

## Vision for Ukrainian biogas/biomethane sector development

## To launch a process of defining vision for Ukrainian biogas/biomethane sector

This paper defines the process of how to launch a vision and targets for the Ukrainian biogas/biomethane sector, how to develop a roadmap, and how implement plans and targets. The roadmap should include recommendations for legislative and market changes as well as activities aimed at achieving the required development in production, trade and consumption of biomethane.

Development of the vision and roadmap for biogas/biomethane is part of REGATRACE project. REGATRACE is EU-wide project funded by the European Union. Similar processes take place in 14 European countries in 2020-2021 including Ukraine. Bioenergy Association of Ukraine is linked party to European Biogas Association in the REGATRACE project.

The EU countries have set a substitution of natural gas consumption by renewable gases (biomethane, green hydrogen) by 2050 as one of the goals of climate neutrality within the Green Deal<sup>1</sup> framework. For this purpose, the legal framework is being created and significant investment projects are being prepared for implementation. Ukraine has all the potential to join this process.

### Background

Biogas production in Ukraine is stimulated by feed-in-tariff (green tariff) for electricity produced from biogas. Almost all Ukrainian biogas plants produce electricity with successive national power grid delivery. By now, there is no specific legislation to facilitate production and utilization of biomethane.

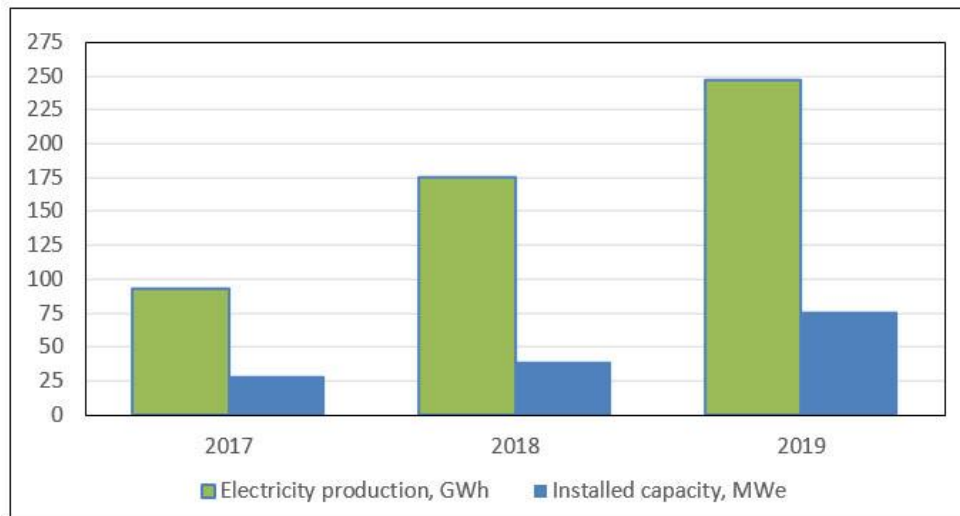
The average annual growth of the biogas sector was 65% in 2017-2019. If at the end of 2017 the total installed capacity of biogas plants was 29 MWe, then at the end of 2019 it was already 76 MWe. During this time period electricity production increased from 93.5 to 247.4 GWh. About 40% of electricity produced from landfill gas (LFG) at municipal solid waste (MSW) landfills and waste dumps. The rest 60% of electricity produced by agricultural biogas plants.

At least 26 agricultural biogas plants were under operation in Ukraine in 2019. The individual projects ranged from 125 kWe to 12 MWe installed capacity. Some of the small projects produce electricity without green tariff, two projects produce only heat for own industry needs. At the same time there were 22 LFG recovery systems, all of them with electricity production.

Despite the limited number of implemented agricultural biogas plants, their technical scope covers a wide range of industries and different types of feedstock. Ukrainian biogas plants are erected at pig, cattle, chicken farms, at sugar plants, breweries, and food production enterprises, using a broad diversity of raw materials such as pig and cattle manure, chicken litter, maize and sugar sorghum silage, sugar beet pulp and molasses, food treatment waste and industry waste water.

---

<sup>1</sup> [https://ec.europa.eu/clima/policies/strategies/2050\\_en](https://ec.europa.eu/clima/policies/strategies/2050_en)



*Biogas sector development in Ukraine (2017-2019)*

*Source: National Energy and Utilities Regulatory Commission of Ukraine*

According to the studies of Ukrainian Bioenergy Association (UABio), Ukrainian's biogas/biomethane production potential for digestion technology was estimated to be about 6.8 bcm of methane in 2018<sup>2</sup>. The potential includes biogas from agricultural waste and by-products (2.8 bcm), landfill gas and biogas obtained from industrial and municipal wastewater (1.0 bcm), and biogas from maize silage (3.0 bcm).

