title, the average price should cover expected expenses during the concession period and be comprised of: (1) operation and maintenance of water supply systems; (2) operation and maintenance of sewage systems; (3) new and acquired debt service, commissions, capital and its returns, and taxes; (4) trust expenses; (5) concession fees to the public contractor (the municipality); (6) Water rights to the owner (the CNA).

The concessionaire would not make profits during two years and would adjust the prior subsidized price up to the real service price. Once achieved there would be no more increases to the real price but only adjustments due to inflation and changes in the other aforementioned indexes. The price structure included five block tariffs: three for domestic use, commercial, and industrial. Domestic tariffs address the socioeconomic levels of users, according to land value in the different urban neighborhoods.

Although tariff structure was based on costs it did not include incentives to reduce or minimize costs, thus users bear the burden of sustaining the service. Prior to privatization, users paid only part of the total cost (perhaps just operational costs), while maintenance and other infrastructure costs were frequently covered by direct and indirect subsidies from other levels of government.

In 1996, after a financial crisis and tariff raising, the Municipality reviewed the concession title to extended it for 10 years more in order to have a greater time span for investment amortization and reduce financial pressures that were driving tariffs up. The Modified Concession Title included incentives for the supplier to increase earnings by enhancing efficiency; strengthening supplier's responsibilities for maintenance, extension and rehabilitation; strengthening supervision and evaluation of service provision; and included a new tariff structure.

Tariff restructuring included a reduction of billing periods to reduce nonpayment problems, and a new formula indexed to general inflation. The new tariff scheme comprised two parts: one was the private contractor's part referred to operative expenses, including consumption and amortization. The second part addressed the grantor and comprised water rights as well as a fund for supporting social goals. Price adjustments apply in the following cases: (a) every four years; (b) in case of significant variation in the number of users or in the characteristics of infrastructure (length of the network, for example); and (c) in case of new operative or fiscal rules. Also a commission of three experts, including an expert from CNA, was created to arbitrate in case of disagreement between grantor and concessionaire regarding new prices.

**Box 2. Mexico City: Service Contracts**

The water and sewerage systems in Mexico City face many operating challenges. The aquifer that is the main source of Mexico City's water supply is overused, and the drinking water distribution network suffers from major leakage, with losses well over 30 percent. As of the mid-1990's, less than half of the water consumed by the system was billed, only 70 percent of those bills were paid, and the existing network reached 98 percent of the population for drinking water and 94 percent for sewerage.

The government needed technical and commercial expertise in water operations, which it decided to obtain by involving the private sector. Clearly linked to the water reforms at the federal level, it was considered that the notion of water as an economic good should be inserted on the new policy design, which meant private appropriation, subsidies suppression, and the development of new scheme that would allow private participation at different stages.

The Federal District Water Commission could carry on service provision by itself or through third parties, implement universally the system of tariff by consumption, metering and improve the distribution network infrastructure.

The government chose to enter into a phased program of service contracts with the private sector to introduce comparative competition and reduce the risk of contract failure. The city was divided into four zones, each of which was allocated a service contract through an auction process. Four ten-year contracts were awarded in September 1993. Contract winners were consortia of national and international firms,[6] the latter with sound technical and managing experience.

The contract mainly consisted of a "menu" of tasks involving the operation and maintenance of the secondary water distribution and sewerage systems and associated activities, including customer services. Each contract anticipated three phases of work:

Phase 1 included basic activities: mapping, completion of a customer census, installation of metering equipment.

Phase 2 included customer-oriented tasks: regularization of billing (metering billing, maintenance and the selling of bills), shared role in collection of bills, establishment of customer care centers, connection of new customers. Phases 1 and 2 do not expose suppliers to commercial risks, since they receive a simple fee-for-service for each task carried out.

Phase 3 included network-oriented tasks: operation and maintenance of the secondary water and drainage networks, detection and repair of visible and invisible leaks, rehabilitation and extension of the secondary network. In this phase, tasks are aimed to improve the distribution network with the revenues earned by each operator. This phase was meant to begin two years after the contracts were signed but there were serious delays.

Private operators managed to improve billing, regularize many unbilled connections, and install over 1 million meters. In addition, some measures of service quality have also improved. However, the minor reform failed to improve performance along many other dimensions. Although the number of registered connections increased by about 300,000 during the contract period –leading to an improvement in the number of employees per 1000 connections, this appears to have primarily been the result of the regularization of unregistered connections. The installation of water meters continues as an important step in discouraging excess consumption. A leak detection program has also been initiated to help with bill collection and to reduce water losses.[7]

Consequently, in practice, the modest reform failed to reduce operating costs and failed to introduce a pricing scheme that would restrain residential consumption. Given that subsidence due to overexploitation of the aquifer is a serious problem in Mexico City, this could impose serious social costs.

## ANNEX 1. PROVISIONS FOR MANAGEMENT OF WATER SERVICES IN STATE LAWS

| State | Creation of Decentralized Agencies | | | | Private Participation | | |
|---|---|---|---|---|---|---|---|
| | Para-Municipal | Municipal | Para-State | State | Contract | Concession | Other |
| Aguascalientes | X | | X | | X | X | X |
| Baja California | | | X | X | X | | X |
| Baja California Sur | X | X | X | | X | | |
| Campeche | X | | X | | X | X | X |
| Coahuila | X | | X | | X | X | X |
| Colima | X | X | X | | X | X | X |
| Chiapas | X | | | X | X | X | X |
| Chihuahua | | X | X | X | X | | |
| Durango | | | X | X | X | X | X |
| Guanajuato | X | X | X | X | X | X | X |
| Guerrero | X | X | X | X | X | X | X |
| Hidalgo | X | X | X | | X | X | X |
| Jalisco | | | X | | X | | X |
| México | X | | X | | X | | X |
| Michoacán | X | | X | | X | X | X |
| Morelos | X | X | X | | X | X | X |
| Nayarit | X | | X | | X | X | X |
| Nuevo León | | | X | | X | | |
| Oaxaca | X | | | X | X | X | X |
| Puebla | X | | X | | X | X | X |
| Querétaro | | | X | | X | X | X |
| Quintana Roo | | | X | | X | X | X |
| San Luis Potosí | X | | X | | X | X | X |
| Sinaloa | X | | | | X | | X |
| Sonora | X | X | X | | X | X | X |
| Tabasco | | | X | | | | |
| Tamaulipas | X | | X | | X | | X |
| Tlaxcala | X | | X | | X | | X |
| Veracruz | | | X | | X | X | X |
| Yucatán | | | X | | | | X |
| Zacatecas | X | X | X | | X | X | X |
| **Total** | **21** | **9** | **29** | **7** | **29** | **20** | **27** |

***Source***: Alcántara (1996).

## ANNEX 2. CONDITIONS FOR THE OPERATION OF WATER SERVICES IN STATE LAWS

| State | Tariff autonomy | | | Service suspension | | Payment catalog | | Bound revenue | | Fiscal credit | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | Congress | Other | YES | NO | YES | NO | YES | NO | YES | NO |
| Aguascalientes | X | | | X | | X | | X | | X | |
| Baja California | | X | | X | | | X | X | | X | |
| Baja Calif. Sur | X | | | X | | | X | X | | X | |
| Campeche | X | | | X | | X | | X | | X | |
| Coahuila | X | | | X | | X | | X | | X | |
| Colima | X | | | X | | X | | X | | X | |
| Chiapas | X | | | | X | X | | | X | X | |
| Chihuahua | X | | | | X | | X | X | | X | |
| Durango | | X | | | X | | X | X | | X | |
| Guanajuato | X | | | | X | X | | | X | X | |
| Guerrero | X | | | | X | | X | X | | X | |
| Hidalgo | | X | | | X | X | | | X | X | |
| Jalisco | | X | | | X | X | | X | | X | |
| México | | | X | | X | X | | X | | X | |
| Michoacán | | X | | X | | | X | X | | X | |
| Morelos | | X | | X | | X | | X | | X | |
| Nayarit | | | X | | X | X | | X | | X | |
| Nuevo León | | | X | | X | | X | X | | X | |
| Oaxaca | X | | | X | | X | | X | | | X |
| Puebla | | X | | X | | | X | X | | X | |
| Querétaro | X | | | X | | X | | X | | X | |
| Quintana Roo | X | | X | | X | X | | X | | X | |
| San Luis Potosí | | X | | X | | | X | X | | | X |
| Sinaloa | X | | | | X | X | | X | | X | |
| Sonora | X | | | X | | X | | X | | X | |
| Tabasco | X | | | | X | | X | X | | X | |
| Tamaulipas | | | X | | X | X | | X | | X | |
| Tlaxcala | | | X | | X | X | | X | | X | |
| Veracruz | X | | | | X | X | | X | | X | |
| Yucatán | X | | | X | | X | | X | | X | |
| Zacatecas | X | | | X | | X | | X | | X | |
| **Total** | **18** | **8** | **6** | **15** | **16** | **21** | **10** | **28** | **3** | **29** | **2** |

***Source***: Alcántara (1996).

## ANNEX 3. TARIFF COMPARISON

| City | Inhabitants | Domestic use tariff | First tariff block | | Tariffs approved by |
|---|---|---|---|---|---|
| | Thousands (February 2000) | (pesos per cubic meter) | Upper limit (in cubic meters) | Amount (pesos)[b] | |
| Distrito Federal | 8,605 | 1.21 | 5 | 5.75 | Legislative Assembly |
| Guadalajara, Jalisco | 1,646 | 2.44 | 17 | 17.34 | State legislature |
| Ciudad Juárez, Chihuahua | 1,187 | 1.99 | 11.5 | 16.79 | Directive Board |
| Tijuana, Baja California | 1,149 | 6.62 | 5 | 25.78 | State legislature |
| Monterrey, Nuevo León | 1,111 | 3.34 | 6 | 15.00 | Management Board |
| Chihuahua, Chihuahua | 658 | 3.82 | 10 | 47.64 | Directive Board |
| Aguascalientes, Aguascalientes | 594 | 5.69 | 10 | 64.14 | Directive Board |
| Morelia, Michoacán | 550 | 0.92 | 15 | 14.10 | State legislature |
| Hermosillo, Sonora | 550 | 2.05 | 14 | 26.26 | Government Meeting |
| Mexicalli, Baja California | 550 | 2.03 | 5 | 19.27 | State legislature |
| Querétaro, Querétaro | 536 | 2.72 | 10 | 6.68 | Directive Board |
| Cancún, Quintana Roo | 397 | 4.78 | 20 | 21.80 | Directive Board |
| Xalapa, Veracruz | 373 | 1.57 | 10 | 15.52 | Government entity |
| Cuernavaca, Morelos | 327 | 2.63 | 60 | 71.70 | State legislature |

[a] Corresponds to low-income users. The consumption level for each block defined as a volume consumed by a household during any 30 day period except for Distrito Federal, Ciudad Juárez, and Cuernavaca.

[b] Includes the disposal service except for Monterrey were this service has an 25% charge.

***Source:*** Water Statistics in Mexico, 2003. CNA

## NOTES

1 Individuals or companies created according to Mexican laws.

2 Article 115 regulates the activities of municipalities, its 1983 amendment made explicit the general functions of municipalities regarding land planning, public services, ordinances, budget autonomy, and others.

3 Some State laws are silent regarding this issue.

4 Namely, assignations are granted to public entities and concessions to private agents but the LNA refers both as concessions.

5 This means that the charge increases with each additional unit of water used or wastewater treated.

6 Two were from the United Kingdom and two from France.

7 Haggarty et al. (2002)

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# NETHERLANDS

## Introduction

The first water supply company in the Netherlands was established almost 150 years ago in 1854 in Amsterdam. In the following 100 years gradually all parts of the country became serviced by public water supply and the foundation was laid for the legal and institutional framework that we know today, including the Water Supply Act of 1957. The 150-year history of the public water supply can be divided in three periods. The water supply started with companies under private management. Soon after this the mode of direct municipal water companies was coming up. From 1920 – 1975 this was the dominant form. In 1975, based on the Drinking Water Supply Act, a reorganization took place resulting in public (= government) owned limited liability companies.

The number of water companies changed over time. From 1880 the number of companies increased to 231 companies in 1938. Of those 155 were municipal companies under direct public management, 41 under private management and 32 were regional companies mostly set up as (public) limited liability companies (PLC's) with shares held by local government. From 1938 the number of companies declined to 210 in 1950, 185 in 1965, 105 in 1980 and 40 in 1994.

In the sixties, we entered the era of 'planning for the future'. There was a strong awareness that the growing population as well as the economic growth would lead to a fast increasing water demand in the next decades. Between 1960 and 1970 the production of drinking water nearly doubled and a further strong increase was expected. The opinion at time was that this increase should be met by central planning directed by the national government. Moreover, there was also a general understanding that small water supply companies could not cope efficiently with this increase as well as with the more stringent drinking water quality standards and the increasing pollution of the resources. Therefore, a system of central planning was developed in the early seventies. The Water Supply Act was amended in 1975 with provisions for reorganisation of the public water supply by take-overs to upscale the water companies in order to face rising demand, environmental pollution, new technical developments and to improve quality control. As a rule of thumb the minimum recommended size of the companies at that time was 100.000 connections or a supply of five million m3 per annum.

## Supplier selection and incentives

At present drinking water in The Netherlands is supplied by 14 regional water companies. All of them but one (which is a municipal company), are limited liability companies with shares held by local government (e.g. provinces and municipalities). In the Annex tables are given with figures on number of connections and water supply for the year 2002.

The water supply is characterized by regional natural monopoly. The water companies supply drinking water in designated supply areas without competition between them. (For water used for industrial purposes the situation is different, as will be discussed in a separate paragraph.)

Drinking water is considered a public service. Drinking water policy is aimed at guaranteeing a high quality drinking water for everyone at a reasonable price for now and in the future. In addition, water companies play a role in the protection of ground- and surface water.

Since water supply is a natural monopoly the governments policy in the discussion on competition, liberalisation and privatisation is to maintain government ownership of the drinking water

supply. In view of the lack of competition, privatisation would lead to private monopolies. That goes for other forms of private involvement, such as (long term) concessions with a separation of ownership and management (including maintenance and operations), too. Private monopolies are undesired. First because this would necessitate a strict regulation of prices to protect customers. Secondly, financial partners prefer low risk and private investors require profitability. This will put the assurance of a high quality of water supply at risk because a shift from (focus on) quality optimisation to (focus on) profit maximization is to be expected. The incentive to reduce costs may go at the expense of attention to quality, investments in infrastructure and innovation. Therefore the government proposed an amendment of the Dutch Drinking Water Act to consolidate the government (public) ownership. The proposal has recently been approved by the Lower Chamber.

Since water companies have a (regional) monopoly on the supply of drinking water, attention needs to be given to efficiency. To guarantee an efficient water supply the instrument of benchmarking is used in the Netherlands. In this benchmarking the performance of water companies is compared, using performance-indicators on water quality, customer service, environment and finance & efficiency. The aim of the benchmark is threefold: 1) increase transparency, 2) give account (to the public, shareholders and the Board of Directors) and 3) generate information to improve performance.

Two benchmark studies have been carried out so far. The results of the first benchmark study were published in 1999 (reference year 1997. The second study was published in 2001 (reference year 2000).

At present benchmarking is carried out on a voluntary bases, but most water companies participate, covering over 90% of the sector. In the near future the benchmark study will be compulsory. However, the way to supervise the efficiency of water companies and drinking water tariffs in the near future- through benchmarking or through price regulation using yard stick competition - is under discussion.

**Consumer Pricing and Access**

The company policy and management of water companies (including drinking water tariffs) are supervised by the local authorities through shareholders meetings and the Board of Directors. Tariffs are set by the management of the companies after approval by the shareholders and board of directors. They are based on a not-for-profit and full cost recovery basis.

The average water tariff for households is 1,40 euro (ex. VAT 6% and tap water tax of 0,14 euro/m3) (year 2002). The average costs for an average household (average consumption of approx. 125 m3/y) including all taxes (groundwater tax, VAT and tap water tax) is approximately 200 euro. The tariffs are composed of a standing charge and a volumetric rate.

There is sufficient capacity to supply drinking water to all users, without a distinction between different value users. However, with respect to the allocation of groundwater as a source for water supply, priority is given to high quality uses (e.g. drinking water) above lower quality uses (e.g. cooling-water).

**Quality and Environment**

Both government and water supply companies consider drinking water quality and reliability of supply as the most important indicators for the level of services. This relates to the whole process of extraction, purification, transport and distribution of water, including investments in infrastructure and innovation

Nationally legally binding standards for drinking water quality (Drinking Water Quality Decree) are in conformity with the 47 standards set in the EU Drinking Water Directive (98/83EC). However, more stringent quality standards have been set for 15 parameters and standards have also been set for 15 additional parameters. A distinction is made in three groups of parameters: microbiological parameters, chemical parameters and indicator parameters. The latter group is intended to control the water treatment process and the water quality during distribution.

The Environment Inspectorate checks the water companies concerning the quality of the water supply. Drinking water quality is monitored according to programmes according to the Drinking Water Quality Decree, taking into account the minimum requirements of the EU Drinking Water Directive. Monitoring is done by the water supply companies and supervised by the Environment Inspectorate. Analyses have to be carried out by laboratories approved by the Minister of Housing, Spatial Planning and the Environment. One of the approval criteria is the accreditation by a certifying body.

A water supply company has the obligation to report a breach of standards immediately to the Environment Inspectorate unless it is trivial. The Inspectorate will then in consultation with the water supply company decide on basis of potential health risks what has to be undertaken by the water supply company to comply as soon as possible. The Inspectorate checks the actions of the water supply company. In case the water supply company fails to take adequate actions, the Inspectorate will take enforcement actions.

All monitoring results have to be reported on a yearly basis to the Environment Inspectorate who publishes a yearly report that is sent to Parliament and to the European Commission. The yearly number of regulatory analyses is approximately 1 million, monitoring a drinking water production of 1190 million $m^3$/year. The compliance rate (percentage of analyses complying with the standard) over the last five years has been between 99.5 and 99.9 %, showing a good performance of the Netherlands water supply companies (VROM, 2000).

Several water supply companies have implemented certified quality and environment management systems (ISO 9000 series and ISO 14001) to improve their performance even further. Other companies are well underway and before 2002 all companies are expected to have these systems in place.

As stated earlier, one of the reasons to consolidate government ownership of water companies is the belief that real competition in water supply is not possible. Another important reason is the concern of assurance of a high quality water supply in a framework of private operation of water services. Privatised water supply companies operating on a commercial basis have the risk of creating a tension between costs and quality and a strain on investments in infrastructure and innovation.

**Water supply for industrial use**

Industrial water is defined as water that is used as a means of production or as a raw material in a production process. Whether or not water is classified as industrial water is not determined by its quality, but by its use. Industrial water may be of any quality, including drinking water quality, as long as it is not intended, or also intended, for drinking. No distinction is made in connection with this between the food industry and other industries. The present Dutch Water Supply Act includes no rules on industrial water. However, the Consumer Goods Act stipulates that water that is used in the foods industry must meet the quality requirements for drinking water that are set out in the Dutch Water Supply Act. This is in line with the EC Drinking Water Directive.

***Organizing the market for industrial water***

A distinction is made in the organization of the market for industrial water between industrial water supplies that form part of the public water supply and those that are separate from the public water supply infrastructure (see below). Moreover, the entire mains water supply infrastructure of the water companies, from the water resource to the tap, is part of the public water supply.

The following general starting points and preconditions apply to the organization of the market for industrial water:

- The market for industrial water is a free market.
- Competition in the public water supply infrastructure of the water companies is prohibited, owing to the inadvisability of opening the network to third parties. This is because of problems concerning quality assurance and legal liability.
- Market forces for major consumers must not be allowed to have adverse consequences for tied customers and sustainable management of water resources.
- Water companies have exclusive authorization to supply drinking water to third parties.

*Separate supply from public water supply infrastructure*

There is a free market for water supplies that are separate from the drinking water infrastructure. Some industrial companies obtain water from their own abstraction points (groundwater). Due to technological developments (membrane technology) it is becoming increasingly easier to make surface water suitable for use as industrial water. This offers possibilities in situations in which surface water is available in the vicinity. There is no reason from the point of view of quality management or efficiency to impede the entry of alternative suppliers in this market.

*Supply as part of public water supply*

Water companies supply a substantial part (around 40%) of industry in the Netherlands with water. At the moment, there is often a lack of any alternative to this piped supply. Their task within the framework of the public water supply means that water companies will also continue to play a central role in supplying industrial water in the future. The public water supply would not benefit from water companies competing with each other through their infrastructure. It has therefore been decided that the piped water that the water companies supply must be related to their supply areas. This draws a parallel with supplying drinking water, which is the preserve of the water companies in their designated supply areas. It also largely removes the risk of costs being passed on to tied customers, as a result of the disconnection of major consumers or reductions in rates for major consumers at the expense of tied customers.

# ANNEX

*Table 5 Connections on 31-12-2002* [1)]

| company | technical connections [2)] | | | | | administrative connections [3)] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | small scale users | medium scale users | large scale users | total | % metered | small scale users | medium scale users | large scale users | total |
| Wbgr | 253,177 | 8,789 | 189 | 262,155 | 97 | 260,325 | 8,789 | 189 | 269,303 |
| WMD | 172,577 | 8,140 | 181 | 180,898 | 99 | 177,049 | 8,019 | 130 | 185,198 |
| Vitens | 1,482,390 | 73,874 | 827 | 1,557,091 | 100 | 1,522,742 | 74,026 | 829 | 1,597,597 |
| PWN | 623,364 | 19,278 | 112 | 642,754 | 100 | 680,970 | 19,278 | 112 | 700,360 |
| GWA | 159,333 | 19,580 | 435 | 179,348 | 23 | 445,828 | 18,898 | 633 | 465,359 |
| WRK | - | - | - | - | . | - | - | - | - |
| DZH | 340,439 | 16,595 | 157 | 357,191 | 100 | 541,699 | 25,567 | 230 | 567,496 |
| WBE | 460,764 | 20,253 | 573 | 481,590 | 83 | 716,808 | 20,253 | 573 | 737,634 |
| Hydron-ZH | 288,339 | 10,085 | 110 | 298,534 | 100 | 304,720 | 10,085 | 110 | 314,915 |
| Hydron-Fl | 111,400 | 6,600 | 186 | 118,186 | 100 | 108,496 | 6,456 | 186 | 115,138 |
| Hydron-MN | 448,443 | 23,539 | 315 | 472,297 | 99 | 506,373 | 23,827 | 314 | 530,514 |
| DELTA | 206,157 | 909 | 155 | 207,221 | 99 | 216,341 | 909 | 155 | 217,405 |
| Brabant Water | 799,647 | 41,712 | 548 | 841,907 | 99 | 887,173 | 41,712 | 548 | 929,433 |
| TWM | 69,250 | 2,539 | 60 | 71,849 | 100 | 87,303 | 2,628 | 60 | 89,991 |
| WBB | - | - | - | - | . | - | - | - | - |
| WML | 444,350 | 17,374 | 226 | 461,950 | 100 | 492,859 | 17,580 | 226 | 510,665 |
| **The Netherlands** | 5,859,630 | 269,267 | 4,074 | 6,132,971 | 96 | 6,948,686 | 278,027 | 4,295 | 7,231,008 |

1) Small scale consumers use less than 500 $m^3$/year, medium scale consumers between 500 and 10,000 $m^3$/year and large scale consumers more than 10,000 $m^3$/year.
2) A technical connection consists of the distribution pipe between the mains network and the end user, including water metre (if present).
3) An administrative connection is taken to mean a premises related to the technical connection (e.g. an apartment). A collective (technical) connection includes several administrative connections.

*Table 6 Sales of drinking water 2002* [1)]

| company | supply | | | | income | | | |
|---|---|---|---|---|---|---|---|---|
| | small scale market | medium scale market | large scale market [2)] | total | small scale market | medium scale market | large scale market [2)] | total |
| | *1000 $m^3$* | | | | *1000 €* | | | |
| Wbgr | 24,789 | 8,840 | 12,525 | 46,153 | 24,558 | 8,591 | 8,817 | 41,966 |
| WMD | 19,511 | 6,264 | 4,899 | 30,674 | 27,219 | 3,000 | 2,543 | 32,762 |
| Vitens | 152,559 | 65,101 | 28,965 | 246,625 | 194,985 | 76,016 | 31,761 | 302,761 |
| PWN | 68,689 | 23,662 | 8,421 | 100,772 | 121,579 | 33,861 | 11,403 | 166,843 |
| GWA | 49,381 | 10,127 | 30,604 | 90,112 | 65,083 | 12,644 | 21,401 | 99,128 |
| WRK | - | - | - | - | - | - | - | - |
| DZH | 43,247 | 19,847 | 11,009 | 74,103 | 82,530 | 26,004 | 12,101 | 120,636 |
| WBE | 82,050 | 8,315 | 46,646 | 137,011 | 116,983 | 9,072 | 37,081 | 163,136 |
| Hydron-ZH | 33,874 | 4,118 | 9,105 | 47,097 | 63,781 | 5,392 | 7,219 | 76,392 |
| Hydron-Fl | 11,176 | 3,208 | 3,620 | 18,004 | 15,465 | 3,491 | 2,657 | 21,612 |
| Hydron-MN | 45,649 | 21,070 | 8,344 | 75,062 | 53,463 | 22,432 | 8,527 | 84,422 |
| DELTA | 26,011 | 1,740 | 11,402 | 39,154 | 35,280 | 2,411 | 6,784 | 44,475 |
| Brabant Water | 94,188 | 33,969 | 32,108 | 160,265 | 109,430 | 37,528 | 26,445 | 173,403 |
| TWM | 9,068 | 1,924 | 2,176 | 13,168 | 7,797 | 1,654 | 1,467 | 10,918 |
| WBB | - | - | - | - | - | - | - | - |
| WML | 48,333 | 16,937 | 8,842 | 74,112 | 72,034 | 22,988 | 12,001 | 107,023 |
| **the Netherlands** | 708,524 | 225,122 | 218,666 | 1,152,311 | 990,188 | 265,083 | 198,207 | 1,445,478 |
| *of which* | | | | | | | | |
| *wholesale* | | | 38,067 | 38,067 | | | 18,489 | 18,489 |
| export | | | 3,705 | 3,705 | | | . | . |
| final sale | 708,524 | 225,122 | 176,894 | 1,110,540 | 990,188 | 265,083 | 171,717 | 1,426,988 |

1) Small scale consumers use less than 500 $m^3$/year, medium scale consumers between 500 and 10,000 $m^3$/year and large scale consumers more than 10,000 $m^3$/year.
2) Including industrial process water of drinking water quality. The individual details shown in this table further include *wholesale sale* and exports. The total figure at the bottom of the table for the whole of the Netherlands is split into final sales to large scale users, *wholesale sale* and exports

Source: Water Supply Statistics 2002 (VEWIN, 2003)

# POLAND

## Introduction

In Poland, the legal framework for the regulatory policy in the area of water supply has been set up by virtue of the Act of 7th July 2001, on collective water supply and sewage treatment ('Act on collective water supply', O.J. 01.72.747).[1] The aim of the act in question is to define "*the rules and conditions of collective supply of water intended for human consumption and collective sewage disposal, including the rules of activity of water and sewage companies, principles of creation of conditions ensuring a continuity of supplies and appropriate quality of water, reliable sewage disposal and purification, as well as protection of the interests of services' recipients, taking into account environmental protection requirements and cost optimization*".[2]

The Act on collective water supply establishes the two-tier regulatory system for implementation of water supply policy[3] in Poland.

