

Renewable energy in Ukraine



InvestUkraine

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Dear Reader,
It is my great pleasure to introduce you to our new publication about attractive sectors of Ukraine, made in partnership with Deloitte.

We developed these brochures to make information about sectors of Ukraine accessible and easy to understand. The booklets provide analysis of economic attractiveness, as well as comparative characteristics and undiscovered opportunities.

Ukraine enjoys a long industrial tradition, robust transportation and technical infrastructure, rich natural resources, strong secondary and tertiary education, a broad network of research and development institutes, and a large pool of technically skilled labor. As a WTO member since 2008 and having signed International Agreements for the Avoidance of Double Taxation with 63 countries, Ukraine is a fair player in the business world, a transparent and predictable partner.

InvestUkraine offers individual support to investors and is here to assist potential investors with setting up production in Ukraine. We offer professional support in obtaining information and analysis, legal advice, site visits, site selection services, assistance in communication with local authorities, and an aftercare program.

I encourage you to consider Ukraine as a place for your future business and discover all the benefits of locating your company's operations in our country.

I look forward to welcoming you in Ukraine.

Sergiy Yevtushenko,
Head
InvestUkraine
State Agency for Investment and
National Projects of Ukraine



A favorable geographic position, vast consumer market, ample resources and high level of education – all these factors ensure great investment potential for the economy of Ukraine.

At present, Ukrainian market is at the development stage. There are many niches and opportunities for introducing new players and strengthening the positions of existing ones. However, most of Ukraine's industries lack investments, though international investors are highly interested in them. We believe that foreign investments will be very successful and promote economic growth if a favorable investment climate is created in Ukraine.

To assist you in determining the most promising areas to invest in and get an insight into Ukrainian market, Deloitte experts in cooperation with InvestUkraine have conducted this research.

We hope that this overview will be useful and interesting for all companies interested in investing in various industries of our country.

Vladimir Vakht,
Managing Partner
Deloitte

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1. Executive summary

Implementation of the “green” tariff for electricity produced from renewable sources in Ukraine in 2010 has been an important stimulus for the development of renewable energy sector, represented by solar, wind, hydro, and bio energy. The state purchases electricity from more than 50 companies, which produce energy from renewable sources. There are 6 solar, 5 wind, more than 30 hydro power stations and several bioenergy stations.

At the end of 2011 in Ukraine there were plants with capacities of 117 MW of wind energy, 104 MW of hydro power and 68 MW of bioenergy in operation. The capacity of Ukrainian solar power plants has increased from 3.5 to 188 MW (i.e. 54 times).

In 2012 the total output of solar and wind power is expected to increase threefold and to exceed

1000 MW. In 2011 the “green” energy sector was mainly dominated by solar energy plants (SEP); however, in 2012, an increase in wind energy production is expected - the total capacity is expected to exceed 750 MW. In particular, during 2012 solar power capacities are expected to grow by at least 100 MW (on January 1, 2012 the total capacity of SEP was about 188 MW), along with more than 600 MW of wind power capacities (on January 1, 2012 the total capacity was 150 MW). Thus, the total capacity of “green” power production will increase from 340 MW in 2011 to over 1000 MW in 2012.

According to the State Agency on Energy Efficiency and Energy Saving of Ukraine, the installed capacity of renewable energy power plants, in 2011 increased more than twice, and electricity generation amounted to 332 million kWh.

Electricity generated from renewable sources in 2011

#	Energy type	Number of facilities	Installed capacity (MW), incl:		Electricity produced in 2011, million kWh
			Total	Installed in 2011	
1	Wind energy	11	151	64.3	88.98
2	Solar energy	18	188	185.7	30.04
3	Hydro power	73	71	2.3	203.46
4	Bioenergy	2	4	–	9.60
	Total	104	414	262.3	332.09

Source: Internet project ecoclub.com

According to EBRD, Ukraine may soon become a leader among environmentally friendly economies in Europe, with its renewable energy sector being among the most prospective and attractive for investments.

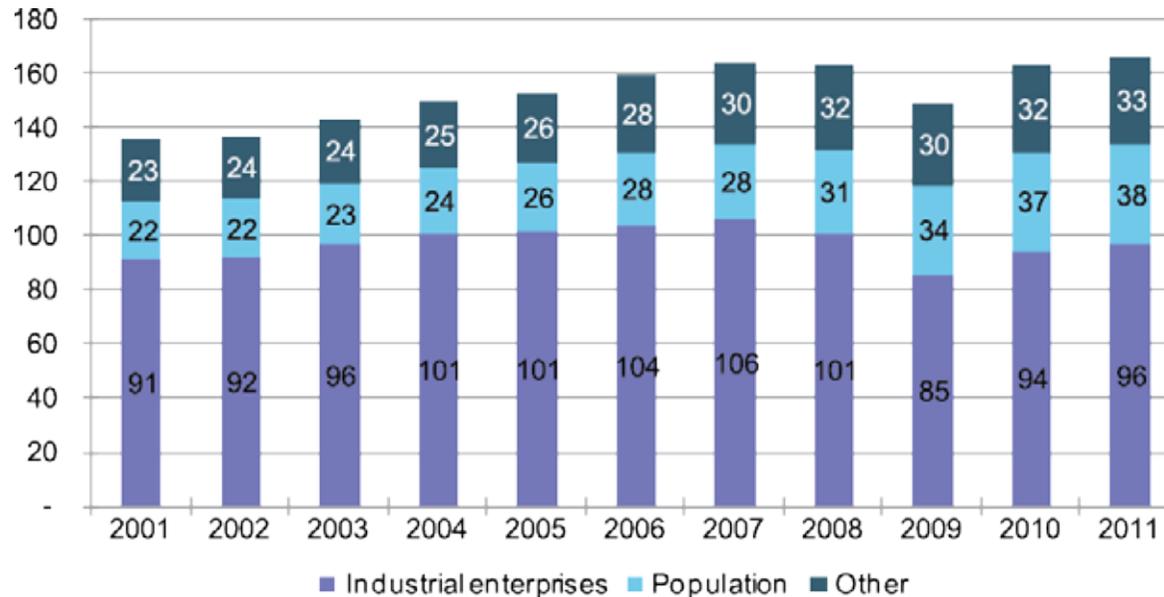
Overall, total investments in the Ukrainian solar and wind parks in 2011 amounted to approximately EUR 400 m. The forecast is that investments in renewable energy generation, including solar and wind energy, biomass and biofuel production, in the next five years could reach nearly USD 5 bn.

2. Sector overview

Despite governmental incentives for implementation of energy-saving technologies, there is a tendency for increase in energy consumption. Thus,

in 2011, taking into account technological losses in networks, consumption increased by 2% or 3.738 billion kWh (to 187.647 billion kWh).