Expert estimates show that the potential for biogas/biomethane production may increase up to 17 bcm in 2050. Such significant growth can occur due to increase of industrial production, growth of raw material base for biogas production (crop residues), consolidation of livestock enterprises and the transition from solid waste disposal to the use of mechanical and biological AD treatment technology.

It should be noted that according to the company “Naftogaz of Ukraine”, the total consumption of natural gas in Ukraine was 29.8 bcm in 2019, of which 14.3 bcm (48%) were imported<sup>3</sup>. Therefore, the maximum possible exploitation of the available biogas/biomethane potential is one of the tools of ensuring the country's energy security.

## Setting a Vision and targets

There is considerable untapped potential for a wide spread implementation of biogas and biomethane projects in Ukraine.

The Ukrainian natural gas transportation system (GTS) is internationally connected potentially enabling biomethane and other renewable gases physical or virtual delivery from Ukraine to Western Europe. At the moment there is a downward trend in the transit of natural gas to Europe by Ukrainian GTS. Ensuring the maximal possible load of the Ukrainian GTS with natural gas of own production and alternative renewable gases is urgent.

Ukraine has the largest area of agricultural land in Europe, one of the highest agricultural areas per capita and developed agriculture industry. Using biomethane as a motor fuel is an excellent opportunity for

<sup>2</sup> <https://uabio.org/en/materials/9115/>

<sup>3</sup> <https://www.naftogaz.com/>

agricultural producers to obtain own energy source by means of waste and secondary products of their own production.

In Ukraine there is a long term tradition to use compressed natural gas (CNG) as a motor fuel for buses and heavy vehicles. More than 200,000 vehicles were running on CNG and the country offered a reasonably good network with about 300 CNG filling stations distributed all over the country.

The use of biomethane for public transportation can significantly improve air pollution in large cities. Biomethane should be used not only by road transportation, but also by water and rail, not only in compressed (CBG), but also in liquefied (LBG) form. However, so far there are any examples of biomethane use for transportation in Ukraine including both separately or blending with natural gas.

Ukrainian biogas sector should be strongly integrated into the modern energy system and network. Besides that, the sector should hold a strong foothold in national the nutrient recycling activities and participate in the archiving of the national target of greenhouse gases emission reduction.

In order to stay on track and to reach its potential, the Ukrainian biogas sector should set the production target of 17 TWh to be reached by 2035. The significant part of the biogas would be upgraded to biomethane; so that the biogas sector could serve the growing demand in sustainable and clean energy from the transport and industry sectors.

The new biogas production would be based in particular on the utilization of agricultural-based by-products, but new technologies and feeds would also play a role. That may include thermal gasification of lignocellulose originated from agriculture and forest, and also power-to-gas process. In energy systems with large share of renewable energy sources, excess electricity could be used to produce hydrogen by electrolysis of water followed by the methanization of hydrogen with carbon dioxide from the process of biogas upgrading the biomethane.

## Understanding barriers and drivers

The biogas production and consumption have increased in Ukraine during last years, however further development is not clear due to limited attractiveness of green tariff for electricity. Larger growth leap has yet to be taken. The Ukrainian biogas sector has potential in terms of both the availability of raw materials and the demand for biogas. The Ukrainian biogas market can be considering as emerging and promising.

Opportunities for the Ukrainian biogas sector are created by many factors such as carbon neutrality targets, interests in advancing national self-sufficiency of energy and the vitality of the rural areas, and emission reduction targets for transport and agriculture. The nutrient recycling offers also wide ranges of business opportunities for the biogas sector.

So far, biomethane production is not competitive with natural gas market price and need support in Ukraine similarly to all over the world. The low profitability of biogas production is challenging the sector. The availability of low-cost fossil fuels is also considered to slow down the development of the biogas industry.

Well-designed and targeted policy instrument can fasten the development: the profitability can be improved with subsidies and other means of support. Demand for end-products can also be increased with various incentives. Incentive schemes should be made more predictable and long-term to encourage for new investments.

Using the capabilities of the Ukrainian GTS connected to European GTSs and, in the long term, virtual export to the EU market, could improve the economic attractiveness of biomethane production in Ukraine. Development of the Ukrainian Register for biomethane production and utilization and cooperation with similar Registries of EU countries is the potential possibility to exchange the biomethane Guaranty (certificates) of Origin (GoO) with other countries.