On the national level it designates the President of the Office for Housing and Urban Development[4] ('OHUD') as a central administration body responsible for regulatory policy in the water sector. The responsibilities of OHUD in the discussed area cover: preparation of draft acts on standards; fixing directions of recommended scientific and research work; co-operation with municipalities, professional and social organizations; international cooperation.[5]

On the local level the responsibilities in the area of water supply (covering also those regulatory powers which are not within the scope of competences of OHUD) are entrusted to the municipalities.[6] In addition to the core water supply competences, the municipalities are also responsible for establishing the development targets for the water system within their local spatial development plans.[7]

## 1. Supplier Selection and Incentives

### *1.1. How is the water supplier chosen?*

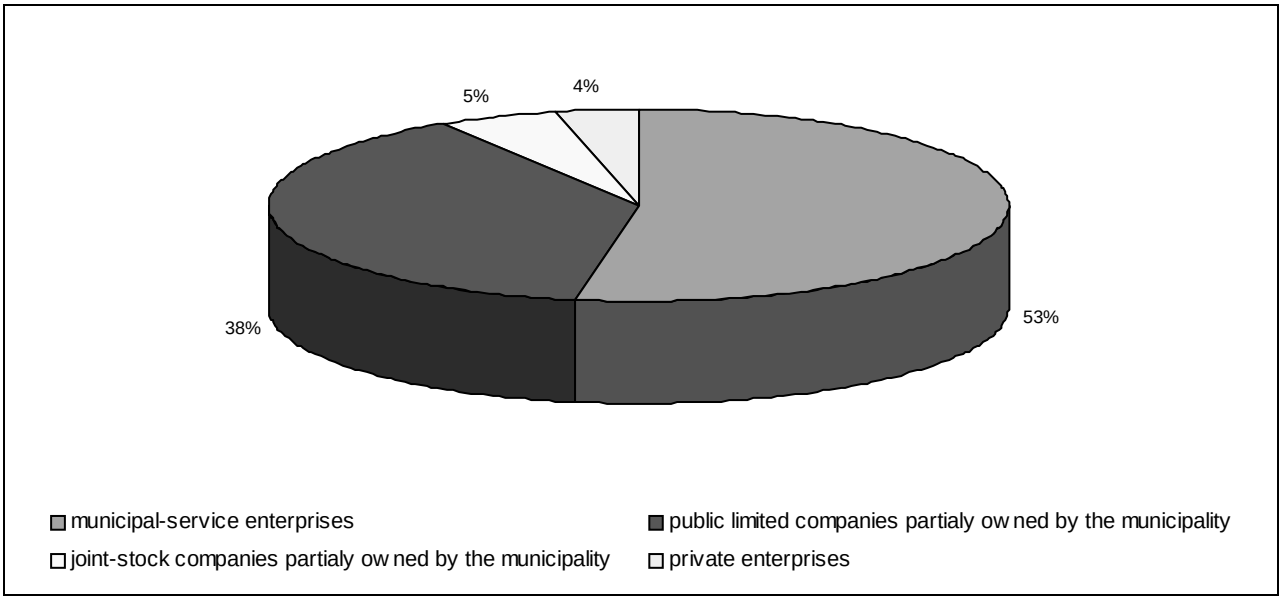
As it has been mentioned in the introduction section of this paper, the overall responsibility for providing the water supply has been entrusted to the municipalities. Among others, the scope of their competences covers the selection of an undertaking, which will provide the water supply services within their territory.

The municipalities as well as all other public bodies in Poland are subject to the rules of the public procurement law,[8] whenever their activities involve the participation of the private-sector companies. This applies also to the selection of the water supplier. In practice, due to the fact that the water supply services are very specific in their nature (i.e. network monopolies) usually, there is only one water supplier available, and no competitors who would be willing to provide those services on the territory of the municipality. There are of course municipalities where the water is provided by the entirely private undertakings. Nevertheless in the majority of the Polish municipalities water is supplied either by the specialized municipal-service enterprises (dependent entities of the municipality), or by the commercial entities within which the municipality possess an ownership stake.

The ownership structure discussed above has been statistically confirmed in the study of the water services sector, which has been carried out in 2001 by the regional branch of the Office for Competition and Consumers' Protection ('OCCP', 'Office') in Wroclaw. The territorial scope of the study

in question covered only the area of western Poland (the jurisdiction of this particular branch of the Office). Nevertheless, the findings of the study concerning the ownership structure in discussed sector, which are presented on the bellow chart, may be treated as a rough approximation of the ownership structure of the water providers in Poland as whole.

**Water services sector: Ownership structure in western Poland in 1999-2000**




Source: Survey of the undertakings operating on the market for water supply and sewage treatment services in the years 1999 – 2001 (OCCP, 2001).

In light of the above, the public procurement law provides the municipalities with possibility of applying the simplified procurement procedures – the so called 'free-hand procurement'.[9] Under the free-hand procurement the municipality may negotiate the terms of providing the services with just one undertaking, if no other undertaking expresses its will to provide the services covered by the procurement. The application of the aforementioned free-hand procurement is without prejudice to the fact, that the regular public procurement procedure applies in every situation, when more than one undertaking wants to provide the water in the municipality.

The public procurement law explicitly prohibits any forms of public anticompetitive conduct. The Article 16 of the aforementioned Act states that the public body organizing the tender (in this case the municipality) is obliged to "*treat equally all of the entities participating in the tender and to observe the rules of fair competition while conducting the public procurement proceedings*".

After the water supplier has been selected, the head of the municipality, by way of the decision grants such undertaking a permission to carry-out the water supply services.[10]

Summarizing, in majority of the municipalities the water supply services are carried-out either by the municipality itself (via the municipal-service enterprises) or by the commercial entities in which municipality has a stake. It ought to underlined, that the water sector in Poland is not excluded from the scope of the competition law. Therefore, aforementioned ownership structure is due to the structural factors,[11] rather than due to the fact of restraining by the municipalities the entry of an independent competitors to the market. This state of affairs is fully confirmed in the structure of OCCP's competition

cases having the water sector in their scope. During the past few years there were virtually no proceedings against the competition-restrictive practices regarding the process of selecting the water supplier.

### *1.2. Is competition possible between different suppliers in the same geographic area?*

In order to answer the above question the issue of the water supply has to be approached from two different angles. Namely, the distinction has to be made between the process of supplying the water to the end-users within the municipality (i.e. the primary scope of this paper) and the water supply understood as water production (i.e. water in-take facilities supplying the water from the natural sources and the water treatment facilities).

In case of the former, the competition between undertakings exists at the stage when water supplier is being selected by the municipality. However, it is quite obvious, that due to the nature of the water supply (i.e. natural monopoly), the chosen undertaking gains a semi-exclusivity[12] over the water supply in the given area. Hence the existence of the multi-aspectual regulatory framework, which sole aim is to prevent the water suppliers from abusing their dominant position, thus to safeguard the satisfactory availability of the water of proper quality and at right price. The core institutional framework consists of Office for Housing and Urban Development and the municipalities. This is without prejudice to the fact, that in certain matters also other public bodies have an opportunity to influence the shape the water policy via enforcement of their competences (i.e. the Office for Competition and Consumers' Protection in the area of protecting the competition in the sector, the Ministry of Heath in regard to the quality of water used for consumption or the Ministry of Environment in the area of environmental costs).

As for the water supply understood in terms of water production the competition between different water producers is unrestrained. The municipalities bear the right to choose freely the source of their water supply. At this point it ought to be observed that the wholesale water supply falls outside of the regulatory framework discussed above, as it is not subject to the provisions of the Act on collective water supply.

The most potent example of competition on the water production market could be observed in the south-western Poland. Recently, one of the municipalities located close to the border with Czech Republic, instead of using the water from local sources, decided to import cheaper water from the producer located across the border in Czech town of Ostrawa.

### *1.3. How is the incentive provided to increase productive efficiency?*

As it has been mentioned in the introduction to this paper, Polish regulatory framework in the water sector, is rather decentralized. Therefore, it is the responsibility of the municipalities to provide water suppliers with incentives for enhancing their production efficiency. The provisions of the existing legal acts regulating the issues of the water supply introduce a general framework within which such effectiveness-enhancing steps could be undertaken by the municipalities.

Firstly, the Act on collective water supply identifies the municipalities as the public entities responsible for establishing the development targets for the water system within their local spatial development plans.[13] Further on, it imposes on the water suppliers an obligation to follow those development targets[14] and upgrade the water supply infrastructure when it is necessary to attain those targets.[15] Secondly, the aforementioned act sets up a cost-based system for calculating the prices (i.e. tariffs). The tariff-calculation system allows the water suppliers to include in the proposed tariff also the costs incurred in relation to the upgrading the infrastructure, which has been required by the municipality's development targets.

In light of the above, the municipalities, through the proper construction of their development targets may enhance the productive efficiency. If the municipality deems certain parts of the water network to be ineffective then in can include the upgrading of this particular part of the network into the development target. It ought to be noted, that the mechanism depicted above is applied by the municipalities with caution, as part[16] of the development costs incurred by the water supplier will be transferred onto the end-users. Nevertheless, the development targets' mechanism may contribute to enhancing the overall long-term productiveness of the water system.

Summarizing, the existing regulatory framework in water sector provides the municipalities with instruments, which can be used in order to enhance the productive efficiency of the water supply. However, due to the decentralization of the regulatory framework the degree to which those tools are used depends solely on the municipalities' will to apply them. Among others, the reinforcement of the regulatory framework would be viable in case of the water network leakages, as at the moment there are no mechanisms, which would specifically address this issue. Generally speaking, the process of enhancing the productive efficiency could be also strengthened by faster privatization of the sector. However, at present, the pace of the privatization is inhibited by the structural factors discussed in section 1.1 of this paper, as well as general social reluctance toward privatization of this particular sector.

## 2. Consumer Pricing and Access

### *2.1. What is the general structure of retail water prices?*

The legal framework for calculation of the water tariffs by the suppliers has been established by virtue of the Act on collective water supply and the Regulation of the Minister of Infrastructure of 12th March 2001, on setting the tariffs, specimen of the application form for approving the tariffs and the conditions for settlement of payments for collective water supply and collective sewage treatment ('Regulation on water tariffs', O.J. 02.26.257).

The Act on collective water supply states the tariffs used by the water supplier are subject to renewal every year. Prior to entering into force the new tariffs are verified by the head of the municipality under the criterion of cost-purposefulness. After tariffs have been verified by the head of the municipality, they are approved by the council of the municipality by way of resolution.[17] While providing the municipality with the tariff plan to be approved, the water supplier must also produce the detailed calculations on which its new tariffs are based. The methodology for calculating the tariffs has been laid down in the Regulation on water tariffs. The Regulation on water tariffs explicitly defines seven items, which must be taken into account by the water suppliers while calculating their prices. Those are: costs of operating and servicing the water infrastructure; environmental charges; costs of capital loans whenever their value exceeds the level of the amortization; interest payments on loans and other forms of debts incurred by the water suppliers; reserve funds for covering the irregular liabilities; and profits.[18] When establishing the levels of the above items, water suppliers must take into account the levels of the costs incurred in the year previous to the year for which the tariffs are being set, as well as the costs stemming from their long-term development and modernization plans.

It ought to be underlined, that the application of the cost-related tariff calculation system (as presented above) implies a significant degree of transparency in tariff setting process. On one hand, it provides the water suppliers (both private and public ones) with proper remuneration for their services, without allowing them to charge excessive prices for the water they provide. On the other hand the system prevents the municipalities from imposing on the water suppliers artificially low tariffs. This is due to the following reasons. The previous year costs used in the system are impartial as they are the costs indicated by the company for the accounting purposes.[19] Further on, the Council of the municipality may not change the development and modernization costs (agreed initially with the supplier) without changing at the same

time the development targets discussed earlier in this paper.[20] Finally by virtue of the Act on the collective water supply the water suppliers are allowed to encompass in their tariffs also their estimation of movements in the level of the previous year costs (e.g. caused by inflation) and the predicted changes in the overall economic conditions.

In addition to the above, the Article 20 of the Act on collective water supply introduces mechanism, by means of which the water supplier my set different tariffs for different categories of users (i.e. tariff groups system) and thus allocate more efficiently the costs of providing the service.

The specific regulations on the application of the tariff groups by the water suppliers have been enshrined in the § 10 of the Regulation on water tariffs. While molding the tariff groups the water suppliers must observe two rules, i.e. they are obliged to incorporate into their system at least two different tariff groups (tariffs for households, and tariffs for the commercial users); the system of the tariff groups may not be applied for any purpose other than the enhancement of cost allocation (e.g. it may not be used for the profits' maximization).

The water suppliers use two basic charges for composing their tariffs (i.e. the fixed charge and the metered charge). The fixed charge covers the costs of reading the meters and invoicing the user, and it amount usually does not exceed the 5% of the total bill presented to the user. The remaining fixed costs are incorporated into the metered charge (they approximately form up to 70% of the metered charge). The fixed costs account for an overwhelming majority of all costs incurred by the water supplier. Therefore, by tying those costs with the metered charge, water suppliers avoid the excessive water wastage (i.e. if those costs were to be covered by the users within the fixed charge, the metered charge would be insignificant, and thus the users would have no incentive to use water rationally).

### *2.2. Is water provided to the highest value users?*

The system of cost-based calculation of the prices for water supply together with the system of tariff groups, which has been described above, provides the best possible mechanism of effective water allocation. While limiting the water wastage, it safeguards the provision of the water to the highest value users.

Further on, the Regulation on the water tariffs explicitly pronounces two specific types of tariffs, which may be employed by the water suppliers in order to enhance the effectiveness of the water services. Those are: the seasonal tariff and the progressive tariff.[21] In case of the seasonal tariffs the Regulation allows the water suppliers to increase the price of water at the peak times and to decrease in when usage is bellow average. Application of such tariffs allows for minimizing the wastage of water for example in summer during the heat seasons. Similar mechanism works in case of the progressive tariffs, where the price of water (per cubic meter) rises in correlation with an increase in the amount of water used by the customer.

### *2.3. How can the access to the water be ensured for low-income users?*

The mechanism providing the appropriate access to the water supply for the low-income users, has been embedded in the Act on collective water supply. By virtue of the discussed Act, the municipality "*may adopt a resolution on subsidizing one, a few selected or all tariff groups of recipients of services*".[22] The subsidy shall be transferred by the municipality to the water supplier, which then charges the selected customers with proportionally lower prices.

Another tool for providing the low-income users with proper access to the water are the rent allowances.[23] The system rent allowances apply only to those low-income users who rely on the rental

housing. The mechanism embedded in the rent allowances works quite similar to the one applied in municipal subsidies, i.e. the subsidy is being passed to the manager of the building, who then charges the low-income user with proportionally lower rent.

## 3. Quality and Environment

### *3.1. How can water quality be assured within the competitive framework?*

The quality of the water supply is safeguarded by the relevant provisions of the Act on collective water supply.

The Article 5.1 stipulates that the water supplier "shall ensure capacity of the owned water supply and sewage disposal facilities for supplying the required quantities of water at an appropriate pressure, as well as water supply and sewage disposal in a continuous and reliable way, and shall ensure an appropriate quality of the supplied water and of the sewage removed".

Further on, the Act in question states that the health minister shall issue a regulation covering the specific issues related to the quality of water.[24] Such as:

- requirements concerning the quality of water intended for human consumption, including bacteriological, physicochemical and organoleptic requirements;
- methodology for assessing suitability of water intended for human consumption;
- minimum frequency and places for taking samples of water intended for human consumption;
- scope of testing water intended for human consumption;
- programme of monitoring of water intended for human consumption;
- methodology for controlling the materials and products applied in the processes of treatment and distribution of water intended for human consumption;
- procedures for controlling of laboratories carrying out quality tests of water intended for human consumption;
- procedures for informing the consumers about the quality of water intended for human consumption.

It ought to be underlined, that both private and municipal suppliers are bound by the requirements on the quality of water supply described above.

### *3.2. How can water supply be combined with environmental objectives?*

The environmental issues related to the water supply services, have been regulated by virtue of the Act of 27th April 2001, on Environmental Protection Law (O.J. 01.62.627). The discussed Act introduces the environmental cost-recovery system, which aim is to quantify the costs of water supply services in terms of the burden those services impose on the environment and the natural resources. The quantified costs are then used for constructing the water abstraction fees which are paid by the water suppliers in exchange for using the environment. The amount of the water abstraction fees to be paid, is calculated based on following factors:[25]

- water source and quality;
- the amount of resources available for use in the particular in-takes and the costs of deriving water from these resources;
- availability of resources;
- environmental requirements and degradation level of particular areas and resources;
- special protection requirements for groundwater resources and lakes.

As in case of the quality regulations depicted above, also the environmental regulations affect all water suppliers.

## 4. Enforcement of the competition policy in the water sector: Summary of the most interesting cases.

During the recent years the numerous cases carried out by the OCCP in regard to the water sector dealt mostly with the abuse of dominant position by the water suppliers in their relations with customers. Further on, the cases in question could be roughly divided into three sub-subcategories, i.e. the cases dealing with exploitative pricing of water services; cases regarding the unfair contractual terms offered to the water users; and cases dealing with forcing the users into contributing to the development of the infrastructure belonging to the supplier.

### *4.1. Exploitative pricing*

One of the more interesting investigations against exploitative pricing has been launched by the OCCP in 2000. On 9th March 2000 a complaint has been filled by the manager of the housing community against the municipal-service enterprise ('water supplier') supplying the water in one of the municipalities.

The investigation focused on the water tariffs introduced by the water supplier for the year 2000. The tariffs in question imposed significant increase in the prices of the water provided to the residents of the municipality as compared with the previous year prices. According to the new tariffs the prices of the water increased by 63%, whereas the price charged for the sewage treatment rose by 135%. In light of the above, on 19th August 2000, the President of the OCCP launched an investigation on the grounds of suspected abuse of dominant position by the water supplier. In response to launching the proceedings the water supplier stipulated that the aforementioned price increases were due to the withdrawal of the water subsidies by the municipality, as well as introduction of the value-added tax on the water supply services, which has taken place in 2000. Further the water supplier stated the as a municipal-service enterprise it may not be hold responsible for the structure of the tariffs, since those are approved by the Council of the municipality.

In due process of the investigation the existence of the exploitative pricing has been fully confirmed. Therefore, on 30th November 2001, the President by way of decision issued a cease and desist order, which has been obeyed by the water supplier.

### *4.2. Unfair contractual terms*

An interesting investigation regarding unfair contractual terms has been concluded by the Office in 2001. On 17th May 2000, a housing community located in one of the municipalities filled a complained against the municipal-service company involved in water supply (‘water supplier’) on the grounds of unfair

contractual terms. In its complaint the housing community objected the wording of one of the paragraphs included in the standard contracts regulating the provision of water supply, which stated that *"the water supplier may discount the price charged to the user, if the quality of the water provided does not meet the relevant stadarts"*. Further on, the discussed paragraph stipulated that the discount shall be awarded by the water supplier on the case-by-case bases in the amount not exceeding the 10% of the price.

In response to the charges brought, the water supplier stipulated, that the contracts fully compliant with the specimen contracts on water services, which were published by the OCCP. Moreover, the water supplier stated, that it never refused to negotiate with customers the individual terms of contracts, should the customers express such will. In addition, the undertaking stated that as a municipal-service company it sets its prices to maintain the cost coverage at break-even point (i.e. it does not generate any profits).

In due course of investigation it has been revealed that the wording of the paragraph in question was indeed similar to the corresponding paragraph of the OCCP's specimen agreement on provision of water services. Nonetheless, the changes applied by the water supplier to the wording of the specimen resulted in the paragraph of the agreement generating entirely different legal effect.

Upon the completion of the investigation, on 11th April 2001, the President of the Office issued a cease and desist order, which has been obeyed by the water supplier (i.e. the amendment has been applied to the paragraph).

### *4.3. Mandatory contributions to the development of water network*

An interesting case dealing with the customers mandatory contributions to the development of the infrastructure has been concluded by the OCCP in 2001. In the discussed case the water supplier insisted that one of its customers shall pass on to it the property rights to the piping, which the customer has build in order to obtain the connection to the sewage network. It ought to be noted, that the water supplier did not compensate the customer for the transfer of the discussed element of infrastructure. In addition, the water supplier charged the customer fee for carrying out technical check-ups of the discussed infrastructure, which in customer's view was much higher than the costs associated with check-up, incurred by the water supplier.

In regard to the first of the charges brought-up (i.e. lack of compensation for transfer of property rights) it has been established during the investigation, that although the water supplier had right to insist on the obligatory transfer of the property rights, such transfer had to be properly compensated. Therefore, the lack of reimbursement amounted to the abuse of dominant position, thus cease and desist order has been issued by the President of the OCCP.

The second of the charges (i.e. inadequately high fees for the technical check-ups) was not confirmed due to the results of the comparative analysis carried out by the Office. The analysis in question revealed that the price of the check-up reflected the relevant costs, as well as it did not differ significantly from the fees charged by other water suppliers operating under the similar conditions.

## Conclusions

The water sector in Poland is subject to regulatory framework, in which the regulatory powers are shared between the Office for Housing and Urban Development – on the national level, and the municipalities - on the local level. The decentralization of the aforementioned framework allows for tailoring the certain aspects of the regulatory policy in order to take into account unique conditions prevailing on the local markets for water services (e.g. decentralized setting of the water tariffs, allows for acknowledging different conditions under which those services are provided in municipalities).

Currently, one of the top priorities of the regulatory policy in the water supply sector is the acceleration of the shift in the ownership of the water supply undertakings from public sector to the private hands. The privatization shall in turn increase the overall effectiveness of various activities carried-out in the area of water supply services. In order to support the realization of the aforementioned goal the Ministry of Economy, Labor and Social Policy is currently in the process of drafting the Act on Public-Private Partnership, which shall better codify the rules on which the private entrepreneurs are to form joint-ventures with municipalities and other public bodies. The introduction of the discussed act, by setting clearly the rights and responsibilities of partners may also contribute to the softening the reluctance of the society to privatize the water sector.

As it has been stipulated in the section 1.1 of this report, the present (largely public) ownership of the water suppliers in Poland is also due to the structural conditions prevailing in the sector, i.e. high fragmentation of the markets; high fixed costs stemming from the constant need to upgrade the infrastructure; regulated prices which do not allow the water suppliers to maximize their profits. An initiative to overcome some of those deficiencies of the sector has been proposed by the group of eleven water suppliers from the region of lower Silesia (south-western Poland). The basic idea of this initiative is to concentrate the management layer of several undertakings into the so called ‘water holding’. In view of the authors of this initiative, the discussed concentration would attract significant economies of scale. It would also contribute to enhancing the exchange of expertise between the different water suppliers.

At present stage, the initiative is only a project. Nevertheless, it marks the rising trend among the Polish water producers to actively seek for the solutions of the most common problems encountered in the sector. This, in combination with the ongoing enhancement of the legislative framework, shall provide a firm base for further reinforcing the quality of the services provided by the discussed sector.

## NOTES

1 The discussed Act replaced the relevant provisions of the Act on Water Law from 1974 (part IV section 3), which has become outdated as a result of the economic and political reform of the nineties. Among others, the Act on collective water supply provided better grounds for the performance of the regulatory functions in the discussed area. The new law is also fully compliant with the requirements of the EC Water Framework Directive.

2 Article 1 (If not stated otherwise all articles quoted in the herby paper are the articles of the Act on Collective Water Supply).

3 Due to the fact, that in Poland the regulatory activities in the area of water supply and sewage treatment are pursued jointly within single legal and institutional framework, for the purpose of the herby paper the term 'water supply' shall cover not only the water supply itself but also to the sewage treatment activities.

4 As of 1st January 2004, the Office for Housing and Urban Development has been incorporated into the Ministry of Infrastructure.

5 Article 4.

6 In this respect the term 'municipality' does not only cover the single municipalities but also refers to any kind of inter-municipality agreement or the union of municipalities, in which one municipality has been entrusted with maintaining the water supply on behalf of the others.

7 Article 3.

8 Act of 10th December 1994, on public procurements ('public procurement law', O.J. 02.72.664).

9 Articles 15a and 71.1a of the public procurement law.

10 Article 16.

11 Among others those are: significant fragmentation of the markets within the water sector, which inhibits attaining the economies of scale by the water suppliers; combination of high cots (e.g. stemming from the need to upgrade the infrastructure or to comply with quality standards) with low revenues (due to the price regulation).

12 The 'semi-exclusivity' stems from the fact that in almost every municipality (bar the biggest and most densely populated cities) there is certain number of objects with individual water supply facilities (i.e. private wells or septic tanks). Therefore the water supplier never attains the 100% coverage in the given area. Additionally, it ought to be noted that the discussed 'exclusivity' does not imply the water supplier's right to abuse its dominant position.

13 Article 3.3.

14 In accordance with the development targets of the municipalities the water suppliers are obliged to prepare and implement the long-term plans for development and modernization.

15 Article 15.1.

16 The municipality may directly co-finance the investments related to the upgrading of the water system, subventions may be also granted from other public bodies dealing with infrastructure and environmental protection (§ 7.4 of the Regulation on water tariffs).

17 Article 24.

18 § 6 of the Regulation on water tariffs.

19 § 7.1.1. of the Regulation on water tariffs.

20 § 7.3. of the Regulation on water tariffs.

21 § 14 of the Regulation on water tariffs.

22 Article 24.6.

23 By virtue of the Act of 21st June 2001, on rent allowances (O.J. 01.71.734).

24 Regulation of the Health Minister of 19tth November 2002, on the quality of water supply intended for human use (O.J. 02.203.1718).

25 Helsinki Commission: Water Pricing and cost recovery in the water sector in Poland PITF 18/2001 (meeting in Estonia, Oct. 2001).

# PORTUGAL

## 1) How is the water supplier chosen?

The 1976 Constitution of the Portuguese Republic stipulated in Article 87 that only the public sector had access to water service management. Law 46/77 of 8 July, known as the Sector Demarcation Law, also prohibited private and similar undertakings from engaging in a wide range of business activities, including the collection and distribution of water. Accordingly, the general system for public water services was as follows: they were municipal public services, barred to private initiative, which implied that their management was carried out by the municipalities themselves, on an independent basis or in associations of municipalities, or through the municipal services department.

In passing Decree-Law 372/93 of 29 October about a decade ago, the government allowed private capital to participate in managing this kind of public service, using the legal figure of the concession. The most important milestone was when Decree-Law 379/93 of 5 November came into force, providing the regulations for operating and managing municipal and multi-municipal systems of water collection, treatment and distribution and stipulating a different regime for municipal and multi-municipal systems.

According to the preamble of the above legislation, multi-municipal systems are regional systems that lie upstream of water distribution (bulk systems). They can only be created in situations of strategic importance, on condition that they serve at least two municipalities and require an investment predominantly by the state, on the grounds of the national interest. In turn, the municipal systems are considered to be all the others, which are managed by the municipalities or associations of municipalities.

Under Article 3(1) of Decree-Law 379/93 of 5 November, the state either directly operates and manages multi-municipal systems or assigns such activity, in the form of a concession, to a public body of a commercial nature or an undertaking resulting from the association of public and private bodies. Before the concession is granted, on a non-competitive basis, the system is created by legislation or, more precisely, a decree-law that also creates the undertaking that is going to operate the system.

With regard to municipal systems, under Article 6 of Decree-Law 379/93, “the municipalities or associations of municipalities may directly operate and manage municipal systems or assign such activity, in the form of a concession, to a public or private body of a commercial nature or to a users’ association.” Article 10(1) of the same legislation stipulates that the concession contract must be preceded by a public invitation to tender while Article 10(2) specifies the components that the tender documents must contain, with special importance being given to the admissibility demands with regard to the technical, economic and financial requirements.

