REGATRACE
Renewable Gas Trade Centre in Europe

D6.2 | Guidebook on securing financing for biomethane investments

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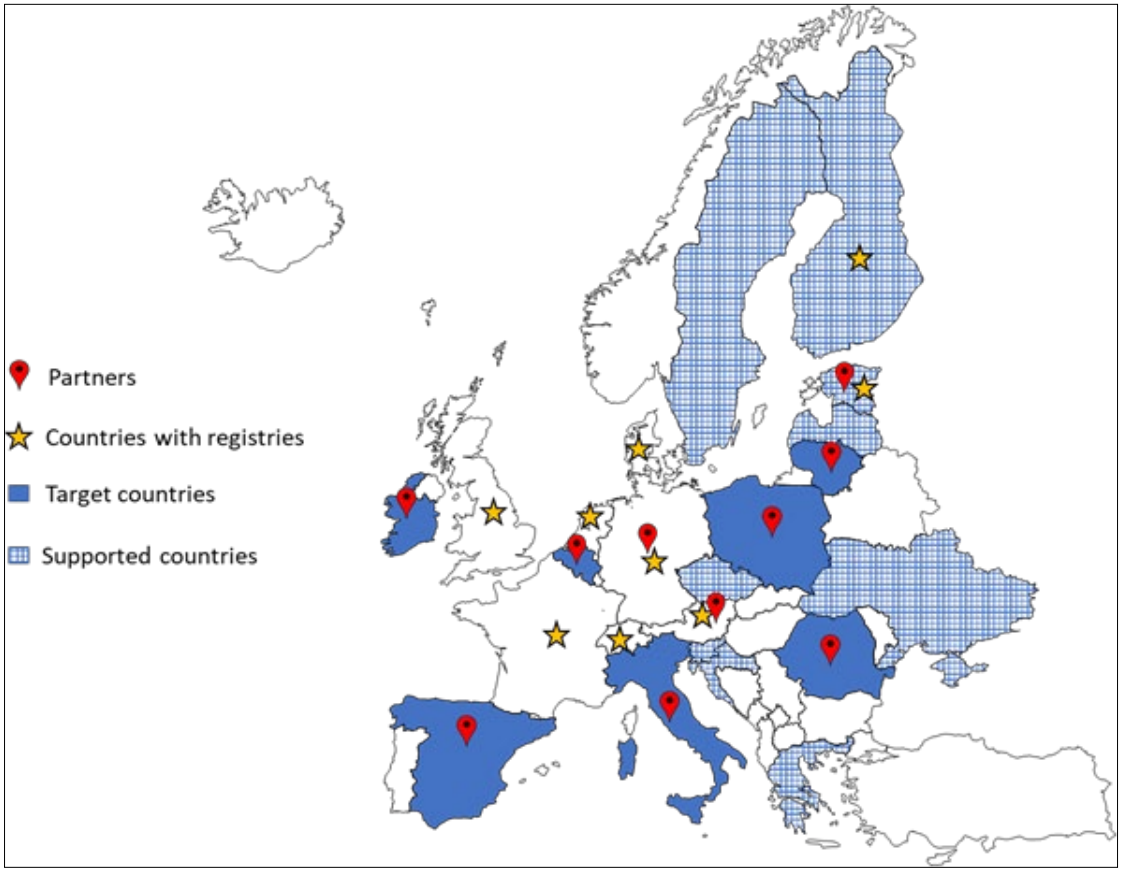
REGATRACE in a Nutshell

REGATRACE (REnewable GAs TRAde Centre in Europe) aims to create an efficient trade system based on issuing and trading biomethane/renewable gases certificates/Guarantees of Origin (GO) with exclusion of double sale.

This objective will be achieved through the following founding pillars:

- European biomethane/renewable gases GO system
- Set-up of national GO issuing bodies
- Integration of GO from different renewable gas technologies with electric and hydrogen GO systems
- Integrated assessment and sustainable feedstock mobilisation strategies and technology synergies
- Support for biomethane market uptake
- Transferability of results beyond the project's countries



REGATRACE countries and partners

The network of issuing bodies will be established by including existing national biomethane registries (Austria, Denmark, Estonia, Finland, France, Germany, The Netherlands, Switzerland and UK) and by creating issuing bodies in the Target countries of the project (Belgium, Ireland, Italy, Lithuania, Poland, Romania and Spain).

