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Tax Incentives in Public Administration Strategy for Territorial Leadership in Energy Conservation

Olga Ivanova
Doctor of Economics, Associate Professor
National Academy of Sciences of Ukraine, Research Centre for Industrial Problems of Development
1a Inzhenernyi Ln., Kharkiv, 61166, Ukraine
e-mail: laptevaou@gmail.com
https://orcid.org/0000-0002-3656-2473

Leonid Tulush
National Scientific Center «Institute of Agrarian Economy»,
Heroiv Oborony str. 10, 03127 Kyiv
Ukraine
e-mail: tulush@ukr.net
e-mail: tulush@ukr.net; ORCID ID: 0000-0002-3922-5245

IrynaGryshchenko
Doctor of Science in Public Administration,
Professor Department of Public Administration and Innovation Management,
National University of Life and Environmental Sciences of Ukraine
gryschenkoiryna@ukr.net
http://orcid.org/0000-0002-8191-1177

BohdanHrebeniuk
postgraduate student
Department of Public Administration and Innovation Management
National University of Life and Environmental Sciences of Ukraine
gbofront@gmail.com
http://orcid.org/0000-0002-0423-8476

AnnaFedorova
postgraduate student
Department of Public Administration and Innovation Management
National University of Life and Environmental Sciences of Ukraine
9949@i.ua
https://orcid.org/0000-0001-8833-6606

Abstract. The aim of the study is to identify levers and determine prospects for promoting energy conservation with the help of tax policy tools, which formscompetitive advantages of a territory in the struggle for leadership in world markets. The article analyses statistical data on energy intensity and energy consumption, which are formed by the World Energy Council (WEC) and International Energy Agency. The analysis of trends in using energy resources indicates that there is an increase in the global electricity consumption; one of the pressing problems faced by society is high rates of energy consumption in the manufacturing sector of developing countries, making products of the countries uncompetitive in world marketsdue to their cost; at the same time, there is a decrease in electricity consumption per unit of GDP for 2016-2017 and a further decrease of 27 % is forecasted for the period 2017-2040.There observed a significant gap in the energy intensity of countries with

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different economic structures, which is explained by the presence of energy-intensive industries. However, the downward trend in energy intensity in these countries indicates a decrease in their industrial activity caused by the crisis. The driversofthe need for promotingenergy conservation – economic, political and ecological ones – are defined.The influence of state regulation of energy conservation on the leadership of territories in the competition in world markets through tax incentivesis substantiated. The practices in using tax incentives by countries of the world to promote energy conservationwhen levying corporate income tax is systematized.It is proved that the fiscal measures most often used in countries of the world for this purpose aretax credit, accelerated depreciation, tax reduction.It is determined that the benefitsof business entities from tax incentives for energy conservationare as follows: reduction in the amount of tax, decrease in the cost of industrial products, provision ofimpetus to the implementation of environmentally friendly production technologies;the benefitsof the State are environmentaladvantages, delayed effect of increase in future tax revenues.
Keywords: energy efficiency, energy resources, leadership, tax incentives, state regulation, public administration strategy, publicity policy, anti-corruption management

1 Introduction

The problem of modern global society concerns efficient use of resources at all levels of government, both in the whole world and in individual countries and their territories. It is the effective use of the strategic potential of a territory that makes it possible to increase its competitiveness and take a leading position in international markets. Sustainable development of the economies of the world under condition of resource shortage requires development and implementation of a well-considered national policy for energy conservation includingenergy saving and energy efficiency.

The main policy documents of the EU and countries of the world among strategic priorities contain tasks concerning rational use of energy.For example, according to the EU Framework Program for Research and Innovation "Horizon 2020"(Horizon 2020) the priority areas of development include renewable energy and promotion of energy saving.Moreover, energy efficiency is defined as a priority area of development in strategic documentsof Organisation for Economic Co-operation and Development (OECD 2011), European Commission (Europe 2020), International Energy Agency(Wadim Strielkowski, Gryshova I.Yu (2018),and others.(Dragan Ivan.O., Kovalova Olena, Gryshchenko Iryna, Ridei Nataliia, Livinskyi A. I, 2020), (Vinogradova, E., Nikoliuk, O., Galimova, A, 2020)

The national energy conservation policy should form directions, a system ofleversfor energy conservation, which helps to increase financial productivity, energy and ecological security, and, as a result, increase the competitiveness of territories.