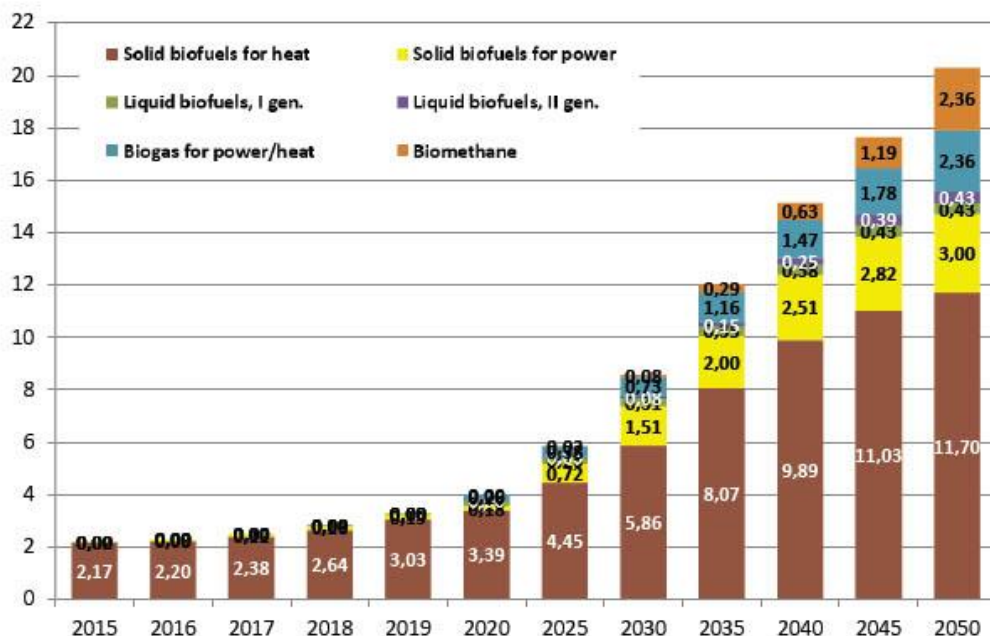
## How to reach objectives and targets?

In order to reach the objectives and targets there is a need for having better dialogue between different stakeholders (producers, users, decision makers, official and other). There is big number of different stakeholders, as the biogas sector is strongly involved in different sectors such as energy production, agriculture, transportation and waste management. Biogas is not only about energy production but it also an excellent way to recycle nutrients.

Moreover, there is a need for defining long term actions; hence an official national biogas production target for 2035 and long-term national incentive package are urgently needed. The targets and actions agreed together would create confidence in the industry's growth potential for the current players and for newcomers.

The Ukrainian biogas sector has already started the journey to call for long term actions by launching a *Roadmap for Bioenergy Development in Ukraine until 2050 published in the UABio Position Paper #26*<sup>4</sup>.

As estimated by the experts of the UABio production of biogas could be 1.45 Mtoe (17 TWh) in 2035.



*Suggested structure of using biofuels in Ukraine until 2050, by type of energy carrier, Mtoe*  
 Source: UABio Position Paper #26

<sup>4</sup> <https://uabio.org/en/materials/9115/>

The statement was developed by Ukrainian Bioenergy Association and need to be discussed among all interested parties including:

- Ministry for Development of Economy, Trade and Agriculture of Ukraine – [www.me.gov.ua](http://www.me.gov.ua)
- Ministry of Energy of Ukraine – <http://mpe.kmu.gov.ua>
- Ministry of Development of Communities and Territories of Ukraine – [www.minregion.gov.ua](http://www.minregion.gov.ua)
- State Agency on Energy Efficiency and Energy Saving of Ukraine – <http://sae.gov.ua/en>
- Energy and Utilities the National Regulatory Commission of Ukraine – [www.nerc.gov.ua](http://www.nerc.gov.ua)
- Gas Transmission System Operator of Ukraine – <https://tsoua.com/en/>
- Private business and NGO representatives.

So, the first steps have already been taken: the dialogue has been strengthened in the value chain of the Ukrainian biogas sector. Next step is to seek for actions in the long-term, which will be elaborated in the next phase of the national vision and roadmap process starting in November 2020.

## More information

Ukrainian Bioenergy Association – [www.uabio.org](http://www.uabio.org)

Georgiy Geletukha – [geletukha@uabio.org](mailto:geletukha@uabio.org)

Yuri Matveev – [matveev@uabio.org](mailto:matveev@uabio.org)