TOWARDS ENVIRONMENTAL SECURITY VIA ENERGY EFFICIENCY: A CASE STUDY*

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Abstract. The article is devoted to the features and problems of the formation of economic mechanism for ensuring environmental safety via energy efficiency in the process sustainable development at the regional level. The focus on environmental risk, which is considered as one of the components of the environmental safety system. In modern conditions, close attention is paid to issues of finding economic mechanism in ensuring environmental safety via energy efficiency: development of directions for implementation of green strategy in the regions and countries. Features of the economic mechanism in ensuring environmental safety and energy efficiency held back in sufficient development of theoretical issues, methodological and regulatory framework. The relevance of the study lies in the fact that sustainable development analysis of the current situation, problem analysis optimization prospects play an important role in improving economic mechanisms for regulating the market for petroleum products, oil and gas industries, economic mechanisms of energy regulation, etc. There is a need, on the one hand, for quantitative assessment the probability of occurrence of processes and phenomena that reduce the quality environment, and on the other hand, quantification of possible damage from their manifestation at the regional level. The aim of the study is to elaborate the economic mechanism for ensuring environmental safety of the region. Authors conduct analysis using observations, reports and comparative official statistics; formulate original insights, which can have policy implications.

Keywords: economic mechanism; environmental safety; region; efficiency; development


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1. Introduction

The presented study was conducted in a predetermined sequence. At the first stage, the articles are obtained by searching in the Scopus database, Web of Science. The following keywords and key combinations of words were used: environmental safety, mechanism, programs, environment, region, energy efficiency. Articles were limited to those published in English-language journals and on the basis of the International journal of energy Economics and policy. At the second stage, annotations and Discussion of materials on topics related to research on the economic mechanism for ensuring environmental regional security and energy efficiency in sustainable development were reviewed and studied. In the third stage, analyses were carried out using observations, reports and comparative official statistics.

Notable that sustainable development is the development of society on the basis of inexhaustible environmentally sound environmental management, providing a high quality of life for people of all generations, namely human health, high life expectancy, favorable habitat, environmental safety and others. Targets can be determined by indicators, characterizing the quality of life, the level of economic development and ecological well-being in the regions. Analysis of the search for materials on the research topic revealed that environmental impact include air pollution, noise pollution, water and soil pollution, agricultural degradation resources and loss of agricultural land and vegetation. Types mining, included as small-scale mining, sometimes called “Galamsi” (illegal mining of minerals by local residents), which is conducted on a small scale using a small quantities of tools and equipment, and large-scale mining (legal), mining, commonly exploited by foreign companies conducted on a large scale using heavy equipment. Most environmental and health risks, quantities of tools and equipment, and large-scale mining (legal), mining, commonly exploited by foreign companies conducted on a large scale using heavy equipment. Most environmental and health risks, associated with mining, widely distributed to all production sites from an economic point of view of environmental research security, in particular the economic mechanism.

2. Literature review

Many studies address issues regarding the effectiveness of policy towards economic mechanism in ensuring environmental safety (Aslanturk, Kpirizli, 2020; Ilyinova, 2018; Imangozhina et al., 2019). There is a point of view whose advocates point to significant benefits of developed policies and opportunities to accelerate development economies through the use of various economic mechanisms Support (Zonn et al., 2016; Tvronavičienė, Razminienė, 2017, El Idrissi et al., 2020; Eddelani et al. 2019; Tvaronavičienė, Ślusarczyk, 2019).

The essence of the study is that the authors reflected a dynamic view of the features of the economic mechanism for ensuring environmental security of the region and energy efficiency in the process of sustainable development (Gagarina et al., 2019; Sarma et al., 2019; Chehabeddine, Tvronavičienė, 2020).

The official statistical reporting for the 8-year period served as the informational basis for the study to ensure comparability, where the sample was taken for 2010-2017. In accordance with the methodology of comparative analysis (Smelser, 1976), data was grouped, which helped to conduct a comparison.

As it is mentioned above, questions of energy efficiency and environmental safety are thoroughly discussed in many works. Today, in the economic literature, the concept of “environmental security” is inextricably linked with the socio-economic development of society. Moreover, some scientists do not even distinguish it as a special
issue but define it as an integral part of environmental protection.

We aim to reveal additional subtleties of environmental efficiency and environmental safety via examining case of separate regions in Kazakhstan.