Electricity consumption by major groups in Ukraine, billion kW*h

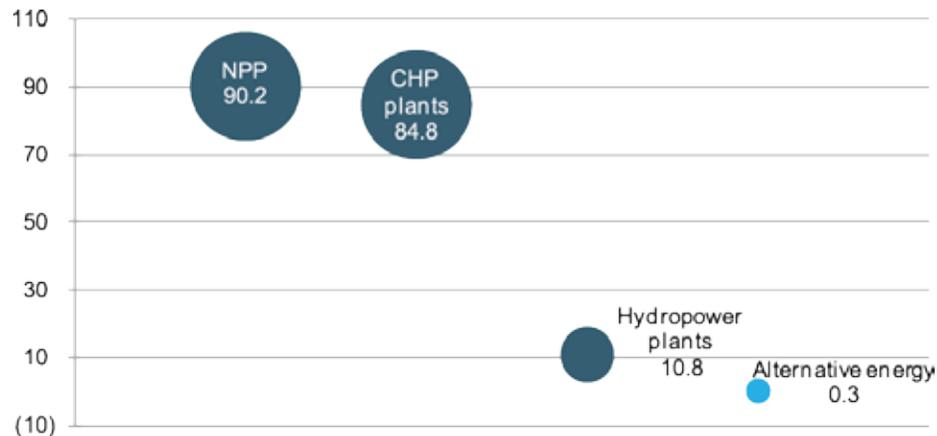


Source: State Statistic Service of Ukraine

Average annual consumption growth in Ukraine in 2001-2011 amounted to 2.1%. The main driver of growth was increase in energy consumption by population (by on average 6% annually).

The share of the alternative energy in total energy generation in Ukraine in 2011 was 0.2%.

Electricity generation in 2011, billion kWh



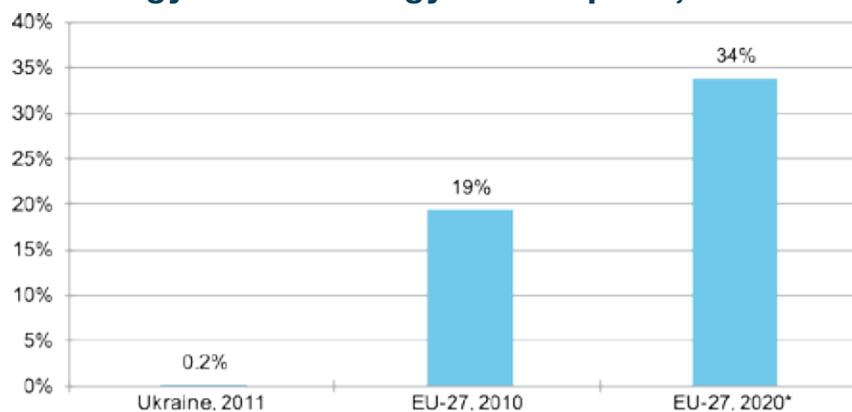
Source: Ministry of Energy and Coal Industry of Ukraine

Quite an urgent issue currently is the need for large-scale introduction of alternative energy generation technologies from environmentally friendly and inexpensive sources for stabilization of regional energy markets.

Today, in Ukraine there are about 100 facilities with total renewable energy generation capacity of 397 MW (compared to 152 MW in 2010), which in 2011 produced 332.091 million kWh of electricity.

However, the total share of electricity generated from alternative sources is still relatively small, indicating the huge potential and little to no competition. For comparison, the share of energy consumption from renewable sources in EU in 2005 amounted to 8.5% with the prospect of increasing to 20% in 2030.

Share of alternative energy in total energy consumption, %



Source: Ministry of Energy and Coal Industry of Ukraine, European Commission JGC report

*Projected

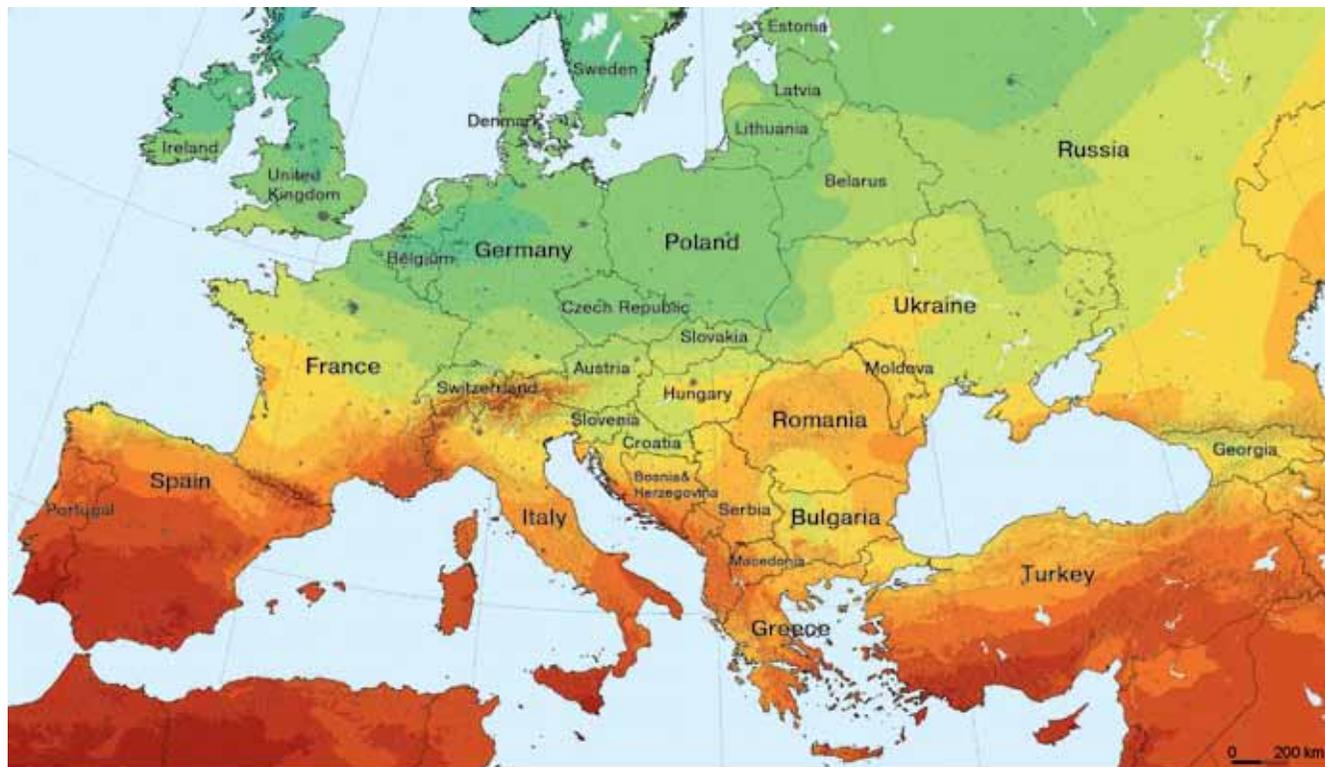
3. Solar energy

In Ukraine, one of the most recent trends is an active development of photovoltaic solar energy generation technologies, which contributed to such a rapid increase in renewable energy generation capacities in 2011. It was the first time that the installed capacity of solar facilities surpassed that of wind power.

