For Official Use **ENV/EPOC/WPIEEP(2014)18**

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development **31-Oct-2014**

English - Or. English

ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE

ENV/EPOC/WPIEEP(2014)18
For Official Use

Working Party on Integrating Environmental and Economic Policies

EFFECTIVENESS OF SPATIAL AND LAND USE POLICIES IN ACHIEVING ENVIRONMENTAL AND ECONOMIC OBJECTIVES

Paris, 18-19 November 2014

This document presents a set of specific proposals for empirical and analytical work on the evaluation of the economic and environmental effectiveness of spatial and land use policies for the 2015-16 PWB. It explains the importance of the policy issues underlying the proposed directions for future work and justifies the need for a small number of foundational studies, which will provide: (i) an operational framework for the study of the economic and environmental effectiveness of these policies, and (ii) an inventory and typology of the spatial planning and land use systems and policies implemented across OECD countries.

Action required: For discussion

For further information please contact:
Walid Oueslati, Tel. +33 (0)1 45 24 19 83; e-mail: Walid.Oueslati@oecd.org

JT03365334

Complete document available on OLIS in its original format

English - Or. English

TABLE OF CONTENTS

1. INTRODUCTION

1. In its February 2014 meeting, the Working Party on Integrating Environmental and Economic Policies (WPIEEP) supported new lines of work under the 2015-16 Programme of Work and Budget (PWB) on spatial planning and land use policies. Specifically, it endorsed the work outlined in the note preparing the PWB for 2015-16 (ENV/EPOC (2014)1): "*Spatial and land-use planning is one of the domains where the tensions between economic and environmental objectives are particularly acute, and work will be undertaken to develop a typology of land use and spatial planning instruments, followed by case studies and empirical analysis to examine the environmental and economic consequences of such instruments*."

2. This note identifies a number of opportunities for empirical and analytical work directed towards the evaluation of the economic and environmental effectiveness of spatial and land use policies. It briefly explains the importance of the policy issues underlying the proposed directions for future work. It further justifies the need for a small number of foundational studies, which will provide: (i) an operational framework for the study of the economic and environmental effectiveness of spatial and land use patterns and policies, and (ii) an inventory and typology of the spatial planning and land use systems and policies implemented across OECD countries.

3. Section 2 presents the key policy areas identified for future empirical work, while Section 3 draws on foundational work which will provide the essential input for the proposed empirical analyses. Section 4 concludes with some questions for the Delegates.

2. PROPOSED DIRECTIONS OF EMPIRICAL WORK IN 2015-2016

4. This section presents a set of policy areas which are relevant for future empirical work. It further proposes possible research approaches for conducting this work.

2.1. Land use policies and urban sprawl

5. The term "*urban sprawl*" is used to denote the process of urban expansion to the city outskirts by more than what might be socially desirable. Most experts seem to agree that fragmentation of urbanised areas, increased mobility needs, and low population density are the most significant features of urban sprawl.

6. Urban sprawl can pose significant threats to the environment. Higher emissions of CO_2 and air pollutants, lower water quality, loss of biodiversity and reduction of open space comprise only few examples of the possible effects of urban sprawl. On the other hand, urban sprawl may also entail reduced risks to human health and social welfare, mainly stemming from lower population density. Examples of such risks include population exposure to air pollutants (see Subsection 0 below), natural hazards (e.g. floods, storms, etc.) and epidemics.

7. Local authorities employ a wide array of land use instruments to contain urban sprawl and secure a wide range of outcomes which are not always mutually compatible. These outcomes include, for example, limiting the costs of provided services (such as water supply, waste management and public transport), preserving farmland, and curbing emissions of greenhouse gases and air pollutants. Deployed instruments range from stringent land use controls (e.g. zoning) to more flexible market-based instruments (e.g. property taxes) However, there is a lack of evidence about the effectiveness of different types of instruments in containing urban sprawl. The following relevant policy questions arise in this context:

- What is the effectiveness of *land use controls* and *market-based land use policy instruments* in limiting urban sprawl and thereby preventing its possible consequences for the environment?

- Given that stringent land use controls are the predominant instruments used for this purpose, which factors would encourage greater use of market-based land use instruments?

- What are the potential environmental gains from land use policy reforms in this context?

8. Empirical analyses can provide answers to these questions. Geospatial and socio-economic data at the level of the *urban area* are necessary to conduct empirical studies on these issues. An inventory of land use policies implemented at the local level is needed to provide a clear basis for these analyses. It is also essential that the developed empirical approach takes into account the multidimensional nature of urban sprawl (e.g. population density, decentralisation, connectivity and scattering of urbanised areas). Examples of relevant work which can be performed include the empirical estimation of the effects of zoning on open space availability or of market-based instruments on decentralisation.

