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NATIONAL PECULIARITIES OF BIOFUEL MARKET IN THE CONTEXT OF ENERGY SECTOR GLOBALIZATION

The article studies one of the contemporary ways to solve the global problem of countries' energy supply using renewable energy and its important part – biofuel; peculiarities of biofuel production development in various countries and regions at the global consumption market of renewable energy products and innovative-investing development' directions of this field are defined.

Keywords: renewable energy; biofuel; investment; globalization.

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НАЦІОНАЛЬНІ ОСОБЛИВОСТІ РИНКУ БІОПАЛИВ В УМОВАХ ГЛОБАЛІЗАЦІЇ ЕНЕРГЕТИКИ

У статті досліджено один із сучасних шляхів вирішення глобальної проблеми енергозабезпечення країн з використанням відновлюваної енергетики, її важливої складової – біопалива, визначено особливості тенденцій розвитку виробництва біопалива у різних країнах та регіонах на фоні світового ринку споживання продуктів відновлюваної енергетики та в контексті інноваційно-інвестиційного розвитку цієї галузі.

Ключові слова: відновлювана енергетика; біопаливо; інвестиції; глобалізація.

Рис. 3. Табл. 2. Літ. 15.

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НАЦИОНАЛЬНЫЕ ОСОБЕННОСТИ РЫНКА БИОТОПЛИВ В УСЛОВИЯХ ГЛОБАЛИЗАЦИИ ЭНЕРГЕТИКИ

В статье исследован один из современных путей решения глобальной проблемы энергообеспечения стран с использованием возобновляемой энергии, ее важной составляющей – биотоплива. Определены особенности тенденций развития производства биотоплива в разных странах и регионах на фоне мирового рынка потребления продуктов возобновляемой энергии и в контексте инновационно-инвестиционного направления развития этой отрасли.

Ключевые слова: возобновляемая энергетика; биотопливо; инвестиции; глобализация.

Introduction. According to the IEA's experts, the reason for Ukraine's low achievements in promoting renewable energy sources is the lack of comprehensive, analytical approach to justifying its energy policy goals, especially concerning research and innovations (Mandil, 2006).

Contemporary views on the development of renewable energy have been formed under the conditions of the ongoing world economic financial crisis. With the changes occurring in the economy of particular countries and regions many members of the world community have preserved a single understanding and approach to resolving such an important question for the civilization's development as energy security (Green paper, 2006). An innovative way of solving this problem is considered to be the transition of the world economy onto biofuel, based upon the scarcity of fossil fuels and the availability of today's high-technology of transforming renewable raw materials into biofuel (Renewable energy road map, 2007).

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Technical literature provides numerous definitions of renewables including the following one: renewable energy is energy that is derived from natural processes that are replenished constantly. Although this definition leads to some issues, dealing for instance with the time horizon for replenishment, it will be used as the reference in this paper.

The Renewables and Waste Questionnaire classifies the renewable and waste products into 3 main groups:

- Group 1 includes the products which need to be transformed into electricity in order to be captured (such as hydro or solar photovoltaic).
- Group 2 includes the products which are produced and then can be put for multiple use in the transformation and final consumption sectors (such as geothermal or solar thermal); because of their nature, these products cannot be stored in a conventional sense, and therefore are products for which no stock change data can be reported.
- Group 3 includes the products which are produced and used for multiple purposes in the transformation and final consumption sectors (such as wastes, fuelwood, biogas and liquid biofuels). Because of their nature, these products can be stored in a conventional sense, and therefore are the products for which stock change data can be reported.

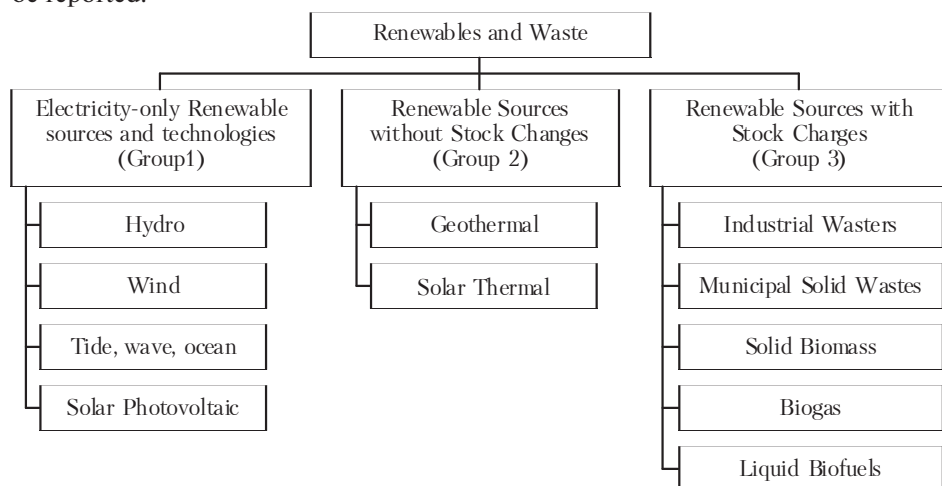


Figure 1. Renewables and waste compounding structure (Energy Statistics, 2004)