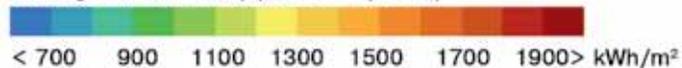
The largest share of global solar energy market belongs to the European market – about 70% of globally installed capacities (67000 MW).

Global horizontal irradiation

Europe



Average annual sun (4/2004 – 3/2010)



Source: solargis.info

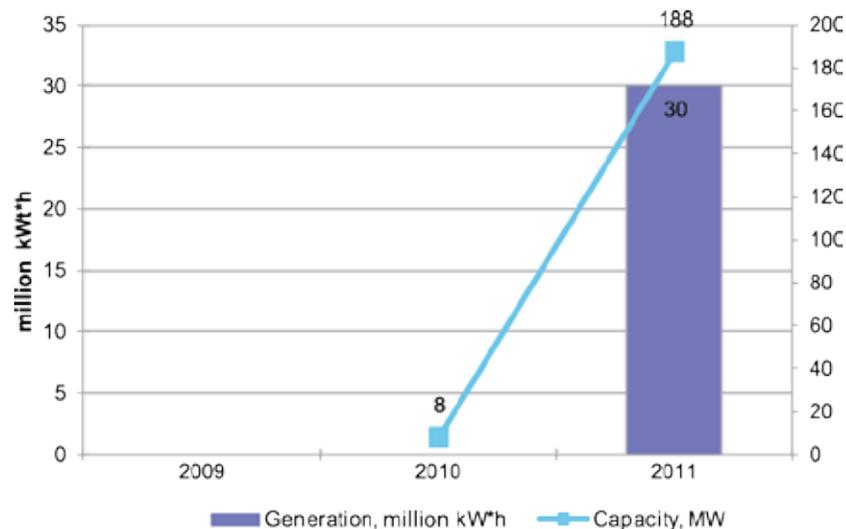
The total capacity of solar power plants in some European countries (2011).

Country	Capacity, MW	Country	Capacity, MW
Germany	24700	Belgium	1500
Italy	12500	United Kingdom	750
Spain	4200	Greece	550
France	2500	Slovakia	500
Czech Republic	1959	Ukraine	188

Source: EPIA Market Report

Despite the leadership of Ukraine in terms of installed capacities per plant, the share of solar power generation in Ukraine in comparison with the EU is very low.

Solar power generation facilities in Ukraine, 2011

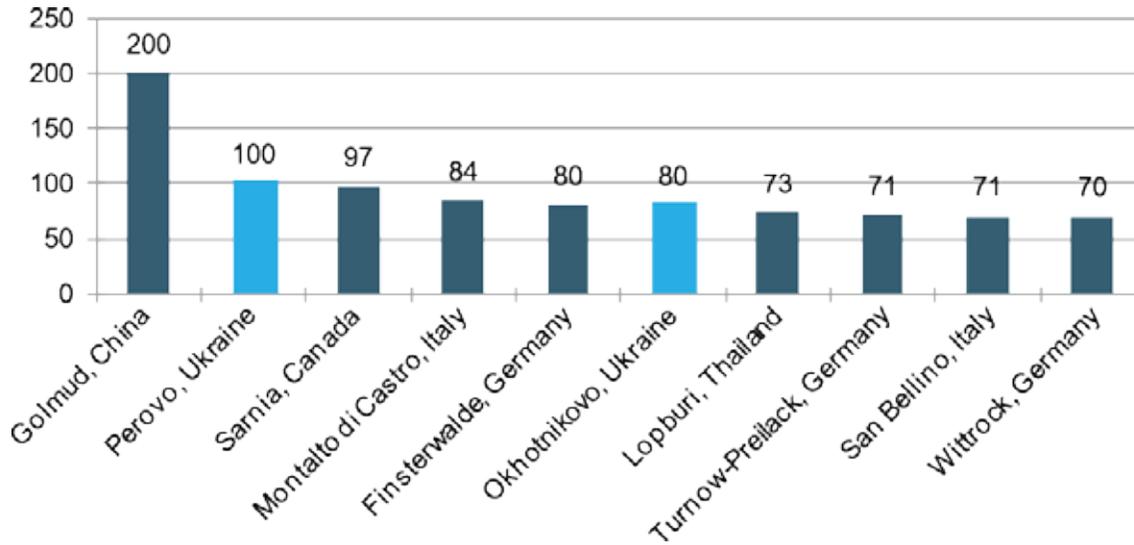


Source: Internet project ecoclub.com, news portal vkurse.ua

Production of solar electricity in Ukraine generally takes place in the southern regions of the country, mainly in Crimea. The largest solar power plants Perovo (100 MW), Okhotnikovo (80 MW), Dzherelne

(7.5 MW), which can supply more than 15% of the total power demand of the region, are located there. All plants were installed in 2011 two of them are among the top-10 largest solar power plants in the world.

World's largest solar power plants, MW



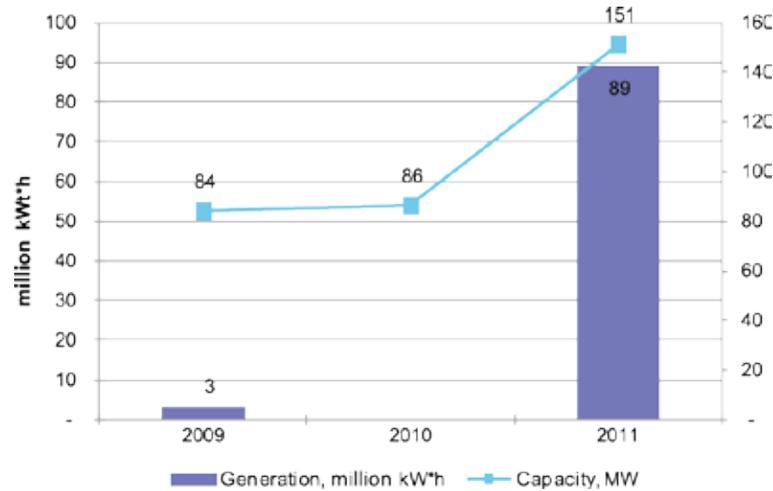
Source: PV Resources

4. Wind energy

Electricity production from wind is also a prospective field of alternative energy development in Ukraine. According to the Wind Energy Association, wind energy potential in Ukraine is estimated at 30,000 GWh. Some researchers believe, Ukraine is among the top-four European countries, most suitable for generating electricity from wind.

The installed capacities at the end of 2011 totalled 89 MW and the amount of electricity generated from wind was 151 MW.

