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## **ECONOMIC INSTRUMENTS IN ENVIRONMENTAL POLICY OF UKRAINE TAKING INTO CONSIDERATION THE EXPERIENCE OF GERMANY**

**Summary:** In article presented main economic instruments of environmental protection and differences within the scope exploitation economic instruments in Ukraine as well as in Germany. Special attention was focused on new solutions in this field. These instruments, which function in Ukraine since 2002, which are using by highly developed countries already for a long time. Besides, classified and discussed the role and meaning of other instruments, which are used in policy of environmental protection, like ecotaxes, subsidies, charges, ecological insurances. Presented also experience and solutions used in Germany, which could be used in Ukrainian policy of environmental protection, and indirectly influence on developing of renewable energy sources.

**Key words:** ecological policy, renewable energy, economic instruments, ecocharges, ecotaxes, product charges, deposit refund systems, subsidies, ecological fees, ecological insurance.

### **Introduction**

Protection of environment and rational use of natural resources in the conditions of extreme industrial production growth became one of the main issues nowadays. Results of influencing of man on nature are necessary to examine not only in the light of technical progress development and growth of population but also in dependences from social terms, which they appear in. Attitude toward a natural environment is a measure of social and technical achievements of human society, characteristics of civilizational level.

Nowadays in the economically developed countries the proper efforts are adopted on integration of ecological and economic policy, revision of priorities of community development. Realization of nature protection policy takes place by the selection of ecological projects in obedience to their greatest economic profitability, and decentralization of management of natural environment protection is combined with delegation of row of functions (as a rule, in financial means) from a government to local authorities, transfer of state grounds, forests, territories which are protected, to the private capital with the purpose of management by them on commercial principles. Essence of these approaches – in limitation of the

state role and considerable facilitation of economic load in ecological policy for a private capital.

Economic instruments are powerful tools for achieving environmental goals at a lower cost, and often more effectively than many of the Command-and-Control (CAC) policies now in place. Additionally, the ability to use economic instruments (EI) together with existing CAC approaches is of great benefit. The efficiency improvements associated with EIs must nevertheless be balanced against the constraints posed by current policies, institutional capabilities and factional interests.

There are a great number of instruments and they are applied to a wide range of environmental problems. They are, however, generally used to achieve some mixture of three main goals:

1. using property rights to redress problems that contribute to pollution or poor stewardship of resources;
2. establishing and enforcing prices for resources consumed and environmental damage associated with production; and
3. subsidizing transition to preferred behaviours.

During 90th considerable experience of the use of different economic methods of environment quality management was accumulated in many developed countries<sup>1</sup>. Main among them is possible to unite in the followings groups<sup>2</sup>:

Subsidies;

Instruments in the system of crediting;

Tax instruments;

Ecological payments;

Price instruments;

Payments for achieving/saving certain ecological results;

Pollution rights Selling;

Market certificates;

Ecological insurance

Emissions trading

Ecological bailouts

Among many market values in the last years a specific „ecological” market got distribution – market of ecologically clean products and services, exchange of which brings improvement of vital environment of people, saving of natural resource potential. Ecotechnologies and „nowhow” are the distinguishing features of German industry in the world market. Basically, the only way to meet the challenges of the future is with the help of innovation. In its High-Tech Strategy, the

<sup>1</sup> *Экологическая экономика. М.: Евразия 1994, т. I-II; J.-P. Barde, Polityka ochrony środowiska i jej instrumenty, [w:] Ekonomia środowiska i zasobów naturalnych, red. H. Folmer, Krupski i S-ka, Warszawa 1999; S. Weiland, Politik der Ideen: Nachhaltige Entwicklung in Deutschland, Großbritannien und den USA. 1. Aufl., VS Verlag für Sozialwissenschaften, 2007.*

<sup>2</sup> *OECD/EEA database on instruments used for environmental policy and natural resources management, www.oecd.com [dostęp 10.09.2011].*

government identified environmental technology as one of 17 thematic sectors in which Germany can make a substantial contribution to technological innovation worldwide. All Federal Ministries are working together to implement this strategy. The idea is to deepen cooperation between the private sector and universities as well as research institutes by creating a framework that supports innovation. It has strategic areas of focus, including: promoting interdisciplinary projects, creating international ties and deepening cooperation between science and business in order to turn ideas into marketready products<sup>3</sup>.

