

BIOGAS PRODUCTION EUROPEAN UNION AND NATIONAL REGULATORY ENACTMENTS AND REGULATIONS IN LATVIA

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Abstract. The article analyses the laws and regulations governing the production of biogas in the European Union (EU) and in Latvia, which determine practical economic solutions in the biogas industry. The strategic goals and basic directives of the EU energy policy are the ones on which the renewable energy sector in Europe is based, which are largely focused on a sustainable energy sector, putting the EU as a world leader in this field with a common energy market. However, each EU Member State has its own energy policy, so in order to achieve the common goal of a higher share of renewable energy in the national economy, the Member States choose different ways to achieve the goal. *The aim of this article* is to find out whether the regulatory acts in Latvia regulate the development of the biogas industry in a favourable way. Considering the unprecedented geopolitical situation created by Russia's invasion of Ukraine, during 2022 the renewable energy indicators to be achieved by 2030 were reviewed in the EU. They were adjusted to promote Member States' energy independence and, in the long term, the goals of climate neutrality and zero pollution, as well as to phase out dependence on Russian fossil fuels and reduce energy prices. The research shows that Latvia, following the legislation of the EU in the field of energy and also focusing on the use of renewable energy sources, to which biogas belongs, has adapted its package of policy planning documents and regulatory acts in order to comply with the goals set by the EU.

Key words: bioenergy, biogas, renewable energy sources, regulations, policy documents.

JEL code: K32; O13.

Introduction

The European Commission (EC) (European Parliament..., 2021a) has emphasized that significant investments and efficiency measures are needed to meet the growing energy demand in the EU. Ambitious energy and climate change goals for 2020 were set already in 2007 - reducing greenhouse gas emissions by 20%, but increasing to 30% in case of appropriate conditions, as well as increasing the share of renewable energy to 20% and energy efficiency to 20% (European Parliament, 2007). In 2014, the European Council approved energy and climate targets for the EU for 2030: to reduce the total economy's greenhouse gas emissions by at least 40%, to improve energy efficiency by at least 27%, and to reach at least 27% of the renewable energy consumed in the EU. Later, a new target for 2030 has been introduced for the EU - to reach the share of renewable energy of at least 32% and to improve energy efficiency to the level of 32.5% (European Parliament..., 2018c). The EC (2019) Communication "The European Green Deal" sets out a new growth strategy that brings together a comprehensive set of mutually reinforcing measures and initiatives aimed at achieving climate neutrality in the EU, including reducing net greenhouse gas emissions to zero by 2050. Its aim is to transform the EU into a fair and prosperous society with a modern, resource-efficient and competitive economy where economic growth is decoupled from resource use (Pilvere, I. et al., 2022).

In recent years, both the EU and the Member States at the national level have adopted a series of regulatory acts to bring their countries closer to this ambitious goal - climate neutrality. The COVID-19 pandemic has affected the economy of the EU and the level of greenhouse gas emissions to an extent that cannot yet be fully determined. At the same time, the EU is implementing its biggest ever stimulus package, which also potentially affects emissions. In order to implement stronger climate action strategies over the next five years (2023-2027), support measures are needed to enable Member States to adapt to stricter

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regulation. The total expected cost of EU support measures is 1.75 million euros (European Parliament and..., 2021a). Due to these uncertainties, it is appropriate to review the emissions data in 2025 and adjust the annual emission allowances if necessary (General Secretariat of..., 2022). A new challenge has emerged in the process of achieving this global goal. In the current geopolitical situation, when the Russian invasion of Ukraine took place and which affected the availability of energy resources and their price in European countries, it is essential to promote the production and availability of renewable energy sources (RES), including biogas. Since the summer of 2022, the energy crisis has worsened, which means that urgent action is needed. Due to the increase in energy costs, the purchasing power of citizens decreases and companies lose their competitiveness. Insufficient gas and electricity supplies and relatively inelastic energy demand in the EU has led to significant price increases and volatility in gas and electricity prices (European Commission, 2022b).