## 2) Is competition possible between different water suppliers in the same geographical area?

So far, the possibility of competition only exists in the municipal systems, in the adjudication phase of the public tendering process for the concession. In the multi-municipal systems there is no possibility of competition in the same geographical area. That stated, other ways are being pursued to further introduce competitive forces into existing utility jurisdictions. One way is allowing for alternative sources of water on the boundaries of bulk systems (boundary competition). Another way is to allow for independent supply to wholly new developments (inset competition).

**3) How is an incentive provided to increase productive efficiency?**

Under the terms of the respective statute, the Institute for Water and Waste Regulation (Instituto Regulador de Águas e Resíduos, IRAR) is responsible for ”promoting evaluation of the service levels of managing bodies” and “distributing information on specific cases that stand as a reference for quality of design, implementation, management and operation in multi-municipal and municipal systems.”

According to the April 2003 document entitled “The strategic lines of the IRAR regulatory model”, this model “will always be complemented with the operator’s own mechanisms for controlling its performance results, validated with the regulatory body’s mechanisms for evaluating these results and for comparing them with those of other similar operators active in distinct geographical areas (*benchmarking*). For this purpose the regulatory body must receive the operators’ information in the form of previously defined performance indicators. After validation, it must carry out both a comparative analysis with the earlier records of the operator itself, to ascertain the development over time of the various aspects of its management, and also a comparison with other similar operators, to be able, in particular, to define performance levels and establish the points of reference that allow new goals to be set realistically.”

The document defines some of the performance indicators that are important for water supply: “Economic regulation should therefore make use of the operators’ economic and financial performance indicators (such as the average selling price of exported water and the volume of water not invoiced), and operational, water-resource and infrastructure indicators, e.g. the availability of water resources, inefficiency in their use, the availability of treatment, the reserve capacity for raw and purified water, damage to main and lateral conduits, water losses, the rehabilitation of main and lateral conduits, and meter replacement. For service quality, the following indicators should be used: the resident population served; adjustment of the water pressure; cuts in supply; efficiency in making connections and repairs or in reading clients’ meters; complaints about water pressure, the reliability of supply, water quality, cuts, billing and other matters (including requests for an explanation); and, lastly, answers to written complaints. With regard to the quality of the water intended for supply to customers, there should be indicators on the water-quality monitoring and analyses carried out and on the actual quality of the water supplied on the basis of the same parameters.”

Accordingly, the IRAR is preparing directions for performance indicators on the various sectors it regulates. The action to be taken includes: definition of the performance indicators to be used in evaluating the quality of the service provided by bodies managing the water supply and definition of the procedures for evaluating the service quality of managing bodies, through the information to be obtained from calculating the indicators, interpreting them, analysing the benchmarking and producing concise reports. Further action to be taken is the publication of a Portuguese version of the International Water Association’s manual “*Performance Indicators for Water Supply Services*”.

**4) What is the general structure of retail water prices?**

For multi-municipal systems, the prices are set by the Minister for the Cities, Land Use Planning and the Environment. For municipal systems operated on the basis of a concession, the conditions for establishing tariffs are set out in the concession contract, in strict observance of the provisions of the tender documents. For municipal services that are not the object of a concession, tariffs are set by municipal regulation.

The law defines criteria for the setting of prices. These include guaranteeing the amortization of the managing body’s initial investment and any new investments for expanding or modernizing the system; guaranteeing the maintenance, repair and renewal of assets involved in operation; taking account of the

cost levels necessary for efficient management of the system, and guaranteeing economic and financial equilibrium in operating the system, with an appropriate return on capital for the managing body.

With regard to municipal systems, whether or not the object of a concession, the managing bodies have the right to set, settle and charge consumer rates and tariffs for the sale of water. The prices are set in compliance with the principles laid out in Decree-Law 147/95 of 21 June. Among others, consumers are subject to the following tariffs: the fixed tariff, the volumetric tariff and tariffs for other services. The fixed tariff is meant to cover at least the maintenance costs of the water mains on the property and the meter rental and maintenance. It is set in accordance with the type of meter installed. The volumetric tariff is calculated on the basis of the volume of water used and is defined on the basis of consumption bands and the type of consumer (domestic consumption, commercial and industrial consumption and consumption by local authorities or humanitarian institutions, among others).

**5) How can one ensure that water is provided to the highest value users?**

Portuguese law states that in cases of conflict over the use of water resources, the following order of priority exists, whenever possible: human consumption, agriculture, industry, power production, tourism and other uses.

Tariffs set are not usually used as instruments for managing water shortages, except in some municipalities where they differ for the summer and winter periods, with higher tariffs in summer to discourage water consumption.

**6) How can access to water be insured for low-income consumers?**

It is common practice to have a progressive, incremental tariff policy. This allows for an initial band at a low value to guarantee the minimum necessary access to the service, even for consumers with low income, and, at the same time, a top band that penalizes excessive use.

**7) How can water quality be assured within a competitive framework?**

Given the importance of water quality for health and the need to safeguard and promote the sustainable use of water, one of the primary objectives of present-day societies is to guarantee the quality of water for human consumption. As a Member State of the European Union, Portugal must comply with Council Directive 98/83/CEE of 3 November, which was transposed into national law by Decree-Law 243/2001 of 5 September.

In Portugal, the IRAR is the competent authority for guaranteeing the quality of water for human consumption. In order to guarantee the quality of the water supplied, the managing bodies are obliged to: a) submit a quality control programme for the competent authority's approval; b) ascertain water quality in accordance with the quality control programme; c) inform the health authorities and the competent authority of any non-compliance with the parametric values; and d) take responsibility for the distribution among the relevant users and consumers of the advice on precautionary measures issued by the health authorities to minimize the effects of water consumption in risk situations for human health. The competent authority also carries out water quality inspections at any point in the public supply system, alerting the health authorities and managing bodies to any irregularities detected.

**8) How can water use be combined with environmental objectives?**

Water is undoubtedly one of the main concerns of environmental policies according to the European Union Framework-Directive. Tariff structures should encourage the sustainable use of water resources and, hence, water tariff policies should be based on an assessment of the financial and

environmental costs connected with water use. The price of water should thus reflect both the scarcity of water and the external costs associated with its use so as to guarantee greater efficiency in the use of the resources available.

# SWITZERLAND

## I. Introduction: General legal, economic and political situation in the field of water supply and regulation in Switzerland

In Switzerland, water supply and sewage treatment is the object of a complex set of regulations involving federal, cantonal and municipal actors and disposing of numerous connections to other fields of law, in particular environmental law. Since the main responsibilities for water supply are in the hands of the municipalities, the Swiss water supply sector is highly decentralized: Not less than 3000 water companies supply the whole country.

Located at the centre of the Alps, water shortage is generally not a problem in Switzerland. There is a high number of sources providing the country with water of excellent quality. On average about 52 billion $m^3$ water annually drained away to foreign countries. 82 % of Swiss tap water is supplied by groundwater sources. Only 18 % is treated water taken from the lakes. About half of the groundwater meets the legal standards of drinking water and can thus be distributed directly to consumers without any treatment. Around 40 percent requires only a simple treatment.

Water prices are relatively low in comparison to international standards. Since 1980, the share of private income spent on water supply has declined. There has also been a decline in water consumption by industry and households, which currently lies below the level of 1950. Due to the abundance of high-quality water in Switzerland, public policy is mainly concerned with the preservation of water quality and the maintenance of the infrastructure.

With regard to the funding of the Swiss water industry, in many cases the principle of cost recovery is prescribed by cantonal law. In addition to this, wastewater treatment is also subject to the polluter-pays-principle.

On the political level, liberalisation in the water sector has not been discussed broadly although it has been an issue during the negotiations about the GATS-revision and during the debate about the broader consequences of liberalisation in the energy sector. Contrary to the electricity sector, however, Switzerland does *not* play a key role in European water supply management. Notwithstanding the abundance of water sources, due to technical reasons there are no exports and therefore access of Swiss water producers to the European Market has not to be ensured. In addition to this, liberalisation of the water sector is generally believed to be contrary to the constitutional principle of sustainable development. Given that this discussion involves furthermore sensitive human rights issues it is feared that it would become politically even more delicate. For these reasons the general idea is rather that water – by constitutional prescription a natural resource - and the strategic decisions in water supply and regulation should be kept under public and democratic control. The negative result of the referendum on the Federal Act on the Electricity Market serves as an indicator of the general political resistance against additional liberalisation efforts.

In short, the current legal, economic and political situation in the water sector does neither provide an ideal basis for ambitious reforms towards extensive liberalisation and competition nor does it give a substantial reason for the necessity of such reforms which meet further resistance due to the particularly strong bottom-up approach prevailing in this sector.

Despite such an overall positive evaluation of the Swiss water industry, recently, some water suppliers have undergone structural changes in the aftermath of the discussion about the liberalisation of the energy sector. However, only “multi – product - utility suppliers” (i.e. those producing also gas and

electricity) have been involved in these changes, which could be adequately described as "soft liberalisation". The following presentation will therefore focus on the water *supply* sector.

## II. Supplier selection and incentives

### *1. Choice of the water supplier*

For the following reasons the choice of a water supplier in Switzerland – subject to a complex and interdependent set of cantonal and municipal legislations and competences - is rather not determined by hard competitive constraints:

First of all, although a concession for water use is always needed, a canton is neither by federal nor by international law obliged to provide for an invitation to bid.

Some scientists consider the French model (by means of a concession or lease a water company is run by private undertakings whereas infrastructure and water source remain in public hands) to be a possible future option for Switzerland. However, it is feared that this model implies an irreversible loss of the current public benefit solutions in the water sector.

### *2. Is competition possible between different water suppliers in the same geographic area?*

Water has some economic characteristics that differentiate it from more ordinary goods. For instance, the construction of the infrastructure to distribute water to households involves a very high degree of fixed and sunk investments. Many economists therefore agree that water supply is essentially a *natural monopoly*.

In addition, water is sometimes considered a *public good* for which competition is not desirable. The assignment of property rights to water sources is therefore - apart from a few exceptions - legally impossible. Water is therefore to a large extent a non-excludable good. However, in contrast to traditional public goods (such as air, for example), consumption of water is rival. Since water is a natural resource and property rights are difficult to assign, the "tragedy of the commons" arises.[1]

The presence of *externalities* is a characteristic feature of the water industry. Many uses (e.g., in agriculture) result in the pollution of natural water resources and endanger the quality of water. In order to ensure the quality of water, there is a wide scope for government regulations. It is sometimes argued that since it is difficult to measure and control the quality of water, competing private firms may not have sufficient incentives to maintain or even increase water quality.

Furthermore, it is important to note that water *cannot be considered a homogeneous good*. There are large differences in quality between different sources of water. Different types of water, ranging from surface water to drinking water, can be distinguished, each with its own uses and demand characteristics.

For these reasons, competition *within* the market is often difficult to achieve. Nevertheless, in the last years different models of competition in the water sector have been discussed. They are briefly reviewed in the following.

Maybe the most far-reaching model of competition in the water sector is *common carriage*. With common carriage, a single infrastructure is used by competitors to distribute water. Common carriage is already known in other infrastructure industries such as electricity, telecommunications and transport.

However, common carriage does not seem to be easily applicable in Switzerland. Due to the lack of a nation-wide interconnected network, access to different suppliers of water is currently not possible. Moreover, the efficiency gains that can be expected from common carrier competition may not be very

significant. This is due to the fact that the bulk of the costs of water supply is generated by the infrastructure, in which competition is not possible, and not by the water itself. Finally, since water is not a homogeneous good – in contrast to electricity, for example - and there are important differences in quality, common carrier competition is difficult to implement.

While competition *within* the market does not seem an easy solution for the Swiss water sector, there might be the possibility of increased competition *for* the market through an improvement of the concession system. However, in Switzerland only a few cantons have chosen to assign a concession to a private firm to operate the water supply.[2] Increased participation of the private sector, however, may help to overcome financial problems of municipalities, which are faced with the need to renew their infrastructure.

Another way to increase competitive pressure in water supply is the introduction of benchmarking or yardstick competition. The measurement of efficiency as required by yardstick competition is not an easy task. Due to topographic factors, the amount and quality of available natural resources and other factors, the average cost of water supply may vary considerably across regions. Under yardstick competition, the regulatory authority must take these differences into account. Even without a full-fletched framework of yardstick competition, competitive pressure may be intensified by benchmarking based on enhanced transparency about prices and quality. The effect of benchmarking may be particularly important if the suppliers are mandated to participate and the results are made public ("naming and shaming").

### *3. How is an incentive provided to increase productive efficiency?*

In recent years, there has been debate in Switzerland about organizational structures best suited to assure an efficient supply of water. In Switzerland, three basic types of structures can be distinguished:

1. Municipal plants;
2. Associations of several municipalities;
3. Private corporation.

In recent years, there has been a trend towards the creation of associations of several municipalities. Associations of several municipalities allow for the realization of scale economies through the regionalisation of water supply. However, since these associations are usually run by an inter-municipal committee, the operation remains in public hands. Therefore, the creation of associations of municipalities may not have a significant impact on economic incentives to increase productive efficiency. An additional shortcoming is that despite the remaining public control this solution most often implies a loss of direct democratic control since decision-making powers have to be delegated to the municipal representatives.

A second trend is the increasing creation of corporations under private law. These corporations usually remain under public ownership. According to their proponents, private corporations have several advantages that may help to increase productive efficiency of the sector:

- *Increased managerial autonomy and flexibility*

  Public water utilities heavily depend on the municipalities in the definition of their strategies and their operation. For instance, in most cases changes in water tariffs must be authorized by public authorities or even by public vote. Prices are therefore often determined based on *political* rather than business criteria. In the end, it is the citizen who determines the water price.

Spinning-off the water supply and creating a private corporation allows for a strict division of strategy and operation. While the public authorities are responsible for defining the basic strategy, the corporations enjoy some entrepreneurial freedom in the operation of the business.

- *Improved accounting methods and transparency*

  Municipalities which are faced with the need to renew their infrastructure are increasingly lacking resources for these investments. The reason is that due to improper accounting practices (e.g., missing distinction between operational accounts and investment accounts), too low prices were charged in the past.

  Accounting standards based on business principles may help to improve the reliability of financial information and increase financial transparency.

- *Improved customer orientation*

  Private corporations with service objectives and financial autonomy need to orientate themselves to customer preferences. The introduction of modern marketing methods may help to better take customer preferences into account.

The creation of private corporations may also have some disadvantages, however. According to their adversaries, spin-offs lead to a *loss of democratic control* over one of the most important natural resources. In addition, because of the natural monopoly of water supply, there is a *need for price controls* after the reorganization of water supply.

## III. Consumer pricing and access

### *1. What is the general structure of retail water prices?*

A wide range of different price structures is currently applied in Switzerland. Table 1 gives an overview of different prices charged to consumers based on a survey of 163 water suppliers.

**Table 1: Overview over water tariffs**

| Fee | Percent of water suppliers |
|---|---|
| Fee for making territories accessible | 26 |
| Connection fee | 90 |
| Basic fee | 69 |
| Flat fee | 10 |
| Fee for water meter | 40 |
| Usage fee (per $m^3$) | 85 |
| Fee for peak consumption | 0 |
| Fee for excessive consumption | 4 |
| other fees (e.g., sprinkler) | 8 |

*Source*: Price Supervisor, „Der schweizerische Trinkwassersektor: Kosten und Preise. Hauptergebnisse einer Umfrage der Preisüberwachung“, 2. Version, September 1998.

As follows from table 1, most water suppliers charge a two- or three-part tariff. The prices often consist of a nonrecurring connection fee and/or a fee for making a territory accessible, in combination with a recurrent basic fee and a variable usage charge.

Fees for peak and excessive consumption are not common. It thus seems that there is ample scope for the introduction of tariff structures that improve incentives for economic usage of water.

## IV. Quality and Environment

### *1. Water quality*

In Switzerland, water quality control remains a public task independently of the supplier. I. e., even if the local supplier is a private company, federal law obliges the cantons to carry out regular quality controls for which cantonal law determines the necessary supervisory bodies.

As far as the excess quality – problem is concerned (e.g. drinking water which is used for the toilet flush) the only general solution would be very cost intensive since it requires a separate infrastructure. Therefore, the installation of such an infrastructure within a competitive framework seems to be even more unlikely than under the current system. Some ecologists propose individual solutions, which oblige the house owner to use collected rainwater instead. However, recent studies come to the result that – even from an ecological point of view – such individual solutions are not advisable.[3]

### *2. Financing environmental objectives in the wastewater treatment sector*

On the one hand, Swiss law strictly prohibits uncontrolled disposal of polluted water and on the other hand, public financing of sewage treatment has continuously decreased. During the last revision of our Federal Act on Water Protection federal subsidies have been abolished and thus full effect to the polluter-pays-principle is granted. Cantonal authorities hardly encounter any technical or practical obstacles in applying this principle although it has not yet been fully implemented. Water protection has quite a long tradition in Switzerland and a 30 year old system ensures that industrial polluters have actually difficulties in avoiding to pay for such costs: Industries are obliged to get connected to the sewage network or to provide for a waste water treatment plant at their own costs. Compliance with these provisions is subject to regular control.

## V. Summary and conclusion

Although there is generally no urgent need for profound liberalisation efforts, there are two main structural challenges which currently prevail within the Swiss water supply sector and which show that the current system can be optimised:

- Swiss water industry is extremely split-up: there are roughly 3000 suppliers
- Cumbersome decision making process due to strong political involvement

So far, the Swiss system has provided two basic solutions to these problems, which prevail over economic privatisation and market opening, deregulation and competition:

- The first challenge is met by a continuous development towards regional corporations.
- The second challenge is met by an increasing trend towards legal or organisational privatisation which includes flexibility as to the legal form, organisation and decision-making process as well as elements of managerialism through New Public Management, the principles of cost recovery and the internalisation of external costs.

Nevertheless, both solutions contain an important drawback, which consists in the loss of democratic control, at least as far as the operational decisions are concerned. The strong bottom-up approach ensures a certain *political competition* among the different municipalities striving for an optimum solution balancing efficiency efforts against democratic concerns.

## NOTES

1 The "commons" is a resource which is shared by a group of people. The failure of private incentives to provide adequate maintenance of public resources is known to economists as the "tragedy of the commons". As a result of the tragedy of the commons, resources may by overused.

2 An example is the region of Zug, where a concession has been granted to a water supplier which is owned to 80 percent by private investors.

3 Study carried out by the Swiss Agency for the Environment, Forests and Landscape (SAEFL), see http://www.ecogis.admin.ch/gufpublications/dokugs8/WohinMitRegenwasser.pdf?_Publications_from_www.WATERandFISHERIES.ch.

# UNITED KINGDOM

## Introduction

The Office of Water Services (Ofwat) is the economic regulator for water and sewerage services in England and Wales. Ofwat is a non-ministerial government department headed by the Director General of Water Services (known as the Director).

The water and sewerage industry in England and Wales was privatised in 1989. Following privatisation the Secretaries of State for the Environment and Wales appointed 10 licensed water and sewerage companies and some licensed water-only companies (there are now 14) to provide water and sewerage services for England and Wales[1].

Ofwat works with the UK Government, the Welsh Assembly Government and the quality regulators (the Environment Agency, the Drinking Water Inspectorate, English Nature and the Countryside Council for Wales) to monitor the way in which these companies provide a good quality and efficient service at a fair price.

Ofwat does this by:

- setting limits on what companies can charge customers;
- ensuring companies are able to carry out their responsibilities under the Water Industry Act 1991;
- protecting the standard of service customers receive;
- encouraging companies to be more efficient; and
- helping to facilitate competition where appropriate.

Ofwat also makes comparisons between the companies to raise the standards of those that need to improve.

## Supplier selection and Incentives

### *How is the water supplier chosen?*

The 1989 privatisation of the water and sewerage industry in England and Wales created 10 new regional water and sewerage companies from the publicly-owned river basin authorities. In addition, a number of private water-only companies were in place providing water services to around 25 per cent of the population. All these companies are vertically integrated, controlling the supply chain from resource development to local distribution for water services, and from collection to treatment and discharge for sewerage services.

Each appointed water and sewerage or water-only company (Appointee) holds a Licence. These appointments are for at least 25 years from 1 September 1989. The Secretary of State for the Environment or the National Assembly for Wales (depending on where the Appointee operates) may terminate these appointments provided they give 25 years' notice[2]. The long notice period contributes towards a stable regulatory environment and it ensures that companies are able to access the capital markets on reasonable terms.

***Is competition possible between different water suppliers in the same geographic area?***

The Director General of Water Services has a duty under the Water Industry Act 1991 (WIA91), to facilitate effective competition in the water and sewerage industry in England and Wales. He interprets his duty to include creating a framework in which market competition can develop. The framework for competition is set out in WIA91 and the scope was extended by the Competition and Services (Utilities) Act 1992 and the Competition Act 1998 (CA98) which took effect from 1 March 2000. The Water Act 2003 (WA03) introduced a new duty on the Director to further the consumer objective by protecting the interests of consumers, wherever appropriate, by promoting effective competition in the provision of water and sewerage services. This is unlikely to take effect before April 2005.

Several forms of competition for different water suppliers in the same geographic area are available within the current legislative framework. These include:

- Inset appointments. An inset appointment is where an existing statutory water or sewerage supplier can be replaced by another for a specific geographic area. Inset appointments are limited to: (1) large users (in England using 100Ml[3] per year and in Wales using 250Ml per year); (2) greenfield sites; or (3) where the current incumbent agrees to the change.

- Cross-border supplies. Companies have a duty to allow connections to their water mains from outside their areas. This means that customers are entitled to receive water for domestic purposes from any licensed supplier, irrespective of where they live. The incumbent can recover the costs of connecting the customer to its mains. In practice, this duty to connect is rarely used as it requires a pipe to be laid from one water company's area into another, which often proves uneconomic.

- Unregulated supplies. Most people in England and Wales receive their water and sewerage services from appointed companies regulated by Ofwat. However, some private operators exist. The terms and conditions of supply to their customers are not regulated, although private supplies are subject to quality standards, enforced by local authorities. Ofwat can consider complaints about unregulated supplies under CA98.

- Common carriage. Common carriage occurs when one service provider shares the use of another's assets, such as its pipe network or treatment works. Common carriage between companies occurs now, but is limited in scale. The regime for common carriage will change with the start of WA03 provisions (see below).

The Water Act 2003 extends the opportunities for competition within the England and Wales water supply industry. It provides a specific framework for market entrants to become authorised to enter into common carriage or wholesale agreements with water companies in order to supply non-household premises that are likely to consume at least 50Ml of water per year. From autumn 2005 large business customers will therefore be able to choose whether to remain with their existing water company or be supplied by a new water supply licensee. There will be around 2300 eligible customers, accounting for about 30% of water companies' non-household water revenues.

The exact details of the new regime are still being developed. However, Ofwat will license new entrants to put treated water into the public distribution network and to sell water to eligible customers. Licensees may arrange for the production and treatment of water and to have it conveyed to their customers by an incumbent water company and may also purchase supplies of water from the incumbent. The legislation and licensing regime will provide clear rights and responsibilities for all parties in the water industry. The clear framework should assist market entry. The Government will review the new regime, including the 50Ml threshold, within 3 years of the start of the regime.

*Other forms of competition in the water sector*

As well as competition between water suppliers in the same geographic area, other forms of competition occur in the water industry. For example, Ofwat operates a system of comparative competition in England and Wales. (More details are given below.)

There is also competition in providing new water mains and sewers. Developers can choose between employing the appointed water company to install water mains or sewers or employing a contractor directly to carry out the work.

***How is an incentive provided to increase productive efficiency?***

The introduction and extension of competition in the water and sewerage industries discussed above has given, and will give, water companies an incentive to increase their productive efficiency. In addition, incentives to increase productive efficiency are provided by privatisation, yardstick competition and leakage targets.

*Privatisation*

As stated above the water and sewerage industries in England and Wales were privatised in 1989. In the 1980s the UK government had privatised many of the UK's utilities. One reason for this was the expectation that the private sector, driven by the profit motive, would increase productive efficiency in the provision of utility services. However, the UK government recognised that privatisation alone would not be sufficient for the efficient provision of utility services. As a result, privatisation of the water and sewerage industries was accompanied by a regulatory framework based on the "RPI – X" price cap regulation used in the other privatised UK utilities.

*The "RPI-X" price cap and yardstick competition*

The rationale for the RPI-X pricing framework is to provide incentives for efficiency in delivering monopolistic services. We expect many aspects of water and sewerage service delivery to remain a natural monopoly for the foreseeable future. So the basic RPI-X framework has been refined and developed to mimic competitive forces in driving innovation and efficiency[4].

Ofwat sets price limits once every five years in a "periodic review"[5]. In broad terms Ofwat's approach involves:

- building sensible and stretching efficiency targets into forward price limits, usually in the form of an assumption about the rate at which costs can be reduced;
- where companies deliver outputs at lower than forecast costs, by "outperforming" efficiency targets, they are able to retain the savings for five years; and
- in the medium and longer term efficiencies are passed on to customers in subsequent price reviews.

Price caps are applied to the overall level of charges, rather than individual charges, usually through a "tariff basket" mechanism. Large commercial users of water are excluded from the tariff basket as competition determines their prices.

The price cap regime means that companies and their owners retain around 20% of the value of efficiencies, in present value terms. Ofwat has also refined the regulatory rules to ensure that companies gain the same benefit from efficiency gains, regardless of their timing within the five year regulatory cycle.

A further dimension of Ofwat's approach is the system of comparative (or "yardstick") competition to support the setting of efficiency targets. This acts to enhance the incentives for efficiency in delivering services. Econometric methods are used to model costs and assess the relative efficiency of companies, based on detailed data returns. The less efficient companies are set more demanding efficiency targets when we set price limits, while less is expected of the best performers. This offers the best performers the chance to achieve higher returns if they continue to achieve frontier standards of performance. There is a strict merger control regime in the water sector reflecting the value we place on having a sufficient number of companies to compare performance amongst.

Given the continuing need for substantial investment in new assets to deliver higher standards, Ofwat also uses a comparative tool called the "cost base" as a way of assessing relative efficiency in capital works. This is based on standard capital works that are costed by each company in order to derive credible benchmarks. These benchmarks support regulatory assumptions about efficiency improvements, both for maintenance works and investments in new assets and service enhancements.

The system also incorporates penalties for poor performance that does not meet regulatory expectations. If funded outputs are not delivered we take account of this in subsequent price limits to ensure that companies and their owners do not retain the financial provision made for delivery of those outputs. If companies are not able to deliver the output package within the forecast cost, then the overspend is usually not recoverable from customers through price limits.

*Leakage*

In 1997 Ofwat set the water industry in England and Wales the medium term objective of achieving the economic level of leakage (ELL) by 2002-03. ELL is the level of leakage at which it would cost more to make further reductions in leakage than to produce the water from another source. Operating at ELL means that the total cost to the customer of supplying water is minimised and companies are operating efficiently.

The majority of water companies in England and Wales now report leakage levels in line with targets they have set themselves based on their own economic analyses. Leakage for England and Wales in 2002-03 was 30% lower than at its peak in 1994-95. This reduction of some 1500 Ml per day is equal to the daily needs of almost ten million domestic customers. From next year Ofwat will set 36-month rolling targets rather than an annual target to allow for short-term variations in leakage rates.