Leadership of territories in the competition is also determined by the ability to efficiently use energy resources. Thus, under these conditions, an analysis of the global practices in using the existing tools for promoting energy conservation will help build a system of effective levers for forming the national energy conservation policy.(BilynskaM, BaltsiiYurii, BoyarskyyOleksandr, BykovaTetianaValerijivna, GryshovaRymma, 2020)

*The aim of the study*is to identify leversand determine prospects for promoting energy conservation with the help of tax policy tools, which forms competitive advantages of a territory in the struggle for leadership in world markets.

The study of energy conservationis carried out by a number of international organizations, in particular:EuropeanEnvironmentAgency, WorldEnergyCouncil, InternationalEnergyAgency, USEnergyInformationAdministrationand others. Problems of state regulation of energy conservation, energy efficiency, and energy savingare studied by foreign and Ukrainian experts, namely:V. Khaustovaet al. (2019),O. Kovalova (2019), M. Kyzymet al. (2018),

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V. Rudyka(2018), Yu. Ivanov (2014), M.Kyzymet al. (2020), V.Laptiev, O. Ivanova (2020),O. Lelyuk (2018), andothers.However, the problems of creating effective levers of tax incentives for energy conservationremain relevant for many countries of the world since it allows reducing the energy intensity of GDP and increasing the competitiveness of products in international markets.

2 Materials and methods of research

Theanalytical basisofthestudyis the dataof WorldEnergyCouncil (WEC), InternationalEnergyAgency (IEA),Global Energy Statistical Yearbook, PricewaterhouseCoopersInternationalLimited (PwCIL), WorldwideTaxSummaries.
Theresearchtechniquesusedareanalysisandcomparison, grouping, statistical and graph method.

3 Results and discussions

According to forecasts by Bloomberg New Energy Finance(NEO 2017), global electricity consumption is expected to grow by 58 % by 2040, which is 2 % of the average monthly growth. At the same time, it is forecasted that consumption of electricity per unit of GDP will decrease by 27 % in the period 2017–2040 (NEO 2017).
The growth in global energy consumption (NEO 2017) indicates the need to develop viable mechanisms for ensuring effective use of the strategic potential for energy saving.
Rational use of energy in the context of globalization is becoming a sustainable competitive advantage for the economies of the world, given the economic, geopolitical and environmental consequences of irrational use of energy resources.
Thus, high energy consumption in the manufacturing sector in developing countries makes their products uncompetitive because of their cost. According to the Global Energy Statistical Yearbook (Global Energy Statistical Yearbook 2019), the energy intensity of GDP in 2016 in Russia and Ukraine is almost 2.5 times higher than the average level of this indicator in countries of the world. In 2017, this trend is gradually improving. However, compared with the global average energy intensity, it remains negative.(Fig. 1).
This trend negatively affects the balance of imports and domestic productionof a country, reduces the competitiveness of its goods, and requires effectiveefforts of the government to meet its needsfor fuel and energy resources.
Another important driverof the need for promoting energy conservationis energy dependenceof countries. For example, the average energy dependence of the EU countries is about50 % (Austria – 64.7 %; Germany – 61.4 %; France – 50 %; Italy – 18 %, Japan – 7 %)(Worldwide Tax Summaries – Corporate Taxes 2018/19).
The decrease in energy intensity of GDP, e.g., in Ukraine, is explained by the unstable political and economic situation in the country, which directly affects producers, as well as by the decline in demand for energy resources from the most energy-intensive industries. In general, in 2017, the energy intensity of the country's GDP (PPP) decreased by 40 % compared to 1990 (Official Website of the International Energy Agency; Khaustova, Kovalova 2019;Khaustova, Salashenko, Lelyuk 2018).
Countries with the largest growth in total energy consumption outside the OECD are Ukraine, Russia, China and India are the largest contributors, whereas OECD growth is supported primarily by the United States. Strong decreases in the EU and Japan bring OECD overall value downwardsYearbook (Global Energy Statistical Yearbook 2019).
And finally, the driver affecting the quality of life is the environmental consequences of irrational use of energy resources(environmental disasters, climate change, etc.)
Thus, with regard to the abovementioned consequences of inefficient use of energy resources, it is important to develop effective incentives for energy conservation,as priorities for the socio-

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economic development of countries of the world.