2.2. Urban structure and local air pollution

9. An important rationale often referred to in support of compact city policies is that compact cities induce lower energy and mobility needs. The latter imply lower travel times and lower levels of emissions of greenhouse gases and air pollutants. However, the adverse health effects of local air pollution (e.g. respiratory diseases) are caused by high levels of human exposure to air pollutants, which is a function of local concentrations, and not by aggregate air emissions per se. This distinction is especially important in the context of the comparison of the adverse effects of different urban structures. While compact cities may indeed result in lower air emissions than dispersed urban structures, it is likely that they also suffer from higher pollutant concentrations, as emissions are dispersed over a much smaller area. Population, economic activity and traffic flows concentrate at higher rates in dense urban forms, implying that compact cities are more likely to lead to higher levels of human exposure to air pollutants and therefore more pronounced health effects. The questions arising then are:

- What is the impact of urban structure on local concentrations of various air pollutants and potential human exposure to them?
- How can land use policy reforms address local air pollution problems?
- How can reforms of parking policies contribute to the combat of local air pollution?
- Under what conditions can energy efficiency measures be more effective than compact city policies in curbing local air emissions?

10. Empirical approaches built around geospatial and socio-economic data and indicators of concentrations of air pollutants and population exposure at the *level of urban area* can shed light on these questions. For instance, future work could empirically estimate the impact of urban fragmentation on the concentration of specific pollutants, such as nitrogen oxides (NOx) and particulate matter (PM), and on the associated population exposure to them.

2.3. Side-effects of spatial policies designed to address agri-environmental pressures

11. Land use and spatial policies are motivated by a number of policy objectives, including the reduction of the nuisance induced by industrial activities to residential ones, the reduction of the costs of provision of public infrastructure and environmental objectives. However, environment-based spatial policies can sometimes have unintended adverse effects on the environment. Agri-environmental policies constitute a particularly interesting field of study in this context, as they manifest the acute tensions that might arise between residential and agricultural land uses and nature conservation. For example, spatially-targeted agri-environmental policies aim at encouraging farmers to adopt more environmentally benign practices within the vicinity of sensitive ecosystems. However, the provision of environmental amenities induced by these practices will attract residents to the borders of the spatially-targeted area and trigger urban development. This development might then lead to a deterioration of the ecosystem, thus, going against the initial intention of the land use policy. Our understanding of these side-effects and the underlying mechanisms causing them is so far limited. In particular, the following questions are of primary interest:

- How are the side-effects of spatial policies designed to address agri-environmental pressures manifested in OECD countries?
- Which types of land use policy instruments are more likely to trigger these side-effects?

- Which spatial policy reforms could prevent the induction of these side-effects or mitigate their consequences?

12. The empirical study of the environmental side-effects of agri-environmental policies requires the use of geospatial and socio-economic data at the local level and the compilation of a comprehensive database of environment-based land use policies.

2.4. Natural risks and spatial policies

13. Spatial policies are often put in place to contain the possible adverse effects of natural risks, such as floods, earthquakes, wildfires and storms. The extensive use of spatial policies for this purpose has mainly been triggered by the largely improper functioning of the relevant insurance markets. The latter may partially result from general public's (and sometimes also insurers') tendency to misperceive the probability of occurrence of such events and the magnitude of costs entailed by natural disasters.

14. Natural disasters impose substantial costs to society, and the mitigation of their possible impact is of primary policy relevance. Stringent land use controls (e.g. prohibition of residential activity in high-risk zones) are frequently proposed to address such concerns. However, these policies also limit the amount of land available for use and can place pressure on land prices and production costs. Information about the possible economic costs of these policies is largely unavailable. A question that remains thus to be answered is:

- What are the costs of stringent land use controls directed to the mitigation of the impacts of specific natural disasters (e.g. floods)?

Climate change has further increased the uncertainty of the occurrence of natural disasters. This underlines the importance of additional insights into the following question:

- How adaptable are current land use and spatial policies to potential changes in the occurrence of natural disasters (e.g. induced by climate change)? Which reforms could enhance the adaptability of these policies?

15. Empirical analyses based on non-market valuation methods (e.g. hedonic pricing) can be used to address the first question. Cross-country studies could also be conducted in this context.

2.5. Land use and spatial policies for nature conservation

16. The protection and conservation of sensitive natural areas has been an important driver of spatial and land use policies. Nature conservation policies predominantly encompass stringent land use controls, such as zoning (e.g. designation of Natural Parks and other Protected Areas). In sharp contrast, market-based instruments have been largely neglected in the design of nature conservation policies. The assessment of the effectiveness of the implemented measures remains, however, an open issue. The following important questions can be explored:

- How effective have so far stringent land use controls been in achieving nature conservation objectives?

- What have been the most efficient management practices for nature conservation?

- Which land use policy reforms can contribute to efficiently pursuing nature conservation objectives?

17. Cross-country empirical analyses can provide insights into the questions above. A detailed inventory of *national* spatial and land use policies for nature conservation is necessary for the purposes of this analysis. Information about the levels of *stringency* of different policies would also be very useful in this context.