**Consumer Pricing and Access**

***What is the general structure of retail water prices?***

*Water charges*

- <u>Households - unmeasured</u>

Approximately three-quarters of household customers in England and Wales do not have a water meter. Charges for most of these customers comprise a fixed charge and a charge related to the "rateable value"[6] of the customer's property.

Inevitably, there is a cross-subsidy between unmeasured customers. The cost of supplying each customer (over the long run) depends largely on the amount of water they use. Customers in properties with high rateable values, but whose water use is relatively low, pay more than it costs to provide their water and sewerage services. Correspondingly, some unmeasured customers pay less than the costs of the services they receive.

- Households – measured

Charges for most measured customers also have two elements: a fixed charge; and a charge that varies depending on how much water the customer uses.

To give customers sensible incentives to use water efficiently, we expect companies to set the volumetric charge to recover the costs that they will incur over the longer term to meet demand. The standing charge, on the other hand, should recover no more than the customer-related costs for the unmeasured service, plus the additional fixed costs associated with providing a measured service (for example, meter reading).

- Non-households

Most non-household customers pay according to the amount of water they use. Typically, the unit charges for larger customers are lower than for household and smaller non-household customers. This reflects the lower cost of supplying larger customers – for example, such customers tend not to be supplied via the smallest parts of the distribution network.

In many cases, non-household tariffs follow the same two-part structure as for measured household customers. But some companies have developed more sophisticated tariffs.

Several companies have peak demand or seasonal tariffs. These are structured with an increased volumetric charge during the summer months and a decreased volumetric charge for the remainder of the year. They ensure that, should customers choose to use more water during the summer, their charges will reflect the cost of meeting this demand. This offers an incentive to customers with high summer demand to be more efficient in their use of water.

A few companies have what we call "subscribed demand" tariffs. These are structured to encourage customers to manage their peak consumption. They reflect the lower costs of supplying customers whose consumption has fewer and less extreme peaks. This type of tariff usually comprises three main elements.

- An annual reservation charge (£ per megalitre per day), which is generally based on a customer's peak daily demand.

- A reserved volumetric rate (pence per cubic metre), which is applied to the volume up to that which the customer has reserved.

- A penalty volumetric rate (pence per cubic metre), which is applied to all volumes taken that are in excess of the reserved quantity.

***Is water provided to the highest value users?***

As explained above, water supplied to most non-household customers and about one quarter of household customers is metered. These customers will tend to use water up to the point where their marginal benefit from using the water equals the price (marginal cost) of an extra unit of water. Unmeasured customers have no financial incentive to restrain their water consumption (except that, in the aggregate, unmeasured customers pay all the costs associated with supplying unmeasured water).

In the event of water shortages water prices do not change for household customers or for the majority of non-household customers (some non-household users have peak demand or seasonal tariffs). However, in times of drought, non-price mechanisms are used to restrict the use of water for low-value purposes such as bans on the use of hose pipes for domestic purposes.

***How can access to water be ensured to low-income users?***

When setting price limits Ofwat's objective is that all customers should pay no more than is necessary to enable well-managed companies to finance the services they deliver and this would obviously include low-income customers.

Although there is no competition to supply households in England and Wales the existing tariff / regulatory system provides protection to all customers to ensure that they have constant access to water. Since 1 July 1999, water companies in England and Wales have not been allowed to disconnect domestic customers for non-payment of bills. Although the ban protects those customers on low-incomes who cannot afford to pay their bills from being cut off from an essential resource, it also increases the bills of low-income customers who do pay.

Customers who are charged on an "unmeasured" basis (which is normally based on the "rateable value" of the property) and who face large bills are free to opt for a measured charging basis which may result in a lower bill. Households with meters have some control over their bill. The less they use, the lower their bill, therefore there is an incentive to economise on water use.

Furthermore, under the Water Industry (Charges)(Vulnerable Groups) Regulations 1999 certain low-income metered customers who need to use a great deal of water for medical reasons or because they have large families can apply to companies to have their metered bills capped. They pay no more than the average for their water company area. This removes the incentive for low-income customers to over-economise with their water use. The cost of the tariff is borne by other water customers some of whom will also consider themselves to be on low incomes.

**Quality and Environment**

***How can water quality be assured within a competitive framework?***

The Government believes that the properly managed development of competition in the water industry in England and Wales is desirable as this should lead to greater efficiencies, keener prices, innovation and better services, to the benefit of consumers. However, the Government also believes that competition must be balanced against its wider objectives to protect public health, protect and improve the environment, meet the Government's social goals, and to safeguard services to customers.

In England and Wales, all drinking water supplied by appointed water companies for public water supply must comply with the quality standards set down in the Water Quality Regulations. These are based on the EC Drinking Water Directive with national standards for some parameters. The Directive allows member states to set their own standards under subsidiary arrangements. The Regulations also set out many of the administrative procedures to ensure that water quality is adequately monitored. These include both the size and delineation of water supply zones, and the frequency of sampling and reporting of results.

The Secretary of State in England, and the Welsh Assembly Government in Wales, sets the standards by making the Regulations. They are enforced by the Drinking Water Inspectorate (DWI). It is the objective of the Regulations that all water supplied via the public water supply is wholesome at consumers' taps. DWI produces an extensive annual report reporting both on quality and any recommendation or enforcement action taken to ensure that water quality is satisfactory.

It is a requirement on appointed water companies supplying water via the distribution system to comply with the Regulations. If an appointed water company obtains a bulk supply from another source which enters its distribution system that company, as well as the initial supplier, may suffer any

enforcement action. In serious cases the DWI can prosecute a water company for supplying water unfit for human consumption - this is a criminal charge.

The Water Act 2003, which introduces competition in water supply to eligible large users, also provides safeguards to minimise the risk of an adverse effect on water quality as a result of the new competition regime. The DWI has been granted extended powers under the new legislative provisions to audit new entrants (Licensees) as well as existing water companies. The offence of supplying water unfit for human consumption has also been extended to ensure that all relevant persons concerned in the supply of water unfit for human consumption will be liable to prosecution. This will enable DWI to initiate proceedings against appointed water companies, Licensees and their respective contractors. DWI will also play an important role in the licensing process to ensure that applicants are technically competent.

***How can service quality be assured within a competitive framework?***

Ofwat monitors company performance each year against level of service indicators that reflect water, sewage and customer services. Company performance against these level of service indicators is published each year in "Levels of service for the water industry in England and Wales", which compares companies with each other.

Since 1991 industry performance has steadily improved across the range of levels of service indicators. These improvements reflect the continuing efforts of companies to improve service to customers, particularly to reduce problems of low water pressure and the risk of sewer flooding. Performance is now stabilising at levels that broadly meet customers' expectations.

Each year Ofwat assesses companies' overall delivery of service to customers in the Overall Performance Assessment (OPA). The assessment serves two purposes. Firstly, it enables Ofwat to make comparisons of the quality of the overall service companies provide to customers, and to take this into account when setting prices. Secondly, the OPA informs customers (and other interested parties) about the overall performance of their local water company. The OPA reflects the broad range of services provided to customers including water supply; sewerage service; customer service; and environmental impact.

Ofwat introduced the OPA as incentive mechanism for companies to improve and maintain their service levels. The reward comes when Ofwat sets the limits for the price companies can charge their customers. A company that has a high OPA score may be allowed to charge slightly more than they otherwise would have done, reflecting the good value for money received by their customers. And companies with a lower OPA score may have to charge slightly less.

The industry-wide improvement in levels of service and the OPA can be interpreted as evidence that comparative monitoring is effective. A possible downside of this approach is the requirement for comparable audited data.

***How can water use be combined with environmental objectives?***

*Water abstraction*

The abstraction of water for the public water supply can have an impact on the environment. The Environment Agency (EA) is responsible for licensing all water abstraction from the environment for all purposes. About half of the volume abstracted is for the public water supply. The rest is mainly for agriculture, industry, power generation and fish farming.

The EA works with English Nature (or the Countryside Council for Wales) to investigate or identify damaging abstractions. The abstraction licence given to the company is then changed; sometimes by adding a restriction in operational or seasonal use as well as by a simple volume reduction. Before new

abstraction licences are granted by the EA the applicant needs to show that there would not be environmental damage. This can be a very difficult task, to prove a negative. In some cases this can be a high hurdle to developing new water resources. It may limit the entry of new companies into the supply of water.

*Environmental water quality*

All discharges of water to controlled waters in England and Wales are regulated by the EA. The controlled waters include rivers, estuaries, coastal waters, canals, lakes and groundwater. All discharges need to have a consent issued and enforced by the EA.

There are minimum standards for discharges from sewage treatments works treating municipal waste water for communities above 2,000 population equivalent. These are set under the Urban Waste Water Treatment Directive. The emission standard is set based on the size of the works and the type of receiving water. It may also specify types of treatment required. These are in a range from appropriate to primary, secondary and tertiary. Each step leading to a cleaner effluent. A large majority of sewage effluent in England and Wales is required to be treated to at least secondary biological level.

The EA can require the discharge consents to be tighter to meet river quality objectives to deliver Government policy. There are also many other directives and domestic legislation which may require stricter standards in discharge consents; for example nutrient levels under the Habitats Directive and ammonia levels under the Freshwater Fish Directive. Normally discharge consents are set with regard to the capacity of the receiving water to deal with the pollution load.

The EA enforces the discharge consents, and can prosecute companies for failure to meet discharge consents, or for other pollution incidents that are not covered by discharge consents at all.

Finally, it is worth noting that Ofwat has a duty to set price limits for water and sewerage companies which enable prudent and well managed companies to finance their functions. These functions include compliance with the relevant quality standards for drinking water and discharges of waste water.

## ANNEX

## WATER AND REGULATION: FACTS AND FIGURES

## OFWAT NOVEMBER 2003

The average household bill in 2003-04 is £236 for water and sewerage (average water bill is £111 and the average sewerage bill is £125). This is a real terms increase of 21.4% since 1989.

| **Industry average household bills** | | | | | |
|---|---|---|---|---|---|
| Unmeasured | Real % change to bills 1989-2004 (excluding inflation) | Level (£) from 1 April 2003 | Measured | Real % change to bills 1989-2004 (excluding inflation) | Level (£) from 1 April 2003 |
| Water | 27.4% | £116 | Water | -25.7% | £96 |
| Sewerage | 25.7% | £129 | Sewerage | -18.1% | £113 |
| Combined | 26.5% | £245 | Combined | -21.38% | £209 |

- Household customers' bills increased on average by 1.0%, excluding inflation, from 1 April 2003. Including inflation the increase is 3.7%.
- The average daily costs for households for the water and sewerage service is 65 pence per day in 2003-04.
- A litre of tap water costs 0.08 pence, and 0.14 pence including sewage treatment costs.

| **Average price limits** | **1990-95 Set at privatisation** | **1995-2000 Ofwat's determinations** | **2000-05 Ofwat's determinations[7]** |
|---|---|---|---|
| Water and sewerage companies | 5.0% | 1.4% | -1.7% |
| Water companies | 6.1% | 0.4% | -2.6% |
| Industry | 5.2% | 1.3% | -1.8% |

- The industry average price limit for 2003-04 is 1.9%. This was –12.3% in 2000-01, –0.3% in 2001-02 and 0.3% in 2002-03.

| Average annual capital investment (water & sewerage) all 1999-2000 prices | | | | | |
|---|---|---|---|---|---|
| | **1980-85** | **1985-90** | **1990-95** | **1995-2000** | **2000-05** |
| Water and sewerage companies | £1.4bn | £1.8bn | £3.1bn | £3.3bn | £2.9bn |
| Water companies | N/a | N/a | £0.2bn | £0.3bn | £0.2bn |
| Industry | N/a | N/a | £3.3bn | £3.5bn | £3.1bn |

- Between 1989 and 2005 over £50bn will have been invested in improved drinking water quality and higher environmental standards.
- Price limits set in 1999 for the period 2000-05 assume capital expenditure of over £8million a day.
- Under Ofwat, investment in water and sewerage services is at its highest ever level.

| Environmental Improvements | **1990-91** | | **Latest figures** | |
|---|---|---|---|---|
| *Environmental Quality* | | | | |
| **River and canal chemical quality** - good or fair | 84% | | 95% | (2001) |
| **River and canal biological quality -**good or fair | 84% | | 94% | (2000) |
| **Coastal bathing water** compliance | 66% | (1988) | 99% | (2002) |
| **Sewage treatment works** compliance [8] | 90% | | 99% | (2001) |
| Unsatisfactory combined **sewer overflows** | 31% | (1994-95) | 24% | (2001) |
| **Sewer flooding** incidents - % of connections | 0.05% | (1993) | 0.02% | |

| *Water Distribution* | | | |
|---|---|---|---|
| Properties at **risk of low pressure** | 1.26% (1992-93) | 0.10% (2001-02) | 0.06%(2002-03) |
| Unplanned **interruptions** over 12 hours | 0.42% (1990-91) | 0.12% (2001-02) | 0.05% (2002-03) |

| **Drinking Water Quality. Percentage of tests complying with standards** | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
| 99.5% | 99.7% | 99.75% | 99.78% | 99.82% | 99.83% | 99.86% | 99.87% |

- In 1990 only 99% of tests met the required standards.

| **Customer Service** | **Time close to privatisation** | | **2002-03** |
|---|---|---|---|
| % of written complaints answered in 10 wkg days | 81.9% | (1992-93) | 99.8% |
| % of billing contacts answered in 5 wkg days | 79.8% | (1992-93) | 99.5% |
| Number of compensation payments (GSS) | 11,388 | (1993-94) | 36,136 |

- Compensation and rebates obtained: Over £7.6million since 1991.
- The WaterVoice committees dealt with 9,679 complaints in 2002-03.
- Ofwat has dealt with 150,301 complaints from customers between Sept 1989-March 2003.

| **Leakage rates in litres per property per day** | **1994-95 Leakage peak since privatisation** | **2001-02 Leakage** |
|---|---|---|
| Industry | 228 l/p/d | 154l/p/d |

- Since its peak in 1994-95 leakage has fallen by 33%, enough to supply the daily needs of more than 12 million people.

**Facts and figures**

- The water industry has more than 700,000 kilometres of mains and sewers (640,206 kilometres in England and Wales) enough to stretch to the moon and back. Water UK
- In one hour a sprinkler can use the equivalent of two days' consumption by a family of four. UK Round Table on Sustainable Development
- It takes 2,000 tons of water to grow a ton of rice, and some 1,000 tons of water to grow a ton of wheat. World Water commission 2000
- In 2002-03 approximately 23% of households were on metered charges. This is expected to rise to 24% by March 2004. Ofwat
- In 2000, three quarters of water abstracted was for the public water supply and electricity supply industry, split almost evenly between the two. DEFRA
- Fresh water is a precious resource. Only 2.5% of the world's water is not salty, and of that two-thirds is locked in icecaps and glaciers. Of the remaining amount … 20% is in areas too remote for human access, and of the remaining 80% about three-quarters comes at the wrong time and place – in monsoons and floods – and is not captured for use by people. The remainder is less than 0.08 of 1% of the total water on the planet. It is precious indeed. World Water Commission 2000
- The UK water industry has 1,584 boreholes, 666 reservoirs and 602 river abstractions – two thirds of our water comes from surface water and one third from groundwater. Water UK
- 'Human community should be linked in common effort to protect, share water equitably, sustainably, peacefully.' Kofi Annan, United Nations Secretary-General
- More than 1 billion people, the equivalent of one-sixth of the world's population, lack access to safe drinking water and 2.4 billion people, two-fifths of the world population, lack basic sanitation facilities. NAO

***Ofwat costs each customer in England and Wales, on average, less than 50 pence a year.***

**For further information**
Contact our library or visit our website:
Telephone: 0121 625 1373
E-mail address: enquiries@ofwat.gsi.gov.uk
Website: www.ofwat.gov.uk

## NOTES

1 In Scotland, Scottish Water is the only water provider and is a public sector body which is structured and managed like a private company. The water sector is regulated by the Water Industry Commissioner for Scotland. In Northern Ireland, the Government provides water and sewerage services, which are funded by regional taxes (rates). The Northern Ireland Water Service is an agency within the Department for Regional Development.

2 One water-only company has different appointment and notice terms.

3 Ml means one megalitre, or one million litres.

4 In the water and sewerage sector the price cap is called “RPI+K”.

5 An “interim determination” or change in the price cap between periodic reviews is possible if certain conditions are met.

6 The “rateable value” is an assessment of the monthly rental value of a property made by the Local Authority.

7 Takes account of Competition Commission's determinations for Mid Kent and Sutton and East Surrey Water and of the interim determinations for Dŵr Cymru and Tendring Hundred in 2000; interim determinations for South West, Bournemouth & West Hampshire and Dee Valley in 2001 and interim determinations for Yorkshire and Severn Trent in 2002.

8 Based on the equivalent population served by sewage treatment works in breach of the consent.

# UNITED STATES

Provision of water and wastewater services in the U.S. is handled at the local level, with little federal oversight other than environmental regulation, including water safety standards, although federal financing plays an important role in the industry. Competitive forces have recently begun to affect the sector:

> The water industry has and will continue to display many characteristics of monopoly. Nevertheless, the water industry in the late 1990s has felt the forces of competition. Water utilities are competing with themselves and with others in a number of venues, including: extending services to unserved or underserved areas; engaging in acquisitions and mergers (voluntary); bidding for operations contracts; bypassing the utility (including self-supply); purchasing water on wholesale markets; trading water rights (alternative uses); maintaining a service and quality image (bottled water); promoting public versus private ownership; contesting markets, ownership, takeovers; and participating in convergence acquisitions.[1]

**Structure of the U.S. Water Industry**

The structure of the U.S. water industry is described in *Privatization of Water Services in the United States: an Assessment of Issues and Experience*, National Research Council, National Academy Press (2002), pp. 2-3:

> Historically, water services were initially delivered by private providers in many cities in the United States, such as Boston, New York, and Philadelphia. As these and other larger U.S. cities grew, water services became a core function of local government. This trend accelerated largely because of a legislative change after World War I, when Congress exempted interest payments on municipal bonds from federal income tax. This assured that municipalities could issue bonds at lower interest rates than those for taxable bonds.
>
> The U.S. water industry today is highly diversified. As of 1999, there were nearly 54,000 community water systems in the United States. ... The vast majority of these systems serve small populations. In fact, 85 percent of U.S. community water systems serve only 10 percent of the population served by community water systems.
>
> Investor-owned water supply utilities (i.e., "private utilities") accounted for about 14 percent of total water system assets in the United States in 1995. Investor ownership of wastewater utilities is more limited than investor ownership of water supply utilities, in part because of extensive federal funding of wastewater treatment plants that began after World War II. Investor-owned water supply and wastewater facilities are subject to state economic regulation that oversees rates charged, evaluates infrastructure investments, and controls profits. In contrast, private contract arrangements under public ownership are not subject to state economic regulation. According to the National Association of Water Companies (NAWC), the proportion of water services in the United States provided by private water companies, whether measured by customers served or volume of water handled, has remained close to 15 percent since World War II.
>
> The term "privatization" covers a wide spectrum of water utility operations, management, and ownership arrangements. The four major classes of privatization options can be characterized as (1) private provision of various services and supplies such as laboratory work, meter reading, and supplying chemicals; (2) private contracting for water utility plant operation and maintenance (both 1

and 2 are often referred to as "outsourcing"); (3) negotiating a contract with a private firm for the design, construction, and operation of new facilities (this option is referred to as design, build, and operate, or DBO); and (4) outright sale of water utility assets to a private company. In the United States, the contracting of management and operations to a private provider (outsourcing) has been more common than the sale of utility assets to private companies. No major U.S. city has sold its utility assets in recent decades, although some smaller water utilities have done so.

**Issues Relating to Privatization**

The National Research Council addressed a number of issues in the conclusions to its study of privatization of water services in the United States:

> Water services privatization takes many forms, and no one type fits all situations, complicating the choices that communities face if they consider reorganizing their water and wastewater-utilities. The range of choice extends from (1) "outsourcing" of various services such as provision of supplies and meter reading; (2) private contract operation and maintenance of existing plants; (3) contracts for the integrated design, construction, and subsequent operation of new facilities (DBO contracts); and (4) sale of public utility assets to investor-owned companies that take responsibility for all operations, maintenance, and expansion of services. Outright sale of public assets has been infrequent in the United States except for "regionalization" of small utilities. Nonetheless, investor-owned companies have historically played and continue to play an important role in providing water services in the United States.
>
> Private contractors are often large companies with extensive experience and expertise that they can bring to bear on local operations. Contractual arrangements usually give them greater freedom in dealing with the workforce, which is often the greatest single source of cost savings. Large operating savings have, indeed, been achieved under existing contracts. Under some circumstances, private companies can provide needed capital. Also, private operators, being under contract or owning the utility, are often farther removed from local politics. This has the advantage of less political intervention in matters of technical management, but can lead to less transparency and accountability.
>
> The largest gains from the new water utility privatization environment in the United States are likely to come from improved operations of the majority of water utilities that will remain publicly owned. The presence of private alternatives has clearly motivated improved performance on the part of public utilities. "Contestability" for public utilities has been ratcheted up by the existence of attractive private alternatives. Some larger public systems are actively working with smaller suburban utilities to provide better water sources and better management. This form of regionalization promises to yield large benefits.
>
> Small-to medium-sized utilities face the greatest challenges and problems and are prime candidates for availing themselves of private services. Small and medium-sized utilities often lack needed expertise to meet today's high standards for drinking water and wastewater treatment. Consolidation and regionalization of small-to-medium sized utilities holds great promise for improved performance. New management, communication, and monitoring technologies create opportunities for economies of scale and scope. The small water utilities that comprise 85 percent of all water utilities could benefit from physical consolidation or provision of services through regionalization. Both are being provided by leading public utilities as well as by private companies specializing in assistance to small utilities.
>
> Procurement processes through which private services are solicited are increasingly standardized, reducing uncertainty on both the public and private sides. The challenge is to find ways of

standardizing procedures to reduce costs while not infringing on the freedom of municipalities or contractors to propose innovative approaches.

Communities often express concerns when considering privatization options, which include possible impacts on public goods such as environmental protection, water quality protection, transparency of decision processes, and openness to public input. The capacity to take over operations in case of contractor failure to perform is an issue, as is the need for the municipality to develop the capability to monitor the work of the contractor—a set of skills that differs from those needed for ordinary municipal operation. Concern for the continued employment and welfare of the utility workforce is often expressed. Possible loss of services provided by the water utility for other municipal departments (e.g., snow removal, flood-control measures, drainage systems) is a concern at times. In a longer time perspective, there are concerns about maintenance of water-shed lands, protection of raw water sources, and provision of recreational opportunities, as well as public health, under privatization. Reservoir and watershed lands are often highly valuable, and there may be pressure to develop these lands if privately owned. However, privatization of operations and maintenance need not imply turning over ownership of land and water rights.

Another concern is that water rates charged to customers following privatization have in some instances gone up. But rates can move in either direction, depending on the financial condition of the utility, the cost savings realized, and near–term improvements and investments called for under the contract. Historically, public utility water rates have been only loosely tied to costs, while public officials have sometimes been unwilling to charge appropriate prices because of a tradition of underpricing. However, customers appear to highly value reliability and quality, and surveys have shown customers have a significant willingness to pay for high-quality services.

The term "privatization" tends to evoke the presence of a competitive environment with the attendant advantages of competitive markets, especially in the U.S. setting of markets that are frequently quite competitive. However, the "natural monopoly" attributes of water services (capital intensity, high costs of duplicating infrastructure) make competition of the usual type unlikely or impossible.[2] Strong competition is likely to exist at the point in time when private proposals are submitted, and competition may continue along the boundaries of the service area. But during the contract period, continued monitoring of performance is needed to protect against failures to perform according to the contract. Conditions of the contract must substitute for active year-to-year competition. Investor-owned utilities (assets privately owned) are subject to regulation by state commissions but these commissions frequently lack the resources to oversee all utilities, especially under newer forms of ownership. In the case of publicly owned utilities, the supposition is that city government will monitor performance and prevent abuses.

There are elements of an "uneven playing field" in the competition between public utilities and private operators, especially relating to the availability of capital funds. Municipalities can issue tax-free bonds that carry lower interest rates than private bonds or loans. They often have access to "state revolving funds" not available to private firms. Until recently, there have been legal constraints on the private operation of physical plants that have been financed through public funds. ... It is thus a major public policy debate whether the subsidies to public utilities thus provided are justified by public good advantages of public ownership and operation or whether they constitute an economically inefficient and unfair financial framework. Several financial reforms are now being debated that would tend to level the financial playing field.[3]

The use of water markets to effect transfers of water from lower-valued to higher-valued uses is a different form of privatization that has long existed in the western United States but that is becoming increasingly important in all parts of the country. Utility managers, public or private, will have to

learn to deal with these institutional innovations. These transfers can be temporary or permanent and are usually from agriculture to urban uses. The use of systems of water ownership and marketing that were developed in western states is expanding to other parts of the United States to allow the voluntary transfer of established water rights or contracts to new permanent or emergency uses. Water markets are subject to some degree of state supervision to protect other water users and various social and environmental values that can be impacted by changes in water use. Acquisition of water supplies through water markets will require collaboration of utility managers with state regulatory agencies.[4]

**Antitrust Enforcement Related to Water Supply**

In 1998 the Department of Justice and the City of Stilwell, Oklahoma reached a settlement that prohibited the City from withholding water service from city residents who wanted to purchase electricity from other electric companies. The agreement settled a civil antitrust lawsuit filed by the Department against the City and the Stilwell Area Development Authority. The complaint alleged that Stilwell forced local customers to buy its electricity by refusing to provide them with water and sewer services unless customers also agreed to purchase their electricity from the City. Stilwell was the sole supplier of water and sewer services within the city limits. The complaint alleged that this “all-or-none” utility policy prevented consumers from receiving the benefits of competition from a rural electric cooperative that was seeking to serve new customers in Stilwell. Under the settlement, the City may no longer use its water and sewer monopoly to suppress competition from other electric companies.

## NOTES

1 Beecher, Janice A., Privatization, Monopoly, and Structured Competition in the Water Industry: is there a Role for Regulation?, paper presented at the 1999 American Water Works Association Annual Conference.

2 In the arid conditions prevailing in much of the western U.S., a very large portion of water consumption is not for household use, but rather for irrigation of urban lawns and gardens, yet all of this water is processed to the level required for household use. The estimates range as high as 75%. Under these circumstances, there may be potential savings available from investment in parallel water distribution systems at least for high use customers -- with the additional distribution system being used for less fully processed water to be used for irrigation of urban lawns and gardens. Such investment opportunities might well be opened to private firms which would then compete with the public system to serve the demand for urban irrigation. Recent drought conditions in the great basin area has raised interest in this possibility.

3 When water systems are owned by municipalities, the municipality may elect to use some tax revenues to pay for part of the water system. This may be more efficient than charges that cover all costs (if one abstracts from the economic distortions caused by the added tax burden). One variation is to charge usage rates that cover the average variable costs of the system. Tax revenue then pays for the fixed costs, mostly physical plant. To the extent that usage is price sensitive, this may be a closer approximation to marginal cost pricing and may involve less distortion of consumption than average cost pricing.

4 Privatization of Water Services in the United States: an Assessment of Issues and Experience, National Research Council, National Academy Press (2002), pp. 110-113.

# EUROPEAN COMMISSION

## Introduction

In 2002 a study on the application of the Competition rules to the water sector in the European Community was prepared for the European Commission (see below). In 2003, the Commission announced in its Communication on the Internal Market Strategy Priorities 2003-2006[1] that "the Commission services will undertake a review of the legal and administrative situation in the water and waste-water sector. This will include an analysis of the competition aspects, in full respect of Treaty guarantees for services of general economic interest and environmental provisions".