Wind power generation facilities in Ukraine, 2011



Source: Internet project ecoclub.ua, news portal news portal vkurse.ua

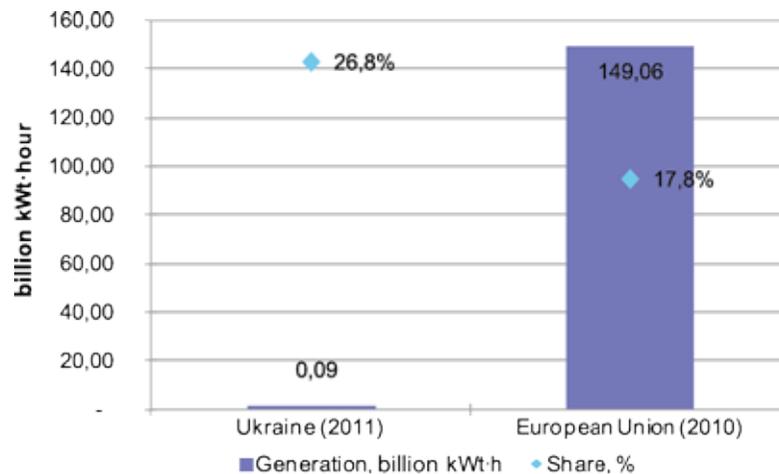
For comparison, the capacity of wind power plants in the EU in 2011 equelled about 94 GW.

are located in Mykolayiv and Donetsk regions and in Crimea.

Intensification of the process of modern wind power plants construction in Ukraine started in 2011 with construction of the Novoazovsk wind power plant (Donetsk region). Major wind power plants facilities

Shares and amounts of electricity generated from wind in Ukraine and European Union are provided in the graph below:

Wind energy production and its share in total alternative energy production



Source: Internet project ecoclub.ua, Eurostat

Wind power plants capacities in some European countries (2011), MW

Country	Capacity, MW
EU-27	93,957
Germany	29,060
Spain	21,674
France	6,800
Italy	6,747
UK	6,540
Portugal	4,083
Denmark	3,871
Greece	1,629
Turkey	1,691
Poland	1,616
Romania	982
Bulgaria	612
Czech Republic	217
Ukraine	150

Source: Wikipedia

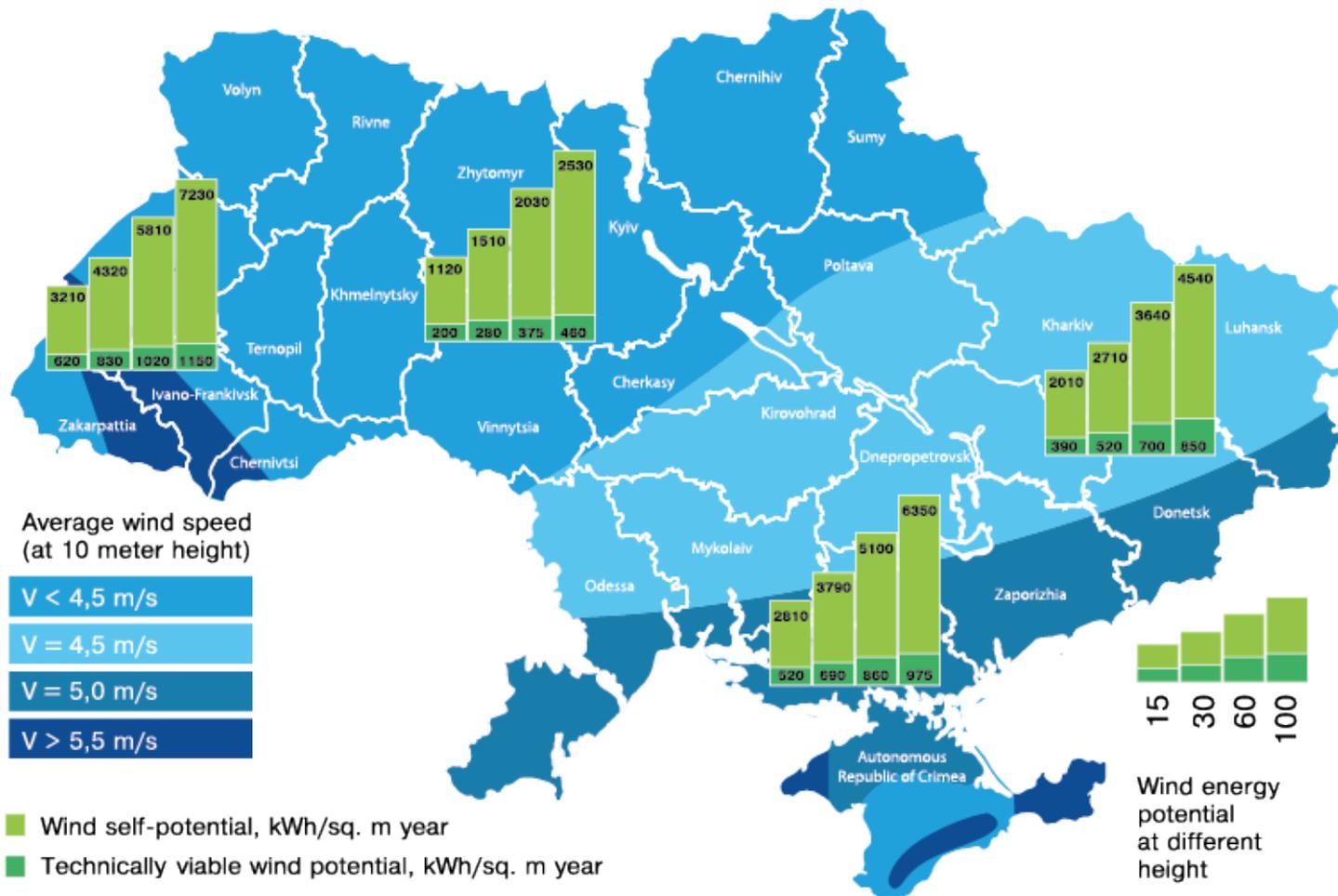
In January 2012, 37.5 MW of modern wind power plant Novoazovsk were put into operation, out of 107.5 MW planned. Also, in 2011 wind power plant Wind Park Ochakiv with capacity of 25 MW and 3 MW wind power plant in the Kherson region (Vindkraft Ukraine) were put into operation.

Thus, in 2011, about 65.5 MW of modern wind power plants were constructed in Ukraine, and the total ca-

capacity of all Ukrainian wind power plants increased to 150 MW.

About 50% of Ukraine's territory is suitable for installation of wind power plants and commercial generation of electricity from wind. In particular, the prospective regions are the Black Sea coast, the southern steppe regions, and the Carpathian Mountains.

Wind power potential of Ukraine



Source: Atlas of Renewable Energy Sources Potential of Ukraine.

Institute of Electrodynamics of National Academy of Sciences of Ukraine with support of State Committee for Energy Conservation of Ukraine

5. Hydro power

At the end of 2011 there were about 70 small hydro power plants in Ukraine with total capacity of about 100 MW. They produce from 275 to 400 million kWh of electricity per year, which amounts to 0.15-0.25%

of total electricity consumption in the country. Majority of the plants are outdated and need modernization.