3. Methodology

The methodological basis of the study became fundamental provisions in the field of environmental safety. Scientific papers of scientists in areas of economics, environmental performance review results activities of the Republic of Kazakhstan. In science, certain development methods in the field of environmental safety in sustainable development. However, to identify directions of the country's regions need various integrated approaches. In the course of studying the issues of ensuring the economic mechanism in the field of environmental safety in the context of sustainable development, we analyzed data for a number of years “investments in environmental protection in the context of activities” and “Current expenditures for environmental protection in the regions of the Republic of Kazakhstan” (Energoprom, 2020).

It should be noted that the analysis focused on the disadvantages of observation methods inherent in many studies. Human perception is limited, so researchers may have missed or overlooked important manifestations of the topic. The limitation of the study is that a lot is determined by the measurement of influences such as lack of time, technical facilities, incomplete data for a thorough analysis, etc. Note that these restrictions may have influenced the results of the study. Therefore, we had to approach our conclusions more carefully.

4. Application functionality

Energy-saving is an integral part of resource-saving, involving the effective use of critical factors reduce energy intensity of production. Relevance of the direction due to the presence of symptoms of an energy crisis.

An intensive energy-saving policy is paramount in containing the growing deficit of fuel and energy resources and reliable provision of all sectors of the national economy of the regions. The impact of resource supply and resource conservation problems on social society's progress is intensifying in a number of ways. One of areas of impact of rational resource consumption is associated with ecology and public health.

Country experience indicates the need to create a mechanism for efficient resource consumption and resource saving in sustainable development, as well as their regulation. There are five regions in Kazakhstan: the Eastern region, Western region, Northern region, Central region and Southern region. We intend to present the regions and cities as part of the above regions (table 1).
Table 1. The regions and cities as part of the above regions

<table>
<thead>
<tr>
<th>Regions</th>
<th>Western Kazakhstan</th>
<th>Northern Kazakhstan</th>
<th>Central Kazakhstan</th>
<th>Southern Kazakhstan</th>
<th>Western Kazakhstan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>Eastern Kazakhstan</td>
<td>Aktyubinsk</td>
<td>Western Kazakhstan</td>
<td>Mangystau</td>
<td>Almatinsk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atyrau</td>
<td>Central Kazakhstan</td>
<td>Akмолinsk</td>
<td>Kostanay</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pavlodar</td>
<td>Karagandy</td>
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<td>Karagandy</td>
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</table>
| Most regions lack domestic financial means to independently solve the problems of socio-economic development. Every year, the dependence of local on subventions increases from the republican budget. In Kazakhstan, each region seeks to improve its position in nationally and internationally.

A big role is played not only by the quality of services, the cost of products and services, but also the management of natural resources, environmental impact control at all stages production cycle and the range of services provided. All set goals are achieved through voluntary environmental certification, implementation of an environmental management system in compliance with international standards. The environmental management system plays an important role in enhancing environmental safety, energy efficiency and stability. System environmental management when transporting gas and oil in full brought in accordance with the new requirements.

The main areas of environmental protection Kazakhstani enterprises are: compliance with established environmental legislation requirements; environmental monitoring environment; planning and organization of environmental work; improvement and improvement of environmental measures; emergency prevention and containment; diagnostics environmental impact; providing conditions to reduce emissions of harmful substances into the atmosphere, water and energy consumption, reduce the amount of waste generated and other negative environmental impacts; development, acquisition and implementation technologies, materials used in pumping oil, the most safe for the environment and the public; mandatory environmental examination of projects of newly built and reconstructed objects, raw materials, used equipment; preparation and provision of conditions for repair and maintenance of trunk pipelines; increase employee culture and environmental literacy Kazakhstan enterprises in the regions. Improving the competitiveness of the enterprise, its reliability work dictates its conditions. It is the need to replace obsolete equipment; transition to a new level of pumping process control oil, expanding the tank farm, increasing through put the ability of the pipeline.

The Republic of Kazakhstan is developing strategic plans, environmental management programs; compliance measures are included environmental standards, reduce energy consumption, reduce pollutant emissions and waste generation, improving environmental education, system improvement environmental management, the implementation of which is absolute requirement for regional enterprises.
Energy efficiency, environmental and economic sustainability of the region is a sustainable balanced development and increase environmental image in an effective and efficient environment management aimed at minimizing negative economic and environmental consequences of its functioning as part of environmental and an economic system characterized by sustainable damage reduction environment. Improving pipeline energy efficiency through system approach to energy conservation of fuel and energy resources should be considered as an actual direction of development on enterprises. In order to achieve maximum fuel efficiency of energy resources, a system of energy management has been introduced in the regions and at Kazakhstani enterprises. The main advantages of the system implementation are the possibility of more efficient use of fuel and energy resources, a systematic approach to energy saving, which allows you to make more effective decisions based on the analysis of statistical and actual data. Held certification audit of the energy management system, after the audit certificate of conformity is issued, which confirms that implemented energy management system for oil transportation through oil pipelines. In the regions, akimats developed and implemented energy policies, reflective organization energy management strategy that includes regulatory commitment requirements and continuous improvement in efficiency. Energy policy is implemented by achieving the set goals and objectives in the field of energy management.