In addition to this contribution, please consult:

- Articles 16 and 86 of the EC Treaty, and the definitions in the Green Paper on Services of General Interest[2] of "services of general economic interest" and "public service obligations" (attached);

- the study on the application of the Competition rules to the water sector in the European Community available at http://europa.eu.int/comm/competition/publications/publications/#water;

- the Commission Communication on pricing policies for enhancing the sustainability of water resources[3] with in annex a Commission Staff Working Paper on water pricing policies in theory and practice (attached).

## Supplier Selection and Incentives

### *1. How is the water supplier chosen?*

Between 1989 and 1993, the EU adopted specific legislation to ensure that public authorities and entities active in a number of sectors including the water sector (which also covers waste water) contract out goods, services and works in a transparent and non-discriminatory manner. In particular, Directive 92/50/EEC[4] contains detailed rules that a public authority must follow when awarding public service contracts. And Directive 93/38/EEC[5] contains detailed rules that an entity active in the water sector must follow when awarding goods, services or works contracts. However, these Directives only apply to contracts and not to concessions, where the operator bears the risk involved in operating the service in question by obtaining all or part of its revenue from the user, particularly by charging fees in any form, or where revenue is otherwise related to the volume of use. It should also be noted that under these Directives the provision of water (waste or drinking) is considered a 'non-priority service' , and so only a limited set of their provisions apply to the selection of a water supplier.

Even when the selection of a water supplier is not covered by the detailed rules of the procurement directives, the EC Treaty must be respected, and in particular the requirements of transparency and equal treatment that flow from Articles 43 and 49 of the Treaty. So the Commission issued an interpretative Communication on Concessions under Community Law[6] to clarify the application of the EC Treaty Internal Market rules to the behaviour of public authorities when they grant concessions. This interpretation was largely confirmed by the European Court of Justice (ECJ) in its Telaustria judgment[7].

For the application of the public procurement rules an important issue is to decide when the relevant authority should be considered to be outsourcing a service or when it can be considered to be carrying out the service in-house. Broadly speaking the public procurement rules apply whenever a local authority or contracting entity in the water sector awards a contract (or grants an exclusive right) to a legally distinct entity. Where a legally distinct entity is subject to a control by the contracting authority similar to the one it exercises over its own services, and realises the essential part of its activities with the contracting authority, it can count as in-house (see the Teckal judgment of the ECJ[8]). But where, for instance, a contract or exclusive right is awarded to an undertaking controlled by the authority but with a minority shareholding by a private undertaking, or where the publicly controlled undertaking gains a significant amount of its revenue from other sources, an in-house relationship may not exist. The ECJ is considering these issues in a number of cases[9], and the position should be clearer once it issues its judgment.

These Directives will soon be modified and updated, but the main principles of procurement policy will remain the same.

How the relevant authorities select their contractors or grant their concessions, and how they provide incentives to the operators, is a matter for the authorities to decide themselves as long as the Community rules are respected.

Finally, in the EC's internal market, public and private water operators should be able to compete on equal terms and with no unjustified discrimination between them (eg differences in the tax regime).

### *2. Is competition possible between different water suppliers in the same geographic area?*

This question raises important issues and needs to be analysed carefully. Water distribution and waste water collection, particularly for domestic purposes, are generally considered to be natural monopolies because it would not be economically viable to have two separate networks in a given area. However, the supply of water and waste water services is not always a natural monopoly. For example, water consumers, particularly large ones, could in theory be supplied in a number of different ways:

(a) by the local operator;

(b) by a neighbouring operator if located relatively near by (either via specific pipeline for the site or via third party access to an existing pipeline);

(c) through self-supply of water (eg water abstraction rights for raw water from a river or aquifer and possibly own treatment of this raw water); or

(d) by a large neighbouring water consumer carrying out its own water services (see c above) and with spare capacity who could provide water services to other consumers for example on an industrial site.

In these situations the question is therefore whether there are legal obstacles to competition between different water suppliers in the same geographic area. In accordance with the EC Treaty, the EC competition rules apply to all economic activities where there is an effect on trade between Member States unless there is a specific derogation from the competition rules in the form of special or exclusive rights granted in accordance with Article 86(2) of the EC Treaty.

- The ECJ has never explicitly ruled on whether the provision of water and waste water services are economic activities. But based on its case law in similar sectors (eg Höfner[10] and Ambulanz

Glöckner[11]), it can be presumed that these services can generally be considered to be economic activities.

- There is usually an effect on trade[12] between Member States in the water sector (a) if the water consumer is sited close to a border between Member States and so could technically be supplied with water by an operator in the neighbouring Member State, (b) if the water consumer uses the water services as an input into goods that are then traded between Member States, (c) where the water operator is dominant on a substantial part of the European Community (eg supplies large cities or regions), (d) when there is a cumulative effect from lots of smaller networks, or (e) when a contract or concession is outsourced and an operator in another Member State might be interested in it. Normally if there is no effect on trade and the EC competition rules do not apply then the relevant national competition rules (which are generally similar to the EC rules) will apply. Following 1 May 2004, Member States and national courts will become more involved in the enforcement of Article 81 and 82 as well as national competition rules.

- It is common for water operators to be entrusted by the relevant authority with the operation of services of general economic interest. This would often include a universal service obligation whereby operators are obliged to provide water and waste water services to all households in a given geographical region. In this case the relevant authority can grant special or exclusive rights to the water operator in accordance with Article 86(2). But in accordance with the EC State aid rules[13], the benefit to the water operator of any special or exclusive rights must be proportionate to the cost of the provision of the service of general economic interest. This therefore limits the scope and the duration of any special or exclusive rights. Furthermore it should be noted that public service obligations generally only cover domestic and not industrial purposes and the same should apply to the scope of any special or exclusive rights. This would therefore suggest that non-household users should legally be able to choose the most economically advantageous water and waste water services available to them.

Where there is no special or exclusive right, the standard competition rules apply: Article 81, on restrictive agreements between undertakings, and Article 82, on abuse of dominant position.

- Agreements between undertakings could be vertical (eg supply agreements between a water network operator and a treatment plant owner) or horizontal (eg agreements between water operators not to poach customers on each others territory). Where EC or national competition rules apply such agreements would have to be examined on a case by case basis. The questionnaire specifically asks about competition between adjacent water treatment plants, and it would seem that adjacent treatment plants should be able to compete to supply treatment services to the local water distributor or to supply water consumers via third party access to the distribution network (see below) or via their own pipelines.

- As regards abuse of dominant position, it should first be noted that the water operator responsible for the water and waste water network in a given region would normally be in a dominant position, at least in the market for water and waste water distribution services. It would therefore have a special responsibility not to abuse this dominant position in an exclusionary or exploitative manner. An issue that often raises particular concern is third party access to infrastructure such as water networks or treatment plants. It is important to clarify that third party access is technically possible at least in some cases, although issues such as liability in case of pollution and quality standards have to be carefully addressed. For waste water treatment, adequate monitoring (either on-line or in advance) is technically available so as to allow third party access to the network. As for drinking water, public health considerations lead, under the currently available monitoring for bacteriological quality, to a restrictive attitude to third party

access to the drinking water network. The main issues are therefore whether the provision of third party access should be made obligatory (either under competition rules or specific sectoral regulations) and what impact this would have in practice. The UK is the only Member State that obliged water operators in accordance with national competition law to draw up third party access codes for both water and waste water, and it has now included regulated third party access (for the supply of water for industrial purposes) in the Water Act of 2003.

In addition to water supply in the strict sense as analysed above, many ancillary services, such as laying pipes or retail services, could be open to competition as long as there is no reason (eg health or environment) to include them in any special or exclusive rights.

***3. How is an incentive provided to increase productive efficiency?***

As regards the question of whether privatisation is a sufficient step for increasing efficiency, it should be noted that European law is neutral on the issue of ownership of undertakings in accordance with Article 295 of the EC Treaty. The EC Treaty and in particular the competition, internal market and environmental rules apply to both public and private undertakings. From a competition point of view the key question when there is a monopoly is whether the exclusive right is justified.

The Member States have chosen different means to provide incentives to water operators to improve their efficiency. At this stage, the European Commission has no particular views on which system should be used in the water sector. Since 2001 the Commission has measured the performance of other network industries providing services of general economic interest and publishes an annual report summarising the results. It has also published a Communication on "a Methodological Note for the Horizontal Evaluation of Services of General Economic Interest"[14]. Although the water sector has not been included in the annual reports so far, there is no reason why the same principles should not be applied to this sector as well. One possibility would be to encourage water operators to benchmark their performance standards and publish the results. This would help to ensure that domestic consumers receive the benefits of improved efficiency in the industry.

**Consumer Pricing and Access**

***4. What is the general structure of retail water prices?***

In October 2000, the Council and European Parliament adopted the Water Framework Directive (Directive 2000/60/EC) which established the key principle that water prices should reflect costs. In particular, Article 9.1 of the Water Framework Directive requires Member States to reflect full cost-recovery, split at least into the sectors households, industry and agriculture by 2010.

In the context of adoption of the Water Framework Directive, the Commission adopted a Communication on pricing policies for enhancing the sustainability of water resources[15] with in annex a Commission Staff Working Paper on water pricing policies in theory and practice (both attached). The key message of the Communication, as regards the structure of water prices, is that water pricing policies need to take into account both the financial costs of providing services as well as environmental and resource costs. A price directly linked to the water quantities used or the pollution produced can ensure that pricing has a clear incentive function for consumers to improve water use efficiency and reduce pollution.

In response to the specific question in the questionnaire, there are two main methods by which private undertakings can be protected from the imposition of increased costs linked to legislation, such as higher quality standards. First, there is normally a fairly long transition period in any new legislation, which both allows the operator to decide how and when to modify its facilities in the most cost-effective manner and reduces the Net Present Value of the increased costs. Secondly, water operators can generally

increase their prices in line with increases in costs (for example, this can be explicitly allowed for in the long term contracts between the authorities and the operators, or agreed informally between them, or explicitly taken into account by the regulator).

***5. Is water provided to the highest value users?***

As a principle, water problems should be addressed at the level of the river basin to achieve the objective of good quality for all water bodies including groundwater and the objective of a long-term sustainable balance between natural recharge and abstractions. Water transfers are in this context not *per se* ruled out, provided they comply with environmental objectives in the region of abstraction as well as by the transfer carrier. This environmental objective, combined with proper pricing will distinctly promote the prudent use of water. The requirement that sectors, at least households, industry and agriculture, pay prices that reflect the full cost of the water they use by 2010 should directly help to address the problem of groups of users who are currently indirectly subsidised in their water consumption.

The allocation of water abstraction rights (and the rights to discharge water) is an issue in the context of the implementation of the Water Framework Directive for national, regional and local authorities, given that as a rule every abstraction will require authorisation. But when such rights are allocated, in addition to respecting health and environmental obligations, they must respect the EC Treaty obligations and in particular the requirements of transparency and non-discrimination and the State aid rules.

***6. How can access to water be ensured for low-income consumers?***

The provision of a universal service to households is typically a service of general economic interest that is entrusted by a public authority to water operators. In addition to simply building the network to permit the connection of all households, this could also include the provision of services at a reduced rate to low-income households. To pay for the additional costs linked to this service of general economic interest, the water operator could receive compensation directly from the authority concerned, or from a fund paid for by all operators (as is done in the telecommunications sector) or from a special or exclusive right of proportionate value (as is often done in the water sector). From an EU perspective the key issues are, first, that the Commission and the national, regional and local authorities take care that such services operate on the basis of principles and conditions which enable them to fulfil their missions (Article 16 of the EC Treaty) and, secondly, to ensure that any compensation granted by the Member State or local authority to the water operator is in line with Article 86(2). Also, the Water Framework Directive provides for certain options for only partial cost recovery for water-related services, mainly based on social and ecological considerations (article 9).

**Quality and Environment**

***7. How can water quality be assured within a competitive framework?***

Environmental legislation sets the limits within which competition can take place in the water sector. In this way issues of water quality are addressed directly through specific legislation applying to all water operators.

***8. How can water use be combined with environmental objectives?***

The Water Framework Directive combines environmental objectives (article 4) with economic tools. Article 5.1 requires Member States to prepare economic analyses of water use in each river basin for the end of 2004, and this should ensure that these issues are addressed for each river basin. These analyses

will be key elements for preparing the river basin management plans with its mandatory public participation, and also for implementing the cost recovery principle (article 9).

# ANNEX:

# EXTRACTS FROM EC TREATY AND GLOSSARY

## Extracts from the EC Treaty

Article 16

Without prejudice to Article 73, 86 and 87, and given the place occupied by services of general economic interest in the shared values of the Union as well as their role in promoting social and territorial cohesion, the Community and the Member States, each within their respective powers and within the scope of application of this Treaty, shall take care that such services operate on the basis of principles and conditions which enable them to fulfil their mission.

Article 86

1. In the case of public undertakings and undertakings to which Member States grant special or exclusive rights, Member States shall neither enact nor maintain in force any measure contrary to the rules contained in this Treaty, in particular to those rules provided for in Article 12 and Articles 81 to 89.

2. Undertakings entrusted with the operation of services of general economic interest or having the character of a revenue-producing monopoly shall be subject to the rules contained in this Treaty, in particular to the rules on competition, insofar as the application of such rules does not obstruct the performance, in law or in fact, of the particular tasks assigned to them. The development of trade must not be affected to such an extent as would be contrary to the interests of the Community.

3. The Commission shall ensure the application of the provision of this Article and shall, where necessary, address appropriate directives or decisions to the Member States.

## Glossary

Paragraph 17 of the Green Paper on Services of General Interest[16] states: "The term "services of general economic interest" is used in Articles 16 and 86(2) of the Treaty. It is not defined in the Treaty or in secondary legislation. However, in Community practice there is broad agreement that the term refers to services of an economic nature which the Member States or the Community subject to specific public service obligations by virtue of a general interest criterion. The concept of services of general economic interest thus covers in particular certain services provided by the big network industries such as transport, postal services, energy and communications. However, the term also extends to any other economic activity subject to public service obligations."

Paragraph 20 of the Green Paper states: "The term "public service obligations" is used in this Green Paper. It refers to specific requirement that are imposed by public authorities on the provider of the service in order to ensure that certain public interest objectives are met, for instance, in the matter or air, rail and road transport and energy. These obligations can be applied at Community, national or regional level."

## NOTES

1 COM(2003)238 of 7 May 2003.

2 COM(2003) 270 final of 21 May 2003.

3 COM(2000) 477 of 26 July 2000.

4 OJ L209 of 24 July 1992, page 1.

5 OJ L101 of 1 April 1993, page 1.

6 OJ C121 of 29 April 2000, page 2.

7 Case C-324/98, ECR 2000, page I-10745.

8 Case C-107/98, ECR 1999, page I-08121.

9 Case C-26/03 (Stadt Halle), Case C-231/03 (CO.NA.ME), and Case C-458/03 (Stadtwerke Brixen), pending.

10 Case C-41/90, ECR 1991, page I-01979.

11 Case C-475/99, ECR 2001, page I-08089.

12 For a detailed examination of effect on trade, see the draft Commission Notice "Guidelines on the effect on trade concept contained in Articles 81 and 82 of the Treaty" published on 10 October 2003 and available at http://europa.eu.int/comm/competition/antitrust/legislation. Paragraphs 52 and 53 of the draft Notice introduce negative and positive rebuttable presumptions on effect on trade, based on market share and turnover.

13 Articles 87 and 88 EC Treaty and Commission Directive 80/723/EEC on transparency of financial relations between Member States and public undertakings as well as on financial transparency within certain undertakings as amended by Commission Directives 85/413/EEC, 93/84/EEC and 2000/52/EC. See also the ECJ judgment in Altmark (Case C-280/2000, not yet reported).

14 COM(2002) 331, of 18 June 2002.

15 COM(2000) 477, of 26 July 2000.

16 COM(2003) 270 final of 21 May 2003.

# SUMMARY OF THE DISCUSSION

## Introduction

The **Chairman**, Alberto Heimler, began the roundtable by noting that among all the industries that have been analysed in WP2, water is the one where at first sight there is the least to say about competition. It is a common view that the water sector is a natural monopoly with limited potential for introducing competition. However the submissions to the roundtable imply that there is room for market-oriented regulation in water supply. All submissions agree that many aspects of water supply are a natural monopoly, but there are many differences with respect to the extent of market type mechanisms that have been adopted.

The Secretariat's background paper outlines some of the major issues. In most countries water is generally low cost and low price. Water is a renewable resource, it is generated every year and the cost of water is generally just the cost of processing water. As a consequence, water travels relatively short distances. The man-made infrastructure that is used is generally not interconnected nation-wide and not in many cases region-wide. Final customers (such as household or industrial users) are generally connected to one and only one supplier, the municipal company. Furthermore water in most countries has been relatively plentiful so that the main issues that have traditionally been debated are governance of the municipal company and transport leakage. Transport leakages are important in situations of seasonal scarcity. For both of these problems one of the most common solutions has been privatization. One of the main objectives sought by many policymakers has been to increase prices to reflect the cost of the infrastructure, the opportunity cost of the water source, and the treatment of waste.

## Is privatization an option?

The Chairman pointed out that the question of what type of regulation is appropriate when water is not scarce arises from the above issues. Both in Switzerland and in the Netherlands supply far exceeds demand, and the Swiss contribution says that supply is almost double demand. According to the Swiss submission, Switzerland sees democracy at stake in the process of corporatisation of water providers. The Chairman remarked that the Swiss contribution says that Swiss water, although plentiful, is not exported.

The contribution also states, that, because water is a natural resource it has to remain in State control. The Chairman was wondering what characteristics of water justify this attitude that is different from the case of other type of natural resources. The Swiss submission highlights the balance between democracy and efficiency. The Chairman called on the Swiss delegation to explain why this applies only for water and not for other public utilities that are as important or in some cases even more important then water.

A delegate from **Switzerland** noted that in Switzerland the water supply is highly decentralised, and the municipalities have the ultimate responsibilities. For this reason there are around 3000 water suppliers in the whole country. In the municipalities the political system can be described as direct democracy, which means that the decision bodies and these municipalities are the assemblies of municipal citizens for which every residents of each municipality receives an invitation to attend. All the decisions concerning water are brought at this level.

Since water, more than other public utilities, involves sensitive human rights issues there is a certain reluctance as far as liberalisation, privatization or even corporatisation is concerned. However there

is less reluctance to outsource the operation as long as the more basic strategic decisions remain in public hands.

The Swiss delegate then mentioned the example of the water supplier in the region of Zug, which has been a private corporation since the end of the 19th century, because by that time the municipality of Zug had serious financial problems and therefore it granted a concession to a private supplier. However there is a high degree of social control especially as far as water supply is concerned. This company despite its success had difficulties in expanding and buying other suppliers in neighbouring municipalities, because the municipalities are not willing to replace the public supplier with a private one. As regards exports, the delegate concluded that there are a lot of technical difficulties in exporting water, because it can not be transported for long distances.

Turning to the Netherlands the **Chairman** noted that in comparison with Switzerland, the Netherlands has undergone a major restructuring with 230 companies in 1938, 105 in 1980, 40 in 1994 and 14 today. All 14 are limited liability companies owned by municipalities. Since water is a natural monopoly, public ownership (with quality as an objective) is much better than private ownership (with profit as an objective). The Chairman asked how it can be assured that a private liability company simply because it is owned by a municipality pursues quality and not profits. The Chairman was wondering whether the fact that it was owned by the municipalities was really the major reason, or something more, for example a specific system of incentives for managers, or a system of political control being needed.

A delegate from the **Netherlands** agreed that in the Netherlands water supply companies try to attain a higher level of water quality than is required by European guidelines. In most limited liability companies the shareholders cannot interfere with the management of the company, but water supply companies are exempted from the general laws thus shareholders have much more influence on the management of the company. This means for example that the shareholders who are in this case municipalities and provinces have to agree on the setting of tariffs, for example, which gives them a lot of influence on price increases.

Basically the municipalities and provinces have allowed price increases as long as they lead to the investment in the infrastructure or higher quality. The Ministry of Environment, which is responsible for the water supply companies, has felt that if these companies were privatised then this type of political control would cease to exist, and it would be very difficult to put other types of control in place that would force these water supply companies to attain the same level of quality.

The **Chairman** next focused attention on the United Kingdom and noted that the United Kingdom has chosen restructuring and privatization as the solution for inefficiency. As is common with most previously regulated industries or public utilities, there is a difference between England, Wales and Scotland. In England and Wales there are now 10 integrated and 14 water-only companies, in Scotland there is only one. The Chairman wanted to know why Scotland has consistently fewer operators than England and Wales.

He also asked whether privatization has achieved some of the objectives it was aiming at, namely more efficiency from the demand side and raising consumers' awareness of the cost of the water they consume. The Chairman was wondering how that could be feasible in a situation where ¾ of the water customers are unmetered and pay a charge unrelated to consumption.

A delegate from the **United Kingdom** addressed the second question about metering first, explaining that all commercial users are metered in England and Wales. In terms of household users, in 1990 there was no metering or very little metering, and now a quarter of all households in England and Wales are metered. The main factor in this increase is efficiency, because there are 30 million households

in England and Wales and it is an expensive process to fit those meters. At the moment about a quarter million meters are being fitted each year. The policies that are pushing metering are (1) all new houses that are built have to have meters in; (2) following an act in 1999, any consumer can have a meter free of charge. In certain cases water companies can require costumers to have meters (e.g., if they have a swimming pool or if they use hosepipes regularly).

The United Kingdom does not push harder towards universal metering because the cost of installing meters and the annual reading of meters is about 10-15 percent of the average household bill. Also there are some households that gain from the current system if they use a large amount of water but they live in a small house, and there are some concerns about the short term effects of putting them onto meters.

Addressing the first question of why Scotland is different, the delegate explained that the privatisation of the water industry was a political decision by the government and it was felt that Scottish consumers could be more against it than in England and Wales. Recently Scotland has merged three water companies into one that is different to the English and Welsh approach of maintaining comparative companies. The new water regulator in Scotland closely compares the performance of the Scottish water company to the English and Welsh water companies.

The **Chairman** asked the British delegation about the objectives of the privatisation and whether there has been a positive assessment of privatisation's results.

A delegate from the **United Kingdom** responded that in general they feel the privatisation to be successful. Basically the government had two motives to support privatisation. One is that private sector operators would have better incentives and the second is that European legislation concerning environmental standards got stricter and the government thought that the consumers should pay for these new costs through their water bills.

Privatisation efficiency gains were around 19% per household in the water supply area, and slightly less in the sewage. Water bills have gone up even though there have been efficiency savings, but this is because of the improved quality. Generally privatisation is worthwhile. However the companies are very strictly regulated, so it is not a free market by any means.

The **Chairman** inquired if there is any local branch or decentralized staff, or all the work is done from London.

A delegate from the **United Kingdom** answered that they do it all from Birmingham. There are ten WaterVoice Committees that represent consumer interests in the different regions, but basically there is one central regulator.

**Bidding processes**

The **Chairman** then moved to questions on bidding processes. He concluded that privatisation does not necessarily imply full transfer of property rights of water companies to private investors. Privatization can also result from a bidding process where the running of a water company is outsourced for a limited period of time by the granting of a concession or license. In most jurisdictions, and also in the EU regulation, a bidding procedure becomes mandatory only when the municipality is no longer willing to self-supply water and there are a number of competitors.

In Denmark the competition authority has participated in a task force for identifying ways and means to increase efficiency in water supply. In Denmark the structure of the water companies is extremely dispersed, with around 2800 water utilities of which 166 are owned by the municipality. In the Danish

bidding process the private utility can outbid the municipal utility if it is more efficient. The Chairman called upon the Danish delegation to explain better how the system works, and what the reasons were for introducing it.

The delegate from **Denmark** started with the statement that there is some room for competition directly or indirectly in the water sector. He added that Denmark is currently participating in a task force where they look into the question how to implement competition in the water sector. As for the question, the delegate stated that there is a potential right to challenge the municipality, but that is more general and exists in all sectors. This right has only been implemented recently so there have only been seven cases, where private companies have used the right to challenge public companies, and none of them have been in the water sector.

There are two recent and frequently used institutions in Denmark, the right to challenge public services, and the law on municipal service strategy. There are some exceptions as for the rights to challenge public services (e.g., the public authority tasks of the municipality; tasks that are a part of tenders are excluded). There are some threshold values which have to be complied in this regard, going from a minimum of 66.000 euros to a maximum of approximately 300.000 euros.

The **Chairman** then turned to Hungary and remarked that in Hungary, 75% of the service is supplied by municipalities. In many cases the service is contracted out, generally with a tender. The chairman wanted to find out more about the characteristics of these tenders, and also if there are nationwide water companies that have developed some specific competence or those participating in the tender are local companies.

A **Hungarian** delegate referred to the fact that these tenders are covered by the Act on Public Procurement. If the investment or the agreement goes above a certain amount, then it is subject to the act. The tender itself could be an open-tender, when firms are free to enter in the tender, or it can be a tender based on invitation. In many cases the tender itself is announced because it is not only about the contracting-out of the service but about the establishment of the infrastructure, mainly in smaller villages or smaller localities.

There are no nationwide water companies, so local or regional undertakings participate in these tenders. In most of the cases the municipalities themselves provide the water services. The basis of the choice is mainly the price offered by the undertakings, but there are other factors as well such as the possible quality of the service provided by the undertaking. There have been examples where the undertaking selected was not the cheapest, because the amount offered for investment was so low that the municipality considered that it would not cover the real cost of the investment, and further the undertaking would request other contributions from the municipality.

Turning to Portugal the **Chairman** asked if there is competition for the market when granting a concession. He also wondered whether there is a bidding process and whether private concerns are actually common in the Portuguese water market.

A delegate from **Portugal** said that ten years ago there was a very dispersed system in Portugal with more than 300 different municipal operators. After changing the system, now there are two different levels of operators. On the first level there are multi-municipal operators – or bulk operators – (bulk systems) at regional level, dealing with abstraction, treatment, and transport for water supply and with treatment and transport in the disposal of waste water. On this level the state assigns a concession on a non-competitive basis to a public undertaker. The second level is a local level, the municipalities that operate in distribution, regarding water supply and collection of waste water. On this level municipalities

can operate the system of services by themselves or they can assign a concession to private companies on a competitive basis.

As for the question about the private participation in the sector, at the moment there are four main private companies operating in this sector, and there is an increasing trend for private sector participation at three different levels: through operating contracts, through concessions and probably in the future through minority participation on the multi-municipal original concessions.

The delegate concluded by saying that the regulatory body was created in 2000 for structural regulation, for dealing with the operators' economic regulation tariffs, and for dealing with the quality of the service.

Referring to the Mexican contribution, the **Chairman** pointed out that according to the Mexican Constitution, water is federal property, but in most States the responsibility of providing service is left to municipalities. There is a problem of scarcity in some parts of the country, a problem aggravated by non-payment and leakages. Tariffs are not consumption-based and do not encourage water savings. Since 1992 private parties have been encouraged to build, operate and transfer water infrastructure. The Chairman requested that the Mexican delegation explain how the system functions especially in terms of prices, and whether the federal or the local government gives an assurance to investors that prices will not be changed in the course of the period for which they are granted the possibility to operate the facility.