The economic essence of the national energy conservation policy, according to D. Drozhzhin, is "an organized and purposeful activity / inactivity of public authorities in regulating the use of primary energy and conversionof energy in the national economy". However, this definition does not take into account the promotion of energy conservation(Drozhzhin 2012).

State regulation of energy conservationshould be carried out through various tools and techniques (Fig. 2), which contributes to forming a sustainable leading competitive position of a territory in international markets based on using the strategic potential forenergy saving.

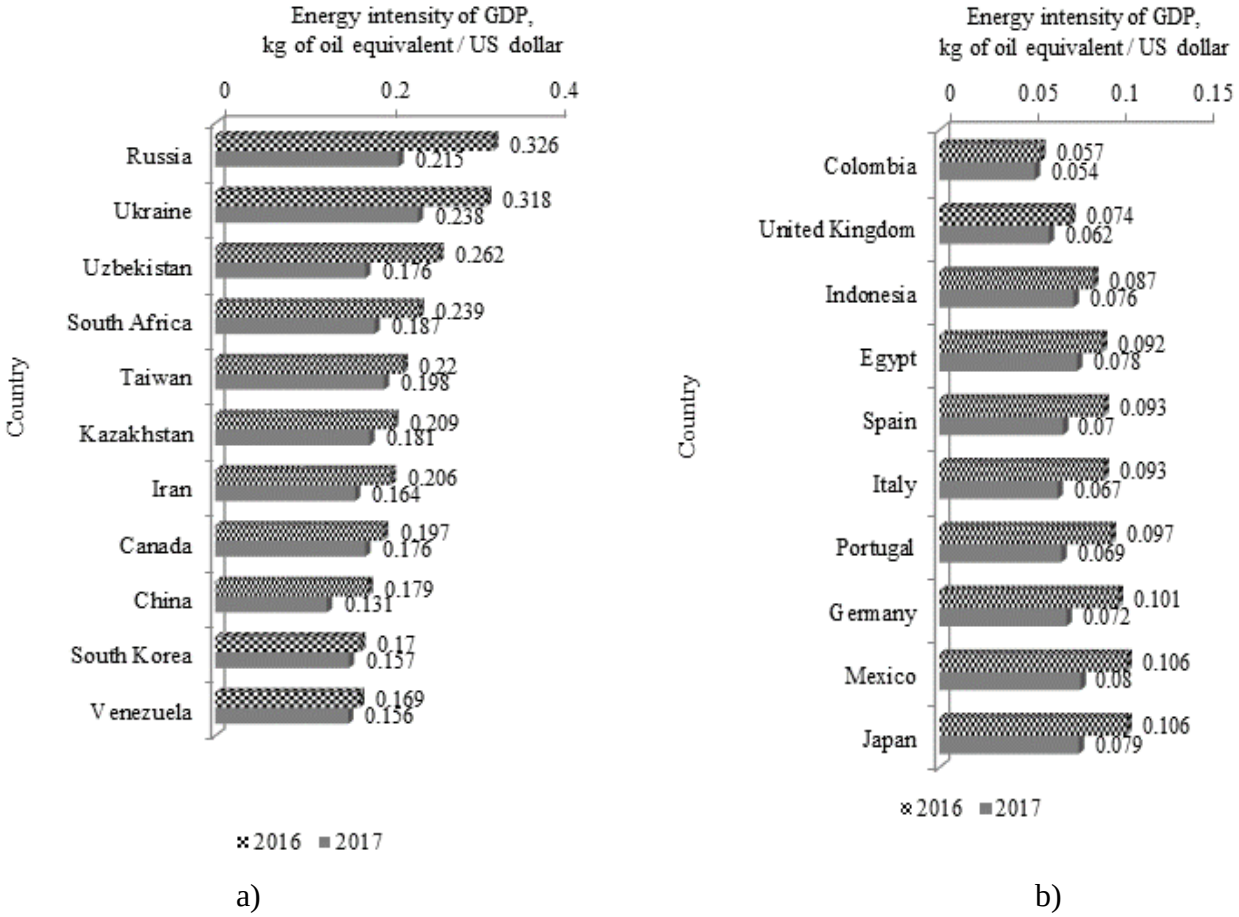

Fig. 1. Maximum (a) and minimum (b) values of energy intensity of GDP at constant purchasing power parity by countries of the world, 2016-2017

Source:Global Energy Statistical Yearbook (2019)

