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Improvement of Regional Innovation Policy in Ukraine in the Sustainable Development Context

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Abstract: In the light of the Sustainable Development (SD) concept, the eco-innovation promotion becomes the central issue of innovation regulation. Given the strategic significance of SD goals for Ukraine and ongoing powers decentralization reform, it is desirable to study the capacity of regional and local authorities to form a proper incentive environment for the sustainable community's development on innovation (eco-innovation) basis. The conducted analysis shows a limited capacity of regional and local bodies to set drivers of the eco-innovation development in motion. The need to extend the authorities' powers in the field of resource prices and local tax rates setting and to strengthen the environmental orientation of existing innovation regulation tools is emphasized, in order to improve the regional innovation policy in Ukraine.

Keywords: innovation policy, sustainable development, regional policy, eco-innovation, eco-innovation drivers

JEL: O38; O31; Q01; Q58; R5

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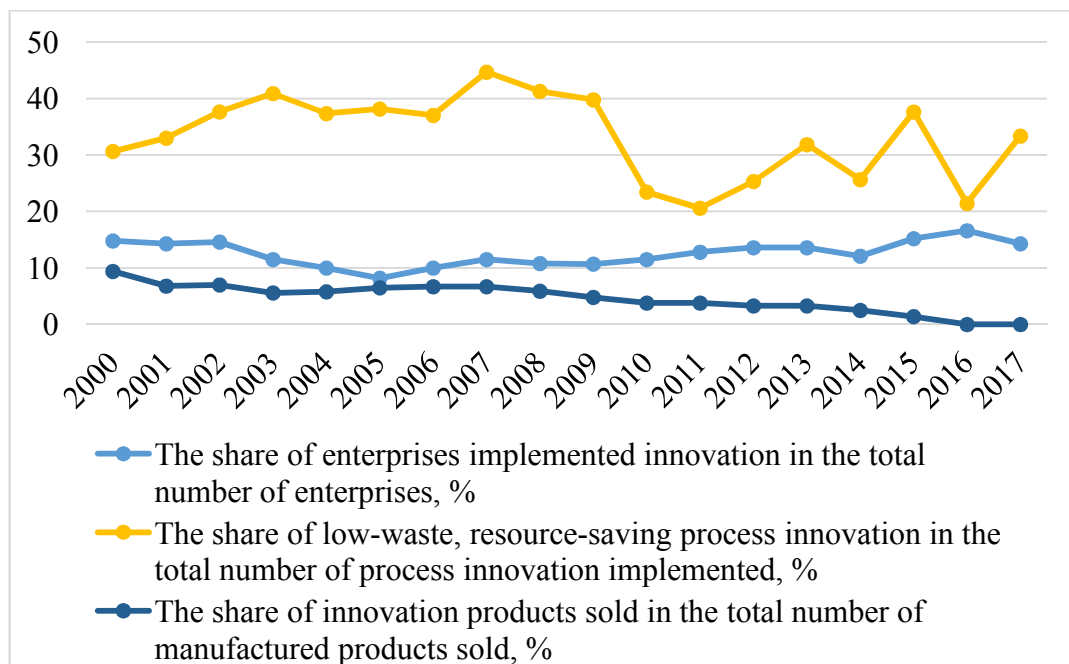
1. Introduction

The achievement of the sustainable development goals requires the strengthening of innovation activity in a country (Park et al., 2017; Lundin & Serger Schwaag, 2018). It justifies the need for the qualitative improvement of innovation regulation at all levels of the management hierarchy. Such a policy focuses on resource productivity and eco-efficiency, on long-term common goals and on eco-innovation, which should become the main policy driver in the innovation field, providing the basis for the "fourth generation" innovation policy (Reid & Miedzinski, 2008). In the light of political determination of the strategic significance of the sustainable development goals in Ukraine (President of Ukraine, 2015; Cabinet of Ministers of Ukraine, 2014), one can point out the inefficiency of existing innovation regulation mechanisms evident from innovation activity dynamics (cf. Figure 1). The current situation in this area is rather "a state of stable stagnation", as the modest increase of the share of enterprises introducing innovation in 2015-2016 is due to changes in the research methodology and even with that, the share of innovative enterprises is less in 2017, compared to the level of 2000 (14.3% versus 14.8%). In this context, the dynamics of the share of sold innovation products in the total industrial output is vibrant. It decreases from 9.4% to 0.7% for the analyzed period. The dynamics of the low-waste and resource-saving technologies share in the total number of new technological processes implemented is somewhat chaotic and in general, does not exceed 44.7% (in 2007). The eco-innovation comprises only a third of the total number of process innovation in 2017. From this perspective, it is clear that resource and energy-saving objectives do not guide the innovators and their activities, so the need to revise state and regional innovation policy becomes evident, in order to achieve the existing strategic goals of Ukraine's development.