German Federal Ministry of Education and Research commissioned a wide array of stakeholders from science, industry and politics to draw up a comprehensive "High-Tech Strategy for Climate Protection". Its core is research on sustainable energy supply and utilization as well as an intelligent use of natural resources. To this end, it makes a significant contribution to mobilizing private research efforts and capital. It initiated a number of crossindustry innovation alliances, addressing topics like organic photovoltaic, highly efficient energy storage solutions and improved efficiency in the automotive sector. The strategy connects these technological objectives to a better understanding of the processes within our climate and earth system as well as the interactions with society, economy and individuals. And it creates new structures to make climate knowledge available for decisions in politics and investment planning.

From data of the Federal department of environmental protection, Germany takes leading position in export of ecological techniques worldwide<sup>4</sup>. German Institute for Economic Research has developed a method to quantify future global demand for environmental goods and services based on alternative economic scenarios. The method places a key focus on the international trade of environmental goods and services. Those calculations predict that the effective annual demand for environmental goods and services in Germany will increase from \$75 billion in 2004 to between \$106 and 171 billion by 2020. The high growth in German exports is responsible in particular for this trend<sup>5</sup>.

In comparing to other countries, Germany in which there are more than 10,000 ecology oriented companies<sup>6</sup> offering environmentally friendly products to consumers around the world but considerably falls behind the USA, where about 30000 companies are counted (plus about 80000 communal economic enterprises)<sup>7</sup>.

<sup>3</sup> *The High-Tech Strategy for Germany*, Federal Ministry of Education and Research, Berlin 2006.

<sup>4</sup> G. Hünnekens, A. Wittmann, *Die Umsetzung und Anwendung des europäischen Umweltrechts in Deutschland*, „Umwelt- und Planungsrecht“ 2007, 27(3).

<sup>5</sup> J. Blazejczak, F. Braun, D. Edler, *German Institute for Economic Research*, DIW Berlin, Weekly Report 2009, NO. 20.

<sup>6</sup> *Keeping the blue planet green*, Federal Ministry of Education and Research, Basic Policy Issues, Berlin 2009.

<sup>7</sup> С.І. Соколенко, *Глобалізація і економіка України. 2000; Екологічні механізми: ІТТТ робить ставку на трансфер ноу-хау*. Deutschland, „Журнал про політику, культуру, економіку та науку” 2000, № 5.

Nearly every fifth environmental product on the global market can be traced back to Germany. Most of the firms in the sector are small and medium-sized enterprises that are highly specialized, many in the area of waste and wastewater technologies.

German companies lead internationally, due in part to the country's high domestic environmental standards. These include the Renewable Energy Sources Act that was passed and linked with a market-stimulus measure. Firms took their experience in meeting the standards of the law onto the export market and became leaders in their sectors. And industrial companies have invested hundreds of millions of euros in integrated technologies that help reduce emissions during production. Thus, the country has become an important global partner for coping with the environmental challenges of the 21st century.

The reason of high level development of the German ecological techniques - severely regulated by law ecological norms. Germany occupies leading positions in such technologies as garbage liquidation, water cleaning as well as renewable energy sector - classic areas of ecological techniques. In these sectors a turnover from 1985 was doubled and made at the end of 2000-85\$ billion<sup>8</sup>.

Germany's renewable energy sector is among the most innovative and successful worldwide. Nordex, Repower, Fuhrländer and Enercon are wind power companies based in Germany. SolarWorld, Q-Cells and Conergy are solar power companies based in Germany. These companies dominate the world market. Every third solar panel and every second wind rotor is made in Germany, and German turbines and generators used in hydro energy generation are among the most popular worldwide<sup>9</sup>.

Nearly 800,000 people work in the German environment technology sector; an estimated 214,000 people work with renewables in Germany, up from 157,000 in 2004, an increase of 36%<sup>10</sup>.

Siemens chief executive, Peter Löscher believes that Germany's target of generating 35% of its energy from renewables by 2020 is achievable - and, most probably, profitable for Europe's largest engineering company. Its "environmental solutions" portfolio, which is firmly focused on renewables, is "already generating more than €27 billion a year, 35% of Siemens' total revenue, and the plan is to grow this to €40 billion by 2015". Ending its involvement in nuclear industry will boost the credibility of Siemens as a purveyor of "green technology"<sup>11</sup>.

The German environmental technology industry has an internationally leading position, particularly in the fields of air pollution control, noise mitigation and recycling. Germany's share in the global export of so-called potential environmental

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<sup>8</sup> Ганс-Ніколаус Ляуер, *Технології ET*, Deutschland, „Журнал про політику, культуру, економіку та науку” 2000, N 5.