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Moreover, REGATRACE will prepare the ground for setting-up national biomethane registries in other 7 Supported countries (Croatia, Czech Republic, Greece, Latvia, Slovenia, Sweden, and Ukraine).

Using a participatory process involving several stakeholders, REGATRACE will develop strategic visions and national roadmaps to boost the biomethane market.

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Purpose of the Guidebook

Energy is the driving force of our society. Exploring climate change issues and implementing adequate measures of reduction of green house gases (GHG) are causing us to rethink the way we produce and consume it. In this respect, renewable energy sources (RES) represent an essential part of a sustainable energy future. The European Union, therefore, committed to raising the share of renewable energy to at least 32% by 2030 and adopted the ambitious Green Deal at the end of 2019.[1] The Green Deal is a growth strategy aiming to make Europe the first climate-neutral continent by 2050 and to reduce the EU's greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Reaching these targets in practice means that EU member countries need to do their share. Increasing the production of renewable energy will bring other benefits as well. It will boost the development of new technologies in the field and create a need for a knowledge-based industry. In other words, this means new jobs, increased competitiveness, new export opportunities, and economic growth.

Energy production has a crucial impact on climate change – using renewables to replace fossil fuel and any high pollution, creating energy generation, lower greenhouse gas emissions and reduced air pollution. It improves the security of our energy supply by reducing our dependence on imported oil and gas. Biomethane and other renewable gases are an important cornerstone of a carbon-neutral economy in Europe, according to the European Biogas Association (EBA).[2] By 2050, biomethane and other renewable gases will enable Europe to thrive on a fully renewable energy system – both on and off-grid.

This Guidebook is focusing on biomethane. But, when relevant, also biogas and other renewable gases are discussed. The wording "renewable gas" is used in this document for the production of gas from gasification, power-to-methane, and anaerobic digestion (AD). In contrast, biomethane refers to the production of gas from AD only.

The purpose of this Guidebook is to describe financing mechanisms that are appropriate for biomethane investment projects and to identify potential sources of capital for these projects and how to access them. Besides, policy and regulatory measures that will promote renewable energy and innovative measures to foster renewable energy development in Europe are discussed. This Guidebook is designed to be a practical tool for project developers, manufacturers, entrepreneurs, non-governmental organizations, community-based organizations, local utilities, and others that are seeking financing for biomethane projects in Europe. The authors would like to thank everyone who contributed to this document through numerous discussions and constructive feedback to develop this Guidebook. There is a list of the individuals and organizations that are contributors to this Guidebook in Appendix III.

[1] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

[2] https://www.europeanbiogas.eu/about-us/vision-mission/#:~:text=Biomethane%20and%20other%20renewable%20gases,both%20on%20and%20off%20grid.

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1. Methodology

1.1. Methodology

The base of our European overview of biomethane financing options and mapping at the country level is a literature review, direct communication with biogas and biomethane industry stakeholders, and with financial professionals. During the preparation of this Guidebook, most of the information was independently verified where possible. Please note that where exact data was not available, the common business sense was applied to validate the information's integrity and feasibility.

The methodology employed in this Guidebook is summarized below:

- Research and analysis of the current political and economic climate in Europe relevant to the financing of biomethane investments;
- Research of all European Union Directives and the countries regulations and legislative framework related to the biomethane market;
- Identification and research of all relevant organizations, associations, and key stakeholders in the biomethane sector;
- Assessment of the main risks occurred in the biomethane investment process;
- Identification of problems and risks for financing in the biomethane sector;
- Research of the opportunities for funding of biomethane projects related to co-financing, including multilateral banks, international financial institutions (IFIs), European funds, grant schemes, debt and equity capital and related; research of the mechanisms for application to European Union programs;
- Research of additional opportunities for investment in biomethane projects on European countries' territory, including private equity investment funds and renewable energy ventures.

Our conclusions are on the base of information and data gathered through extensive industry research, including:

- Industry reports from reputable institutions;

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- Interviews with industry stakeholders, including executives and managers of companies operating in the biomethane sector, owners of biomethane energy projects, journalists, and government officials;
- A detailed review of articles published in the last 5 years by reputable local and international media.