Latvia's electricity generation industry is largely dependent on RES. Already in 2009, it was established that Latvia had the third highest share of RES in energy consumption in the EU (European Parliament ..., 2009a). In recent years, the dependence on RES in Latvia has increased. This is confirmed by the fact that in 2021, the share of RES in electricity production was 51.4%, while their share in gross final energy consumption was 42.11% (Official Statistics Portal..., 2022).

According to the definition of EU Directive 2009/72/EC (European Parliament..., 2009b), "biogas energy" is one type of energy obtained from renewable sources and "biogas" is a gaseous fuel produced from biomass. Biogas is a suitable form of RES within the European Green Deal. The researchers (Iriarte, L. et al., 2021; Lenerts, A. & Strikis, V., 2013; Zeverte-Rivza, S., 2014; Zeverte-Rivza, S. et al., 2014) emphasize that increased biomass production and its local use for energy production could increase the energy security of local communities. Dispatched bioenergy (biogas, biomethane) could contribute to flexibility in electricity systems with a high share of renewable energy. According to research (Priekulis, J. & Aboltins, A. 2015; Priekulis, J. et al., 2015; Zeverte-Rivza, S. 2014), biogas produced in accordance with EU guidelines and correct production technologies practically does not produce either methane or nitrogen emissions. The proportion of biogas production (gas from landfills, sewage sludge gas, other biogas) is insignificant, although sufficient resources for its production are available in Latvia. Biogas production would make a more significant contribution to electricity consumption.

It is important to understand how to practically manage the achievement of the goals of the European Green Deal in Latvia from a national institutional perspective regarding biogas production. Therefore, *the aim of this article* is to find out whether the regulatory acts in Latvia regulate the development of the biogas industry in a favourable way. In order to obtain a more complete picture, legal and regulatory acts issued by EU institutions and other international organizations, national laws and regulatory documents adopted in Latvia regarding RES were used. The task is to find out the shortcomings of the regulatory acts in Latvia for the further development of biogas as a form of RES defined and applied within the framework of the European Green Deal.

The framework of normative documents is of great importance for energy market regulation. Regulators and politicians must constantly balance economic and environmental concerns, including grid stability and other technological challenges, and social inclusion policies (Toporek, M. & Campos, I., 2019). Over time, policy makers and scientists have been actively working to create a sustainable electricity market in EU Member States. Regarding the field of bioenergy, various strategies, action plans, regulations, directives, etc. have been developed over the years. They are complex and contain few references directly related to biogas production. The documents were changed, clarified and improved, so within the framework of this article, mainly those regulatory documents that stipulate and/or affect biogas production will be reviewed.

In practice, it is important for biogas industry participants to be aware of the scope of regulatory documents that must be considered in order to be able to work successfully and receive state support.

EU and Latvian policy plans and regulatory acts, which relate to and affect renewable energy production and consumption, as well as available scientific research on the field of biogas, were used for the study. Analysis, synthesis, logical and construction, induction and deduction were used to perform research tasks.

Research results and discussion

1. Brief review of the main EU regulatory enactments

The European Green Deal is a new strategy at the EU level, but the EU's climate action and regulatory documents also for renewable energy was introduced much earlier. At a time when Latvia was not enrolled in the EU, the Directive 2001/77/EC came into force in 2001 on the promotion of electricity produced from RES in the internal electricity market (RES-E Directive) (European Parliament..., 2001). This directive established a minimum framework for RES-E policy and stipulated that each Member State is allowed to choose the support scheme that best suits its specific situation. The Directive 2001/77/EC was replaced by a new one. The Directive 2009/28/EC (European Parliament..., 2009a) on the promotion of the use of renewable energy sources was a very important EU directive regulating the field of RES for several years. It determined that by 2020, 40% of the primary energy in Latvia must be provided using RES. Member States built their bioenergy strategies in line with national targets based on this directive until it expired on 30.06.2021 when a new Directive (EU) 2018/2001 (European Parliament..., 2018b) on promoting the use of RES energy entered into force.

