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**Session II - Electricity Markets in Latin America: Regional Integration
and Competition Issues**

-- Contribution from Chile (FNE) --

16-17 September 2014, Montevideo, Uruguay

The attached document from Chile (FNE) is circulated to the Latin American Competition Forum FOR DISCUSSION under Session II at its forthcoming meeting to be held on 16-17 September 2014 in Uruguay.

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Session II - Electricity Markets in Latin America: Regional Integration and Competition Issues

TENDERS VS. BILATERAL NEGOTIATIONS IN THE WHOLESALE ELECTRICITY MARKET IN CHILE

-- CONTRIBUTION FROM CHILE (FNE)--

Introduction

1. As stated in the announcement, this meeting mainly concerns regional integration of electricity systems. The National Economic Prosecutor's Office has made a contribution describing the operation of the electricity market (which is highly liberalized) and discusses other competition issues in the sector, relevant for countries developing a policy of integration of their systems.

2. In particular, the unequal intensity of competition that stems from different market designs may be of interest to other countries. In Chile, an auction mechanism is used for transactions between distributors and generators (industry segments that are completely separated and both managed by private companies), while direct negotiations are used for transactions between generators and industrial customers. The National Economic Prosecutor's Office (FNE) recently published a study that evaluates and compares the levels of competition in both market segments.¹ The study found, through an econometric exercise, that tendering to distributors was more competitive than supplying industrial customers by means of negotiation. Given the positive impact of tendering on competitive intensity, the study concludes by recommending extending the use of tendering to industrial customers, especially those that are smaller in size, and offers a series of recommendations for improving the design of auctions.

¹ Last year, the FNE commissioned a study from the economists Natalia Fabra (Universidad Carlos III), Juan-Pablo Montero (Pontificia Universidad Católica de Chile) and Mar Reguant (Stanford University), on competition in the wholesale electricity markets in Chile. Available at: http://www.fne.gob.cl/wp-content/uploads/2014/01/informe_final_FNE_Enero13_2014.pdf

1. Description of the electricity market in Chile

3. In Chile there are five electricity systems, the two principal systems being the Large Interconnected Northern System (SING) and the Interconnected Central System (SIC).² Both systems have distinct usage profiles and makes use of different generating technologies.³ The electricity generation phase depends on private companies that sell the energy generated according to mechanisms provided for in law⁴ which vary depending on the installed load of clients. In the SIC, three companies represent 90% of the market (Endesa, AES Gener and Colbún), while in the SING, three firms represent almost 100% of the installed capacity (E-CL, AES Gener and Endesa).

4. A basic element for understanding how the market works in Chile is that all the energy demanded is produced and dispatched as a marginal cost for each power station, a process that is coordinated by an autonomous body that functions as an organizer of supply, called the Economic Load Dispatch Center (CDEC).⁵ Thus, the generators have no control over the quantity of energy they produce. Each generator receives payment for each watt injected into the system at the average cost incurred by the electricity system over an hour in order to supply an additional unit of energy, considering optimum operation as defined by the CDEC (this is called the marginal instant cost of the system). The site where the energy transactions between generators are carried out, at marginal instant cost of the system, is called the spot market.

5. Meanwhile, each generator incorporated into the system competes to win long-term contracts with industrial clients or with distributors. The energy dispatched to different clients is provided by the generators responsible for the contracts at the marginal instant cost of the system. In the event that a generator has signed contracts for more energy than it produces during a given period, it must purchase the difference on the spot market. In such a case the companies are said to be *deficient*. In the event the generator produces more energy than it has signed contracts for, the additional energy is sold on the spot market. These companies are said to be *excessive*. It is important to point out that neither industrial customers nor distributors may purchase energy directly on the spot market.

6. As mentioned above, Chilean legislation establishes a distinction between clients depending on their connected power. Clients whose connected power is higher than 2 MW are called “free clients,” and negotiate contracts directly with the generating companies. Meanwhile, clients whose connected power is less than 500 KW, are called “regulated clients,” with the result that prior to the most recent legal reform of 2005, they received a price regulated by the sectoral authority. Currently, the prices at which these clients acquire electricity are determined by a bidding process. Those clients that have a connected power between 500 KW and 2MW may choose which regime to subscribe to. Free clients comprise both industrial clients and those clients regulated by residential clients, mainly contracted by the distributors.