The problem is becoming even more relevant given the background of ongoing reforms. The reforming of administrative-territorial structures and decentralization of powers currently implemented in Ukraine create the potential for the formation and implementation of a qualitatively new regional policy at the national and regional (local) levels. The formation of effective local self-government capable to provide endogenous, self-sufficient, sustainable development of local communities constitutes the main purpose of the reform. In this context, it is important to study the capacity of

regional and local authorities to form a proper environment with incentives for sustainable community development on an innovation basis and to identify the areas for further improvement.

Figure 1: Dynamics of innovation activity and eco-innovation in Ukraine, 2000-2017



Source: *State Statistics Service of Ukraine*, <http://ukrstat.gov.ua>

As several scholars (Reid & Miedzinski 2008; Pereira & Vence 2012; Díaz-García et al., 2015) point out, the eco-innovation, being crucially reliant on political regulation, requires a precise approach to policy-making. The formation of this policy should be based on the content, drivers and barriers of eco-innovation development, its state, dynamics, and results of implementation (Park et al., 2017). Accordingly, the study of eco-innovation essence and factors that are crucial for their development at the regional level is required in order to outline the potential instruments of political regulation capable of launching the process of innovation-based sustainable development of Ukrainian regions. It also requires the investigation of the national features of the division of powers at different levels of government hierarchy

concerning the innovation and environmental policy decision-making. The study of outlined issues constitutes the main purpose of this article.

2. Eco-innovation as the main priority for innovation regulation

The generic concept underlying the innovation policy in OECD countries is that eco-innovation should not be restricted to environmental technologies, but rather emerge as a new field of techno-social innovation that focuses less on products and more on the environment and people, forming a conceptual vision for further overall social changes needed to achieve sustainable development (Machiba, 2009). The variability and interconnection of the specific manifestations of eco-innovation (Andersen, 2008) require the identification of distinctive features of this notion. First of all, eco-innovation is associated with the decrease of negative environmental impact and embraces changes in social and institutional structures (Machiba, 2009). Another peculiarity lies in the ‘double externality problem’ (see Rennings, 2000), that is eco-innovation brings public benefits, although it is ‘paid’ by private agents. This determines the special significance and dependence on political regulation (Machiba, 2009; Pereira & Vence, 2012).

The factors affecting innovation as a whole are also relevant for eco-innovation and reflect the generic IS elements and structure, namely: macroeconomic environment and regulation, communication infrastructure, product and resource markets, education and training system, elements of the generation, diffusion and use of knowledge (firms, scientific system, supporting institutions, other research organizations) (Park et al., 2017). The same determinants are also relevant at the regional level, however, they are more specific: accommodation determinants (natural resource base, production structure), regional interrelations, specific parameters of firms, regulatory conditions, market factors (demand, competition), technological capabilities (research and development, sources and dissemination of information) (Horbach, 2017).

The analysis of current research concerning the eco-innovation development determinants gives ground to conclude about the change of the functional role of innovation system (IS) elements in terms of the eco-innovation system formation. In particular, the role of government strengthens regarding the supply and demand-side measures for promoting eco-innovation (Reid & Miedzinski, 2008; Machiba, 2009). It

is mainly due to their social significance and the “double externality problem” (Rennings, 2000), as well as a number of specific characteristics (Table 1).

Table 1: Specific characteristics of eco-innovation that distinguish them among other types of innovation, and determine the relevant areas of political regulation

Specific features	Policy intervention areas
Higher price of eco-innovation product	The revision of pricing for natural resources, tax system reform
Difficult market intervention	The public procurement (green) practices
Riskiness for the firm	Support for eco-innovators through funding, informing, education and training, consultancy, networking
Knowledge intensiveness	The R&D funding; strengthening the cooperation of business and research and education organizations; the regulation of education and training activities
High reliance on socio-cultural determinants	The informing, training and education of the habitants; the trust relations and cooperation strengthening; interaction with stakeholders; eco-efficiency campaigns
High reliance on competitive pressure	The promotion of entrepreneurship and networking
The need for organizational changes	The establishment of centers for consultancy and information; policy and government organizational changes; the promotion of EMAS and ISO 14000
The heed for appropriate resource base	Spatial planning and land use regulation
The industry specificity	The infrastructure development; the promotion of diversified industry structure; the stimulating of eco-innovation in the key industries
The need for network development	The clusters promotion, the facilitation of partnerships establishment
The high reliance on administrative regulation	The formulation of strict environmental policy, standards and norms

Source: *authors' generalization based on (Rennings, 2000; Reid & Miedzinski, 2008; Machiba, 2009; Pereira & Vence, 2012; Horbach, 2013, 2017; Ghisetti & Quatraro, 2017; Chen et al., 2017; Hojnik, 2017)*

One should briefly comment the statements given in Table 1. Primarily, the main firm-side barriers of eco-innovation implementation embrace the lack of adequate financial resources, the high risk, and a misunderstanding of long-term benefits (Reid &

Miedzinski, 2008) due to the middle results time lag (Diaz-Garcia et al., 2015) and the lack of knowledge about the resource saving potential and eco-efficiency (Reid & Miedzinski, 2008; Diaz-Garcia et al., 2015; Mishenin et al., 2015). In view of this, the role of government structures is shifted towards information and learning, joint projects implementation, ensuring the adequate regulation (Reid & Miedzinski, 2008; Chen et al., 2017), resource pricing and taxation (Reid & Miedzinski, 2008), R&D and start-ups funding.