In recent years, Kazakhstan has become one of the leaders in application green economy approaches. With the adoption in 2013 of the Concept for transition to a green economy, Kazakhstan defines a green economy as a clear strategic goal. At the same time, the expansion of scale mining and fossil fuel production is national priority. Kazakhstan is a country with rich oil reserves, coal and mineral resources - in search of opportunities to ensure long-term growth based on climate-friendly technologies, measures to increase energy efficiency and rational use of natural resources, reflecting both ups and downs along the way (see table 2, figure 1).

Table 2. Investments in environmental protection by sector activities for 2010–2017, million KZT

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>90325</td>
<td>70539</td>
<td>75149</td>
<td>77500</td>
<td>103492</td>
<td>82883</td>
<td>43937</td>
<td>86962</td>
</tr>
<tr>
<td>Air pollution</td>
<td>44289</td>
<td>21991</td>
<td>28829</td>
<td>26815</td>
<td>27056</td>
<td>24936</td>
<td>18128</td>
<td>22764</td>
</tr>
<tr>
<td>Water resources</td>
<td>13509</td>
<td>18478</td>
<td>20119</td>
<td>18775</td>
<td>41812</td>
<td>15186</td>
<td>10129</td>
<td>5966</td>
</tr>
<tr>
<td>Wastes</td>
<td>13340</td>
<td>13464</td>
<td>10777</td>
<td>8026</td>
<td>16941</td>
<td>14131</td>
<td>8464</td>
<td>6210</td>
</tr>
<tr>
<td>Soil, groundwater and surface water</td>
<td>10780</td>
<td>12658</td>
<td>7597</td>
<td>10612</td>
<td>13436</td>
<td>10448</td>
<td>4278</td>
<td>8826</td>
</tr>
<tr>
<td>Noise</td>
<td>-</td>
<td>1</td>
<td>22</td>
<td>5</td>
<td>126</td>
<td>-</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>biodiversity</td>
<td>169</td>
<td>618</td>
<td>379</td>
<td>135</td>
<td>164</td>
<td>688</td>
<td>461</td>
<td>420</td>
</tr>
<tr>
<td>Radiation protection (with the exception of protecting the public from external exposure)</td>
<td>2985</td>
<td>429</td>
<td>451</td>
<td>197</td>
<td>71</td>
<td>192</td>
<td>90</td>
<td>81</td>
</tr>
<tr>
<td>NIOKR</td>
<td>1154</td>
<td>278</td>
<td>454</td>
<td>722</td>
<td>790</td>
<td>333</td>
<td>621</td>
<td>129</td>
</tr>
<tr>
<td>Other services on the environment protection</td>
<td>4099</td>
<td>2622</td>
<td>6522</td>
<td>12213</td>
<td>3096</td>
<td>16969</td>
<td>1762</td>
<td>42568</td>
</tr>
</tbody>
</table>

Source: developed by the authors according to the Ministry of National Economy of the Republic of Kazakhstan. Statistics committee, 2018.

Investments in environmental protection by sector activities for 2010–2017, million KZT (figure 1).
For investments in measures to reduce air pollution throughout the last few years accounted for the largest share of investment in environmental activities (table 3, figure 2) - about 40% of the total investments in 2016 and 26% in 2017. The total cost of investments fluctuates from year to year: 50 billion tenge in 2008 (0.3% of the nominal GDP), 90 billion tenge in 2010 (0.3 % of nominal GDP), 103 billion tenge in 2014 (0.3 %) and 44 billion tenge in 2016 (0.1 %).