Table 1. Consumption of renewable energy in the world – 2005, 2010–2012

	2005	2010	2011	2012	Change 2012 over 2011	2012 share of total
	mln tones				%	
Total world	84.6	168.8	205.6	237.4	15.2	100
of which:						
OECD	69.1	127.6	140.1	169.2	13.2	71.3
Non-OECD	15.5	41.0	56.4	68.2	20.5	28.7
European Union	34.1	68.3	82.6	95.0	14.9	40.0
Former Soviet Union	0.2	0.4	0.5	0.6	33.6	0.3

Source: BP Statistical Review of World Energy, June 2013.

It is these two components that constitute a powerful locomotive of progress, which is characteristic of the result of the OECD's countries' activity in the field of biofuels (BICI, Market biofuel, 2010).

Latest research and publications analysis. Over the recent time scientific studies on national peculiarities of biofuel markets have become more and more topical. Apart from the well known publications of BP Statistical Review of World Energy (2013), Communication by the Commission to the Council and European Parliament (Renewable energy road map, 2007; Green paper. A European Strategy for Sustainable, Competitive and Secure Energy, 2006), Energy Statistics Manual – IEA Publication (Energy Statistics Manual, 2004), considerable input was made by Ukrainian scientists: G. Burlaka and G. Pop (2001), I. Karp et al. (2006), O. Kulik (2005), O. Liven (2007), L. Nazarchuk (2007), E. Sukhin (2008).

The object of this research is national peculiarities of the biofuel market under the energy sector globalization conditions.

The aim of the research is the systematic and comparative analysis of the biofuel market in the world, European Union, OECD, former Soviet Union.

Key reseach findings. World biofuels production (Table 2) declined in 2012 by 0.4%, the first decline since 2000. Increased output in South America and Asia Pacific was outweighed by declines in North America and Europe. The global output declined by 1.7%, the second annual decline. Biodiesel production grew by 2.7% and has doubled in the last 5 years and now makes up 31% of the total biofuel supply.

In 2012 the 3 world-leading producers of biofuels were the USA (45.4% of the world production), Brazil (22.5%) and Germany (4.8%).

Nonwithstanding different views on the trends in biofuel production development in different countries over the cyclic periods of time, peculiarities of high technology production are rather characteristic. Therefore, the rates of its development level correspond to the competitiveness rating in these countries, which is largely supported by country's institutional policy.

The present-day US government has managed to approve a number of large-scale programs of increasing the biofuel industry development and strengthening the country's energy security. Of great importance is the federal Blueprint for a Secure Energy Future aiming at decreasing the country's dependence on oil export, creating new (high-technology included) work places, local development, and also at improving the image of American companies and farms, strengthening their position world leader in this sector.

The US large-scale initiatives in the biofuel field enable modernizing the infrastructure in the rural areas of the country, stimulating farmers' innovative activity; and in the long-term perspective they can contribute to attracting labour force and improving the efficiency of rural areas and consequently local population's living standard.

At the end of the 1970s – the beginning of the 1980s, in Brazil, as a result of carrying out a special state program, they managed to transfer nearly 90% of passenger cars to ethanol. However, later low world oil prices decreased the popularity of this type of biofuel. Then using this type of biofuel became popular again. Nowadays, Flex engine vehicles can use bioethanol in practically any proportion with traditional motor fuel.