The EU Member States are bound by Regulation (EU) 2018/842 (European Parliament..., 2018a) introduced to help achieve the goals of the Paris Agreement (2016), as well as the EU's climate neutrality goal by 2050 at the latest under the European Climate Law (European Parliament ..., 2021b). The Regulation (EU) 2018/842 helped to achieve the goals of the Paris Agreement as well as the EU's climate neutrality goal by 2050 at the latest under the European Climate Law, which requires the convergence of all Member States' efforts while taking into account specific national circumstances. The Regulation (EU) 2018/842 required Latvia to reduce greenhouse gas emissions compared to the 2005 level by a total of 6% by 2030. This regulation emphasized the transition of transport modes to the use of sustainable RES in transport after 2020. The European Climate Law has set a legally binding goal for the EU to achieve economic climate neutrality by 2050 – a reduction of net greenhouse gas emissions by 2030 by at least 55% compared to the 1990 level. Thus, policy planning documents and regulatory acts must be developed in each Member State and also in Latvia in order to achieve the goals set by the EU and international commitments.

The development of the bioenergy field is defined in the EU Bioeconomy Strategy (European Commission, 2018a, 2018b) – residual streams from high-value raw materials used for bioproducts should be considered as valuable sources in the energy sector, as the collected waste streams are used for bioenergy production at the end of the useful life of the biomaterials. In general, describing the driving forces and trends of the EU Bioeconomy Strategy and action plan (European Commission, 2018b; Muska, A. et al., 2023) for 2030 and 2050 (assuming the successful implementation of a sustainable, circular EU bioeconomy), the researchers (Fritsche, U. et al., 2020) admit that bioenergy would become less important, while biomaterials and ecosystem services would gain significantly, strengthening the EU's competitiveness and creating jobs. Describing the EU's Bioeconomy Strategy, they recognize that despite the impressive potential of wind and solar, biomass would provide grid balancing services and help sectors that are difficult to decarbonize with electricity, such

as aviation, heavy-duty and marine transport, high-temperature industrial processes. By 2050, bioenergy would play a complementary role. The EU also determines the need for the monitoring of Member States in relation to the climate neutrality goals and greenhouse gas emissions adopted in the policy planning documents. Regulation (EU) 2018/2066 (European Commission, 2018c) on the monitoring and reporting of greenhouse gas emissions and performance data specifies a number of indicators to be submitted, including fuel (including biogas) emission factors related to the lowest calorific value and the lowest calorific value per mass of fuel.

Paying increased attention to RES in Member States and including biogas production, a new regulation has been adopted in September 2022 – Regulation (EU) 2022/996 on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria (European Commission, 2022a). This regulation lays out common rules to ensure efficient and consistent checks of whether businesses are: 1) complying with the EU sustainability criteria; 2) providing accurate data on greenhouse gas emission savings; 3) complying with the criteria for certification of low indirect land-use change risk biofuels, bioliquids and biomass fuels.

In response to Russia's aggression in Ukraine and to promote the energy independence of the Member States, the EU Council adopted the Regulation (EU) 2022/2577 (Council of the EU, 2022a) laying down a framework to accelerate the deployment of renewable energy. Among other things, this regulation mentions that the presumption that renewable energy production is of paramount importance to the public interest would mean that such projects could immediately be subject to a simplified assessment, if necessary, with regard to specific derogations provided for in the relevant EU environmental legislation. Unfortunately, in this regulation, nothing is mentioned about the promotion of biogas production, contrary to the fact that wind, solar, heat pump energy production is mentioned.

In 2022, politicians in the EU have prepared proposals for the "Fit for 55 Package", which also affects the RES sector (Council of the EU, 2022b; European Commission, 2022b). However, regarding biogas production, the regulation has not yet been specified.

2. The main policy planning and regulatory documents for biogas production in Latvia

A report on the situation in Latvia was prepared as part of a European project aimed at identifying barriers and simplifying the use of RES (Biseniece, E. et al., 2020). The report covered RES-E technologies, including biomass. The authors reported that the process of obtaining all necessary permits and the choice of production site for renewable energy technology is complicated. The process is governed by several different laws and subordinate regulations of the Cabinet of Ministers of the Republic of Latvia. The simplified procedure is intended only for small-scale devices (microgenerators up to 16A and 11.1 kW). The procedure includes an agreement on a grid connection with the distribution system operator and consultation with the local building board on the necessary approval. Larger project developers should agree with different institutions at different stages of the project. Although the amount of electricity produced in power plants using biomass would decrease by 2030 compared to 2017, it is still an important source of energy (Biseniece, E. et al., 2020). In addition, Latvia plans to modernize the existing biomass power plants in order to increase the share of RES in heating (Cabinet of Ministers..., 2020a).