² The SING and the SIC represent 23% and 73% of the country’s installed capacity, respectively.

³ In the SING, 89% of sales are to industrial clients and 94% of total generation is thermoelectric, while in the SIC, 69% of sales are to residential clients and 45.9% of installed capacity is hydroelectric, 52.3% is thermoelectric and the remaining 1.8% is provided by wind farms.

⁴ The Decree with Force of Law N° 4/2006, promulgated by the Ministry of Economy, Development and Reconstruction establishes the consolidated, coordinated and systematized text of the Decree with Force of Law N°1 of 1982.

⁵ See <http://www.cdec.cl/>

2. Distribution Bidding

7. In May 2005 the Short Law II (Law N°20.018) was introduced with the aim of responding to the need to increase the security of the energy supply in the light of external uncertainties about prices and the availability of fuel for electricity generation. The principal modification was to eliminate the regulated price for the distributing companies, which up to that point had been calculated by the National Energy Commission (CNE), and to gradually replace it by the price that arose from bidding. The aim of this was to boost the long-term economic signals in order for energy prices to reflect the expectations of the cost of generation of the generators themselves.

8. The form of bidding established (and which remains in force) is *pay-as bid* (each generating company receives its offer for each MWh allocated). The process is open and the allocation is made to the lowest price on offer. In each process, the distributing companies bid for “blocks” of energy, which define an amount of energy (GWh/year), a defining period (years) and a point of supply. Each supply has a maximum auction price. The difference between one block and another consists, principally, in the length of the contract, the identity of the distributing company and the point of energy supply. The bidding mechanism enables companies to make offers for each block separately, while at the same time indicating a maximum capacity for auction or sale.

9. The work commissioned by the National Economic Prosecutor’s Office focuses its analysis on the first four tenders made by the SIC (which encompass 2006 to 2011), in order to carry out a comparison with the data window of the contracts with free clients.⁶ The offers made in the bidding allow a number of interesting observations to be made: (i) firstly, there is a disparity in the prices offered by different companies; (ii) secondly, there is a disparity in the prices offered by a single company in a single auction for different blocks; (iii) thirdly, there is a disparity in the prices offered by a single company in successive auctions; (iv) finally, in most cases the auction prices are lower than the spot prices at the moment the allocation is made.⁷

10. These results contrast with the regularity that should be observed if the processes were competitive. In fact, in the absence of uncertainty and if the companies were risk-neutral, the supply curves should be equal to the opportunity cost of providing the supply, which in this case is given by prices expected from the spot market for the duration of the auctioned contract. Thus, if all the companies shared similar predictions of the spot prices, their offers should have been similar.⁸ If we take into account the uncertainty with regard to the evolution of the spot prices, this might explain part of the variation in offers between companies, insofar as they might have different expectations (this factor may be amplified if the generators have different levels of risk aversion). However, in the opinion of the authors of the study commissioned by the FNE, these elements are not sufficient to explain the facts, and they consider it to be more likely that the barriers to entry and the limited number of actors enables the generating companies to act in a strategic manner in the bids, in the knowledge that their production is necessary to meet the total demand, and that it is too great a risk for a generating company to win contracts it cannot cover with its own generating capacity.

⁶ The paper does not analyze the results or changes in the rules for subsequent tenders. However, most of these auctions were declared void, except for the tender for supply of the SAESA group in March 2012 and tender for supply of the SIC, dated November 29, 2013.

⁷ This is not necessarily indicative of competition, because what is of greatest importance is the expectation of the spot price prevailing during the bid period at the time of the auction.

⁸ This should be true regardless of the technology the companies intend to use to meet their commitments. What is important is the ordinary opportunity cost.

3. Tenders vs. Bilateral Negotiations

11. Normally, it is difficult to assess the level of competition in a market by examining only the margins of the companies in question. This is because opportunity costs are not usually known with precision. For this reason, in order to draw conclusions about the level of competition in the free client market, the authors of the study published by the FNE take advantage of the fact that the companies themselves simultaneously compete for distributor tenders and engage in bilateral negotiations with free clients. As a result, if the distribution contracts are comparable to the contracts for free/industrial clients in terms of duration, size and risk level of the contracts, it would be reasonable to expect similar prices would result from both market mechanisms.