Table 3. Current expenditures for environmental protection in the context regions of the Republic of Kazakhstan for 2010–2017, million KZT

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>99653</td>
<td>99213</td>
<td>109438</td>
<td>129094</td>
<td>140579</td>
<td>174650</td>
<td>152206</td>
<td>175445</td>
</tr>
<tr>
<td>Akmolinsk</td>
<td>550</td>
<td>255</td>
<td>566</td>
<td>694</td>
<td>604</td>
<td>1201</td>
<td>2129</td>
<td>2049</td>
</tr>
<tr>
<td>Aktyubinsk</td>
<td>10075</td>
<td>9 709</td>
<td>12865</td>
<td>12063</td>
<td>16382</td>
<td>18309</td>
<td>17711</td>
<td>19018</td>
</tr>
<tr>
<td>Almatinsk</td>
<td>1371</td>
<td>1152</td>
<td>526</td>
<td>1623</td>
<td>1608</td>
<td>2432</td>
<td>1793</td>
<td>844</td>
</tr>
<tr>
<td>Atyrau</td>
<td>23756</td>
<td>18777</td>
<td>18551</td>
<td>32071</td>
<td>25159</td>
<td>40254</td>
<td>26218</td>
<td>36828</td>
</tr>
<tr>
<td>Western</td>
<td>552</td>
<td>998</td>
<td>1553</td>
<td>6450</td>
<td>4964</td>
<td>3794</td>
<td>7533</td>
<td>10744</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhambylsk</td>
<td>816</td>
<td>1880</td>
<td>2388</td>
<td>1780</td>
<td>2182</td>
<td>3245</td>
<td>3599</td>
<td>3424</td>
</tr>
<tr>
<td>Karagandynsk</td>
<td>12848</td>
<td>13448</td>
<td>15560</td>
<td>16798</td>
<td>16969</td>
<td>23881</td>
<td>17040</td>
<td>24231</td>
</tr>
<tr>
<td>KostanaiISK</td>
<td>8893</td>
<td>13823</td>
<td>12263</td>
<td>12878</td>
<td>16573</td>
<td>5171</td>
<td>8303</td>
<td>6946</td>
</tr>
<tr>
<td>Kyzylordinsk</td>
<td>3074</td>
<td>2138</td>
<td>2222</td>
<td>1754</td>
<td>2429</td>
<td>2905</td>
<td>2709</td>
<td>2402</td>
</tr>
<tr>
<td>Mangystausk</td>
<td>13363</td>
<td>5209</td>
<td>5184</td>
<td>6870</td>
<td>14651</td>
<td>29093</td>
<td>18427</td>
<td>14266</td>
</tr>
</tbody>
</table>
Southern Kazakhstan  1619  2138  3329  3860  4046  4988  5462  5912
Pavlodarsk  12251  17152  17927  15690  16266  16696  19016  22983
Northern Kazakhstan  397  387  330  570  772  1865  1995  2488
Eastern Kazakhstan  7548  9285  12720  11771  13317  15838  15063  17783
Nur-Sultan  267  382  688  1302  992  1585  2425  2211
Almaty  2273  2479  2766  2918  3664  3393  2781  3315

Source: developed by the authors according to the Ministry of National Economy of the Republic of Kazakhstan. Statistics committee, 2018.


Figure 2. Current expenditures for environmental protection in the context regions of the Republic of Kazakhstan for 2010–2017, million KZT.

Analysis of table 3 showed that environmental protection costs differ significantly by region. Aktobe, Atyrau, Karaganda, Mangistau and Pavlodar regions have relatively high levels of environmental expenditure, especially in the Atyrau region, where current environmental expenditure in 2015 exceeded the level of 2012.

This is due to the relatively large scale and structure of these economic zones. If we talk about the structure of the economy, then in the gross regional product (GRP) of the Atyrau and Mangistau regions, a relatively large share belongs to industrial, mining and extractive industries. Manufacturing and energy industries account for a relatively large share of the GRP in the Karaganda and Pavlodar regions. The GRP of Aktobe region is characterized by a relatively large share of mining and energy industries.
Figure 3 shows that the proposed improvement measures environmental safety of regions and energy efficiency in sustainable development may be different. The largest contaminated sites and territories are located in Almaty, Eastern Kazakhstan and Karaganda regions. These territories are characterized by high salinity, water hardness and high concentration of sulfates and chlorides in excess of the MPC.

Groundwater pollution is observed in the Western Kazakhstan, in the Northern Kazakhstan, i.e. in oil producing and mining regions where water pollution is observed by iron, manganese and hexavalent chromium. Separate sources of water supply in rural areas (rural wells) are often polluted and unsuitable for due to over-application agricultural fertilizers in such waters have high levels nitrates despite strict rules that require organization sanitary protection zones around water intakes. In general, according to available data, bacteriological pollution of water in wells in rural areas found in 40% of cases, and chemical pollution - in 16% cases.