The National Energy and Climate Plan for 2021-2030 (Cabinet of Ministers..., 2020a) is an ambitious policy planning document that identifies Latvia's objectives and their execution measures for the energy sector, such as a reduction in greenhouse gas emissions and an increase in carbon dioxide, and an increase in renewable energy. At the EU level, the development of the national plan, its content, national target indicators to be included in it, goals and contributions to the achievement of the EU goals, as well as

performance indicators were determined by several regulatory acts, the main of which were: Conclusions of the European Council on Climate and energy policy framework for the period up to 2030 (General Secretariat..., 2014); Conclusions of the Transport, Telecommunications and Energy Council on Governance system of the Energy Union (General Secretariat..., 2015) and Regulation (EU) 2018/1999 (European Parliament..., 2018).

Regarding biogas, the Regulation (EU) 2018/1999 (European Parliament..., 2018) established the need to define the share of energy from biofuels and biogas produced from feedstocks (different types of food and feed crops) in energy consumption in transport in national energy plans. These requirements are included in the National Energy and Climate Plan of Latvia. Among the measures to be implemented mentioned in the National Energy and Climate Plan 2021-2030 (Cabinet of Ministers..., 2020a), there are several to be emphasized that refer to biogas: 1) promote the production of biogas and biomethane and the use of biomethane – develop relevant legal acts to ensure the installation of biogas purification (biomethane production) equipment within the framework of EU structural funds or other funding sources after 2021; 2) analyse the potential of renewable energy from Latvian territorial waters – the use of marine for biofuel/biogas extraction and energy production; 3) determine the obligation of energy suppliers to implement RES, combining it with the obligation to reduce cycle GHG emissions per unit of supplied energy – by 2030, achieve a share of at least 3.5% of modern biofuels and biogas from the volume of realized transport energy; 4) the possibility of setting the lowest possible excise tax rate for biomethane and biofuels in the period from 2022 has been evaluated, evaluating the possibility of differentiating the reduced rates for first-generation biofuels and modern biofuels and biogas.

The context of the Latvian National Energy and Climate Plan 2021-2030 policy is related to policy planning documents in Latvia and the policies specified therein (Table 1).

Table 1

Relationship of the Latvian National Energy and Climate Plan 2021-2030 to other Latvian policy planning documents and the policy directions specified therein

No	Policy planning documents, acceptance date	The document includes targets and/or measures		The main directions of policy in the policy planning document
		For RES	For biogas	
1.	Sustainable Development Strategy of Latvia until 2030 (2010)	yes	yes	Use of biomass for heat and electricity production. Use of biogas resources.
2.	Latvia's national reform program for implementation of the "EU 2020" strategy (expired) (2011)	yes	no	Increasing the proportion of RES: 1) arranging a legal base; 2) providing access to financial resources for renewable energy production; 3) promotion of biofuels in the transport sector.
3.	National Development Plan of Latvia for 2014-2020 (expired) (2012)	yes	no	Use of RES in energy production by reducing fossil energy dependence and promotion of energy efficiency in centralized heat supply.
3.1.	National Development Plan of Latvia for 2021-2027 (2020)	yes	no	The share of energy produced from RES in transport should reach 5.85% in 2027. The share of energy produced from RES in the total final energy consumption should reach 47.5% in 2027.
4.	Latvian Energy's long-term strategy 2030 – competitive energy for the society (2013)	yes; provide a 50% proportion of RES in gross energy final consumption	yes	Promoting Sustainable Energy: 1) promote wider use of RES in public transport, including the use of public transport transitions for biofuels; 2) waive direct state aid for 1st generation of biofuels by maintaining compulsory biofuels in the medium term for fossil fuel; 3) develop a state support mechanism for promoting 2 nd larvae of biofuels; 4) to ensure the compliance of RES use (including biomass and biofuel) with the sustainability criteria and the positive impact of the RES on the related sectors.
5.	Latvian Rural Development Program 2014-2020 (expired) (2015)	yes	no	Promote the supply and use of resources, by - products, waste, residues and other food raw materials for bioeconomy.
5.1.	Latvian Rural Development Program 2014-2022 (a current version) (2022)	yes	yes	The need to support technologies and equipment that helps reduce the amount of GHG emissions: both promoting the use of agricultural by - products for energy production and thus reducing the use of fossil resources and the digestate of biogas in the production process as a fertilizer.
6.	Energy Development Guidelines for 2016-2020 (expired) (2016)	yes	no	Implement measures to increase: 1) RES proportion of gross energy final consumption; 2) the proportion of energy from RES in the final consumption of energy in transport.
7.	Alternative Fuel Development Plan 2017-2020 (expired) (2017)	yes	yes	Promote the development of alternative fuels and reduce the negative effects of transport on the environment. Evaluate the possibilities of sustainable biofuels (both liquid and gaseous) to determine the minimum excise duty rate, considering the heat capacity of biofuels.