<sup>9</sup> *Green energy boom in Germany*, <http://news.monstersandcritics.com> [dostęp 22.01.2010].

<sup>10</sup> *Green energy boom in Germany*, <http://news.monstersandcritics.com> [dostęp 22.01.2010].

<sup>11</sup> *Nuclear sunset?*, „The Irish Times” 2011, September 23, p. 44.

protection goods was as high as 19% in 2003. The demand for innovative environmental technology and planning expertise from Germany is continuously increasing throughout Central and Eastern Europe, Asia and Africa. Even today, 1,5 million people work in companies that develop environmental technologies. Germany is one of Europe's leading countries when it comes to research and development expenditure in environmental technologies. With 23% of all patent applications in the field of environmental protection, Germany outperforms both the USA (22%) and Japan (19%)<sup>12</sup>.

In addition to traditional services in the areas of waste management and water resources management, the field of environmental technologies includes all technological products and processes that promote a sustainable and forwardlooking economic orientation. The efficient and sustainable use of natural resources and the minimization of harmful effects on the environment are declared goals in German research and development. The relevant fields of technology in this context are:

- environmental protection,
- air pollution control,
- water conservation and water resources management,
- waste management,
- soil conservation and the
- protection of limited resources.

As part of a comprehensive campaign to promote Germany as a key business location that ran from April 2008 until September 2009, the Federal Ministry of Education and Research has supported German research institutions, competence networks and companies with strong research departments in their efforts to market their knowhow in these fields of technology at an international level<sup>13</sup>.

German Federal Government wants to take advantage of the great economic potential offered by environmental technologies for the benefit of country economy. It will create stronger links between environmental and innovation policy instruments. The Government plans to engage in a more intensive dialogue with companies that operate in this sector. Following a suggestion by Federal Research Minister Dr. Annette Schavan and Federal Environment Minister Sigmar Gabriel, the cabinet has now passed the „Environmental technologies master plan”.

„Environmental technologies are an outstanding example of the way in which innovations can be used to make a sustainable contribution to stabilizing our economy”, says Annette Schavan. Federal Environment Minister Sigmar Gabriel agrees: „Environmental protection technologies already have a global market value

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<sup>12</sup> *Search for Companies & Research Institutes*, <http://www.researchin-germany.de> [dostęp: 22.10.2011].

<sup>13</sup> *Environmental technologies: A step ahead in air pollution control*, <http://www.bmbf.de> [dostęp: 22.10.2011].

of more than €1,000 billion. This could rise to €2,200 billion by 2020. The master plan shows the outstanding opportunities that Germany already has in this market sector – and outlines exactly how policymakers will support further development”<sup>14</sup>.

Environmental technologies already make a significant contribution to reconciling nature’s needs with people’s demands. One could go even further: environmental protection offers great economic opportunities for Germany, because German companies already hold a leading position in the global market. In 2006, Germany exported €56 billion worth of environmental protection products to other countries – a global trade share of 16%<sup>15</sup>. With the “Environmental technologies master plan”, the Federal Ministry for the Environment and the Federal Ministry of Research have taken the joint initiative to strengthen Germany’s leading position even further. In accordance with the High-Tech Strategy, close links will be created between environmental and innovation policy with the aim of opening up new markets in three particularly forwardlooking fields. In the first stage, the Federal Government will focus on the areas of water, raw materials and climate protection. These sectors are expected to generate especially strong growth. In addition, they are fields in which many German companies are already technological and global market leaders. Other subsectors are to be included in future, and all Federal Ministries have expressed their support for this initiative.

The core elements of the master plan are research funding, the transfer and dissemination of new technology applications, improvements in education and training, and the support of innovative small and medium-sized companies, especially in the area of international cooperation. For example, the Federal Research Ministry has earmarked over €250 million in funding for four innovation alliances in the area of climate protection. As part of its responsibility for renewable energy sources, the Federal Ministry for the Environment will provide over €100 million for research and technology development this year and in coming years. As for resource efficiency, the BMBF supports innovative technologies and processes in sectors in which large amounts of resources are used, for example in the metal-working industry. The BMU’s “Resource Efficiency Network” follows this up by encouraging the dissemination of innovations.