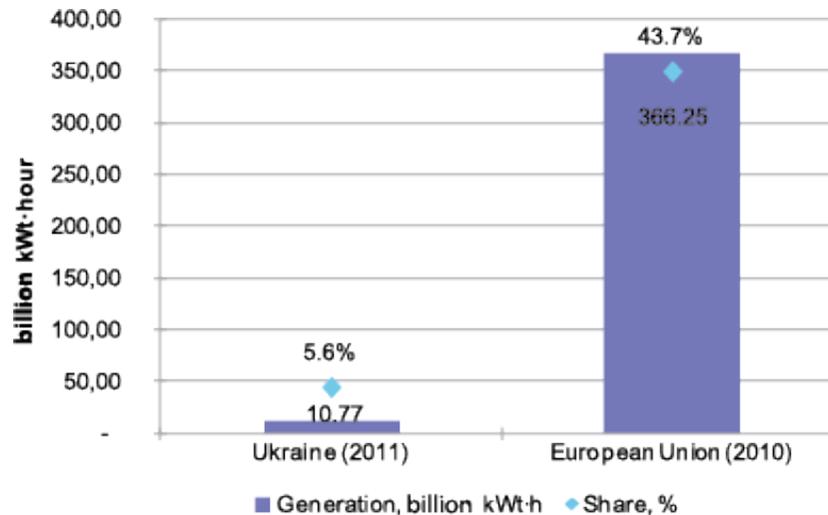
According to the Ukrainian legislation small hydro power plants comprise small electric power stations, which have installed hydropower generation capacity not exceeding 10 MW.

Information provided by the State Agency on Energy Efficiency shows that installed capacities of small hydropower plants at the end of 2011 amounted to 71 MW, and that their electric energy production for the year amounted to 203.5 kWh.

Major hydropower facilities are located in the following regions of Ukraine: Vinnytsia, Kirovohrad, Mykolayiv and Ternopil regions.

The share of electricity produced by hydroelectric power plants, including large, in the general structure of electricity production in 2011 in Ukraine was 5.6% (against 44% in the European Union), while the share of electricity production by small hydroelectric power stations is about 2% of the total production of electricity by hydropower plants.

Hydro energy production and its share in alternative energy production



Source: Internet project ecoclub.ua, Eurostat

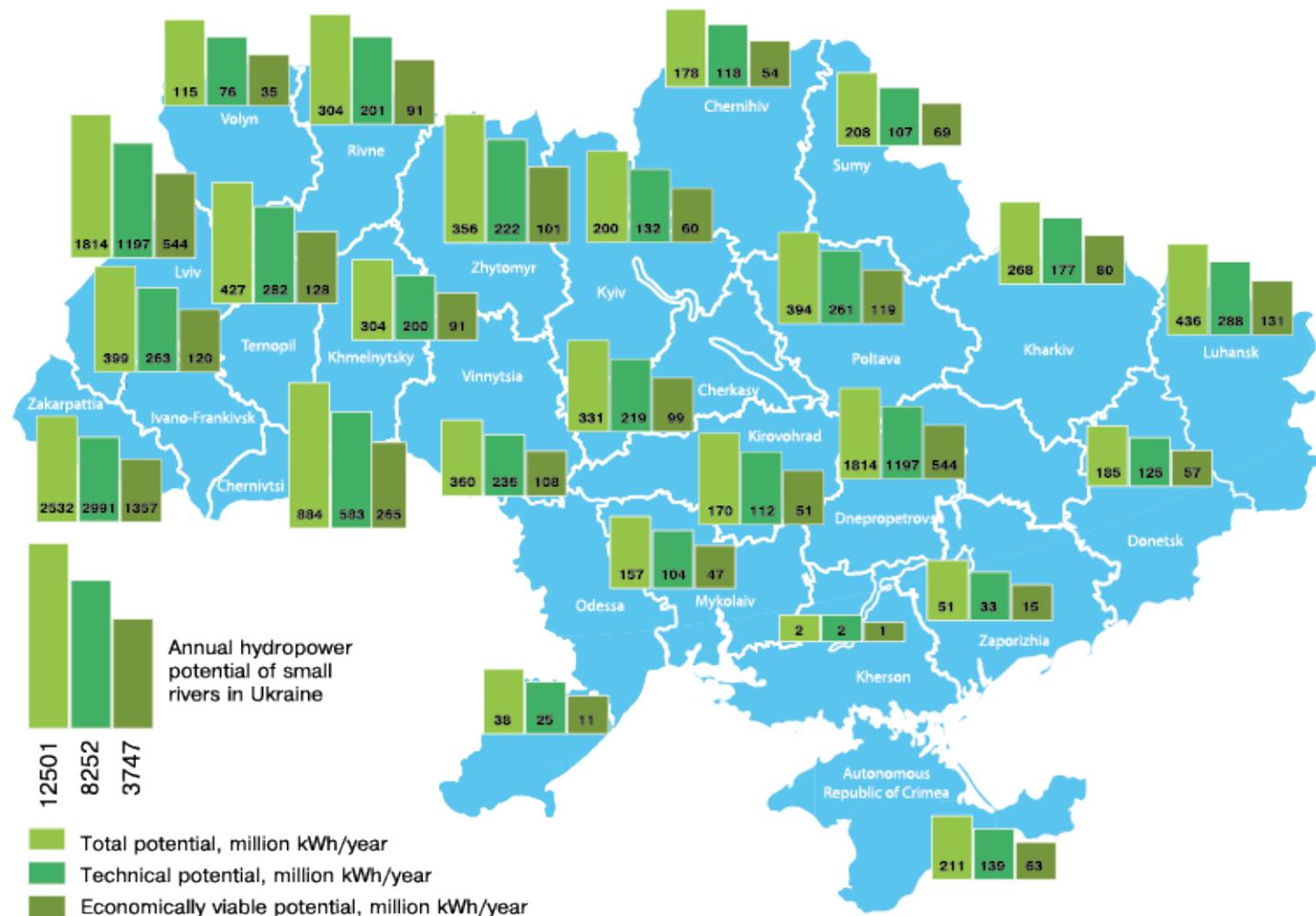
Today, small hydroelectric power plants in Ukraine are gradually being bought out. For example, Novosvit company already operates 14 of such power plants in Vinnytsia, Cherkasy, Khmelnytsky, Ivano-Frankivsk, Chernivtsi and Ternopil regions. Ukrenergy Holding company plans to produce 10000 MWh, after constructing a series of small hydropower plants.

As of beginning of 2012 in Ukraine there are about 30 private companies, which invest in renewable energy production, particularly in small hydropower plants. Investments have been mainly directed into Vinnytsia, Cherkasy, Khmelnytsky, Ternopil and Zhytomyr regions. Currently 64% of all hydro power plants are located in these regions, while the technical hydropotential of the rivers in these regions amounts to only 14% of the country potential.

Ukraine has great potential for development of small hydro power plants, but it requires some investments in this sector. The total length of Ukrainian rivers is about 136 thousand km. For construction of power plants even very small rivers — up to 10 km (which are the majority in Ukraine) — can be used. On such rivers micro hydropower stations with capacity of up to 5 MW and small hydro power stations with capacity of up to 5-25 MW can be constructed.