12. Taking into account that the authors can only base themselves on observable variables (such as the energy supply point, the duration of the contract, the volume of energy contracted and the expected spot price at the moment of signing the contract and at the moment of completing the first energy delivery), and that there are many other aspects they cannot assess, it is clear that the only way of drawing conclusions from the empirical results of the report is to be sure that the missing variables back up the conclusions reached. Thus, they indicate that on the basis of conversations with different actors in the sector, the authors were able to observe that all the differences not captured by these variables pointed in the same direction, namely the contracts with free clients were more attractive than the contracts with distribution companies.⁹ Thus, if it is observed that the contracts with free clients are more costly than those with distributors, taking into account the observable variables, it may be concluded that the auctions are more competitive.

13. In order to analyze and quantify the differences between free contracts and tenders, and to explore the variation among free contracts, the authors carry out a linear regression, taking as a dependent variable the average prices paid in the contracts assigned in the bidding and in the market of free clients, and they proceed to test the inclusion of different control variables. The following table summarizes the results of the econometric exercise, using different control variables:

	(1)	(2)	(3)	(4)	(5)	(6)
Free contract	10.44 (8.46)	55.93** (12.32)	47.19** (11.53)	49.37** (11.74)	50.12** (11.47)	7.02 (13.83)
Major client		-21.25* (8.33)	-24.56** (8.33)	-24.04** (8.40)	-22.76** (8.41)	-24.77** (7.83)
Duration			-2.42** (0.86)	-2.36** (0.88)	-2.13* (0.88)	-2.11* (0.88)
Development cost				1.03 (1.05)		
Opportunity cost					1.04 (0.71)	
Alt. Opportunity cost						1.36** (0.38)
Goodness of Fit	0.01	0.74	0.76	0.76	0.77	0.79

Notes: Robust standard errors in brackets. ** indicates significant at 1%; * indicates significant at 5%; The specifications (2) to (6) include fixed effects of year and generating company. Number of observations: 140.

⁹ The authors refer to four reasons why, at an identical initial price, volume of energy and length of contract, a generator would prefer to take a contract with a free client rather a distributor: (i) contracts with distributors would have a regular component of risk that is absent in free client contracts; (ii) contracts with distributors are less flexible than those signed with free clients, because in the latter there is no restriction on the indexing mechanism; (iii) contracts with distributors take into consideration energy actually consumed, passing all the risk of lower power consumption on to the generating company, which is not the case in free client contracts; (iv) finally, the average residential customer has a different daily consumption profile to industrial customers. The former tends to concentrate their consumption during peak hours of higher spot prices, while the latter tends to consume more evenly over the 24 hours of the day.

14. The first specification shows in simple fashion the price differential between the free contracts and the tenders (the negotiated contracts are on average around 10 dollars per MWh more expensive than the contracts decided by bidding). The specifications (2) to (6) consider different controls that capture factors that affect the contracting process. These specifications include fixed effects of year and generating company. It is observed that in general the large free clients tend to pay less than smaller clients, and that contracts signed for a longer period tend to be cheaper.

15. Due to the difference between the time of signing the contracts and the commencement of supply, the differences in prices may reflect differences in expected costs. For this reason, specifications (4) to (6) develop additional controls that take into account the development cost or opportunity cost, considering alternative definitions in CNE data. Specifications (4) to (5) produce similar results in regard to the difference between the tender prices and those of contracts signed with free clients, while specification (6) shows no significant difference in price between the auctions and bilateral negotiations, even once the effect of the opportunity cost is taken into consideration, correcting for the time at which the delivery of the energy set out in the contract begins.

16. Specification (5) uses the expectations of opportunity cost at the time the contract is signed. Specification (6) uses expectations three years ahead for tenders, given that the delivery usually occurs three years ahead. The regressions suggest that the three year forecasts were optimistic and contribute to explaining why the companies were prepared to offer lower prices in the bidding. Given the limitations of measuring the opportunity cost, it is difficult to distinguish among these alternative models. The authors believe that specification (6) is an extreme case that would make more sense in a world where the contracts were of shorter duration (3 years) or alternatively could not include indexation mechanisms that could cover temporary rises (or falls) in the opportunity cost.

17. In this sense, it is concluded that the evidence is consistent with the fact that tenders are an effective mechanism to increase competition, compared to bilateral contracts. However, it is clear that for this to be the case the entry of enough participants in the auction is required. The fact that recent tender processes have been declared void reveals their lack of attractiveness in the eyes of the generating companies.