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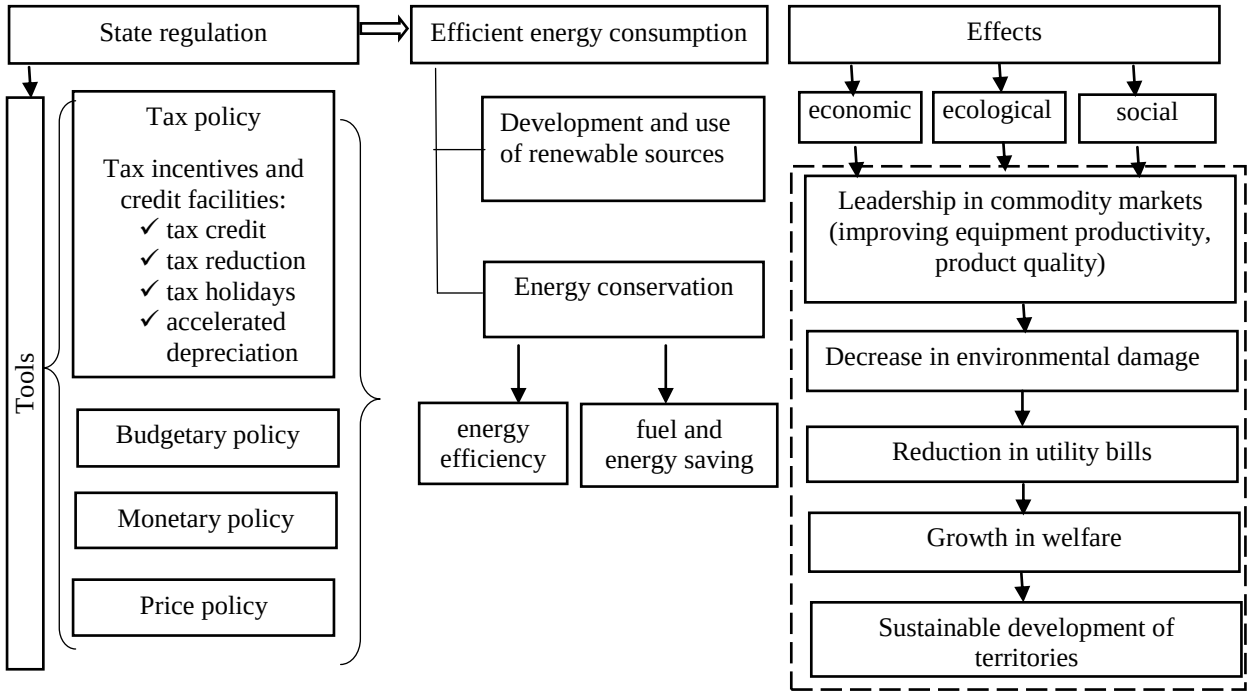

Fig. 2. The influence of state regulation of energy conservation on territorial leadership
Source: developed by the authors

The territorial strategic potential for energy savingis as follows (Ivanova, Laptiev 2020; Nemish 2013; Ivanov, Vinnikova 2014): increasing production of own energy carriers; reducing irrational use of energy resources, implementing new energy-efficient projects and programs at the national, regional and enterprise levels; introducing resource-saving technologies in all sectors of the economy and social sphere.

The analysis of global and Ukrainian practices allowed to identify various dimensions in promoting energy conservationand tools employed, in particular: levers of thebudgetary, monetary, price and tax policy – the use of the tax system of the country being most effective.

The EU have developed a number of directives which regulate the process of energy saving in general and methods to promote it: recommendations on the rational use of energy in industrial enterprises, on scaling up investments in energy efficiency, on promoting the use of biofuels and other renewable fuels for transport. EU member states can exempt from taxationorreduce taxation of fuel used for technological projects aimed at developing renewable energy sources or green products; all types of biofuels; energy of the sun, wind, biomass; electricity consumed by public utilities; natural gas used as motor fuel (Europe 2020).

AccordingtoWorldEnergyCouncil, topromoteenergyconservation, countries of the worldmainlyusethefollowingfiscalmeasures: taxcredit, acceleratteddepreciation, taxreduction. Thus, basedonthereportWorldwide Tax Summaries – Corporate Taxes 2018/19 (2019),the application of tax incentives for energy conservationis systematized (Tbl. 1).