Since the eco-innovation is more “knowledge-intensive” (Horbach, 2013), the availability of external knowledge from universities and research institutions for the firm is of high importance. The space for the policy intervention in the fields of research and education includes, in particular, the forecasting of the requirement for employees, the public contracting for the specialists’ training, as well as ensuring the coordination of firms and research, educational and training organizations. It is also necessary to promote the interdisciplinary and environmental training and education programs. The lack of the latter significantly causes the underdevelopment of human capital as an important determinant of eco-innovation development (Reid & Miedzinski, 2008).

The eco-innovation, compared to traditional innovation activities, are more social and culturally reliant (Reid & Miedzinski, 2008). The overall socio-cultural context of the region’s space plays an important role for promoting eco-innovation, being resulted in consumers’ behavior (Reid & Miedzinski, 2008), firms’ (Horbach, 2017) and other actors actions (research and education institutions, investors and financial institutions, NGOs, etc.). Government structures for affecting the socio-cultural environment are important in the following ways: Firstly, the provision of appropriate education and training availability for all. Secondly, providing information for the population (Reid & Miedzinski, 2008). Thirdly, the creation of a corresponding interdisciplinary policy (Pereira & Vence, 2012; Horbach, 2017; Chen et al., 2017). Fourthly, the joint green projects implementation and support for interactions (Reid & Miedzinski, 2008; Ghisetti & Quatraro, 2017). As the path dependency phenomenon is not significant for eco-innovation (Horbach, 2017), fifthly, the strengthening of trust relationships and network development becomes of main importance (Reid & Miedzinski, 2008; Machiba, 2009; Diaz-Garcia et al., 2015), as well as the business-government cooperation (Horbach, 2017).

The government expenditures are one of the most important drivers of eco-innovation (Ghisetti & Quatraro, 2017). Specifically, the green public procurement is a tool to overcome eco-innovation market failure and to facilitate the new market niche creation along the supply chain (Reid & Miedzinski, 2008, Machiba, 2009; Ghisetti & Quatraro, 2017).

The organizational transformations needed to facilitate eco-innovation development include, among others, the change of the policy itself based on the constant “policy learning” (Reid & Miedzinski, 2008). It involves the establishment of on-going policy evaluation, the feedback mechanisms formation (Koblianska, 2015), as well as changes in the principles and practices of strategic planning, and decision-making on the policy intervention and appropriate tools (Reid & Miedzinski, 2008; Koblianska, 2015). It should be noted, that at the regional level the most important policy tools for eco-innovation promotion are the green public procurement, financial schemes, consulting services, eco-efficiency campaigns, green forecasting, land use planning (Reid & Miedzinski, 2008) and network development (Diaz-Garcia et al., 2015).

3. Regional and local authorities’ capacity to regulate innovation development in view of the SD concept: the Ukrainian case

In view of the above argumentation, it is necessary to examine the ability of regional and local authorities in Ukraine to set in motion the theory-ground eco-innovation drivers (Table 2).

Commenting on the data in Table 2, one should point out that regional and local authorities in Ukraine are not empowered to give full play to the main drivers of eco-innovation development, despite the implemented reform of powers decentralization. Although there is a wide range of administrative regulation powers concerning the permissions for the business functioning and natural resources use, the regional as well as local bodies are not able to set the prices (rent) for the use of these resources, as well as environmental tax rates, which are strictly defined in the Tax Code of Ukraine. Concerning the funding capabilities of regional and local bodies for eco-innovation R&D and project implementation, it is important to note the evident scarcity of

“development budget” funds. In particular, the “development budget” funds of local authorities in Ukraine amount to only 14.7% of the total local budget expenditures (excluding subventions for the payment of privileges and subsidies) in 2017, that is only about 1,8 billion USD (Kaziuk, 2018).