Germany is not just strong in the area of technology, but also when it comes to the scientific basis and the application of research results. In its „Research for Sustainability” framework programme, the Federal Ministry of Research supports pioneering innovations in the field of environmental technologies, including innovative concepts for decentralized water supply and wastewater disposal, weightopti-

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<sup>14</sup> *Joint press release with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Bundesministerium für Bildung und Forschung, Berlin 2008.*

<sup>15</sup> *Germany leads in the export of environmental goods, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, 2008.*

mized vehicle components based on models found in nature, and new processes for the reduction of CO<sub>2</sub> in the production of basic chemical materials<sup>16</sup>.

Ukraine on the other hand, which owns enormous scientific, intellectual, economic and technical potential and has a monopoly among the Commonwealth of Independent States in a number of industries of production of cleaning equipment, monitoring systems, agricultural- and biotechnologies, would due to a production and sales of ecologically clean goods and services solve the considerable particle of economic and social problems. But in Ukraine it, unfortunately, does not have practical realization<sup>17</sup>. The present environmental situation in Ukraine is dangerous and grave. The Parliament of Ukraine declared the whole territory of the country an extraordinary environmental situation zone.

Ukraine, which occupied 27% of the former Soviet Union territory, produced 20 % of its national product and received a quarter of its industrial pollution. The Ukrainian economy was formed with total disregard for the objective welfare of the Ukrainian people. The result is the formation of one of the most polluted economies in the world, over saturated by chemical, metallurgical and mining production facilities utilizing obsolete technologies.

Every year 20 million tons of industrial waste goes into the atmosphere. More than 1 billion cubic meters of harmful substances are ejected into the rivers. Seventeen billion tons of solid wastes are accumulated in the dumps, which continue to grow to more than 1 billion tons annually. Nonrenewable mineral raw stock resources are being exhausted. Soil, water, and atmospheric air gets intensively polluted.

118 million hectares of black soil have been eroded. Such erosion has never previously occurred in the 5 thousand year history of Ukrainian agriculture. Thousands of rivers have perished. The Black Sea and the Sea of Asov suffer degradation due to water pollution. The Carpathian mountains have lost half their forests as a result of intensive cutting for economic purposes. There is a water deficiency in a number of cities. Industrial atmospheric pollution exceeds environmental quality standards up to 10 times<sup>18</sup>.

In many industrially developed countries was introduced such economic instrument on working out of ecological problems, as ecological taxes on a products and technologies – which is stimulator of production limitation and consumption of ecologically dangerous products, and also to the products which are made from rare natural resources. In general, nowadays in industrially developed countries, are

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<sup>16</sup> *Joint press release with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Bundesministerium für Bildung und Forschung, Berlin 2008.*

<sup>17</sup> В.О. Аніщенко, *Теоретичні та практичні аспекти розвитку екологічного бізнесу та ринку в Україні*, „Фондовий ринок” 2001, № 18.

<sup>18</sup> S. Kravchenko, *Environmental Enforcement and Public Advocacy in Ukraine*, INECE Conference 4, 2007, Vol. 1.

used 153 different economic and financial levers, among which 81 – different penalties, 41 – different subsidies and 31 – other measures. As an example of effective ecological actions it is possible to point out establishment in Germany different level taxation on ethyl and nonethyl petrol, high level of lead in fuel, sulfur n o l, taxes are charged for norm v olat on of us ng pest c des, and also us ng taxat on as an nstrument of encouragement car manufacturers to release cars w th the low level of environment contamination<sup>19</sup>.

According to researches, among the factors of the ecologicaleconomic growth, lead ng pos t on occupy nvestments and nnovat ve act v ty, ability to create and use competitiveness of ecologically safe and saving technology and techniques: technologies that don't waste too much resources, productions which requires minimum resources capacity, cleaning techniques and equipment. Accordingly, ecologization of technical development needs financing. In the developed countries of the world for development of ecotechnologies is allocated about 5–10% of GDP from the general volume of financing in innovative activity<sup>20</sup>. In particular by the program of Federal Ministry of Research and Technologies of Germany, about 5–7% of the state budgetary facilities allocated on science researches and scientificconstruction projects in ecological industry<sup>21</sup>. In comparison to Ukrainian situation, where in the f eld of ecotechnolog es and env ronmental protect on from GDP was allocated in 2000 year – 0,36% and in 2006 – 0,41%<sup>22</sup>.

For the improvement of the ecological situation of natural environment in Ukra ne, the techn cal product on rearmament s needed based on the newest sc ent f c ach evements, energy and resource sav ng technolog es, and ecologically clean technological processes.