Table 2. Biofuel production in the world – 2005, 2010–2012

	2005	2010	2011	2012	Change 2012 to 2011	2012 share in the total
	ths tones of oil equivalent				%	
US	7478	25568	28518	27360	95.9	45.4
Canada	133	790	929	949		
Total North America	7612	26371	29459	28321	96.1	47.0
Argentina	9	1656	2218	2267		
Brazil	7835	15575	13197	13547	102.7	22.5
Columbia	14	318	386	403		
Others S. & Central America	235	314	457	458		
Total S. & Central America	893	17663	16269	16675	102.5	27.7
Austria	70	375	370	370		
Belgium	1	462	503	510		
Finland	6	363	363	363		
France	439	2269	1859	1820		
Germany	1525	2888	2825	2894		
Italy	340	670	456	313		
Netherlands	3	385	559	459		
Poland	100	421	398	630		
Portugal	1	275	293	338		
Spain	282	1267	809	575		
Sweden	48	214	212	227		
United Kingdom	39	304	253	321		
Other Europe and Eurasia	293	1231	1242	1203		
Total Europe and Eurasia	3157	11125	10143	10022	98.8	16.6
Total Middle East	-	4	4	4		
Total Africa	6	30	23	23		
Australia	20	251	265	251		
China	622	1441	1597	1729		
India	114	164	210	294		
Indonesia	9	718	1104	1212		
South Korea	9	491	211	211		
Thailand	52	661	721	994		
Other Asia Pacific	10	345	289	483		
Total Asia Pacific	834	4071	4397	5174		
Total World	19701	59465	60286	60220	99.9	100.0
Of which:						
OECD	10779	37928	39726	38457	96.8	63.9
Non-OECD	8922	21536	20560	21763	105.9	36.1
European Union	333	10976	9998	9878	98.8	16.4
Former Soviet Union	22	182	159	174	109.4	0.3

Source: BP Statistical Review of World Energy, June 2013.

In the second half of the 2000s, under the conditions of accumulating sufficient "critical" mass of scientific knowledge and existence of corresponding prerequisites in the society as a whole, the process of ascending to a new technological level began in the global economy. The first to follow this way were the advances OECD countries (the USA, Germany and a number of others), having the most comprehensive (systemic) approach to tackling the tasks at hand and overcoming current challenges.

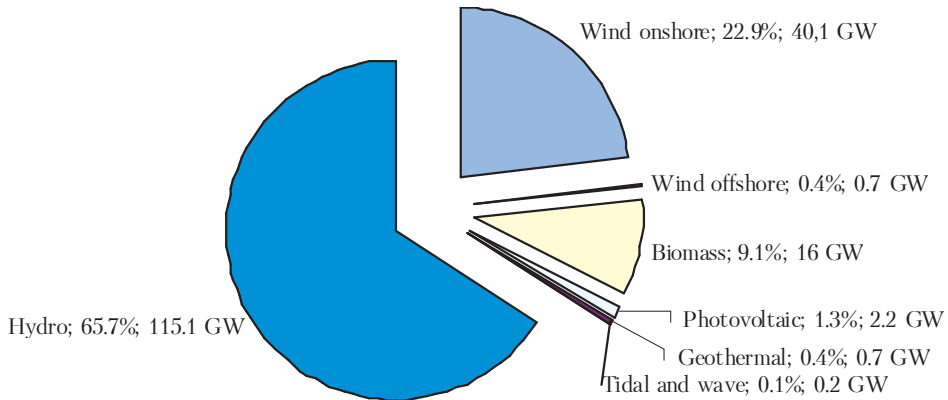
Contemporary technological development focuses on two main directions. The first block comprises mutually penetrating transformations in the energy, IT and electronics sectors. The second block of key technologies focuses on people and consequently on medical, biological, cognitive technologies etc. At the same time the main dominant feature of the new trend is not the amount of attracted investments, but the efficient management of capital, the energy industry included.

One of the innovative, high-technology areas of the energy industry is the sector of renewable energy sources, including the biofuel energy sources production. In December 2008, the Directive 2009/28/Ec of the European Parliament and of the Council of 23 April 2009 was adopted on the promotion of using the energy from renewable sources, aiming at 20% share of RES in the EU's energy balance (Figure 1, Table 1).

Ambitious targets are at the core of the EU's to promote energy from renewable sources (EU Energy, 2011). Due to the early adoption of ambitious national and EU targets, European companies are the world leaders in wind power technology, they have a leading share of the world market. As a result, Europe today gets approximately 20% of its electricity from renewable energy sources, including 5.3% from wind energy.

In order to continue the development and deployment of renewable energy technologies, the EU adopted the 2009 Renewable Energy Directive, which included a 20% renewable energy target by 2020 for the EU. In 2020, according to the Renewable Energy Directive's 27 National Renewable Energy Action Plans, 34% of the EU total electricity consumption will come from renewable energy sources, including 495 TWh from wind energy meeting 14% of consumption.