A delegate from **Mexico** explained that the constitution states that water sources are national property and empowers the federal government to regulate the access to those water sources, but it also establishes that municipalities are responsible for supplying the water to households. In 1992 a new national water law was enacted and created a unique federal regulatory agency, which has been encouraging the private participation in managing the water system. One of the problems in Mexico at the urban level is the leakages with losses over 30% of the total supply, and around 30% equivalent non-payment. Municipalities do not have the rights to suspend the supply of water, unless it is stated explicitly in the state law but only 50% of the states have this provision in their law.

Around 60% of the total water supply to the households is supplied by private entities. In the Cancun and the Aguascalientes cases the private parties won the open bid because they proposed the lowest costs for operating and building and maintaining the infrastructure. However the tariffs have been increasing because of the financial crisis in 1996. Based on the experiences in Aguascalientes, the Mexico City government decided not to fully privatise the system. Basically they bid the contract to supply the water but the government is still in charge of collecting the bills. The most important improvement according to these experiences is that the collection rate increased by about 12-15% and the leakages were reduced by about 12-15%. Given these figures, the federal regulatory entity is still encouraging more aggressive participation by the private sector.

The **Chairman** next drew attention to benchmarking issues and noted that while tendering is one option for introducing indirect competition, another possibility is benchmarking. One of the best known examples of regulation through the benchmarking of competition in any sector is the example of the water sector in England and Wales, from the United Kingdom.

Turning to the delegation from the United Kingdom the Chairman asked for an assessment of their system. Benchmark competition provides a clear increase in the incentives to achieve efficiency, but requires the use of complicated methods by the regulator to figure out, first, who the most efficient operators are and second, how to impute efficient costs to less efficient providers. Usually it is difficult to introduce a comparison between different suppliers; an inefficient supplier can not easily be identified as

being less efficient as it will always claim that its costs are different for example because consumers are distributed in different ways.

The benchmarking exercise is also difficult, because the less efficient operator will have to bear the costs of his inefficiency in the sense that his prices will have to be lower than he would like them to be. The Chairman asked the British delegation to explain what challenges that arise for the regulator in the benchmarking process and if the water companies feel the process is sufficiently clear. He also asked whether the performance enhancements continue at the same pace as the system continues, or whether they are more pronounced in the early years.

A delegate from the **United Kingdom** agreed that benchmark competition can be complicated, but there are certain things that are comparable between the companies such as the costs of treating similar water to a potable standard in case of standard water treatment work. There are also variations between the different water companies: some of them abstract more from rivers which tend to be a bit dirtier than water coming from reservoirs. There are also differences in terms of distribution. In south eastern London there are a lot of consumers grouped closed together so it is much cheaper per capita than in the south west where it is very rural and water has to go over a long distance.

The way of adjusting these factors is through statistical analysis and econometric modelling. The Aquarius-3 model tries to take into account as many factors as possible and be as open as possible. However once these differences are taken into account, there are still significant differences in efficiency between the water companies (from the worst to the best performer there is a 30% difference). So the goal is to work on and to push the weaker companies towards the best performance. Another factor is that certain companies are not suitable comparators; the most efficient water company is a small one and would not act as the benchmark for the 10 large water and sewage producers.

This approach has produced considerable benefits by identifying the worst performers and tightening their price caps because they have more efficiency gains that can be achieved. Performance and efficiency or efficiency and improvements are tending to slow down. Since the start of this process in 1989 the biggest inefficiencies have been identified and dealt with. The challenge going forward now is to try and enhance incentives for efficiencies to improve, by for example giving companies more benefits if they are at the frontier of efficiency, and make even further progress.

The **Chairman** followed up by noting that in England and Wales there are a number of integrated water and wastewater companies and others that are simply water companies. He was wondering whether there were economies of scope in having an integrated company or the two operations are independent.

A delegate from the **United Kingdom** responded that they published a report in January, which will be fed into the next price-setting process. It was found that there are few economies of scope between being water and sewage treater, and in fact there are no particular economies from being large in the water industry. But what was also found is that there is a lot of economies of scope between treating and distributing and being vertically integrated, going all the way from abstracting the water to taking it to people’s houses.

**Market definition**

The **Chairman** then moved to market definition issues and stated that the market for water is certainly local, in the sense that final consumers often cannot look around for alternative water suppliers despite the fact that in many countries there are thousands of water providers. Water locally is a natural monopoly. There is a wider market for the whole water basin that affects a given locality. In that respect

there is a sort of competition between different localities, and there is also competition between different users.

The most important and most difficult issue in the water industry is how to make sure that water is being used by users or groups of users that have the highest value for water. Water supply can come (naturally) from far away and local supply can be affected, positively or negatively, by behaviour upstream. A market can be developed for water supply to a certain area, comprising all alternative uses for water within an area and across areas.

In many countries regulation has tried to address issues of externalities at least domestically. In particular the quality of drinkable water and the minimum standard for waste water are defined nationally. However in situations of scarcity there is a need for coordination across regions. In Italy a new legislation has tried to define optimal territories for water management. The original idea was to create water basin authorities. 84 such territories covering the whole country have been defined. A market for water entitlements has not been created, though. The Chairman asked for a better explanation of the strengths and weaknesses of the Italian regulatory structure with respect to an integrated approach across regions.

A delegate from **Italy** explained that Italy as a whole does not foresee scarcity of water resources. In 1994 Italy started an important reform process that was related to the civil use of water resources. In fact the system of water supply at the beginning of the 90s was inefficient, first because the price structure was independent of the costs, and second because the structure of the sector was characterised by the many firms. The law of 1994 divided the whole country among some Optimal Territorial basins, the so called ATOs, to manage the water resources for civil uses. The authorities related to each basin had to assess existing plans and services, prepare a plan of investment as well as control the behaviour of the management company along the whole water cycle.

As a result of a recent reform, aimed to reach the ultimate size exploiting scale economies, the size of an operating unit will be determined by the legislation that divided the territory into large districts, where only one unit generally operates the whole water cycle. As local utilities are uncertain whether they would be able to maintain their franchise or not, it induces the incentive for greater efficiency and profitability. As a consequence of the new legislation, companies are trying to extend their activities beyond city limits. In a good number of cases agreement has been reached to create joint ventures with big national and international groups, and they have tried to become a provider at the national level, whereas the strategy of medium and small size operators is to a largely at the regional level.

The difficulty in achieving the main purpose of law 36/94 is that the regional administration did not always follow the natural boundaries of the water basin to design the ATOs, but simply replicated the administrative boundaries of its own provinces. As a consequence, such market definition does not allow an optimal management of the water resources and also the maintaining of the rivers among municipalities.

The **Chairman** acknowledged the difficulties of establishing the boundaries in an administrative way without reverting to some sort of market pricing or any other sort of economic signalling, because then the public administration is not willing to relinquish its own powers, and then it becomes a political compromise among those administrations how to set up the boundaries of water markets.

The Chairman then moved to scarcity issues and noted that in most countries water scarcity, especially when it is seasonal or exceptional, is addressed by rationing. The reason for the modest use of appropriate pricing might be the fact that in many countries the consumption is not metered. The flexibility in prices is particularly important in those countries where dry climate and scarcity are real issues.

Referring to the Australian contribution the Chairman pointed out that in Australia the solution was a pricing reform (two-part tariffs); the establishment of a water entitlement different from land entitlement; the trading of water entitlements; and the reform of water institutions. Australia has a consumption pattern that is not so different to what most countries have: agriculture 70%, household 8% and manufacturing 6%. Government is encouraging water trading between districts, states and territories. The Chairman asked whether the two part tariff is flexible also with respect to the seasonal dimension, and furthermore whether the system of trading of water rights is encouraging in terms of results actually achieved.

A delegate from **Australia** stated that as a consequence of a drought on the east coast of Australia urban water restrictions have been put in place. The drought has not been grounds for reflecting scarcity and pricing, but rather the state and local governments have been using it to raise public awareness, and to reduce demand ( e.g., restricting the use of sprinklers in the hottest times of the day; no use of open hoses to clean driveways or cars). The change in urban tariff has had an impact on reducing demand and for water utilities has had implications for investment ( e.g., reconsideration of investment in dams). The question of how far to go with tariff reform is an open one but metering has some costs. Right now the focus is on raising consumer awareness to reduce water wastage, along with the restructuring of tariffs. As for water trading, Australia has made significant progress in putting the infrastructure in place for water trading, but it is too early to assess the effectiveness of that.

The delegate gave an example for entitlements for water, noting that farmers have been given entitlements that are separate from their land title and within certain geographic areas they are allowed to trade that water. The infrastructure is in place for that trading, but the effectiveness of how it is operationalised and some of the details are still to be worked out.

The **Chairman** explained that many of the contributions and much of the discussion deals with pricing for households and the pricing of industrial and agricultural users. In many countries those are far below costs, so the Chairman asked if in Australia the agricultural or industrial users are indeed recovering at least the costs.

The **Australian** delegate referred to their submission, which outlines that they have had a significant reform agenda which dates back to 1994. That reform agenda has required that prices better reflect costs and that infrastructure and institutions are put in place, such as independent regulation.

The **Chairman** turned to Poland and noted that while coordination across regions is feasible within a single jurisdiction, it is not clear how externalities can be taken into account internationally. The Polish contribution refers to a case of a town at the border of the Czech Republic that has preferred being supplied by a Czech water provider. The Chairman asked how that had occurred and whether there was a bidding process.

A **Polish** delegate started by describing the situation on the wholesale market of water supply. In the region in question there is one big wholesale water supplier on the Polish side, a state-owned company. Most municipalities would have had to use the services of this water supplier, but one of the municipalities close to the border decided to use the wholesale supplier from the Czech Republic. As the cities were close to each other, this co-operation was viewed as regional coordination, not as international trading of water.

As for the method for selecting the wholesale supplier, the municipalities applied the comparative analysis of the costs. Simply in this case there were only two suppliers, the Czech supplier and the Polish monopolist, and the costs were significantly lower on the Czech side. Another important fact is that wholesale water supply is not regulated in Poland. It escapes from the scope of the Act on collective water

supply and sewage treatment which sets the regulatory framework for supplying the water to end user, and falls in the scope of regular commercial activities.

Focusing on international dimensions, the **Chairman** turned to Austria and pointed out that water markets may have international dimensions when a water source, such as a river or an aquifer, can serve multiple countries. Even in a country where such water sources are not the major ones, usage may affect countries further down the river. Austria is a country that abstracts most of its water from groundwater sources, but which has the Danube flowing through it. The Chairman asked the Austrian delegation about the relative roles of the Danube and groundwater, and about proposals for international trading for water or pollution.

The **Austrian** delegate noted that the water supply system in Austria differs in some points very substantially from other systems. Around 5% of the yearly stock of water is used in Austria. Nearly 100% of the drinking water is based in ground water, which is of good quality so no treatment of the water is needed or only a very simple treatment. Only a small portion of the water of the Danube is used as cooling water. Water supply is usually handled by municipalities and prices are therefore also set by them.

Concerning international trading of water and pollution rights, Austria has strong reservations against it. Austria at the present cannot perceive that the underlying physical system can be described adequately. The underlying physical systems in the Danube basin encompasses, first the discharge of pollution from different origins and type, whether point source pollution or diffusive pollution, and second its transport and transformation along the path of flow, and third its impact on the receiving Black Sea. All the above processes exist in the environment but they cannot be assessed in such a way that a validated model or set of models would predict effects with the needed accuracy and precision.

Furthermore, in river catchments of the river network there are not only point-source pollutions, but also non-point or diffuse emissions (for example situations where phosphor is not discharged from the pipe but can reach the river network via ground water, tile-drainage, surface run-off, or the erosion of soil). The size of the diffused discharges can only be assessed in a rudimentary way, and the accuracy of such estimations is quite limited.

It is clear that through self-purification, the loads discharged decline along with the path of the flow. The farther away from the Black Sea the discharge is located the less is the likelihood that the phosphorus load affects the flora in the Black Sea. The effective load when entering the Black Sea can not be numerically determined with accuracy and precision needed for the trading of the pollution rights. It is difficult to determine what total phosphorus load discharges to the Danube can be permitted as thresholds, because the cost-effect relationship is not a simple function, but a more complex issue since the discharged loads are reduced along the path of the flow.

The effective amount of loads that is discharged in Vienna in comparison for example with loads that are discharged in Budapest, when entering the Black Sea can not be predicted numerically, these load elements that compose the threshold load cannot be weighted. So in course of the trading of pollution rights the real impact of respective load elements of the threshold load has to be considered as the real load, which means the effective load entering the Black Sea. Because of the above, Austria is in favour of solving pollution problems by regulation instead of trading of water rights.

The **Chairman** noted that the Austrian intervention suggests the importance of regulation. In countries that have faced similar problems as Austria (for example in Italy, the Po river was regionally considered responsible for producing pollution in the Adriatic Sea) the solution has been a regulatory solution more than the trading the pollution rights among different territories.

**Pricing**

Moving to pricing issues the **Chairman** noted that for pollution it might be difficult to identify the right price or the right costs, but in terms of water this difficulty may be smaller. In Germany municipalities have the power to organize water services, supplying it themselves or tendering the service out. If water is supplied by the municipality itself prices are subject to the supervision of local authorities. However if the supplier is a private concern then pricing is free and subject to the federal cartel law and is under the control of the Bundeskartellamt. The Chairman asked if a private company can be regulated in Germany. He also mentioned that leakages in Germany are at a minimum with around 9%, and was wondering what the reasons for that could be.

A **German** delegate started by explaining that in Germany the municipalities are the major players in water supply, which means that there are about 7000 companies in Germany active in water supply, and 7000 active in the sector of wastewater management, with some companies active in both supply and wastewater management. This means that the municipality has choice over how to organise and how to provide water supply in Germany, either selecting a private contractor regime or selecting water supply under the public law.

Supervision, including price regulation, is completely different depending on what the municipality chooses. If it opts for regime under public law, the supervision is undertaken by the state authorities. If the municipality opts for private law the regime is subject to control of the competition authorities of the various Landers because usually these cases do not go beyond the boundaries of a federal Land. For the contractual agreements under private law, there is no regulation, but the law on water supply in Germany is extremely strict, and very close to regulation in itself. Most of the privates companies supplying water are in the hands of the municipalities. So the linkage between them makes any regulation redundant.

As far as the leakage is concerned in Germany, it is a question of the shapes of the pipes and the whole water system. Prices for water in Germany are quite high, which is a consequence of the fact that in public law there is a fee-principle according to which the fees should at least cover the costs including the facility management. Under private law these companies are operating within the framework of a monopolistic environment, and at least are capable of covering the costs.

The **Chairman** noted that in the EU public procurement rules apply when water services are licensed to outsiders; otherwise when it is an in-house management, there is no necessity of public procurement or a bidding process. There is an EC directive which obliges member States to price according to costs, including full costs. In the case of water, being a renewable resource, direct cost is only related to infrastructure and treatment. It is very difficult to identify the opportunity cost of water, to assess how much it should worth for agriculture to pay for water, or for not to be deprived from water in periods of scarcity. The Chairman wondered how the costs and also the opportunity costs could be taken into account given that opportunity cost is so flexible and difficult to measure especially without a market. The Chairman asked how the EC takes into consideration the opportunity costs, and also whether there are problems associated with water basins that cross member States borders.

A delegate from the **European Commission** started by stating that in DG Competition the focus is mainly on the application of the EC competition rules to the water sector, in particular how to avoid overbroad and special exclusive rights. A derogation from the competition rules cannot be larger than justified by any public service obligations imposed on the water companies.

In terms of opportunity costs, they are meant to be included within the water price. In its communication on water pricing in July 2000, the Commission identifies three types of costs: the financial

costs, the environmental costs, and the resource costs. Basically the opportunity costs are equivalent to the resource costs. In the communication it says quite clearly that the existing methodologies to estimate resource costs and environmental costs need to be further developed. The delegate quoted from the communication: "*A wide range of methodologies have been developed to assess and evaluate environmental costs and benefits related to water use. Where mitigation measures to restore water quality or quantity can be identified, a practical way of incorporating environmental and resource costs into prices is to estimate the costs of mitigation measures and then adapt water prices and charges accordingly*."

As for the question on agricultural use, he gave two examples: "Allocation of investment and operation costs of a dam built to restore low river flows resulting from over-abstraction of adjacent aquifers can be made to the uses responsible for over-abstraction". The second example was: "Costs arising from the higher treatment level and increased treatment capacity required because of uncontrolled pollution levels can be allocated to the users responsible for the pollution".

As for the question of whether pricing would be considered in contravention of the water framework directive if it did not take into account the opportunity costs, the relevant passage of the water framework directive says: "*Member states shall take account of the principle of the recovery of costs of water services, including environmental and resource costs, in particular with the 'polluter pays' principle*." Finally the delegate added that there is scope for not applying the directive, particularly in the cases of scarcity or those sorts of issues.

As for the question about international river basins, there is a specific obligation of Member States who have part of an international river basin to establish the administrative capacities, necessary to work together with the other Member States involved and to report all river basin management plans that would be reviewed jointly by the Member States and the Commission.

**Antitrust cases**

The **Chairman** noted that as the industry is heavily regulated, there were only a few submissions that referred to antitrust cases in water. The United States has a case of a multi-utility, facing competition in electricity and not in water, refusing to supply water if not associated with an electricity contract. The Chairman asked the delegation from the United States for a description of the case and the solution that was found.

A delegate from the **United States** explained that the U.S. has a very decentralised water system, with around 54 000 community water systems in which most activity occurs at the local municipal level. That means that apart from environmental issues there is little expertise in the federal government. However the topic is very timely particularly because of the aging infrastructure, which is a large part of the cost of water-delivery (the estimated costs of infrastructure, replacement and maintenance are expected to exceed 300 billion dollars).

In a case from 1998, the Department of Justice (DOJ) brought a case against the city of Stilwell, Oklahoma. The city was the monopoly provider of water and sewage treatment within its own territory, but it was also a provider of electricity in that area. At a certain point a neighbouring rural electric cooperative began to compete and offer to provide electricity, and the city responded by tying its electricity provision to its wastewater and water delivery, so that if consumers wanted to get water they also had to take the electricity from the city. It was a pretty straightforward anticompetitive tying arrangement so the DOJ intervened and sued the city. After a couple of years of litigation the parties eventually agreed to settle the case, by not tying those services and by making it very clear to the customers that there was no tie and that customers were free to choose whichever electricity service they preferred.

The **Chairman** turned to Poland and noted that there are a few Polish cases in the water sector. One of them was against a water supplier that was charging too high price. The defence was that the price had been approved by city council. Nonetheless the competition authority was able to intervene, which would be impossible in most jurisdictions, where determination by a public authority would not be eligible for a competition authority intervention and the authority could only use advocacy powers. The Chairman asked about the legal framework that has allowed the competition Authority to intervene.

A **Polish** delegate stated that municipalities, while self-governing, are also public administration bodies, therefore their decisions and resolutions are subject to review. In certain situations the decisions of the municipalities might be reviewed by the Office for Competition and Consumer Protection (OCCP). The mechanism that allowed the OCCP to intervene in this case can be derived from the Polish competition law. The scope of the Polish competition law covers the whole economy, without any exceptions; therefore it does refer to the relations between the water supplier, which was the municipal service company, and its costumers.

Water supply is a natural monopoly therefore when the municipalities are involved in tariff-setting they are also involved at a certain level in the conduct of the undertaking with the dominant position. In this sense the activity of the municipality falls under the scope of the Polish competition law and the decision in adopting a tariff could be investigated by the OCCP.

The **Chairman** asked if the reason was that the municipality had not established an independent regulator, so there was no independence between who was deciding on the tariffs, and who was running the company.

A **Polish** delegate answered that the municipal service companies are the bodies which are organisationally separated from the municipalities, however the owner and in fact the manager of those municipal service companies is the municipality itself. So to a certain extent there was a separation.

**General discussion**

A delegate from **France** explained that although they did not submit a contribution, the Competition Council has a note on its case law in the water sector in the past three or four years. In France water is a local service in a communal framework. The local communities have a choice between two possible management systems. One is the direct service by the municipalities where the territorial communities finance the necessary equipment and maintain the service and its management. The municipality assures the functioning of the production, the distribution and the control by its internal service. Around 25% of France is supplied by this way.

The second way of operating the system is called the delegated management or concession, which supplies 75% of France. In the market for provisioning the distribution of water, the public communities are on the demand side and they seek a service provider who delivers water to the final consumer. The majority of the supply side of that market is shared by three big groups: Vivendi with 51% of the market; Suez-Lyonnaise des Eaux with 24% and Bouygues-Saur with 13%.

In a number of cases it was found that they fall under the scope of the administrative law, but in the two most important decisions the competence of the Competition Council was found. Particularly in one of them, in July 2002, the Council found the two biggest operators to be involved in a collective abuse of their dominant position. The most interesting point in this case was that the Council intervened on the boundaries of competition and administrative law. Another case was based upon the exploitation of their dominant position by the structural links between them. The Council requested of the Ministry of Economy and Finance a structural decision to separate those firms operating as municipal companies and to enjoin

the groups of firms to cancel their agreement concerning the municipal subsidiaries. The French delegate noted that in the Competition Council's history this was the first decision of this type. In 2003 the appeal court of Paris confirmed the Council's decision about the structural separation.

Another decision which was not brought by the Competition Council, but the Council of State showed a considerable evolution of the administrative jurisdiction. By this decision the Council of State annulled a ministerial judgement which regulated the conditions of remuneration and wage-earners, and which imposed on the private sector firms to remunerate and take into account all the guaranties of a public or a municipal firm.

A delegate from the **Chinese Taipei** noted that a few years ago the CTFTC conducted a survey, whether to privatise the water supply sector or not. The paper suggested that the government was trying to pursue the approach of privatisation but it did not reflect the approach that the CTFTC received among policy makers and the general public.

One aspect to be identified is the efficiency issue; as an economic good, water is both low cost and low price. In Chinese Taipei the government provides heavy subsidises water prices. So people in the industrial or agricultural sector do not feel the strong need for reform in the water sector, because the price is so low. The second point is the question of allocation. Chinese Taipei has a strong semi-conductor industry, which consumes a lot of water. In the past several years whenever the government wanted to establish a science park or to establish an industrial zone, they had to allocate the water, traditionally used by the farmers, to the industrial sector.

In Chinese Taipei, although many farmers for centuries used water, the government has managed to provide water for agricultural use. But when the government changes its policy, farmer complaints are limited, because they believe that they do not have the right to protest. So the second point they made is the importance of the property right's regime. Without state control of water, any measure for change would be difficult.

A delegate from **Denmark** asked the delegation of the United Kingdom and the Netherlands to briefly summarise their experience with third party access, in relation to the possibility of establishing direct competition.

A delegate from the **United Kingdom** answered that in the United Kingdom there are various forms of direct competition in the water industry; the first is the inset appointment regime. According to this, any large costumer that uses more than a 100 million litres a year can act to be supplied by any water company in the UK. It has to be one particular site where another water undertaker can come in and supply. This has happened in a few relatively new cases, for example in the north-west of England. This has to be regulated or checked to make sure that the terms of that agreement are fair, but in practice this is supposed to be more competitive and provide businesses that could provide water more cheaply to the company.

The second area is common carriage, in which the new entrant or other water companies are using the pipes of the incumbent firm to supply their own water to a costumer. That happens in very few cases, because it is difficult to negotiate between the incumbent and the new entrant on the exact terms of the access, and the access pricing. The new water legislation in 2003 will set out and codify the rules on access and the different requirements of quality and environmental standards on the new entrants and the incumbent, which should hopefully facilitate competition. The details on the access price regime are still being developed. It is quite stringent, only for large users over 50 million litres a year, which covers about 2000 costumers in England and Wales, as the government decided that it wants to start slowly and cautiously in introducing competition, to see how it works with large users first.

The **Chairman** then turned to a representative from the Environment Directorate of the OECD Secretariat and asked for his comments and reflections.

**Peter Borkey** explained that most of their work is outreach in the framework of co-operation programs with the countries of the former Soviet Union and with China, but they also monitor very closely what OECD countries are doing in the water sector in order to be able to transfer the relevant OECD experience to countries in those two regions.

Their main focus is clearly on supporting the legal and institutional changes that would support greater efficiency in the water sector, but also simultaneously to ensure the high quality of the water delivered as well as protecting the poorer sections of the population and ensuring that they maintain their access to water. The focus is essentially on water supply and sanitation and not on resource allocation and other resource-related issues.

There has been a major debate on the benefits of the public-private partnerships or installing of some degree of competition into the water sector. The Environment Directorate can not see at this stage any conclusive evidence of whether the privately operated water sector or the publicly operated water sector is really the superior. Some research in the countries of central Europe tends to confirm that public and privately operated utilities operate at similar efficiency levels. Water has a very strong natural monopoly characteristic, and markets need to be very strongly regulated, therefore one of the key issues of regulating the water sector is the information asymmetry issue between the regulator and the utility.

In this sense benchmarking is a very important tool to help overcome the key problems in the water sector. Benchmarking can equally be beneficial in many contexts, both where utilities would be publicly owned, but also in contexts where there is competition for the market. Water is mostly a local issue and actors at the local level have limited capacity. A city hall may renegotiate its concession every 10-20 years while private water companies negotiate every day, so the town hall has a knowledge disadvantage. As the Environment Directorate has observed, once you introduce a mandatory reporting requirement and publicise the performance data, there are immediate positive results in the sector.

The **Chairman** concluded by remarking that the roundtable suggested that water is a natural monopoly, highly regulated, with not much room for competition in domestic markets. However there is indeed scope for competition in the water sector for the supply of water and waste water services to industrial and commercial customers and in the wholesale market, and also some room for other market mechanisms, especially for proper pricing of water. The opportunity cost of water in regimes of scarcity is quite important in order to drive both household consumers and industrial and agricultural consumers. The Chairman referred to the intervention from Chinese Taipei where indeed the issue of different stakeholders in water was addressed.

Without a proper pricing mechanism and without being aware of the costs involved in the use of water, any policy can only be of a rationing type and it is very difficult to get right in terms of allocative efficiency. In a sense public investment can also be driven by pricing consideration. The infrastructure in place is certainly not like in electricity or gas, where there is a national pipeline in water. Pricing can enhance public investment or private investment in the construction of the proper infrastructure, because markets can only operate if there is a possibility to move water, otherwise activity must occur at the local level. The Chairman expressed his hope that with the development of independent regulators and with the development of greater regulatory efficiency, some steps forward can be made in identifying proper costs and proper pricing for water.

# RÉSUMÉ DE LA DISCUSSION

## Introduction

Le **Président**, Alberto Heimler, ouvre les débats en notant que parmi tous les secteurs analysés par le Groupe de travail n° 2, l'eau, au premier abord, se prête moins que les autres à une réflexion sur la concurrence. Il est communément admis que ce secteur se caractérise par une situation de monopole naturel et n'est guère propice à des systèmes concurrentiels. Toutefois, les documents soumis pour la table ronde laissent entrevoir des possibilités de régulation par le marché pour l'approvisionnement en eau. Tous s'accordent à considérer qu'il s'agit à bien des égards d'un monopole naturel, mais divergent sur le rôle des mécanismes de marché qui ont pu être mis en pratique.

Le document de référence établi par le Secrétariat donne un aperçu des grands enjeux. Dans la plupart des pays, le coût et le prix de l'eau sont d'ordinaire peu élevés. L'eau est une ressource renouvelable, produite année après année, dont le coût ne dépasse pas en principe celui du traitement. Elle est transportée sur des distances assez courtes. Les infrastructures mises en place ne sont généralement pas reliées à l'échelle nationale ni, bien souvent, à l'échelle régionale. Les consommateurs finals (ménages et industriels, par exemple) sont normalement raccordés à un seul fournisseur, à savoir la compagnie municipale. En outre, du fait que l'eau est relativement abondante dans la majorité des pays, les principaux problèmes débattus jusqu'à présent se rapportent à l'administration de la compagnie municipale et aux déperditions imputables au transport. Celles-ci revêtent une grande importance dans les situations marquées par des pénuries saisonnières. La privatisation a été l'un des remèdes les plus répandus à ces deux problèmes. Un des premiers objectifs visés par nombre de décideurs a consisté à élever les prix en fonction du coût de l'infrastructure, du coût d'opportunité de la source d'approvisionnement et du coût de l'assainissement.