By law of Ukraine „About the protection of natural environment”, the following budgetary sources operate in Ukraine: paying for contamination of natural environment and for use of natural resources (penalties, lawsuits for violation of nature protection legislation). For the increasing of penalty paying percentage, in the conditions of difficult financial and political situation and insolvency of enterprises, the row of measures were conducted: changes are borne to the nature protection legislation, were developed mechanisms of debt liquidation due to material and technical facilities of enterprises; new approach to priorities of expense

<sup>19</sup> Л. Мельник, *Принципи екологобезпечного розвитку*, „Економіка України” 1996, нр 2. Див.: *Международный регистр потенциально токсичных химических веществ*. – Женева: ЮНЕП, 1992.

<sup>20</sup> Н.Н. Лукьянчиков, И.М. Потравный, *Экономика и организация природопользования*. М.: ЮНИТИ, 2007.

<sup>21</sup> В. Latour, *Politics of Nature. How to bring the Sciences into Democracy*, Harvard University Press, Cambridge 2004.

<sup>22</sup> *Статистичний щорічник України за 2006 рік*. Державний комітет статистики України. К.: Консультант, 2007.



are formed<sup>23</sup>. Thus, influence on an enterprise is carried out as by economic and administrative methods. However not all noted methods give the planned effect: generally in Ukraine, investment reduction proceeds in nature protection buildings<sup>24</sup>. Analysis of statistical reports for 2006 shows that 8,3 billion UAH were directed to the purposes of environmental protection, but only 22% – directed to investments in fixed capital aimed at new buildings and reconstruction of environmental protection facilities, purchasing new equipment for the implementation of ecological goals<sup>25</sup>.

Establishing a viable policy package involves four main phases:  
assembling information in a structured way,  
identifying a shortlist of the most suitable policy options,  
engaging stakeholders to help refine policy choice, and  
implementing and evaluating the policy.

While the theoretical benefits of particular marketbased control approaches are important, practical consideration of the statusquo, including institutional strength, existing policies, and stakeholder power dynamics, will have enormous influence in deciding the most viable policy approach. The key issues which are intended to provide guidance for developing more effective policy, should not be viewed as insurmountable barriers. In fact, economic instruments can help solve many resource use problems even in countries with high poverty and less effective supporting institutions like Ukraine.

It is important to spend the necessary time defining the problem, identifying factional interests, and evaluating past attempts to address the problem. The information base should then be assembled into a structured template from which an initial set of policy options can be proposed and developed. At this point, a process of stakeholder involvement and feedback should be established to gather additional information and to revise assessment of the problem and the proposed range of solutions accordingly. Care should be taken to avoid seizure of the process by vested interests, as this can slow down the policy process and redirect policy in directions that are less effective and more expensive.

Current institutional and economic capabilities need to be realistically assessed. If instrument choice or structure can be adapted to, or compensate for, identified institutional weaknesses, this would generally be the preferred course of action; trying to address environmental problems concurrently with trying to improve baseline conditions may risk failure. If the weaknesses preclude any policy solution, there may be no alternative but to implement institutional reforms, par-

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<sup>23</sup> Т.А. Завгородня, *Удосконалення інструментів економічного механізму охорони навколишнього природного середовища*, „Економіка України” 2000, пг 12.

<sup>24</sup> Ю.М. Остапчук, *Охорона навколишнього середовища та використання природних ресурсів України*, Під загальним керівництвом. К.: Держкомстат України, 1999.

<sup>25</sup> *Статистичний збірник „Довкілля України” за 2006 рік/Державний комітет статистики України*, За ред. Ю.М. Остапчука, К.: 2007.

ticularly if the environmental problems are severe. Such reforms would obviously require a broader coalition than just environment ministries. Policy design should be commensurate with the problem to be solved, avoiding taking overly complicated measures.

Alternative measures to address identified problems should also be considered. If there are gaps in baseline institutions, then implementing command-and-control may have also the same problems as economic instruments. In such circumstances, because economic instruments can operate at a more decentralized level, they may be preferable.

It is also important not to underestimate the challenge of reaching agreement. Establishing a process of stakeholder involvement is crucial in order to understand the terrain and to provide interested parties with a mechanism to be heard. However, it does not necessarily lead to consensus, and the process needs to be managed strategically. Clear definition of timelines and structuring of the stakeholder process can speed up development of policies. To be effective, the environment ministry needs to enforce its timeline in a consistent manner.