2.6. Open space conservation and local budget constraints

18. Open space provides valuable services to local communities (e.g. recreation, environmental amenities) and serves various environmental functions (e.g. biodiversity preservation, CO_2 capture). The importance of open space has induced the development of an array of land use and spatial policies directed to its preservation (e.g. green belts). Even though open space conservation usually results in higher property values and therefore to higher per unit governmental revenues from property taxation, it also induces a notable burden to (usually local) government budgets. This burden is not limited to the purchase and maintenance costs associated with open space conservation, but it also encompasses the foregone tax base resulting from the removal of land from housing, and commercial or industrial development.. It is thus important to study:

- How does open space conservation affect housing prices, development density, tax base, and land values in cities?
- Which land use and spatial policies are more efficient in conserving open space?
- How do different land characteristics and land use patterns affect the efficiency of land use and spatial policies for open space conservation?

19. The application of empirical methods to shed light on the above questions is a challenging task but can be made possible by the use of detailed geospatial data, data on housing prices and housing stocks for the cities studied, and data on local government budgets.

2.7. Spatial controls and the challenge of multi level governance

20. Most spatial and land use policies are in the hands of local governments, and the level of control varies considerably across them. Some local governments have few land use controls, while others are actively involved in spatial planning and regulation. These policies are implemented mostly at the local level. Local governments often respond to specific requirements in their jurisdictions and face the problem of coordinating policies across jurisdictional boundaries. The fragmented local government structure of metropolitan areas often facilitates the conversion of agricultural, forested or otherwise undeveloped land to urban uses, which may have important implications for the environment. Furthermore, certain environmental impacts of land use changes go beyond the borders of a single metropolitan area and should be addressed at the regional and national levels.

21. The challenge here is to strengthen coordination between local governments operating in the same metropolitan area. Territorial cohesion is a necessary condition for the development of environmentally effective and economically efficient spatial and land use policies. As a first step, the following question needs to be answered:

- What are the effects of different levels of territorial cohesion on the environmental effectiveness of spatial and land use policies?

22. For empirical analysis to be able to shed light on this issue, an elaborate country-level assessment of the territorial cohesion of each country's land use policies is a prerequisite. This assessment could be made through a questionnaire distributed to the Delegates (see subsection 0 below).

3. PAVING THE WAY FOR EMPIRICAL WORK

23. Empirical study in the aforementioned areas requires that a set of foundational studies are conducted beforehand. The first such study will provide an operational framework describing land use patterns and their environmental and economic implications and highlight the potential role of land use policies in these processes. The second study will develop an inventory and typology of spatial planning systems and land use policy instruments used across OECD countries.

3.1. Operational framework for spatial planning and land use patterns and policies

24. In particular, the framework will: (i) provide insights into the major linkages between land use patterns and the economic and environmental systems, (ii) describe the major channels through which changes in land use and land use patterns affect economic development and the environment, (iii) justify the role of spatial planning and land use policies by underlining how they can address the economic and environmental challenges posed by land use patterns, and (iv) identify the potential social and economic consequences of these policies.

3.2. Inventory and typology of spatial and land use planning systems and policies

25. This is an essential first step to enhance our understanding of the spatial and land use policies implemented in OECD countries and classify them according to the requirements of future empirical studies. The typology of systems and instruments will reflect the division of powers and responsibilities among different levels of governance (institutionally and territorially). Land use policies will be further characterised in terms of their objectives (raising revenue, wealth redistribution, environmental, social), type of instrument used (command-and-control vs. market-based) and stringency (voluntary vs. mandatory, level of tax rate used, etc.).

26. Policy stringency might also be evaluated through a structured questionnaire requesting information about land use policies directly from the Delegates. Such a questionnaire would invite Delegates to provide information about the governmental levels at which land use policies are designed and implemented, explain how environmental concerns are taken under consideration in these processes and evaluate the stringency of adopted land use policies. Such information would be primarily elicited via closed form questions (e.g. multiple-choice, rating, binary response) in order to minimise respondents' burden and facilitate comparability of responses. The Secretariat will look into the feasibility of developing such a questionnaire in the immediate future.

27. The study will provide the essential input to the empirical investigation of the environmental and economic effects of different classes of land use instruments. Its output will also enable the assessment of the role of higher levels of policy stringency in achieving desired economic and environmental outcomes. The study will also serve as a reference point for sharing experiences and designing new policy proposals.

4. QUESTIONS TO DELEGATES

28. In the course of discussion, the Delegates may wish to reflect on the following issues:

- Do the Delegates have any comments on the proposed lines of work?
- Are there any other policy objectives that have been addressed by spatial and land use policies that the Delegates would like to add?
- Are there any land use systems or policy instruments implemented in specific countries, whose economic and environmental effectiveness the Delegates would like to be studied by the Secretariat?