According to the calculations of the “Ukrhydroenergo” Association technically feasible potential of small hydro power plants in Ukraine amounts to about 8.4 billion kWh or about 4.5% of total electricity consumption in 2010.

Hydro power potential of Ukraine



Source: Atlas of Renewable Energy Sources Potential of Ukraine. Institute of Electrodynamics of National Academy of Sciences of Ukraine with support of State Committee for Energy Conservation of Ukraine

Bioenergy

Ukraine has impressive amounts of biomass available for energy production. Feasible amount of biomass available is estimated at 27 m tons of fuel per year.

According to the Ministry of Agrarian Policy of Ukraine, potential of biodiesel production is estimated at 1 m tons per year, ethanol production – 2 m tons, biomass production from wood – about 1.63 m tons. Considering there are 3,000 thsd ex-

Trends and developments

Among the key factors that determine trends and facilitate the development of renewable energy sector in Ukraine are the following:

- Reduction of the country's energy dependence and diversification of sources of electricity supply (production), which is provided for by the directives of the Energy Community Ukraine is now a member of. Recent resolutions aim at increasing the share of alternative energy in total energy balance of the country, and increasing the 'greening' of the industry;
- Suitable climatic conditions. Ukraine has significant insolation - an average of 1200 kWh per 1 m², more than in Germany – the largest photovoltaics market in the EU. According to the information provided by the DTEK Company, potential solar energy generation in Ukraine is about 350 billion kWh per year, however less than 0.001% of this potential is currently used. Potential for wind power generation varies from 50 to 67 billion kWh per year, with only 0.05% of which is currently used. Potential hydropower generation varies from 22 to 45 billion kWh per year, with only 13% used;
- Favorable tariff legislation ("green tariff"). High return on investment and very quick payback (about 5-7 years) of the projects are attractive to investors;

isting biogas plants, the potential production of biogas at farm enterprises is estimated at 2.45 m tons; however, only a few of such plants are currently in operation.

According to the State Statistics Committee of Ukraine the energy potential of biomass accumulated by the agricultural complexes is estimated at more than 7.5 m tons of fuel per year. This could supply up to 10% of the total energy demand of Ukraine.

- Present sufficient scientific potential to produce the necessary equipment, including photovoltaic cells and wind equipment.

In 2011, the installed capacity of power plants operating on renewable energy sources in Ukraine increased from 152 MW to 397 MW. Thus, the growth in 2011 reached impressive 161%.

Experts forecast that in 2012 solar power plants with capacities of 100 MW and wind power plants with capacities of 600 MW will be put into operation, and so the total capacity will exceed 1000 MW. In addition, it is expected that electricity power plants with renewable energy sources will produce about 1 billion kWh.

In 2012 wind energy generation industry will be actively developing, with the share of renewables in overall energy balance will amount to 0.5%.

Solar energy

The company Activ Solar (Austria) in 2012 is expected increase capacity of existing solar power plants by 8.2 MW, and plans to complete the construction of power plant Mytyaev (Crimea) with capacity of 31.55 MW. Overall capacity of solar power plants built by Activ Solar in Ukraine in 2012 will be at least 227.26 MW.

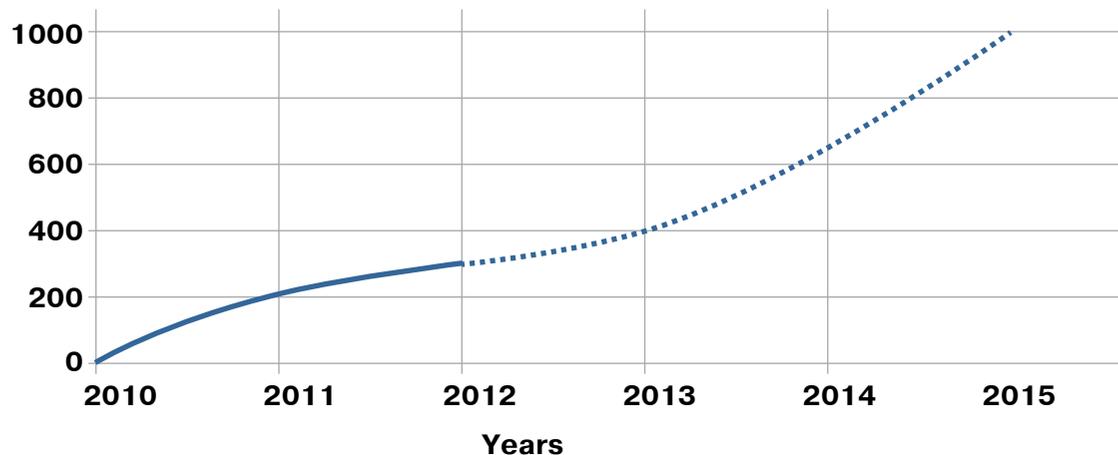
Investing in solar modules production in Ukraine is currently considered by a number of companies, in-

cluding such well-known companies as: Sharp, Schneider Electric and Renewable Energy Corp.

According to forecasts, capacity of solar power plants built in 2012 will reach 300 MW, while in 2011 it amounted to 190 MW.

By 2015 Ukraine plans to increase the installed capacity of photovoltaic power plants up to 1 GW.

The total capacity of solar power plants constructed and planned for construction in Ukraine (years 2010-2015).



Source: news.finance.ua

Czech company Ecotechnika Prague is planning to build solar power plants in Vinnytsya, Kyiv and Dnipropetrovsk regions with total capacity over 100 MW in 2012.

In addition, China National Machinery Industry Corporation decided to invest in construction of solar power plants in southern Ukraine achieving the total capacity of 300 MW. Over the past 5 years, China has become one of the world leaders in terms of investments in alternative energy.

Wind energy

The research of the Institute of Renewable Energy of Ukraine and Ukrenergomash NSA of Ukraine conclude that the total capacities of wind power

plants in 2030 will equal approximately 16000 MW with the following distribution by regions:

Region	Capacity as of 2030	
	MW	%
Crimea	3 700	23,1
Mykolayiv	3 600	22.5
Kherson	3 500	21.9
Zaporizhzhya	3 200	20.0
Donetsk	2 000	12.5
Total	16 000	100.0

Source: Research Institute of Renewable Energy of Ukraine and Ukrenergomash NSA of Ukraine

Onwind energy market of Ukraine, a number of companies are currently in the process of construction and commissioning of wind power plants, including: Concord-group (implements projects in Crimea - construction of two wind power plants with the total capacity over 400 MW) and DTEK Wind Power (implements projects in Zaporizhzhya and Donetsk regions - construction of two wind power plants with the total capacity of about 1200 MW).

According to the Ukrainian Wind Energy Association about 50 projects of wind power plants construction have been announced, however, less than ten of them have been practically started.