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Table 1. The practices of individual world countries in using tax incentives for energy conservationwhen imposing corporate taxes

Tax incentives	Countries																			
	Australia	Argentina	Belgium	United Kingdom	Honduras	Indonesia	Ireland	Spain	PRC	Liechtenstein	Luxembourg	Malaysia	Netherlands	South Africa	Russia	Singapore	USA	Uruguay	Fiji	Sri Lanka
Accelerated depreciation	+	+		+			+			+	+		+		+	+				
Tax credit								+	+		+						+			
Tax holidays					+	+						+						+	+	+
Tax reduction	+		+										+	+			+			

Source:Worldwide Tax Summaries – Corporate Taxes (2018/19); Ivanova, Laptiev(2020); Ivanov, Vinnikova(2014); Energy Efficiency: A Recipe for Success (2010); NEO (2017)

According to Table 1, the most common toolsused internationallyto promote energy efficiency in industry are accelerated depreciation and tax credit.

The application oftax incentivesfor energy conservation is widespread in many countries of the world including the USA, Japan and several European countries after the global energy crisis, which has become a driverof the development of measures to promote energy saving.

For example, in Australia, accelerated depreciation is used for depreciatingcapital expenditures for the geothermal energy exploration (100 % write-off).Argentina'sregulation envisages writing off expenditures for the exploration of alternative energy sources (e.g., wind energy) during a three-year period.In the UK, there is an opportunity to write off up to 100 % of the cost of relevant technologies and equipment within a year from the purchase date. Only the products included in the Energy Technology List, whose compilation criteria are reviewed and approved annually with regard to the latest developments, are eligible foraccelerated depreciation.The practice of Ireland implies using accelerated depreciation in the amount of 100%in the first year to depreciate the cost of some energy-saving equipment: information and communication technologies; heat and power supply; electric vehicles and alternative fuel vehicles; heating, ventilation and air conditioning systems; lighting; motorsand drives; building energy management systems; freezing and cooling systems; electro-mechanical systems; restaurant and hotel equipment.In a small country of Liechtenstein,the method of accelerated depreciation is used for energy-saving equipment and installations using solar energy, which are depreciated at a rate of 50 %. In Luxembourg, accelerated depreciation of 80 % of the value of fixed assets applies to the assets that contribute to energy savings. In Singapore, the rate is 100 % for capital expenditures for energy-saving equipment (Ivanova, Laptiev 2020;Worldwide Tax Summaries – Corporate Taxes 2018/19 (2019).

The practices of using tax incentivesfor energy conservation presented in the table 2.

Table 2. The practices of using tax incentivesfor energy conservation: tax credit, tax reduction

Tax credit	
Luxembourg	An incremental tax credit is granted in the amount of 12 % of the increase in investment in tangible assets during the tax year. A tax credit – in the amount of 8 % of the first EUR150,000 of new investments in tangible energy-saving assets.

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Spain	A 30 % tax credit for investments made inequipmentused forenvironmental conservation and improvement and for conservation of energy is provided. The equipmentis listed inBasqueListofEnvironmentalTechnologies.
USA	Production Tax Credit in the amount of 30 % for investments in new, expanded or converted advanced energy projects in manufacturing. The applicants receive tax credits depending on the expected commercial viability of the project.
Hungary	A tax credit is granted in the amount of up to 80 % of the tax payable
Tax reduction	
USA	The Energy Efficient Commercial Buildings Tax Deduction is applied at a rate of USD0.30 - 1.80 per square foot (0.093 m^2), depending on the technology and the degree of energy reduction.
Australia	There provided a tax reduction of 150 % of the actual cost of energy audits, not exceeding BBD25,000 (USD12,500) for each year within five years, and additional write-off of 50 % of the cost of improvement of premises or installing systems for generating electricity from renewable sources. The condition for obtaining a discount is the absence of debts for the payment of the profit tax, VAT, land tax, and national insurance premiums
Belgium	Atax reduction of14.5 % on qualifying investments for energy-saving investments. In case of insufficiency or absence of taxable profit, investment deductions can be carried forward without any restrictions in time or amount.
Netherlands	A taxreductionof41.5 %on total annual investment in excess of EUR2,300 for investments in energy efficient assets

Source: *Source*:Worldwide Tax Summaries – Corporate Taxes (2018/19); NEO (2017); Ivanova, Laptiev (2020); Ivanov, Vinnikova (2014); Energy Efficiency: A Recipe for Success (2010)

Tax credits (Tbl. 2) are granted in the amount of 4 % to 100 % of the corresponding expenses. The advantage of their application for enterprises is the possibility of reducing tax liabilities without the need to pay them in the future, as evidenced by statistics on the use of tax credits by sector: industry – 32 %, households – 36 %(Gryshova, I.; Kyzym, M.; Hubarieva, I.; Khaustova, V.; Livinskyi, A.; Koroshenko, M., 2020).