Source: authors' calculations based on Cabinet of Ministers..., 2016, 2017, 2020a; Cross-Sectoral Coordination Centre..., 2012, 2020; Ministry of Agriculture..., 2015; 2022; Ministry of Economics..., 2011, 2013; Saeima..., 2010

The production and use of biogas is implicitly covered by strategies and regulatory documents designed to manage the bioeconomy, including RES. The specific regulatory documents applicable to the field of biogas production are the Directive (EU) 2018/2001 (European Parliament..., 2018b), the Regulation (EU)

2018/2066 (European Commission, 2018c) and Regulation (EU) 2022/996 (European Commission, 2022a). The new Regulation (EU) 2022/996 will be in force from 30.12.2023, which means that the national legislation must be ready for its implementation.

In order to gradually implement the measures defined in the National Energy and Climate Plan 2021-2030, as well as in compliance with EU directives and regulations, the relevant laws and regulations have been implemented in Latvia. Table 2 shows the legal acts that directly or indirectly regulate biogas production. Since Latvia joined the EU, the Latvia's Parliament and the Cabinet of Ministers have adopted some new rules and changed the old ones, based on the regulatory enactments adopted by the EU regarding RES.

Table 2

The main documents regulating biogas production in Latvia

No	Legal act, acceptance date	The main directions of policy in the document	Based on EU document
1.	Energy Law (1998; Amendments to the law from 14.07.2022)	The purpose of the amendment is to adopt the provisions of Directive (EU) 2018/2001 regarding the certification of gas origin. A certificate of origin can be obtained both for the gas obtained from the RES supplied by the gas distribution or transmission network, and for the gas obtained from the RES that is sealed, traded and used outside the grid (off-grid). Produced energy must meet sustainability and greenhouse gas emissions saving criteria.	Directive (EU) 2018/2001
2.	Biofuel Law (2005)	The purpose of the Law is to promote the trade in biofuel, thereby supporting the use of environmentally friendly and safe in supply RES. The law determines the basic principles of the state policy for the circulation of biofuels, including biodiesel, bioethanol and biogas.	Directive 2003/30/EC
3.	Electricity Market Law (2005; Amendments to the law from 19.05.2016)	The purpose of the law is to promote the production of electricity using RES as well as promote the country's energy independence by providing various suppliers of energy resources necessary for electricity production. Amendments excluded the article on the production of electricity in power stations using biomass or biogas, due to the entry into force of the Cabinet of Ministers' regulations regarding this article.	Directive 2012/27/EU
4.	Procedure for awarding state and EU support to the sub-measure "Energy production from biomass of agricultural and forestry origin" of the measure "Support for the creation and development of enterprises (including diversification of non-agricultural activities)" (No 268) (2010)	The purpose of the sub-measure is to support businesses that ensure energy production from biomass of agricultural or forestry origin, with the intention of selling the electricity produced in the form of biogas cogeneration.	Regulation (EC) 1698/2005; Regulation (EC) 1974/2006
5.	Subsidised Electricity Tax Law (2013)	Determines reduced tax rates for taxable income, for example, from: 1) the electricity sold within the scope of mandatory procurement, in the production of which RES were used; 2) the electricity from biogas sold within the framework of mandatory procurement, 3) if the several criteria are met at the same time.	Regulation (EU) 1407/2013
6.	Construction Law (2013)	One of the principles of sustainable construction is the one according to which the construction process creates a quality living environment for existing and future generations, increasing the efficient use of RES.	-
7.	Regulations on the application of subsidized electricity tax (No 1521) (2013)	The regulations determine the criteria and procedures for applying the subsidized electricity tax rate, including for a high-efficiency cogeneration biogas plant.	Regulation (EU) 1407/2013
8.	Regulations Regarding the Generation of Electricity Using Renewable Energy Resources, and also the Procedures for Price Determination and Monitoring (No 560) (2020)	The regulations lay down detailed conditions and criteria regarding: for the production of electricity, the right to compulsory purchase of the electricity produced, the price for electricity using RES, depending on the type of energy resources; as well as measures to promote the production of electricity from biomass.	Directive 2004/8/EC; Directive 2009/28/EC; Directive 2012/27/EU; Directive (EU) 2018/2001