Political challenges also continue even after policy instruments have been chosen. Technical challenges in establishing appropriate tax/charge levels are mitigated to some degree by the ability to modify them over time based on observed market reactions, reducing the pressure to get the initial formulation perfect. However, imposing realistic fee levels on established resource users or polluters can be difficult. In addition, creating and supporting new markets (e.g., for pollution permits) can be challenging, especially where there is no history of strong markets in other commodity areas.

Gathering data on the resource base, which parties are damaging it, and how the costs of that damage are spread among other users and the surrounding population, should take place early in the process. This information can help to justify policy proposals, as well as divide potential opposition groups by identifying which ones are harmed by the status quo.

Monitoring and enforcement are the bases to achieving environmental progress. Expectations on how seriously to take the new policies will be set early, so policy makers need to set the right tone. Instituting a mechanism for third parties to bring suit can offset weaknesses in governmental environment enforcement capabilities.

Disclosure and transparency are necessary tools to ensure the economic instrument is working, and to help offset continual pressure from affected stakeholders to water down or co-opt the policies. Provision of key information on environmental quality and existing subsidies as early in the process as possible will support subsequent policy implementation as well as the initial policy choice.

It is quite common to attempt to achieve political consensus via payments or other subsidies to affected parties. However, providing subsidies to transitional

behaviours in favour of sustainable practices should be used sparingly since they create distortions of their own and are often very difficult to end once they are implemented. Rather, subsidies should focus on protecting the poorest sectors of society from any severe impacts of the change. This could be done with:

A focus of payments for poverty alleviation; transitional payments (e.g., the introduction of environmentally sound technologies); and situations where social benefits greatly exceed private benefits (often where existence and bequest values of a resource are high and flow to more technically advanced societies).

Transitional payments should be decoupled from any activities causing environmental damage, and should be time limited.

Support for subsistence sectors should also be decoupled from environmentally damaging production if at all possible and shifted to subsistence consumption.

Where central governments cannot be relied upon to provide direct subsidies to the poor, pricing mechanisms should be used instead.

Where transitional subsidies are used to accelerate development and implementation of new technologies, look for market based structures such as Renewable Portfolio Standards to accomplish the goal. These will often be more dynamic and more efficient than grants or tax subsidies.

## Conclusions

The choice of the most appropriate policy is influenced by a wide range of factors including environmental laws already in place, the power and technical capability of ministries involved, and the broad economic conditions within the country. It is therefore important to recognize that there is no precise formula for deciding when to apply a particular economic instrument. However, certain patterns and experience of Germany (as one of the leading country in the field of using economic instruments) as to when and under what conditions economic instruments have been successfully used could be great help to constructing and modifying Ukrainian ecological policy. In many cases, modifying some of the flanking measures or policy implementation variables can help tailor the generalized solution to meet the specific conditions in Ukraine. Specific economic instrument choice is driven far more by the problem structure than by the resource area.

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## **Ekonomiczne instrumenty ochrony środowiska polityki ekologicznej Ukrainy z uwzględnieniem doświadczenia Niemiec**

**Streszczenie:** W artykule zaprezentowano podstawowe instrumenty ekonomiczne polityki ochrony środowiska oraz różnice w zakresie wykorzystywanych instrumentów ekonomicznych na Ukrainie z uwzględnieniem możliwości zastosowania doświadczenia Niemiec. Szczególną

uwagę zwrócono na doświadczenia i rozwiązania niemieckie oraz możliwości i perspektywy rozwoju danego sektora na Ukrainie. Narzędzia te funkcjonujące na Ukrainie od początku lat dwutysięcznych dość powszechnie wykorzystywane są w krajach wysokorozwiniętych w tym w Niemczech już od dawna. Ponadto sklasyfikowano i opisano znaczenie innych instrumentów i działań wykorzystywanych w polityce ochrony środowiska, takich jak ekopodatki, subwencje, kary, ubezpieczenia ekologiczne, omówiono również rozwiązania, funkcjonujące w Niemczech, które mogłyby zostać zastosowane w ukraińskiej polityce ochrony środowiska i jednocześnie mogą pośrednio przyczynić się do wsparcia rozwoju energetyki odnawialnej.

**Słowa kluczowe:** Polityka ekologiczna, energetyka odnawialna, ekonomiczne instrumenty, ekopłaty, ekopodatki, opłaty produktowe i depozytowe, subwencje, kary, ubezpieczenia ekologiczne.