However more and more companies from all over the world start to see attractiveness of Ukrainian wind energy sector. As an example could be mentioned French company Filasa International together with its subsidiary, the Ukrainian company Krym-Eol plans to

build several wind power plants in Ukraine with the total capacity of 1.6 GW by 2016. The total cost of wind energy projects of Filasa International in Ukraine is EUR 2.4 bn.

Greek company Prenecon Prime Energy Construction plans to implement a large-scale project on wind power plant construction in Crimea with the total capacity of 1000 MW.

Eurocape New Energy Limited (Principality of Monaco), which is a part of the international concern Eurocape Group intends to build about 180 wind turbines in Pryazovsky district (Zaporizhzhya region). Total capacity has been preliminary set to 450 MW.

Portuguese company MartiferGroup through its Ukrainian subsidiary Nova-Eco declared its willingness to implementat of a large wind power project in the Crimea. The company plans to build in the

Chornomorsky and Leninsky districts of Crimea wind power plants with the total capacity of 300 MW. Investment in the project is planned to be no less than UAH 7.5 bn.

Hydro energy

Under the program of small hydro power plants development in Ukraine there have been a number of projects implemented. In particular, Kyivenerhomash is currently implementing a few projects of renovation and reconstruction of existing small hydro power plants and construction of small hydropower plants in the areas of decentralized and centralized energy supply.

Also, the specification of economically viable hydro potential of Ukraine is now being developed. According to the Energy Strategy of Ukraine plans concerning small hydro plants up to 2030 in Ukraine include: reconstruction and restoration of small hydro power plants with the total capacity of 135 MW, construction

Bioenergy

Biomass potential in Ukraine is significant - about 27 m tons of fuel per year, less than 1% of which is currently used. Production of biogas from organic

Italian company C&C Energy plans to construct wind power plants with the total capacity of 200 MW in Ukraine. German company WKN Windkraft Nord plans to build five wind power plants in Odessa region and Crimea with the total capacity of 800 MW.

of new small hydro power plants on the rivers Tysa and Dnister with the total capacity of 400 MW and 560 MW respectively, construction of new decentralized small hydropower plants with the total capacity of 45 MW.

The forecasted cost-effective performance till 2030 amounts to 1140 MW of capacities with the annual production volumes of 3.75 billion kWh.

The company Ukrnaftohazinvest plans to construct 15 small hydro power plants in the Lviv region. Swiss company Alter Energy Group AG is also interested in construction of small hydropower plants in Ivano-Frankivsk region.

waste is very feasible; however, issues of “green tariffs” implementation, licensing and other procedures still need full attention of authorities.

6. Leading players

The adoption of “green” tariff activated the process of investing in alternative energy sector. Currently in Ukraine the key investors come from

Solar energy

In the solar energy industry the key player is Active Solar, registered in Austria. Go Solar (Activ Solar) is an international group of companies with headquarters in Vienna (Austria), which specializes in development and production of solar technologies. Its key activities are production of silicon products and development of large-scale photovoltaic solar parks.

inside the country, although many foreign investors declared their intentions to invest in the Ukrainian alternative energy sector soon.

Semiconductor Factory (Kyiv), a subsidiary of Activ Solar, has been producing polysilicon since 1964. At the end of 2011 the installed capacity of solar power plants of Active Solar amounted to 188 MW, according to the company’s plans for 2012, it will continue the construction of solar power stations in the Crimea and in Odessa region.

Wind energy

One of the main players in the wind energy market is Vitroparky Ukraine, which operates two wind power plants (in Donetsk and Mykolaiv regions) with the total installed capacity of 50 MW as of the end of 2011. These stations were put into operation in

Hydropower

The key companies involved in operation of small hydropower plants and electricity production are: Novosvit (the company operates 15 small hydro power plants and is building new hydro and solar power

Bioenergy

The number of potential biogas producers exceeds 2000-3000. However, currently there are only a few dozens of plants already working in this sphere. Thermal energy and electricity are produced by Kirovohradoliya (Kernel) and Smilaenerhopromtrans; biogas is produced by Ukrainian Milk Company, MHP, Agro-Oven, Avangard Agroholding, Terezyne.

2011. Other market participants are the state-owned enterprises, with the total installed capacity of about 64 MW. Among the companies, which are involved in construction of wind power plants, the key players are Concord-groups and DTEK Wind Power.

er plants), Enerhoinvest (the company operates 12 small hydro power plants), Podilska Energy Company (4 small hydro power plants), Enerhostar (4 small hydro power plants), etc.

In other sectors a number of industrial enterprises have been equipped with cogeneration units, including: Stirol, TD Ukrainski Poroshkovi Materialy, Slav Enerho Invest, Severodonetska Teplotentral, coal mine Imeni O.F. Zasyadka, Ekoenerhia, Enerhotekhnolohiyi, Krukivsky Carriage Works, etc.

7. Legislation

Alternative energy sources according to the Law of Ukraine “On alternative energy sources” are renewable energy sources which include solar, wind, geothermal, wave and tidal, hydro and biomass energy, gas from organic waste and sewage treatment plants, biogas and secondary energy resources such as blast-furnace and coking plant gas, methane gas from degasification of coal deposits, transformation of industry waste energy.

The main regulatory authorities in the sector are The Ministry of Fuel and Energy of Ukraine and the National Electricity Regulation Commission of Ukraine.

Production of electricity is subject to licensing in Ukraine. However, there is no need in obtaining a

license for production of electricity with generating equipment using alternative energy sources with rated capacity of up to 10 MW for own consumption.

Main legislative acts governing the alternative energy in Ukraine are: the Law of Ukraine “On Alternative Energy Sources”, the Law of Ukraine “On Alternative Types of Fuel” and the Law of Ukraine “On Electrical Power Industry”.

The legislation of Ukraine provides a number of tax incentives for activity connected to development, implementation and use of alternative energy. The Tax Code of Ukraine stipulates that there shall be no income tax for 10 years for:

- Income of enterprises of the electric power industry gained out of sale of the electricity produced with the use of renewable energy sources (such as wind, solar, geothermal, wave and tidal, hydro, and biomass energy, landfill gases, sewage facilities gases, biogases);
- Income of biofuel producers from sales of biofuel;
- Income of producers of mechanisms and equipment intended for production and reconstruction of technical and transport means and electrical devices that consume biofuel, when such income is received from sale of these mechanisms and equipment that were produced in Ukraine;
- Income of enterprises exercising co-generation activity and/or producing heat energy using biofuel;
- Income of enterprises gained out of extraction and use of coalbed methane.

No taxation is also stipulated for 80% of income of enterprises gained out of sale in Ukraine of own-produced goods stated below:

- Equipment working on renewable energy;
- Materials, raw materials, equipment and components which will be used for production of energy out of renewable energy sources;
- Equipment for production of alternative fuel types.

Funds released due to tax allowances shall be directed by the tax payer towards increase of production volumes pursuant to the procedure as stipulated by the Cabinet of Ministers of Ukraine.

