Prospects for Biogas – Leaders' Experience Helps Ukraine

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Abstract – modern trends development of world energy sector is following the strategy of sustainable development. It includes reduce overall energy consumption, significant changes in the structure of the energy sector and replacement of traditional energy to alternative and renewable energy sources. Promising sources are solar power and biomass particularly biogas. Ukraine has significant potential for biogas production.

Key words – sustainable development, renewable and alternative energy sources, biogas plants.

I. Introduction

The threat of global warming and exhaustion of fossil fuels and other factors forcing countries to look for new directions for further development.

During this search was designed the concept of sustainable development. It combines three fundamentally important components – of three spheres, dimensions, domains or pillars, i.e. the environment, the economy and society. Thus it is not just about their "arithmetic adding". There is a much deeper process including mutual interaction and integration of these components (Fig.1).

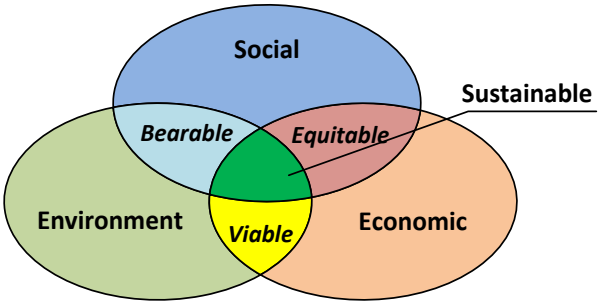

Fig. 1. Sustainable development

The concept of sustainable development supports more and more countries. They develop and implement plans and strategies to reduce overall energy consumption, significant changes in the structure of the energy sector and replacement of traditional energy to alternative and renewable energy sources.

In September 2015, the United Nations General Assembly formally adopted the "universal, integrated and transformative" 2030 Agenda for Sustainable Development, a set of 17 Sustainable Development Goals (SDGs) [1]. The goals are to be implemented and achieved in every country from the year 2016 to 2030.

The United States of America (USA) puts significant efforts in this area. In 2014 U.S. Comprehensive Energy Strategy was announced by the President Obama [2]. One of its key elements is the development of renewable energy sources, mainly "green" electricity generation. In particular, it is planned to triple the amount of electricity from renewables – to 20 % in 2030 (excluding hydropower). Some states, such as California, are moving steadily towards achieving 100 % renewable energy.

This trend supports the development of more and more countries, particularly European countries (EU).

II. EU countries energy strategies

In order to determine the main principles and priorities of state policy in the energy sector and to ensure effective functioning of energy industry prepare and adopt the energy strategies.

Energy strategy is a documented way to develop the energy sector of the state for the next decades. It shows clear objectives and specific priorities for the development of the energy sector. But the main that there is expedience of their implementation.

Today in most European countries defined horizons of the energy sector in 2050 [2]. Summary information on key indicators of long-term energy strategies of some EU countries represented in Table.1.

TABLE 1

PAGE LAYOUT DESCRIPTION

Country	Year			
	2020	2030	2040	2050
Austria	34 %	–	–	–
Denmark	33 %	55 %	68 %	100 %
Germany	18 %	30 %	45 %	60 %
Sweden	50 %	–	–	100 %
Switzerland	45 %	–	56 %	60 %

Most European countries are planning in 2050 to cover more than half of its needs for energy by renewable energy (Table.1). Also, some countries plan to switch completely to renewable sources.

Much attention in the development of renewable energy given to solar energy. More than half of promising fuel balance it should provide solar power.

This is partly due to the fact that solar energy has the greatest potential for development. Only for 88 minutes the Earth's surface receives from the Sun this amount of energy, which covers the annual needs of all humanity. Partially it due that today the cost of solar electricity equal amount of electricity of traditional energy [3].

However, an important role in the future energy balance also plays biomass. This applies particularly to thermal energy.

Against this background, Ukraine plans differ significantly. Actually in Ukraine is the Energy Strategy for the period until 2030 which was adopted in July 2013. Priorities of national energy sector is coal and nuclear powers. However, to date, such a scenario does not meet the priorities of the EU.

Ukraine needs to conduct its power to EU standards. Because energy strategy priorities for 2030 should be revise. The reason for this may be the recently passed National Action Plan for Renewable Energy by 2020 [5].