Kazakhstan seeks to increase the share of processed resources. Solid waste sorting facilities with a total design capacity of 1 million tons of solid waste per year have been established in eight regions, including Almaty and the capital of the state. However, the return of such waste sorting complexes to processed raw materials is extremely low. The waste disposal fee does not cover the operating costs of sorting facilities. Investment in this infrastructure is almost not wasted. East Kazakhstan, as well as its Eastern and South-Eastern mountains, is subject to natural disasters: landslides, mudslides, avalanches, floods, hurricane-force winds, hail, precipitation,
frost, and droughts. The rapid development of other manufacturing industries, such as the oil and gas and metallurgical industries, creates favorable conditions for the growth of the chemical industry. They are located in Aktobe, Atyrau, South Kazakhstan and Zhambyl regions. Approach (situational) to improving the environmental safety of economic activities of regions; reducing air pollution, soil pollution, drinking water and water bodies, and much more by various chemical plants that produce nitrogen, phosphorous, potash and complex mineral fertilizers.

Enterprises are located near industrial areas and regions where qualified labor resources and scientific research centers, for example, manufacturing enterprises household chemicals in East Kazakhstan, Karaganda and Pavlodar regions and the city of Almaty, caustic soda in Pavlodar region, sulfuric acids in Akmola, Kyzylorda and Zhambyl regions and rubber products in the Karaganda region.

In connection with the above, the following solutions are recommended:

1. Strict adherence to international and national norms and rules, reasonable consumer requirements in the areas of production.
2. Customer focus - continuous study of requirements and customer satisfaction with the quality of services provided regional level.
3. The consumer is an important figure. Improvement planning and enterprises of all production processes for minimize negative impact on workers and the environment.
4. Ensuring the safety and health of workers and people, living in areas of activity of enterprises in the regions.
5. Minimizing risks and preventing production risks injuries and occupational diseases.
7. Improving competitiveness in the market for services transporting oil and gas by achieving recognition in regional, national and international levels as competent and reliable partner.
8. Personal participation and responsibility of regional leaders enterprises in quality assurance activities. Clear distribution duties and powers of staff.
9. Improving the training of each employee; aspiration constantly reduce the negative impact of the enterprise on environment and natural resource management.
10. Compliance with environmental obligations. Introducing environmentally friendly effective energy-saving technologies and modern technologies, rational use of material, labor and financial resources.
11. Continuous improvement of the quality management system, occupational safety management systems, environmental management systems in compliance with the requirements of standards.
12. Maintaining contacts with government bodies and the public, as well as the desire for a constructive dialogue with all stakeholders on issues related to politics and eleven activities of regional enterprises in the field of quality, health and the environment.

Conclusion

Thus, in the course of studying the research topic, the following conclusions and recommendations

1. Close attention in the Concept for the transition to "green economy” focuses on social and regional development and investment needs. Particular importance is attached to sustainable use of water resources, development of sustainable and high-productivity agriculture, energy conservation and improving energy efficiency, developing the energy sector, improving waste management, reducing pollution atmospheric air, as well as conservation and effective management ecosystems.
2. In various regions of the Republic of Kazakhstan, Aarhus centers whose mission is to promote the three fundamental principles of the Aarhus Convention. Their activity decreases due to a lack of financing.

3. Kazakhstan has significant fossil fuel resources. According to proven reserves of oil, coal and uranium, the country is among twelve leading countries, and in terms of natural gas reserves - in the first twenty. Kazakhstan is the world leader in annual volumes uranium mining, ranks tenth among the countries of the world in coal mining and Twentieth in terms of oil production. Fuel and energy reserves are unevenly distributed across the country: large coal deposits are located in the northern and central regions, Uranium reserves are concentrated mainly in the southern and central regions countries, oil and gas fields are located in the western region, and insignificant gas and coal resources are available in the southern region. Kazakhstan poses enormous primary energy resources. It belongs to a group of countries, which are capable not only to satisfy domestic demand for energy resources, but also export them in significant volumes. Ensuring the environmental safety of the region and energy efficiency in sustainable development requires implementation of prudent energy management, requires the adoption of environmental standards safety, assessment and analysis of various learned economists and managerial decision making.

In the study, an attempt was made to develop activities created as part of the study, in terms of directions, contexts, paradigms, etc., which would identify inconsistencies in existing areas of analysis of environmental safety. This, in turn, contributed to a more objective picture of reality. This study has developed a neutral and reasonable tool that is equally useful to any economic factors, regardless of their scientific views and positions. All of this allowed us to get convincing and objective results.

References


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