No VAT shall be applied to the import of:

- Equipment consuming renewable energy sources, equipment and materials for production of alternative fuel types or for production of energy out of renewable energy sources;
- Materials, equipment, components used for production of:
 - Equipment consuming renewable energy sources.
 - Materials, raw materials, equipment and components which shall be used for production of alternative fuel types or for production of energy out of renewable energy sources.

Land taxes shall be lowered:

- 25% of the standard rate for land tax;
- 3% of the normative value for yearly lease payment (usually 12% rate is applicable).

Import to Ukraine of goods is free of taxes if such goods are used by the taxpayer for own production and if identical goods of equivalent quality are not produced in Ukraine. The list of such goods with codes pursuant to the Ukrainian classification of foreign economic activity goods is stipulated by the Cabinet of Ministers of Ukraine (the Resolution of the CM of Ukraine from May 14, 2008 No 444 “On import to the customs territory of Ukraine of energy-saving materials, equipment and component parts”).

In addition to this, temporarily, till January 1, 2019 no VAT shall be applied to the following transactions:

- Delivery of mechanisms and equipment determined by Article 7 of the Law of Ukraine “On Alternative Fuel Types” to the territory of Ukraine;

- Import under codes of the Ukrainian classification of foreign economic activity goods determined by the Law of Ukraine “On Alternative Fuel Types” of mechanisms and equipment intended for reconstruction of existing and construction of new enterprises for production of biofuel and for production and reconstruction of technical and transport means consuming biofuel, if such goods are not produced and have no equivalent in Ukraine, as well as of technical and transport means, including self-moving agricultural machinery consuming biofuel, if such goods are not produced in Ukraine.

Ukrainian legislation also stipulates the “green tariff” as a special price applicable to the electricity produced from alternative energy sources and paid to its producers. Electricity producers have the right to receive “green tariff” for electricity produced in such way and not sold at contractual prices directly to consumers or energy supplying companies.

The rate of the “green tariff” shall be established for each economic entity producing electricity using alternative energy sources as to each type of alternative energy and for each company of the electrical power industry. A “green tariff” may be granted also to power plants which combine alternative and usual energy sources, if the share of power generated from renewable sources is at least 50%.

The rate of the “green tariff” is calculated by multiplying retail tariff for consumers of second class voltage as for January 2009 by “green tariff” level factor for each type of alternative energy. Electricity produced by power plants which will be put into operation (or considerably improved) after 2014, 2019 and 2024 is decreased by for 10, 20 and 30 percent of its basis rate respectively. The “green tariff” is established up to January 1, 2030.

Local Content Requirements is making “green tariff” available only to those renewable energy power plants whose total construction cost is made up of Ukrainian raw materials, fixed assets and services:

- 15% for power plants commissioned before 1 January 2013;
- 30% for power plants commissioned after 1 January 2013 but before 1 January 2014;
- 50% for power plants commissioned after 1 January 2014.

Additionally, the eligibility of solar power plants for the “green tariff” depends on the photovoltaic modules containing a certain percentage of Ukrainian raw and other materials in their production cost and applies as follows:

- 30% if a solar power plant is commissioned after 1 January 2013;
- 50% if a solar power plant is commissioned after 1 January 2014.

Calculation of the GT Rate

Types of RES	Minimum GT Rate, EUR cent/ kWh	GT Rate EUR cent/ kWh	Basic Tariff Applicable	GTI	Peak hours coefficient
Wind power plants with installed capacity of less than 0.6 MW	6.46	6.5	EUR cent 5.38 for kW/h	1.2	1.0
Wind power plants with installed capacity between 0.6 and 2 MW	7.54	—	EUR cent 5.38 for kW/h	1.4	1.0
Wind power plants with installed capacity of more than 2 MW	11.3	12.5	EUR cent 5.38 for kW/h	2.1	1.0
Biomass power plants	12.37	13.7	EUR cent 5.38 for kW/h	2.3	1.0
Ground solar installations	46.53	51.6	EUR cent 5.38 for kW/h	4.8	1.8
Roof solar installations with capacity of more than 0.1 MW	44.59	44.6	EUR cent 5.38 for kW/h	4.6	1.8
Roof solar installations with capacity of less than 0.1 MW	42.64	47.3	EUR cent 5.38 for kW/h	4.4	1.8
Small hydro power plants with capacity less than 10 MW	7.76	8.6	EUR cent 5.38 for kW/h	0.8	1.8

If the “green tariff” legislation is amended or replaced, the alternative energy power plants that have been commissioned before that will have the right to either remain under the “green tariff” regime that was effective as on the date of their commissioning or choose to operate under the new regime.

The generating companies selling electricity at “green tariff” rates are subject to preferential treatment compared to other power generating companies.

A new Law of Ukraine No 5021 “On Fees for Connection to the Networks Owned by the Natural Monopoly Entities” (the “Law”) that comes into force on 1 January 2013. The Law changes significantly the procedures applicable to the connection to the power grid. It requires the power plants generating electricity out of the renewable energy sources to pay the reimbursable financial assistance to the TSO which will be later repaid by the latter.

8. Organizations and associations of the sector

Regulatory and governmental organizations of energy sector

National Energy Regulatory Commission (NERC)

NERC is a state agency, which regulates the operation of natural monopolies and is responsible for granting licenses and approving tariffs for producers of heat and electricity, in particular, it approves a “green tariff” for producers of renewable energy.

<http://www.nerc.gov.ua/>

State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE)

SAEE is a government agency responsible for government policy regarding energy efficiency and energy saving in Ukraine. One of the main tasks of SAEE is increasing the share of renewable energy and alternative fuels in the energy balance of Ukraine.

<http://sae.gov.ua/>

Industry institutions and organizations

Institute of Renewable Energy of the National Academy of Sciences of Ukraine (IRE)

IRE was founded in 2004 for further development and coordination of research in the field of renewable energy. The main activities of the Institute include the development of renewable energy and environmental protection.

<http://www.ive.org.ua/>

“Association “Ukrhydroenerho”

Association “Ukrhydroenerho” coordinates the activities of its members, promotes the international development and relations, implementation of investment projects, including participation in international projects in hydro power field, contributes to finding new markets for products and services and provides informational support to its members.

<http://www.ukrhydroenergo.org/>

Association of Alternative Fuel and Energy Market Participants of Ukraine (APEU)

The main task of the Association is to promote production and use of renewable fuels and energy in Ukraine, as well as to strengthen the market position of Ukrainian manufacturers of specialized equipment and technologies, in domestic and in foreign markets, representation of participants' interests before government, international organizations, and protection of the participants's rights, public relations. The association was founded in 2005.

<http://apeu.info/>

Ukrainian Wind Energy Association (UWEA)

UWEA is an All-Ukrainian NGO with a purpose of wind energy technologies promotion, it also insures wind energy producers interests are promoted on the national and international levels. Ever since its foundation in spring of 2008, the association has been committed to wide-scale developing of wind energy generation in Ukraine, involving small and medium size businesses. UWEA popularizes wind energy as environmentally friendly, CO2 neutral source of electricity for Ukrainian consumers.

<http://www.uwea.com.ua/>

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