III. The long-term role of biomass in the energy sector Ukraine

Currently, the main components of energy balance of Ukraine are coal, natural gas, nuclear energy and oil. The share of renewable energy sources is only 2.6 %. The structure of electricity production from renewable energy sources in Ukraine is shown on Fig.2.

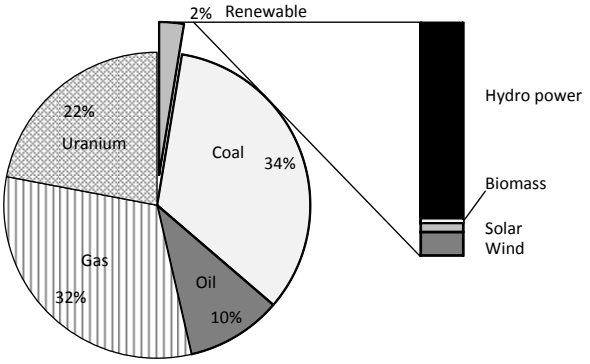

Fig. 2. Structure of electricity production from renewable energy sources in Ukraine

For comparison, the share of renewable energy in Ger-many is 35 %. The structure of electricity production from renewable energy sources in Germany is shown on Fig.3.

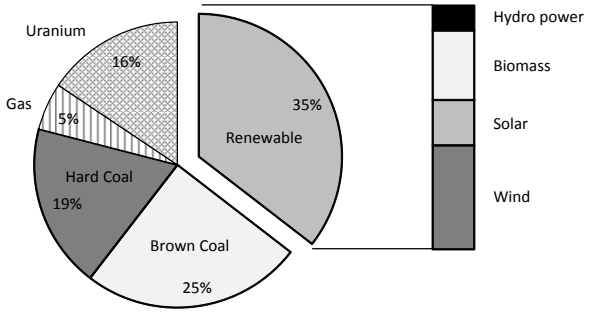

Fig. 3. Structure of electricity production from renewable energy sources in Germany

Using of biomas increases in almost all EU countries. The leader of course Germany. Good results show and the countries of former Soviet bloc, for example Czech Republic [6].

Biomass for energy used in two ways: obtaining biogas by biogas plants or producing fuel (fuel pellets). But, biogas production has a great advantages. Biogas plants do not only allow for biogas, but also help solve the problems of farms related to environmental pollution.

In individual farm and agricultural enterprises always available waste of cattle, pigs, poultry and vegetable waste. Their ever-growing volumes create a number of problems on their collection, transportation, storage, processing. The most promising solution is recycling agricultural waste in biogas plants. In addition, the biogas plant produces not only biogas (Fig.4).

Waste biogas plant – is organic manure (Fig.4).

Such locked loop is realized in the Czech Republic (Knyzhytse) [6]. Disposal of waste pig farms cost farmers money still. Now they get money for it – 10 kroons per ton. Received at the biogas plant organic manures sell by the same farmers for the same price – 10 kroons per ton.

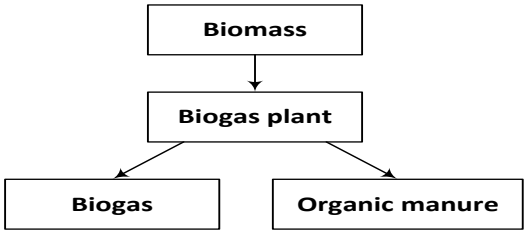

Fig. 4. The products of biogas plant

In Ukraine biogas too easy to produce. The conditions here even better than in Germany or the Czech Republic and raw materials not less. The potential of Ukraine experts estimate widely: 1.6–18 billion m^3 annually[7].

Among the barriers in Ukraine for the development of biogas experts call: inadequate legislation, the lack of targeted funding, excessive hardware requirements ets. Most of these problems need to be addressed at the legislative level.

Realistically, that by 2030 we can produce about 7 billion m^3 annually. This exceeds the current production in Germany (near 2 billion m^3) more than three times.

Conclusion

Energy policy of the EU energy saving proves its effectiveness. Ukraine should accept ambitious goals for the development of renewable and alternative energy sources. To accelerate the development of "green" energy in Ukraine need to improve domestic legislation.

Biomass should has a significant role in the development of alternative and renewable energy in Ukraine.

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