Table 2: Areas of innovation and environmental regulation of regional and local authorities in Ukraine according to their powers

Regulation area	Regional authorities (oblast, district, UTC)	Local authorities (city, village)
Spatial and resource use planning and regulation	General planning and regulation of built-up environment of territory; Granting the permissions for enterprises creation and functioning, for the use of regional and local natural resources; determination of rules (and limits) of natural resources use; suggestions for the creation of special (free) economic zones, etc.	
Pricing and taxation	Approval of prices and tariffs for housing and communal services, in particular, for the waste management services and public transport	Setting the prices and tariffs for housing and communal services, in particular, for the waste management services and public transport; Land tax rate making
Market support	Conducting of public procurements of products and services for appropriate budget funds	
Education and science, socio-cultural environment development	Formation of the forecast of the need for specialists and the regional order for financing of specialists' education and training; Development of social, cultural and educational programs; Informing of the habitants; Funding of the media	Development and funding of local education and training programs; Financing of specialists education and training within the local order; Informing of the habitants
Policy development	Development and implementation (within the budget funds) of regional programs of socio-economic development, education and culture, land use, environmental protection, transport, etc.; The NGO activity support	Development and implementation (within the budget funds) of local programs of socio-economic development, education and culture, land use, environmental protection, transport, etc.
Infrastructure development	Construction and repair of roads, development of housing and communal and waste management infrastructure	
Innovation support	Creation of territorial innovation centers; Setting the medium-term priority directions of innovation activity development in the region; Approval and implementation of regional innovation programs, financed within the appropriate budget funds	Determination of the amount of funds to finance local innovation programs within the “development budget” funds; Create community-owned innovative financial institutions to fund the local innovation programs at a cost of local budgets

Source: authors' generalization based on Verkhovna, 1991; Verkhovna, 1997; Verkhovna, 1999; Verkhovna, 2002; Verkhovna, 2010a, 2010b.

The regional and local bodies have the authority to conduct public procurements. The current legislation, specifically, the “On Public Procurement” Law (Verkhovna, 2015) defines a clear procurement procedure and outlines that the price is the main factor affecting the final decision. In view of this, the introduction of “green” public procurement practices in regional and local authorities is very sophisticated task, given that eco-innovation products and services are less competitive due to the traditionally higher prices.

At the same time, the understanding of the authorities’ powers to regulate environmental and innovation activities also provides the opportunity to form a set of possible regulation tools, aimed at stimulating the innovative development of region (local area) towards the sustainable development. In this context, the main improvements of region’s innovation policy should lie in the following:

- The formation of medium-term regional priorities of innovation development, and a strategy of socio-economic development with emphasis on the SD goals.
- The development of socio-cultural environment, friendly to the eco-innovation, through the joint environmentally targeted cultural, educational and trade measures.
- The ecologically ground spatial planning and use of natural resources.
- The determination of a fixed rate of “development budget” funds to be spend for the eco-innovation projects support and implementation.
- The formation of a regional order for the education and training of specialists in the interdisciplinary and ecologically related fields.
- The creation of regional centers of innovation development, with the provision of a full range of services for business and research organizations.
- Infrastructure development, especially, in rural areas.
- The regulation of activity on public transport and waste management markets (through the establishment of strict standards and requirements for service providers, taking into account the environmental aspects of their activity).

- The promotion of eco-innovation through the creation of special (free) economic zones.
- The differentiation of land tax rates according to the environmental parameters of economic activity (for instance, setting higher rates for traditional farming and lower for organic agriculture).
- The implementation of green public procurement practices, as possible.

4. Conclusions

Summarizing the above, one should emphasize that in the context of sustainable development the main priority in the innovation regulation should be given to stimulating eco-innovation activities. The higher prices of eco-innovation products and services, the complexity of market penetration and greater riskiness, the high dependence on socio-cultural factors, competitive pressure, and administrative regulation as the specific characteristics of eco-innovations determine the peculiarities of the formation of appropriate policy and regulatory tools, aimed at their promotion. In the context of promoting eco-innovation, the role of the regional and local governments should be substantially strengthened in the areas such as R&D funding, the creation of an eco-friendly socio-cultural environment, as well as eco-innovation market support (mainly through the mechanism of “green” public procurement).

The conducted analysis of the regional and local authorities in Ukraine in the environmental and innovation regulation fields has shown the limited capacity of these bodies to set the essential drivers of the eco-innovation development in motion. Regional and local authorities in Ukraine are constrained in determination of the economic aspects of natural resources use at the tributary area. This justifies the need to extend their powers concerning the resource prices and tariffs, local tax rates setting. Additionally, there is a need to improve national procurement law, making possible to take into account the environmental criteria for goods and services procured at public expense. That will make possible to support eco-innovation at the local market. The scientific substantiation of these measures may constitute the subject of further research

in this field.

It should be added that regional and local authorities should also strengthen the environmental orientation of existing innovation administrative regulation tools through setting up the SD goals as strategic priorities, joint eco-friendly actions, detailed planning of budget funding for eco-innovation measures, business support and consulting etc. It will facilitate the achievement of SD goals regionally and, as a result, nationally.

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