## La solution passe-t-elle par la privatisation ?

Le Président souligne que la question du choix d'une réglementation adaptée, lorsque l'eau ne manque pas, est liée aux problèmes ci-dessus. En Suisse comme au Pays-Bas, l'offre dépasse de beaucoup la demande ; le document suisse indique que le rapport est pratiquement du simple au double. Pour la Suisse, la démocratie est en jeu dans la transformation en sociétés des fournisseurs d'eau. Le Président observe que d'après le document, l'eau de ce pays, aussi abondante soit-elle, n'est pas exportée.

Le document ajoute que, du fait qu'elle constitue une ressource naturelle, l'eau doit rester sous le contrôle de l'Etat. Le Président s'interroge sur les caractéristiques de l'eau qui justifient qu'elle ne soit pas envisagée de la même manière que les autres types de ressources naturelles. Le document soumis par la Suisse met en balance la démocratie et l'efficience. Le Président invite la délégation de ce pays à expliquer pourquoi ce raisonnement s'applique exclusivement à l'eau et non à d'autres services d'utilité publique d'importance égale, sinon plus grande encore.

Un délégué de la **Suisse** précise que dans son pays, l'approvisionnement en eau est fortement décentralisé, et que les municipalités sont seules compétentes en dernière analyse. D'où l'existence de quelque 3 000 fournisseurs d'eau. A l'échelle municipale, le système politique répond à la définition de la démocratie directe : les organes de décision sont les assemblées de citoyens, auxquelles sont conviées à prendre part l'ensemble des personnes qui résident dans la municipalité considérée. Toutes les décisions relatives à l'eau sont examinées à ce niveau.

Etant donné que l'eau, plus que tout autre bien public, met en jeu des questions sensibles liées aux droits humains, une certaine frilosité est à signaler envers la libéralisation, la privatisation ou même la transformation en société anonyme. Toutefois, les réticences sont moins marquées s'il s'agit de sous-traiter l'exploitation, sous réserve que les décisions stratégiques fondamentales demeurent la prérogative du secteur public.

Le délégué de la Suisse évoque ensuite l'exemple de l'approvisionnement en eau dans la région de Zug, assuré par une entreprise privée depuis la fin du XIXème siècle ; à l'époque, confrontée à de graves problèmes financiers, la municipalité de Zug a accordé une concession à cet effet à un fournisseur privé. Toutefois, le contrôle exercé par la collectivité est très fort, surtout dans le domaine de l'approvisionnement en eau. En dépit de ses résultats concluants, cette entreprise s'est heurtée à des difficultés pour se développer et acquérir d'autres sources d'approvisionnement dans les municipalités voisines, celles-ci n'étant pas disposées à remplacer le fournisseur public par un fournisseur privé. S'agissant des exportations, le délégué fait état d'un grand nombre de problèmes techniques dans le cas de l'eau, qui ne peut être transportée sur de longues distances.

Se tournant vers les Pays-Bas, le **Président** note qu'à la différence de la Suisse, ce pays a connu une restructuration d'envergure, puisqu'il comptait 230 compagnies en 1938, 105 en 1980 et 40 en 1994, pour passer à 14 aujourd'hui. Il s'agit de 14 sociétés à responsabilité limitée appartenant à des municipalités. Etant donné la situation de monopole naturel qui caractérise le secteur de l'eau, la propriété publique (axée sur la qualité) est de loin préférable à la propriété privée (axée sur le profit). Le Président s'interroge sur les éléments garantissant qu'une société à responsabilité limitée, au motif qu'une municipalité en est propriétaire, place la qualité avant le profit. Il se demande si la principale explication tient véritablement au fait que la société appartient à la municipalité ou si d'autres facteurs sont indispensables : mécanisme incitatif particulier à l'intention des gestionnaires, contrôle politique, etc.

Un délégué des **Pays-Bas** confirme que dans son pays, les compagnies de distribution s'efforcent d'atteindre un degré de qualité de l'eau supérieur à celui qu'exigent les lignes directrices européennes. Dans la plupart des sociétés à responsabilité limitée, les actionnaires ne peuvent intervenir dans la gestion, mais les compagnies de distribution d'eau font exception à la règle, si bien que les actionnaires y exercent une influence beaucoup plus grande à cet égard. Lorsqu'ils doivent convenir d'une tarification, par exemple, les actionnaires – soit dans ce cas les municipalités et les provinces – ont beaucoup de poids dans les augmentations de prix.

Pour l'essentiel, les municipalités et les provinces ont autorisé les augmentations de prix dès lors qu'elles se traduisaient par des investissements dans l'infrastructure ou par une qualité plus grande. Le ministère de l'Environnement, qui chapeaute les compagnies de distribution d'eau, a considéré que leur privatisation mettrait fin à ce type de contrôle politique et qu'il serait très difficile de mettre en place d'autres formes de contrôle obligeant ces compagnies de distribution d'eau à parvenir au même niveau de qualité.

Le **Président** appelle ensuite l'attention sur le Royaume-Uni et observe que ce pays a choisi de remédier à l'inefficience par la restructuration et la privatisation. Comme pour la plupart des industries ou des services d'utilité publique précédemment réglementés, la situation n'est pas la même en Angleterre, au Pays de Galles et en Ecosse. En Angleterre et au Pays de Galles, il existe à présent 10 compagnies intégrées et 14 compagnies des eaux proprement dites, contre une seule en Ecosse. Le Président souhaite savoir pourquoi les opérateurs sont systématiquement moins nombreux en Ecosse qu'en Angleterre et au Pays de Galles.

Il se demande également si la privatisation a permis de réaliser certains des objectifs visés, à savoir une efficience accrue du côté de la demande et une plus grande sensibilisation des usagers au coût

de l'eau qu'ils utilisent. Le Président s'interroge sur la possibilité d'y parvenir dans une situation où trois quarts des usagers ne sont pas équipés d'un compteur d'eau et paient une redevance sans rapport avec le volume consommé.

Un délégué du **Royaume-Uni** répond d'abord à la deuxième question, en précisant que toutes les utilisations d'eau à finalité commerciale font l'objet d'un comptage en Angleterre et au Pays de Galles. Le comptage était inexistant ou très rare en 1990 pour les ménages, mais s'applique aujourd'hui à un quart d'entre eux en Angleterre et au Pays de Galles. Le souci d'efficience l'emporte, car on recense 30 millions de ménages en Angleterre et au Pays de Galles, et l'installation de compteurs est coûteuse. Pour l'instant, quelque 250 000 compteurs sont mis en place chaque année. Le processus est dynamisé par les mesures suivantes : (1) toutes les maisons neuves doivent être équipées de compteurs au cours de la construction ; (2) conformément à une loi adoptée en 1999, tout consommateur peut demander l'installation gratuite d'un compteur. Dans certains cas, les compagnies des eaux peuvent obliger les consommateurs à s'équiper d'un compteur (s'ils disposent d'une piscine ou procèdent régulièrement à des arrosages, par exemple).

Le Royaume-Uni ne déploie pas davantage d'efforts pour généraliser le comptage car le coût de l'installation de compteurs et des relevés annuels représente 10 à 15 % environ de la facture moyenne des ménages. En outre, le système est avantageux pour les ménages qui utilisent de grands volumes d'eau alors qu'ils occupent une petite maison, et d'aucuns s'inquiètent des effets à court terme d'un comptage de leur consommation.

S'agissant de la première question sur la spécificité de l'Ecosse, le délégué explique que la privatisation du secteur de l'eau suppose une décision politique du gouvernement à laquelle, de l'avis général, les consommateurs risquaient davantage de s'opposer qu'en Angleterre et au Pays de Galles. Dernièrement, l'Ecosse a fusionné trois compagnies des eaux en une, à la différence de l'Angleterre et du Pays de Galles qui ont maintenu en place plusieurs compagnies exerçant la même activité. La nouvelle instance de réglementation instituée en Ecosse compare attentivement les résultats de la compagnie des eaux écossaise avec ceux des compagnies anglaises et galloises.

Le **Président** interroge la délégation britannique sur les objectifs de la privatisation et demande si les résultats de celle-ci ont donné lieu à une évaluation favorable.

Un délégué du **Royaume-Uni** répond que la privatisation est généralement jugée concluante. Schématiquement, le gouvernement avait deux raisons de soutenir la privatisation. Premièrement, la situation devait être plus intéressante pour les opérateurs privés et, deuxièmement, compte tenu de la rigueur croissante de la législation européenne en matière de normes environnementales, le gouvernement a estimé que les consommateurs devaient supporter ces nouveaux coûts par le biais de leur facture d'eau.

Les gains d'efficience apportés par la privatisation ont représenté approximativement 19 % par ménage pour l'approvisionnement en eau et un peu moins pour l'assainissement. Les factures d'eau ont grimpé, en dépit des économies réalisées, du fait de l'amélioration de la qualité. Dans l'ensemble, la privatisation s'avère utile. Toutefois, les compagnies sont très rigoureusement encadrées, et il ne saurait être question de marché libre.

Le **Président** souhaite savoir s'il existe des antennes locales ou des effectifs déconcentrés ou si le travail est entièrement centralisé à Londres.

Un délégué du **Royaume-Uni** répond que toutes les activités sont gérées à partir de Birmingham. Les WaterVoice Committees, au nombre de dix, représentent les intérêts des consommateurs dans les différentes régions, mais à toutes fins pratiques il existe un seul régulateur central.

**Processus d'appel d'offres**

Le **Président** passe ensuite à la question des appels d'offres. Il constate que la privatisation n'implique pas nécessairement que les droits de propriété sont intégralement transférés par les compagnies des eaux à des investisseurs privés. La privatisation peut aussi résulter d'un processus d'appel d'offres selon lequel l'exploitation d'une compagnie des eaux est sous-traitée pendant une période donnée via l'octroi d'une concession ou d'une licence. Sur la plupart des territoires, et aux termes de la réglementation de l'UE, l'appel d'offres ne prend force obligatoire que quand la municipalité n'est plus disposée à assurer elle-même son approvisionnement et que plusieurs prestataires entrent en concurrence.

Au Danemark, l'autorité chargée de la concurrence a pris part à un groupe d'étude en vue de déterminer la marche à suivre pour améliorer l'efficience de l'approvisionnement en eau. Le secteur est très morcelé dans ce pays, où on dénombre 2 800 compagnies des eaux, dont 166 compagnies appartenant à des municipalités. Dans le processus danois d'appel d'offres, une compagnie privée peut évincer la compagnie municipale si elle est plus efficiente. Le Président invite la délégation danoise à expliciter le fonctionnement du système et les raisons qui ont conduit à l'adopter.

Le délégué du **Danemark** commence par rappeler que le secteur de l'eau se prête à une certaine concurrence, directe ou indirecte. Son pays, ajoute-t-il, est associé à une réflexion sur les moyens de mettre en pratique la concurrence dans le secteur de l'eau. En réponse à la question posée, il indique que la possibilité de rivaliser avec la municipalité correspond à un droit plus général s'étendant à tous les secteurs. Il s'agit d'un droit tout nouveau qui n'a été exercé que dans sept cas par des compagnies privées vis-à-vis de compagnies publiques, et ce dans des secteurs autres que l'eau.

Deux dispositifs récents tendent à se répandre au Danemark : le droit d'entrer en concurrence avec les services publics et la loi sur la stratégie municipale en matière de services. Certaines exceptions aux droits de concurrencer les services publics sont prévues (sont notamment exclues les tâches municipales touchant à l'autorité publique et les tâches entrant dans l'exécution des appels d'offres). Le seuil à respecter va de 66 000 euros à 300 000 euros environ.

Le **Président** se tourne ensuite vers la Hongrie et fait observer que dans ce pays, l'approvisionnement est assuré à 75 % par les municipalités. Dans bien des cas, les services sont sous-traités, généralement par le biais d'appel d'offres. Le Président souhaite que des précisions soient apportées sur les caractéristiques de ces appels d'offres et demande s'il existe des compagnies des eaux d'envergure nationale ayant acquis des compétences spécifiques ou si les soumissionnaires sont des compagnies locales.

Un délégué de la **Hongrie** rappelle que ces appels d'offres sont visés par la loi sur les marchés publics. Au-delà d'un montant donné, tout investissement ou accord tombe sous le coup de cette loi. Il s'agit soit d'appels d'offres ouverts, auxquels les entreprises peuvent participer librement, soit d'appels d'offres sur invitation. Souvent, ils font l'objet d'annonces publiques parce qu'ils portent non seulement sur la sous-traitance des services mais aussi sur la mise en place de l'infrastructure, surtout dans les villages ou les petites localités.

Il n'existe pas de compagnie des eaux nationale, si bien que des entreprises locales ou régionales répondent à ces appels d'offres. Le plus souvent, les services liés à l'eau sont assurés par les municipalités. Le choix se fonde essentiellement sur le prix proposé par les entreprises, mais aussi sur d'autres facteurs tels que la qualité escomptée du service fourni. L'entreprise retenue n'a pas toujours été la moins coûteuse, car le montant proposé était parfois si faible que la municipalité l'a jugé insuffisant pour couvrir le coût réel de l'investissement, et a considéré qu'elle risquait d'être mise à contribution.

S'agissant du Portugal, le **Président** souhaite savoir si l'octroi de concessions est ouvert à la concurrence. Il se demande également s'il existe un processus d'appel d'offres et si le secteur privé est véritablement présent sur le marché de l'eau portugais.

Un délégué du **Portugal** indique qu'il y a dix ans, le système était très morcelé dans son pays et comptait plus de 300 opérateurs municipaux différents. La réforme du système s'est traduite par la répartition des opérateurs entre deux niveaux. Le premier niveau, à l'échelle régionale, comprend les gros opérateurs desservant plusieurs municipalités (systèmes centralisés), qui se chargent des tâches de prélèvement, de traitement et de transport liées à la distribution d'eau, ainsi que du traitement et du transport liés à l'évacuation des eaux usées. A ce niveau, une concession est accordée par l'Etat sans mise en concurrence à une entreprise publique. Le deuxième niveau, à l'échelle locale, englobe les municipalités auxquelles incombent la fourniture d'eau et la collecte des eaux usées. A ce niveau, les municipalités peuvent exploiter elles-mêmes le système de services ou en accorder la concession à des entreprises privées sur une base concurrentielle.

En ce qui concerne le rôle des opérateurs privés, le secteur compte pour l'instant quatre grandes entreprises privées, et cette participation tend à se développer sous trois formes : aux contrats d'exploitation et concessions s'ajoutera probablement à l'avenir une participation minoritaire aux concessions initialement accordées au niveau régional pour plusieurs municipalités.

Le délégué signale en conclusion que l'autorité de tutelle instaurée en 2000, à des fins de régulation structurelle, est chargée de contrôler les tarifs pratiqués par l'opérateur et la qualité du service.

A propos du document soumis par le Mexique, le **Président** signale que d'après la constitution de ce pays, l'eau est propriété fédérale, mais que dans la plupart des Etats la prestation des services correspondants incombe aux municipalités. La ressource est peu abondante dans certaines régions du pays, problème aggravé par le défaut de paiement et les fuites. Les tarifs ne sont pas fondés sur la consommation et n'incitent pas à économiser l'eau. Depuis 1992, les projets privés de construction-exploitation-transfert d'infrastructures liées à l'eau sont encouragés. Le Président demande à la délégation mexicaine d'expliquer comment fonctionne le système, notamment en matière de prix, et de faire savoir si le gouvernement fédéral ou local garantit aux investisseurs que les prix n'évolueront pas durant la période pour laquelle leur est accordée la possibilité d'exploiter les installations.

La constitution, souligne un délégué du **Mexique,** stipule que les sources d'eau relèvent de la propriété nationale et que les autorités fédérales sont habilitées à réglementer l'accès à ces sources, mais précise par ailleurs que l'approvisionnement des ménages incombe aux municipalités. En 1992, l'instauration d'une nouvelle loi sur l'eau a donné lieu à un organisme de réglementation fédéral bien distinct, qui a favorisé la participation du secteur privé à la gestion du réseau. Dans les zones urbaines, ce pays est notamment confronté au problème des fuites, puisque les pertes représentent 30 % de l'approvisionnement total, et des impayés qui équivalent à 30 % environ. Les municipalités n'ont pas la faculté de suspendre la fourniture d'eau, sauf si la législation de l'Etat l'indique expressément ; or cette disposition figure dans la législation de 50 % seulement des Etats.

Quelque 60 % du total de l'approvisionnement des ménages en eau est assuré par des entités privées. Dans les cas de Cancun et d'Aguascalientes, celles-ci ont remporté les enchères ouvertes parce qu'elles proposaient les coûts les plus faibles d'exploitation, de construction et d'entretien de l'infrastructure. Toutefois, les tarifs ont été relevés par suite de la crise financière en 1996. Compte tenu des enseignements tirés à Aguascalientes, les autorités de Mexico ont décidé de ne pas privatiser entièrement le réseau. En résumé, le contrat d'alimentation en eau est mis aux enchères, mais l'encaissement des factures reste du ressort des pouvoirs publics. La principale amélioration, à en juger par ces exemples, réside dans l'augmentation de 12 à 15 % du taux de recouvrement et la diminution de 12 à

15 % des fuites. Au vu de ces chiffres, l'organe réglementaire fédéral est favorable à une participation encore plus dynamique du secteur privé.

Le **Président** attire ensuite l'attention sur les problèmes d'évaluation comparative et note que si l'appel d'offres permet d'introduire une concurrence indirecte, on peut aussi faire appel à l'étalonnage. L'un des exemples les plus connus de réglementation par l'étalonnage concurrentiel est celui du secteur de l'eau en Angleterre et du Pays de Galles, rapporté par le Royaume-Uni.

Se tournant vers la délégation du Royaume-Uni, le Président lui demande de faire le point sur ce système. L'étalonnage concurrentiel constitue manifestement une incitation accrue en faveur de l'efficience, mais suppose que l'instance réglementaire emploie des méthodes complexes pour déterminer, tout d'abord, quels sont les opérateurs les plus efficients et, ensuite, comment imputer les coûts de cette efficience aux fournisseurs les moins performants. Il est en général difficile de comparer différents fournisseurs ; le manque d'efficience n'est pas facilement repérable car le fournisseur peut toujours faire valoir que ses coûts ne sont pas comparables parce que les consommateurs ne sont pas répartis géographiquement de la même manière, par exemple.

Par ailleurs, l'étalonnage est d'autant plus compliqué que l'exploitant moins performant doit supporter les coûts de son manque d'efficience puisque ses prix doivent être inférieurs au niveau qu'il juge souhaitable. Le Président invite la délégation britannique à donner des précisions sur les problèmes rencontrés par l'instance de réglementation au cours de l'étalonnage et demande si les compagnies des eaux jugent le processus suffisamment explicite. Il voudrait également savoir si l'amélioration des performances se poursuit au même rythme à mesure que le système évolue ou si elle est plus prononcée durant les premières années.

Un délégué du **Royaume-Uni** convient que l'étalonnage concurrentiel peut être compliqué, mais que certains éléments sont comparables d'une entreprise à l'autre, à commencer par les coûts encourus pour mettre une même eau en conformité avec la norme de potabilité par un traitement ordinaire. D'autres aspects varient également selon les compagnies des eaux : certaines effectuent davantage de prélèvements dans des cours d'eau, généralement plus pollués que l'eau des réservoirs. S'ajoutent des différences en termes de distribution. Compte tenu de la densité des consommateurs dans le sud-est de Londres, l'eau y est bien meilleur marché, rapportée au nombre d'habitants, que dans le sud-ouest plus rural où elle doit être transportée sur de longues distances.

Ces facteurs sont pris en compte par l'analyse statistique et la modélisation économétrique. Le modèle Aquarius-3 vise à admettre un nombre de facteurs aussi grand que possible et à offrir une souplesse optimale. Cependant, une fois que les différences évoquées ont été intégrées, un réel écart d'efficience demeure entre les compagnies des eaux (il est de 30 % entre la moins performante et la plus performante). L'objectif est donc de rapprocher les moins performantes du meilleur niveau de résultats. En outre, certaines compagnies se prêtent mal à des comparaisons ; la plus efficiente est une petite compagnie des eaux qui ne saurait guère servir de référence pour les 10 grandes unités de distribution et d'assainissement.

Cette démarche s'avère fort intéressante car elle a permis de repérer les compagnies les moins performantes et de leur imposer des plafonds de prix plus rigoureux, compte tenu des gains d'efficience plus importants à réaliser. A cet égard, les progrès tendent à ralentir. Depuis le début du processus, en 1989, les principales lacunes ont été mises en évidence et surmontées. Il va maintenant falloir proposer des mesures plus incitatives en faveur de nouvelles améliorations, ne serait-ce qu'en offrant aux compagnies des avantages accrus si elles sont à la limite de l'efficience, et progresser plus avant.

Le **Président** poursuit en faisant observer qu'en Angleterre et au Pays de Galles, un certain nombre d'entreprises intégrées de distribution d'eau et d'assainissement coexistent avec de simples

compagnies des eaux. Il se demande si des économies de gamme peuvent être réalisées par une entreprise intégrée, en comparaison avec deux activités indépendantes.

Un délégué du **Royaume-Uni** répond que son pays a publié en janvier un rapport qui sera mis à profit par le prochain mécanisme de fixation des prix. Il ressort que la distribution d'eau et le traitement des eaux usées ne se distinguent guère par des économies de gamme, et que la taille n'apporte au demeurant aucune économie particulière dans le secteur de l'eau. Toutefois, par rapport à la distribution et à l'assainissement, il existe d'importantes économies de gamme en cas d'intégration verticale, allant du prélèvement de l'eau jusqu'à son arrivée au domicile de l'usager.

**Définition du marché**

Le **Président** passe ensuite aux problèmes de définition du marché et rappelle le caractère indéniablement local du marché, puisque les consommateurs finals ne peuvent guère s'adresser à d'autres fournisseurs d'eau, alors qu'il en existe des milliers dans beaucoup de pays. A l'échelle locale, l'eau donne lieu à un monopole naturel. Le marché est plus vaste à l'échelle du bassin hydrographique dans lequel s'inscrit une localité donnée. Aussi peut-on parler d'une certaine concurrence entre localités, et d'une rivalité entre utilisateurs.

L'enjeu le plus important, et le plus délicat, du secteur de l'eau consiste à faire en sorte que la ressource soit utilisée par les usagers, ou les groupes d'usagers, qui en ont le plus besoin. L'eau vient parfois (naturellement) de loin, si bien que l'approvisionnement local peut être modifié, dans un sens favorable ou défavorable, par les comportements en amont. Un marché peut se développer pour l'alimentation en eau d'une certaine zone, compte tenu de toutes les utilisations envisageables dans cette zone et dans l'ensemble de l'espace considéré.

Dans bon nombre de pays, la réglementation a été dans un premier temps axée sur certaines externalités à l'intérieur des frontières. La qualité de l'eau potable et la norme minimale applicable aux eaux usées sont définies à l'échelle nationale. Toutefois, en cas de pénurie, une coordination s'impose entre les régions En Italie, une nouvelle législation vise à définir le territoire optimal pour la gestion de l'eau. L'objectif initial était d'instituer des agences de bassin. Le pays a été ainsi découpé en 84 territoires. On n'a cependant pas créé de marché des droits sur l'eau. Le Président demande que soient précisés les avantages et les inconvénients de la structure réglementaire italienne dans l'optique de l'intégration interrégionale.

Un délégué de l'**Italie** explique que ce pays dans son ensemble n'est pas exposé à une raréfaction des ressources en eau. En 1994, l'Italie a engagé un important processus de réforme lié à l'utilisation de ces ressources par les particuliers. A vrai dire, le système d'approvisionnement manquait d'efficience au début des années 90, premièrement, parce que la structure des prix était indépendante des coûts et, deuxièmement, parce que les entreprises étaient très nombreuses dans le secteur. La loi de 1994 a délimité des bassins territoriaux optimaux (ATO) pour la gestion de l'eau destinée aux particuliers. Les autorités chargées de chaque ATO ont été invitées à évaluer les plans et services existants, à établir un programme d'investissement et à contrôler le comportement de la société gestionnaire tout au long du cycle de l'eau.

En vertu d'une réforme récente, axée sur la recherche d'économies d'échelle, la taille de l'unité d'exploitation doit être déterminée par la législation sur la division du pays en grands districts, étant entendu qu'une seule unité gère en principe l'ensemble du cycle de l'eau. Du fait que les compagnies locales ne sont pas certaines de pouvoir garder leur concession, elles sont davantage incitées à accroître leur efficience et leur rentabilité. Par suite de la nouvelle législation, les compagnies s'efforcent d'étendre leurs activités au-delà des villes. Dans bien des cas, elles ont conclu des accords avec d'importants groupes nationaux et internationaux pour créer des entreprises conjointes, et cherché à s'imposer à l'échelle

nationale pour la fourniture d'eau, tandis que les petits et moyens exploitants optent pour une stratégie essentiellement régionale.

La réalisation du principal objectif de la loi 36/94 se heurte au fait que l'administration régionale n'a pas toujours déterminé les ATO en fonction des limites naturelles des bassins hydrographiques, mais s'est contentée de reproduire les limites administratives des provinces. Or une telle définition du marché n'est pas propice à la gestion optimale des ressources en eau ni au partage de l'entretien des cours d'eau entre municipalités.

Le **Président** reconnaît qu'il est difficile de procéder à un découpage administratif sans revenir à une forme quelconque de fixation des prix par le marché ou d'autres signaux économiques, l'instance publique ne renonçant pas volontiers à ses prérogatives, d'où la nécessité d'un compromis politique entre les administrations concernées sur la manière de délimiter les marchés de l'eau.

Le Président passe ensuite aux problèmes d'insuffisance de la ressource et note que la plupart des pays parent aux pénuries, surtout si celles-ci ont un caractère saisonnier ou exceptionnel, par le rationnement. La tarification au juste prix est peut-être peu répandue faute de comptage des quantités consommées. La flexibilité des prix est particulièrement importante dans les pays où la sécheresse du climat et la rareté de l'eau sont véritablement préoccupants.

A propos du document soumis par l'Australie, le Président fait remarquer que ce pays a choisi de revoir les prix (en optant pour un tarif binôme), d'établir des droits sur l'eau distincts des droits sur les terres, de donner un caractère négociable aux droits sur l'eau et de réformer les mécanismes institutionnels liés à cette ressource. La structure de la consommation n'est guère différente en Australie de celle qui prévaut ailleurs : 70 % pour l'agriculture, 8 % pour les ménages et 6 % pour les activités manufacturières. Les pouvoirs publics favorisent l'échange de droits sur l'eau entre districts, Etats et territoires. Le Président demande si le tarif binôme tient également compte de critères saisonniers et, par ailleurs, si les résultats effectivement obtenus laissent bien augurer du système d'échange.