Practice shows that quite often the tax reduction does not include all relevant expenses, only a certain percentage, or there is a restriction in the form of a certain amount of the expenses(Energy Efficiency: A Recipe for Success 2010).

In the Republic of Fiji,tax holidays imply a ten-year tax exemption on income received by a tax payer from a new type of activity – processing agricultural raw materials in biofuels. A tax exemption for five yearsis available for a taxpayer who is involved in renewable energy and cogeneration projects.A five-year corporate tax holiday is provided for Honduran companies engaged in producing energy from renewable sources. In Indonesia, corporate tax exemption is applied for a period of 5 to 10 years from the beginning of industrial activity, after which tax liabilities can be reduced by 50 % for another 2 years. Since 2013, there has been a ten-year tax exemption for profits and income of enterprises from cultivating renewable energy crops in Sri Lanka. Most often, tax holidays are granted for a period of 3 to 10 years and in the amount of 40 % to 100 % of a tax liability(Dr. Tetiana Tielkiniena, Gryshova Inna, Shabatura Tatyana, Nehodenko Viktoriia, Didur Hanna, Shevchenko Alisa., 2020).

The benefits of business entities from tax incentives for energy conservationare as follows:

Firstly, reduction in the amount of corporate tax bythe full amount of the targeted expenses incurred or part thereof; by the full or partial amount of the increase in relevant expenses in the reporting period in relation to the established base.

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Secondly, decrease in the cost of industrial products through using less energy-intensive production technologies, which increasesthe enterprise'sprofit and enhances its competitiveness in world markets.(Vinogradova, E., Nikoliuk, O., Galimova, A. 2020)
Thirdly, ensuring renovation of fixed assets by means of accelerated depreciation. Increased rates and a shorter (compared to the usual procedure) depreciation period allow the payer increasing the amount of accrued depreciation for usingthe fixed assetsin each tax period, and reduces the item of taxation.(Gryshova, I.; Shabatura, T.; Girdzijauskas, S.; Streimikiene, D.; Ciegis, R.; Griesiene, I., 2019)
Fourthly, provision ofimpetus to the implementation of environmentally friendly technologies for industrial productionto reduce the emission of harmful substances into the atmosphere and their discharge into water bodies.
At the same time, the state receives delayed competitive advantages: 1) environmental benefits, 2) increase in tax revenues due to improved financial results of business entities. (Dragan Ivan.O., Kovalova Olena, Gryshchenko Iryna, Ridei Nataliia, Livinskyi A. I., 2020)
In addition to tax incentives for energy conservation, there are other tax instruments, which imply using value added tax, excise tax, duties, environmental tax, land tax, personal income tax.

5 Conclusions

Thus, the research has led to the following conclusions.
1. The analysis of trends in using energy resources indicates an increase in global electricity consumption. The problem of our time is high energy consumption in the manufacturing sector in developing countries, which makes the countries' products uncompetitive because of their cost in world markets. At the same time, there is a decrease in electricity consumption per unit of GDP for 2016-2017 and a further decrease of 27 % is forecasted for the period 2017-2040.
2. There is a significant gap in the energy intensity of countries with different economic structures, due to the presence of energy-intensive industries. However, the downward trend in energy intensity in these countries indicates a decrease in their industrial activity due to the crisis.
3. The driversof the need for promoting energy conservationincluding economic, political and ecological ones are defined.
4. The influence of state regulation of energy conservation on the leadership of territories in the competition in world markets through tax incentives is substantiated.
5. The practices of countries of the world in using tax incentives for energy conservation when imposing corporate taxesis systematized. It is proved that to promote energy conservation countries of the world most often use the followingfiscal measures: tax credit, accelerated depreciation, tax reduction.
6. The benefits of business entities from tax incentives for energy conservation are reduction in the amount of tax, decrease in the cost of industrial products, provision of environmentally friendly production technologies. The benefits of the state are environmental advantages; delayed effect of increase in future tax revenues.

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