No	Legal act, acceptance date	The main directions of policy in the document	Based on EU document
9.	Regulations on electricity generation, monitoring and pricing in the production of electricity in cogeneration (No 561) (2020)	The regulations determine the detailed conditions and criteria according to which cogeneration plants are qualified for the compulsory purchase right of the produced electricity; procedures for compulsory procurement and its monitoring; the procedure for determining the price of electricity depending on the electric capacity of the cogeneration station and the fuel to be used, including biogas. The merchant must use waste of organic origin as fuel raw material for biogas production in the biogas production facility.	Directive 2004/8/EC; Regulation 794/2004/EC; Directive 2009/28/EC; Directive 2012/27/EU
10.	Regulations on the requirements for the introduction and transportation of biomethane and liquefied natural gas converted into a gaseous state into the natural gas transmission and distribution system (No 567) (2022)	The regulations determine the requirements for sustainable and safe introduction and transportation of biomethane and liquefied natural gas converted into a gaseous state into natural gas transmission and distribution systems.	Directive 2009/73/EC; Regulation (EU) 2015/703
11.	Regulations on sustainability and greenhouse gas emissions savings criteria, criteria for electricity produced from biomass fuel and procedures for justifying, certifying and monitoring compliance with said criteria (No 686) (2022)	The regulations determine the essential requirements for a specific type of fuel, as well as for electricity produced from forest biomass - sustainability and greenhouse gas emission savings criteria and specific criteria for electricity (including from biogas).	Directive (EU) 2018/2001; Regulation (EU) 2018/2066; Regulation (EU) 2022/996

Source: authors' calculations based on Cabinet of Ministers ..., 2010, 2013, 2020b, 2020c, 2022a, 2022b; Saeima ..., 1998, 2005a, 2005b, 2013a, 2013b

In the current geopolitical situation, which creates instability of energy prices, it is important to create additional opportunities for the wider production and availability of local RES. The latest regulations demonstrate the efforts of Latvian politicians to promote high-quality gas production in biogas stations, adaptation of natural gas networks, and will also promote the entry of new market participants into the market by setting uniform requirements for the quality of biogas and the introduction of gases into the natural gas system.

Conclusions, proposals, recommendations

- 1) The importance of bioeconomy and bioenergy governance is recognized at the EU level, but its measures are implemented in a fragmented manner, without comprehensive cross-sectoral and cross-border coordination.
- 2) Although significant efforts have recently been made at the EU level to promote the development and use of bioenergy, only certain regulatory documents are directly applicable to the field of biogas, giving priority to other RES types, for example solar and wind energy.
- 3) Politicians pay little attention to the regulation of the biogas market, although the raw materials required for biogas production (for example, food waste) are widely available in all Member States and efficient technologies have been developed for their processing.
- 4) Latvia currently has several policy planning documents that affect the development of biogas cogeneration stations, but they do not provide a sufficient basis for long-term development.
- 5) Latvia's policy planning and regulatory documents include the relevant requirements of EU-level regulatory documents, but it would be advisable to pay more attention to the development of the local biogas market and to create regulatory framework supporting its sustainability.

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