Un délégué de l'**Australie** déclare que par suite d'un épisode de sécheresse sur la côte orientale du pays, l'utilisation de l'eau a été soumise à des restrictions en ville. La sécheresse n'a pas conduit à établir un lien entre rareté et tarification, mais à l'échelle des Etats comme à l'échelle locale, les autorités ont saisi cette occasion pour sensibiliser le public et réduire la demande (limitation de l'arrosage aux moments les plus chauds de la journée, pas de lavage au jet d'eau des voitures et voies d'accès, etc.). La modification des tarifs en milieu urbain a contribué à faire reculer la demande et entraîné des prolongements en termes d'investissement pour les compagnies des eaux (réexamen de l'investissement destiné à des barrages, par exemple). La portée que doit avoir la réforme de la tarification est encore à définir, mais l'utilisation de compteurs a un coût. Pour l'heure, il s'agit surtout d'inciter les consommateurs à réduire le gaspillage de l'eau, parallèlement à la restructuration tarifaire. S'agissant des droits sur l'eau négociables, l'Australie a marqué d'importants progrès dans la mise en place de l'infrastructure d'échange, bien qu'il soit trop tôt pour en apprécier l'efficacité.

Le délégué rappelle que les agriculteurs ont obtenu, indépendamment de leur titre sur les terres, des droits sur l'eau qu'ils peuvent échanger à l'intérieur de certaines zones géographiques. L'infrastructure nécessaire est en place, mais l'efficacité de sa mise en oeuvre et diverses modalités restent à déterminer.

Pour une large part, indique le **Président**, les documents communiqués et la réflexion portent sur la tarification applicable aux ménages et aux usagers industriels et agricoles. Or, dans beaucoup de pays, les prix pratiqués sont bien inférieurs aux coûts ; aussi le Président demande-t-il si, en Australie, la récupération des coûts est effectivement assurée pour les utilisations agricoles ou industrielles.

Le délégué de l'**Australie** se réfère au document soumis par son pays, dans lequel est retracé un programme de réforme ambitieux remontant à 1994. Ce programme de réforme a imposé la fixation de prix rendant mieux compte des coûts et la mise sur pied d'infrastructures et de mécanismes institutionnels tels qu'une instance de réglementation indépendante.

Le **Président** se tourne vers la Pologne et note que si la coordination interrégionale est réalisable à l'intérieur d'une même juridiction, la prise en compte des externalités à l'échelle internationale ne va pas de soi. Le document polonais cite l'exemple d'une ville située à la frontière avec la République tchèque, qui a préféré s'approvisionner en eau auprès d'un fournisseur tchèque. Le Président demande comment s'est effectué ce choix et souhaite savoir s'il a résulté d'un processus d'appel d'offres.

Un délégué de la **Pologne** commence par décrire la situation du marché de gros de la fourniture d'eau. La région visée est desservie par une grande entreprise d'Etat polonaise. La plupart des municipalités doivent en principe recourir à ses services, mais l'une d'entre elles, à proximité de la frontière, a décidé de se tourner vers le fournisseur en gros de la République tchèque. Les villes étant proches l'une de l'autre, cette coopération passe pour une forme de coordination régionale et non d'échange international de ressources en eau.

En ce qui concerne la méthode de sélection du fournisseur en gros, les municipalités ont procédé à une analyse comparative des coûts. En l'occurrence, il n'existait que deux fournisseurs, le fournisseur tchèque et le fournisseur polonais en situation de monopole, et les coûts étaient bien moins élevés du côté tchèque. Autre fait important, la fourniture d'eau en gros n'est pas réglementée en Pologne. Elle entre non pas dans le champ de la loi sur les systèmes collectifs d'approvisionnement en eau et de traitement des eaux usées qui définit le cadre réglementaire de la fourniture d'eau à l'utilisateur final, mais dans celui des activités commerciales ordinaires.

S'agissant plus précisément de la dimension internationale, le **Président** se tourne vers l'Autriche et observe que les marchés de l'eau ne se limitent pas à l'échelle nationale dès lors qu'une source d'approvisionnement, telle qu'un cours d'eau ou un aquifère, peut desservir plusieurs pays. Même si, dans un pays donné, elles ne constituent pas les principales sources d'eau, l'usage qui en est fait peut se répercuter sur les pays situés en aval. L'Autriche tire l'essentiel de son eau de sources souterraines, bien qu'elle soit traversée par le Danube. Le Président interroge la délégation autrichienne sur les rôles respectifs du Danube et des eaux souterraines, et sur les projets d'échange international de droits sur l'eau ou de permis de polluer.

Le délégué de l'**Autriche** fait remarquer que le système d'approvisionnement en eau de son pays est très différent des autres à certains égards. L'Autriche utilise 5 % environ des réserves d'eau annuelles. Près de 100 % de l'eau potable provient de sources souterraines de bonne qualité, si bien qu'il n'est pas nécessaire de la traiter, ou qu'un traitement très simple suffit. Seule une faible proportion de l'eau du Danube est utilisée à des fins de refroidissement. En règle générale, la fourniture d'eau est assurée par les municipalités, qui de ce fait en fixent le prix.

L'Autriche nourrit les plus expresses réserves vis-à-vis des droits sur l'eau et permis de polluer négociables. Pour l'instant, ce pays considère que le réseau physique n'est pas convenablement défini. Le réseau physique sous-jacent dans le bassin du Danube englobe, premièrement, les rejets polluants de types et d'origines différents imputables à des sources ponctuelles ou diffuses, deuxièmement, le transport et la transformation de ces rejets en aval et, troisièmement, leurs effets sur les eaux réceptrices de la mer Noire. Tous les phénomènes ci-dessus peuvent être observés dans l'environnement, mais ne peuvent être évalués de telle manière qu'un modèle ou un ensemble de modèles dûment validés permettent de prévoir les effets avec l'exactitude et la précision voulues.

Qui plus est, dans le bassin hydrographique du Danube, la pollution ponctuelle s'ajoute à des rejets diffus (par exemple, dans les cas où le phosphore n'est pas rejeté à partir des canalisations, mais peut atteindre le réseau fluvial via l'eau souterraine, les tuyaux de drainage en poterie, le ruissellement de surface ou l'érosion du sol). L'ampleur de cette pollution diffuse ne peut donner lieu qu'à des estimations rudimentaires, dont la fiabilité laisse à désirer.

A l'évidence, l'épuration naturelle aidant, la charge polluante tend à diminuer vers l'aval. Plus le point de rejet est éloigné, moins la probabilité est grande que la pollution phosphorée porte atteinte à la flore de la mer Noire. La charge effective apportée à la mer Noire ne peut être chiffrée avec l'exactitude et la précision que suppose l'échange de permis de polluer. Il est difficile de déterminer des seuils en termes de total admissible de rejets phosphorés parce que le lien entre le coût et le résultat n'est pas univoque ; la complexité est accrue par le fait que la charge polluante est de plus en plus réduite en aval.

Faute de pouvoir pondérer les éléments entrant dans la charge seuil, on ne peut pas déterminer à partir des apports dans la mer Noire ce qui a été rejeté respectivement à Vienne et à Budapest. Or il faut que l'échange de permis de polluer se réfère à l'incidence effective de ces différents éléments, au moment où ils parviennent à la mer Noire. Compte tenu des remarques qui précèdent, l'Autriche penche pour des solutions réglementaires aux problèmes de pollution, de préférence à l'échange de droits sur l'eau.

Le **Président** note que l'intervention autrichienne donne une idée de l'importance de la réglementation. Dans les pays confrontés à des problèmes comparables (en Italie, par exemple, la pollution de l'Adriatique a été attribuée à l'échelle régionale au Po), celle-ci l'a emporté sur les permis de polluer négociables entre différents territoires.

**Tarification**

A propos des questions de tarification, le **Président** note que s'il risque d'être difficile de déterminer le juste prix ou le juste coût de la pollution, la difficulté est peut-être moins grande dans le cas de l'eau. En Allemagne, les municipalités sont habilitées à organiser les services liés à l'eau, en assurant elles-mêmes l'approvisionnement ou en le sous-traitant au moyen d'appels d'offres. Si l'eau est fournie par la municipalité, les prix sont soumis à la supervision des autorités locales. Si elle est fournie par une entreprise privée, la tarification est libre et relève de la législation fédérale sur les cartels, sous le contrôle du Bundeskartellamt (Office fédéral des cartels). Le Président demande si une entreprise privée peut être réglementée dans ce pays. Il indique par ailleurs que les fuites sont réduites au minimum en Allemagne, puisqu'elles ne dépassent pas 9 % environ, et s'interroge sur les raisons de cette situation.

Un délégué de l'**Allemagne** précise tout d'abord que dans ce pays l'approvisionnement en eau est principalement assuré par les municipalités : 7 000 compagnies prennent part à la fourniture d'eau et 7 000 à l'assainissement, certaines conjuguant ces deux activités. Autrement dit, chaque municipalité a toute latitude pour organiser et assurer l'approvisionnement en eau dans ce pays, soit en sous-traitant ce service à une entreprise privée, soit en l'assurant elle-même dans le cadre du droit public.

Le contrôle, notamment en matière de prix, ne prend pas du tout la même forme selon le régime retenu par la municipalité. Dans un régime de droit public, il est effectué par les autorités fédérales. Dans un régime de droit privé, le service est soumis aux autorités chargées de la concurrence des divers Länder car en règle générale, il ne dépasse pas cette échelle. Les contrats de sous-traitance de droit privé ne sont pas réglementés, mais la loi sur l'approvisionnement en eau est extrêmement rigoureuse dans ce pays, et se rapproche d'une réglementation. La plupart des compagnies privées fournissant l'eau sont entre les mains des municipalités. Compte tenu des liens qui les unissent, toute réglementation est superflue.

Pour ce qui est des fuites, la forme des canalisations et le réseau d'approvisionnement tout entier sont déterminants. Les prix de l'eau sont relativement élevés en Allemagne, du fait de l'existence dans le droit public d'un principe de fixation des redevances selon lequel celles-ci doivent au minimum couvrir les coûts, gestion des installations comprises. En droit privé, ces compagnies exercent leur activité dans un contexte monopolistique et sont au moins en mesure de récupérer les coûts.

Le **Président** note que les règles de l'UE relatives aux marchés publics s'appliquent en cas de concession des services liés à l'eau ; en cas de gestion interne, un processus d'achat public ou d'appel d'offres n'est pas nécessaire. Une directive communautaire oblige les Etats membres à fixer les prix en fonction des coûts, afin que ceux-ci soient entièrement répercutés. L'eau étant une ressource renouvelable, le coût direct se rapporte uniquement à l'infrastructure et au traitement. Il est très difficile de déterminer le coût d'opportunité de l'eau en évaluant combien le secteur agricole doit payer pour l'utiliser ou pour ne pas en être privé durant les périodes où elle est insuffisante. Le Président s'interroge sur les moyens de prendre en compte les coûts, coût d'opportunité compris, étant donné que le coût d'opportunité varie et n'est pas facile à mesurer, surtout en l'absence de marché. Il demande, d'une part, comment la CE fait entrer en considération les coûts d'opportunité et, d'autre part, si des problèmes se posent pour les bassins qui empiètent sur plusieurs Etats membres.

Un délégué de la **Commission européenne** commence par préciser que la Direction générale de la concurrence fait prévaloir l'application au secteur de l'eau des règles de la CE en matière de concurrence, notamment pour éviter des droits exclusifs spéciaux trop larges. Aucune dérogation aux règles de concurrence ne peut dépasser la portée justifiée par les éventuelles obligations de service public imposées aux compagnies des eaux.

En ce qui concerne les coûts d'opportunité, il est prévu de les intégrer au prix de l'eau. Dans sa communication de juillet 2000 sur la tarification de l'eau, la Commission met en évidence trois types de coûts : les coûts financiers, les coûts environnementaux et le coût de la ressource. Les coûts d'opportunité correspondent en gros au coût de la ressource. Cette communication fait bien ressortir la nécessité d'affiner les méthodes dont on dispose pour estimer le coût de la ressource et les coûts environnementaux. Le délégué en cite un passage indiquant, en substance, que des méthodes très diverses ont été élaborées pour mesurer et évaluer les coûts et avantages environnementaux liés à l'eau ; là où des mesures d'atténuation permettant de ramener l'eau au niveau qualitatif ou quantitatif voulu peuvent être définies, on peut concrètement prendre en compte les coûts environnementaux et le coût de la ressource dans les prix en estimant les coûts des mesures d'atténuation puis en ajustant les prix de l'eau et les redevances exigées en conséquence.

S'agissant des utilisations agricoles, il donne deux exemples : les coûts d'investissement et d'exploitation d'un barrage construit pour rétablir le débit d'un cours d'eau réduit par des prélèvements excessifs sur les aquifères adjacents peuvent être imputés aux activités ayant occasionné ces prélèvements ; et les coûts résultant d'une intensification du traitement et de l'accroissement des capacités correspondantes, nécessités par des niveaux de pollution non maîtrisés, peuvent être imputés aux usagers à l'origine de cette pollution.

Quant à savoir si la tarification peut être jugée contraire à la directive-cadre sur l'eau lorsque les coûts d'opportunité ne sont pas inclus, les précisions utiles figurent dans la directive-cadre : « *Il convient que le principe de la récupération des coûts des services liés à l'utilisation de l'eau, y compris les coûts pour l'environnement et les ressources associés aux dégradations ou aux incidences négatives sur le milieu aquatique soit pris en compte conformément, en particulier, au principe pollueur-payeur* ». En dernier lieu, le délégué fait savoir qu'il peut exister des raisons de déroger à l'application de la directive, notamment en cas de pénurie ou dans d'autres circonstances exceptionnelles.

En ce qui concerne les bassins hydrographiques internationaux, il incombe expressément aux Etats membres ayant une partie d'un tel bassin sur leur territoire de se doter des moyens administratifs nécessaires pour coopérer avec les autres Etats Membres concernés et de communiquer tous les plans de gestion des bassins hydrographiques qui doivent être examinés conjointement par les Etats membres et la Commission.

**Infractions aux lois antitrust**

Le **Président** note que, le secteur étant étroitement encadré, seuls quelques documents font état de poursuites pour violation des lois antitrust. Les Etats-Unis ont mentionné une compagnie multi-services, confrontée à la concurrence dans le secteur de l'électricité mais pas dans celui de l'eau, qui refusait d'assurer la fourniture d'eau en l'absence de contrat pour l'électricité. Le Président invite la délégation des Etats-Unis à décrire cette affaire et la solution apportée.

Un délégué des Etats-Unis précise que son pays se caractérise par une décentralisation très poussée dans ce domaine, puisqu'il compte quelque 54 000 réseaux collectifs, municipaux pour l'essentiel. Autrement dit, à l'exception des questions d'environnement, les compétences du gouvernement fédéral sont très limitées. Il s'agit toutefois d'un thème d'actualité en raison du vieillissement de l'infrastructure, qui entre pour une large part dans le coût de la fourniture d'eau (d'après les estimations, les coûts liés au remplacement et à l'entretien de l'infrastructure devraient dépasser 300 milliards de dollars).

En 1998, le ministère de la Justice (DOJ) a attaqué la ville de Stilwell (Oklahoma). Celle-ci avait le monopole de l'approvisionnement en eau et de l'assainissement sur son propre territoire, où elle assurait également la fourniture d'électricité. Or une coopérative rurale d'électricité voisine est entrée en concurrence avec elle ; la ville a riposté en liant la fourniture d'électricité à ses services d'assainissement et d'approvisionnement en eau, afin que les consommateurs ne puissent se procurer leur eau auprès de la ville sans lui acheter aussi leur électricité. Face à cet arrangement restrictif ostensiblement anticoncurrentiel, le DOJ a intenté une action contre la ville. Au bout de deux ans, les parties ont décidé de régler le litige en convenant que les services ne dépendraient plus les uns des autres et en signifiant aux consommateurs qu'il n'existait aucun lien et qu'ils étaient libres de s'adresser à leur fournisseur d'électricité de prédilection.

Le **Président** se tourne vers la Pologne et note que le secteur de l'eau a donné lieu à plusieurs procédures dans ce pays. L'une d'elles a été intentée contre un fournisseur d'eau accusé d'exiger un prix trop élevé. Le fournisseur a fait valoir que le prix avait été approuvé par le conseil municipal. L'autorité chargée de la concurrence a pu néanmoins intervenir, ce qui serait impossible dans la plupart des juridictions où elle ne pourrait avoir qu'un rôle consultatif. Le Président demande des explications sur le cadre juridique dans lequel s'est inscrite l'intervention de l'autorité chargée de la concurrence.

Un délégué de la **Pologne** fait savoir que les municipalités, aussi autonomes soient-elles, sont également des organes de l'administration publique, dont les décisions et résolutions sont soumises à un examen. Dans certains cas, les décisions prises par les municipalités peuvent être examinées par l'Office de la concurrence et de la protection des consommateurs. Le mécanisme qui a permis à celui-ci de jouer un rôle dans cette affaire est dérivé du droit de la concurrence polonais. Le droit de la concurrence s'applique dans ce pays à tous les secteurs économiques sans exception ; il régit donc aussi les relations entre le fournisseur d'eau, à savoir la compagnie municipale, et les usagers.

Du fait que l'approvisionnement en eau constitue un monopole naturel, quand les municipalités prennent part à l'établissement de la tarification, elles sont aussi plus ou moins associées à la gestion de l'entreprise en position dominante. Par conséquent, l'activité de la municipalité tombe sous le coup du droit de la concurrence polonais et l'adoption d'une tarification donnée peut donner lieu à une enquête de l'Office de la concurrence et de la protection des consommateurs.

Le **Président** demande si la raison tient au fait que la municipalité n'a pas mis en place d'instance de réglementation indépendante, d'où une confusion des responsabilités entre la tarification et la gestion de la compagnie.

Un délégué de la **Pologne** répond que les compagnies municipales de services sont distinctes de l'appareil administratif municipal, même si elles appartiennent à la municipalité et sont en fait gérées par elles. Les attributions sont donc séparées jusqu'à un certain point.

**Débat général**

Un délégué de la **France** explique que bien que ce pays n'ait pas soumis de document, le Conseil de la concurrence a consacré une note à la jurisprudence dans le secteur de l'eau durant les trois ou quatre années écoulées. En France, les services liés à l'eau s'inscrivent dans un cadre communal. Les collectivités locales ont le choix entre deux systèmes de gestion. D'une part, le service est directement assuré par les municipalités, et il incombe aux collectivités territoriales de financer les équipements nécessaires et de veiller à la bonne marche et à la gestion du service. La municipalité assure le déroulement de la production, la distribution et le contrôle interne. Ce système représente 25 % environ de l'approvisionnement en France.

D'autre part, 75 % de l'approvisionnement passe par une gestion déléguée des services. Sur le marché de la distribution d'eau, du côté de la demande, les collectivités publiques cherchent un fournisseur de services qui livre l'eau au consommateur final. Du côté de l'offre, une part majoritaire du marché est occupée par trois grands groupes : Vivendi représente 51 % du marché, Suez-Lyonnaise des Eaux 24 % et Bouygues-Saur 13 %.

Selon un certain nombre de procédures, ils ressortissent au droit administratif, mais les deux décisions les plus marquantes ont été rendues par le Conseil de la concurrence. Dans la décision de juillet 2002, en particulier, le Conseil de la concurrence a considéré que les pratiques des deux principaux exploitants constituaient un abus collectif de position dominante. Fait intéressant dans cette affaire, le Conseil est intervenu à la limite du droit de la concurrence et du droit administratif. Dans une autre procédure, l'abus de position dominante a été fondé sur l'existence de liens structurels entre ces deux sociétés. Le Conseil de la concurrence a demandé au ministère de l'Economie et des Finances de faire en sorte que les compagnies municipales soient disjointes et d'enjoindre les sociétés en cause de résilier leurs accords concernant les filiales municipales. Le délégué de la France note qu'il s'agit d'une décision sans précédent dans l'histoire du Conseil de la concurrence. En 2003, la cour d'appel de Paris a confirmé cette décision sur la séparation structurelle.

Une autre décision, rendue non pas par le Conseil de la concurrence mais par le Conseil d'Etat, témoigne d'une évolution notable du droit administratif. Le Conseil d'Etat a en effet annulé les mesures ministérielles régissant les conditions de rémunération et de travail des salariés, qui obligeaient les entreprises du secteur privé à se conformer aux rémunérations et à offrir toutes les garanties d'une entreprise municipale ou publique.

Un délégué du **Taipei chinois** fait observer qu'il y a quelques années, la commission des pratiques commerciales (FTC) a mené une enquête sur l'opportunité de privatiser l'approvisionnement en eau. Le document semble indiquer que le gouvernement tente de s'inscrire dans une perspective de privatisation, mais ne rend pas compte de l'accueil réservé à cette enquête par les décideurs et par le grand public.

La question de l'efficience doit être mise en évidence ; l'eau constitue un bien économique dont le coût et le prix sont peu élevés. Dans le Taipei chinois, les prix de l'eau sont fortement subventionnés par

les pouvoirs publics. Par conséquent, les acteurs des milieux industriels et agricoles ne voient guère la nécessité de réformer le secteur de l'eau en raison du faible prix pratiqué. Vient ensuite la question de la répartition. Le Taipei chinois peut se prévaloir d'une industrie des semi-conducteurs dynamique, qui consomme de grandes quantités d'eau. Durant les années écoulées, avant de créer un parc scientifique ou une zone industrielle, les pouvoirs publics ont dû attribuer au secteur industriel une partie des ressources en eau jusqu'alors utilisées à des fins agricoles.

Dans le Taipei chinois, malgré les prélèvements effectués pendant des siècles par d'innombrables agriculteurs, les pouvoirs publics réussissent à fournir l'eau nécessaire à cette activité. Les réformes suscitent peu de revendications chez les agriculteurs, qui ne se reconnaissent pas le droit de protester. Aussi l'accent est-il mis également sur le régime de propriété. Sans contrôle de l'eau par l'Etat, le moindre changement d'orientation s'annonce délicat.

Un délégué du **Danemark** invite la délégation du Royaume-Uni et des Pays-Bas à faire brièvement le point sur l'accès de tiers, eu égard à la possibilité d'instaurer une concurrence directe.

Un délégué du **Royaume-Uni** répond qu'il existe diverses formes de concurrence directe dans le secteur de l'eau, à commencer par les « désignations d'entrants » (« inset appointments »). En vertu de ce système, tout usager consommant plus de 100 millions de litres par an peut être approvisionné par une compagnie quelconque du Royaume-Uni. Seul un site unique peut ainsi être desservi par un autre fournisseur d'eau. Quelques exemples ont été observés assez récemment, notamment dans le nord-ouest de l'Angleterre. Une réglementation ou un contrôle s'impose pour faire en sorte que les termes de l'accord soient équitables, mais en pratique ce système est appelé à favoriser la concurrence et les fournisseurs d'eau susceptibles d'approvisionner l'entreprise à moindre frais.

S'ajoute le « transport pour le compte de tiers » : le nouvel entrant ou d'autres compagnies des eaux utilisent les canalisations de l'opérateur historique pour acheminer leur eau jusqu'à l'usager. Les exemples sont très rares car les négociations entre l'opérateur en place et le nouvel entrant ne vont pas de soi pour déterminer les conditions précises et le prix d'accès. La nouvelle législation sur l'eau adoptée en 2003 doit énoncer et codifier les règles d'accès, ainsi que les différentes exigences de qualité et normes d'environnement imposées aux nouveaux entrants et à l'opérateur en place, et aller normalement dans le sens de la concurrence. Les modalités du régime de prix d'accès sont encore à l'étude. Le système est relativement rigoureux, puisqu'il est réservé aux gros consommateurs qui utilisent plus de 50 millions de litres par an – ils sont au nombre de 2000 environ en Angleterre et au Pays de Galles – car les pouvoirs publics ont décidé d'introduire la concurrence progressivement et avec circonspection, en commençant par en observer les résultats pour les gros consommateurs.

Le **Président** se tourne alors vers un représentant de la Direction de l'environnement de l'OCDE en l'invitant à formuler des commentaires et des remarques.

**Peter Borkey** explique que les travaux portent pour l'essentiel sur l'ouverture dans le cadre de programmes de coopération avec les pays de l'ex-URSS et avec la Chine, mais consistent aussi à suivre de très près les initiatives prises par les pays de l'OCDE dans le secteur de l'eau pour mettre les enseignements utiles à la disposition de ces deux régions.

A l'évidence, il s'agit surtout d'accompagner les réformes juridiques et institutionnelles propices à des gains d'efficience dans le secteur de l'eau, tout en veillant à la qualité de l'eau fournie, et de protéger les franges les plus démunies de la population en préservant leur accès à l'eau. L'approvisionnement en eau et l'assainissement passent avant les questions de répartition et d'autres problèmes liés à la ressource.

Un débat de fond a été engagé sur les avantages des partenariats public-privé ou sur l'instauration d'un certain degré de concurrence dans le secteur de l'eau. A ce stade, la Direction de l'environnement n'est pas convaincue de la supériorité des opérateurs privés ou des opérateurs publics. Certaines recherches effectuées dans les pays d'Europe centrale tendent à montrer que les niveaux d'efficience sont comparables pour les compagnies publiques et les compagnies privées. Etant donné que l'eau se prête fortement à un monopole naturel, et que les marchés doivent être très rigoureusement encadrés, l'un des grands enjeux de la réglementation du secteur de l'eau tient à l'asymétrie d'information entre l'instance de réglementation et la compagnie.

A cet égard, l'étalonnage peut largement contribuer à remédier aux principaux problèmes dans le secteur de l'eau. Il peut être tout aussi intéressant dans bien des contextes, que les compagnies relèvent de la propriété publique ou qu'un marché concurrentiel soit en place. L'eau est une préoccupation essentiellement locale, échelle à laquelle les acteurs ont des moyens limités. Une municipalité peut renégocier sa concession tous les 10 ou 20 ans, tandis que les compagnies des eaux privées négocient quotidiennement, d'où un handicap en termes d'information pour la municipalité. Comme l'a observé la Direction de l'environnement, dès lors qu'une obligation de notification a été instaurée et que les données sur les performances sont rendues publiques, le secteur enregistre immédiatement des résultats positifs.

En conclusion, le **Président** note qu'il ressort de la table ronde que l'eau donne lieu à un monopole naturel, très réglementé, ne laissant guère de place à la concurrence sur les marchés intérieurs. Toutefois, il existe assurément des possibilités de concurrence dans le secteur de l'eau, pour les services d'approvisionnement et d'assainissement destinés aux usagers industriels et commerciaux, de même que sur le marché de gros, et des perspectives d'application d'autres mécanismes de marché, en particulier pour la fixation du juste prix de l'eau. Si la ressource est peu abondante, le coût d'opportunité de l'eau peut être un facteur déterminant pour les ménages comme pour les usagers industriels et agricoles. Le Président rappelle l'intervention du Taipei chinois, dans laquelle il a été question des différentes parties intéressées dans le domaine de l'eau.

En l'absence de mécanisme de tarification judicieux, et de sensibilisation aux coûts qu'implique l'utilisation de l'eau, les politiques ne peuvent obéir qu'à une logique de rationnement et il est très difficile de parvenir à une répartition efficiente. D'une certaine manière, l'investissement public peut aussi être dynamisé par la volonté d'agir sur les prix. L'infrastructure en place n'est certes pas comparable à celle du secteur de l'électricité ou du gaz. La tarification peut favoriser l'investissement public ou privé dans la construction de l'infrastructure voulue, car les marchés ne peuvent fonctionner que si l'eau peut être transportée ; faute de quoi, l'activité ne dépasse pas l'échelle locale. Le Président espère que la mise sur pied d'instances de réglementation indépendantes et l'efficience accrue du contrôle permettront d'aller plus loin dans la détermination du véritable coût et du juste prix de l'eau.