Onshore wind is set to have the largest installed capacity in the renewables sector (35% of the total installed capacity) in 2020, followed by hydro at 28%. Solar photovoltaic installations will represent 17% of the total renewable electricity capacity, followed by offshore wind and biomass. In all, the total installed renewable electricity capacity is set to more than triple from 175 GW installed in 2005 to over 487 GW in 2020, including 213 GW of wind power capacity (Figures 2, 3).



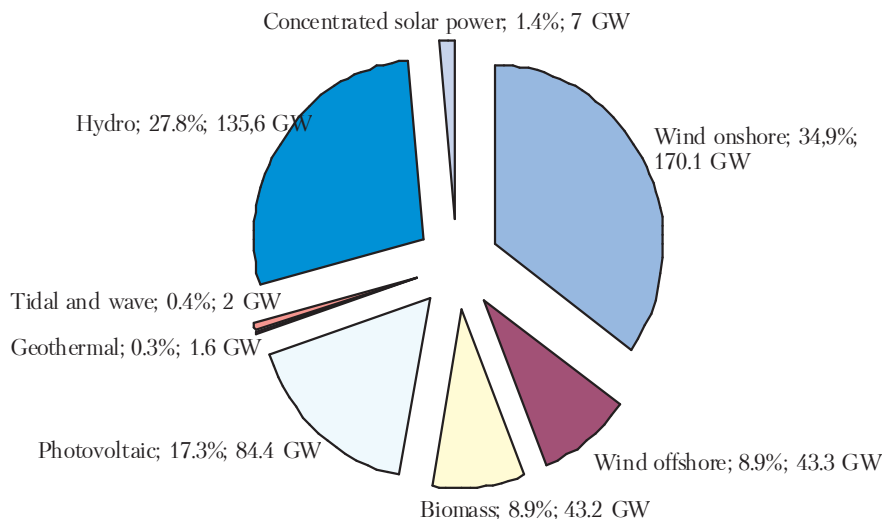
Source: BP Statistical Review of World Energy, June 2013.

Figure 2. **Technology shares of the EU installed renewable power capacities in 2005, total 175.1 GW**

Any post-2020 legislative framework should include a tighter emission reduction target for the ETS to reach 95% domestic greenhouse gas reductions by 2050, preceded by the target of 30% domestic GHG reductions by 2020, and further domestic targets for 2030, 2040 and 2050 (95% reduction).

It is clear that the most effective way of ensuring that the EU is able to continue reducing its greenhouse gas emissions beyond 2020 is to continue with the existing,

stable, predictable and successful EU policy framework, by establishing a binding and ambitious renewable energy target for 2030. This policy should be complemented with other technology neutral policies – an ambitious EPS and ETS. In April 2009 the European Renewable Energy Council prepared a report on the development prospects of this sector in the area up till 2050, containing a grand goal of the full transfer of the EU countries onto renewable sources of energy (EU Energy, 2011).



Source: BP Statistical Review of World Energy, June 2013.

Figure 3. Technology share of the EU installed renewable power capacities in 2020, total 487.2 GW

Conclusion. This goal, as mentioned in the report, is quite economically and technically feasible, with the total amount of the necessary investment comprising only 120 bln EUR. The complex of measures to achieve this goal comprises: firstly, compulsory phased institution of the existing facilities with renewable energy facilities; secondly, opening of the energy market to free competition; and finally, the abolishment of traditional energy sector subsidies; and also compulsory taxes on carbon dioxide emissions.

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КНИЖКОВИЙ СВІТ



СУЧАСНА ЕКОНОМІЧНА ТА ЮРИДИЧНА ОСВІТА
ПРЕСТИЖНИЙ ВИЩИЙ НАВЧАЛЬНИЙ ЗАКЛАД

НАЦІОНАЛЬНА АКАДЕМІЯ УПРАВЛІННЯ

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Фінансово-економічний розвиток України в умовах глобалізації: Колективна наукова монографія / За ред. Я.В. Белінської. – К.: Національна академія управління, 2008. – 212 с. Ціна без доставки – 25 грн.

Монографія присвячена фінансово-економічним проблемам розвитку економіки України в умовах глобалізації. Викладені теоретико-методологічні питання розробки стратегії входження України у світове господарство та формування фінансово-економічного механізму цього процесу. В основу викладу матеріалу монографії покладені багаторічні дослідження науковців в галузі економічної теорії, фінансів та банківської справи, які були апробовані на сторінках авторитетного журналу "Актуальні проблеми економіки" в 2004–2007 роках. В монографії обґрунтовано шляхи забезпечення структурно збалансованого економічного зростання економічної системи України та її ефективного міжнародного співробітництва, визначені напрями вдосконалення всіх ланок господарської системи.