1.2. Literature review

The literature review focuses on biomethane production from anaerobic digestion (AD), but there is an explanation of biogas production issues when relevant. The study covers regulation, directly and indirectly, affecting the financing in the biomethane market. Furthermore, we discuss the business environment and challenges for financing biomethane projects, biomethane use as biofuel, preferential access for the domestic biomethane producers to the gas grid, and grid connection investment cost.

1.3. Limitations

This Guidebook does not contain descriptions of each reviewed documents. Only those documents and issues, which we regard as being material in the context of the financing of biomethane investments in Europe have been identified and discussed. The accuracy of this Guidebook is dependent on the reviewed documents being correct, complete, accurate, and not misleading. This Guidebook is a crucial issue document and does not purport to provide a detailed description of all the facts that have been established in the course of the biomethane industry development in Europe.

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2. Executive summary

This Guidebook reveals the current state and available opportunities for biomethane financing in Europe and reveals challenges and the existing business environment. The intention is to provide the reader with an overview of the main features and problems of biomethane investment projects, different forms of financial assistance by International Financial Institutions (IFIs), selection of the main financing actors, and tasks for project developers to secure financing. This Guidebook describes the benefits offered by biomethane. Furthermore, it is a source of quick reference for developers looking to understand how to finance their biomethane investment projects.

Europe is the largest producer of biomethane in the world at present. There are good examples at the government level (Germany, the UK, Italy, France, and Sweden), and, currently, 18 countries are producing biomethane in Europe. This document aims to spread as much as possible information and knowledge about good financing practices from countries with a larger number of biomethane plants to countries where the industry is in the early development stages. Besides traditional financing forms, there are also non-traditional ways to finance a biomethane plant, like 'crowdfunding' and 'green bonds'.

The biomethane financing and usage in Europe are facing challenges and obstacles. The biggest economic challenge is the low price of natural gas on the European market. There is a high probability of natural gas to keep its low price in the medium-term. For this reason, at present, the gap between natural gas prices and biomethane production costs is significant. However, the governments of many European countries provide support programmes, subsidies and financial support to overcome this gap, and to facilitate biomethane investments.

Besides fighting with the health, the social and financial impact of COVID-19 on the economy and power market, the European countries' governments have to manage to take appropriate measures to continue their country's engagements under the EU's Green Deal. A new Recovery and Resilience Facility of €560 billion will offer financial support for investments and reforms, including green and digital transitions. Biomethane investors and project developers should turn attention to the additional financing opportunities available in the aftermath of the COVID-19 crisis.

Some international financial institutions, banks, and private equity investment funds have realized the current opportunities to finance biomethane projects. They develop products suitable to support biomethane investments. Many European countries are now aware of specific financial products from financial institutions to help finance biomethane projects. These financial products support a range of projects from the early development stage of feasibility analysis financing to funding of the construction and commission stage of biomethane plant with all the related construction works.

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3. Special features of biomethane investment projects

3.1. The main features and difference between biogas and biomethane

Biomethane is a near-pure source of methane produced by "upgrading" biogas, a process that removes any CO_2 and other contaminants present in the biogas.

Biomethane consists of methane, small amounts of carbon dioxide, and impurities. It has a slightly lower heating value (than pure methane since the energy density is proportional to the methane content[3]. Methane is an odourless and colourless greenhouse gas.[4] Companies and individuals can use biomethane as a transport fuel, often as a mixture of biomethane and natural gas with fossil origin. Other areas of use are heat and power production and as raw material for chemical products.

Biogas technology makes use of the natural process whereby organic material (like biowaste, food leftovers, or manure) is transformed by different groups of microorganisms in anaerobic (i.e., oxygen-free) situations into methane (CH4) and digestate. Depending on the type of feedstock that is used, the CH4 content of biogas fluctuates between 50% and 70%. The second most abundant component is carbon dioxide (CO2), which makes up between 30% and 45% of biogas. There are also small quantities of other ingredients such as water, oxygen, traces of sulphur compounds, and hydrogen sulphide.[5] The dominating use of biogas in many countries is for electricity production without prior upgrading to biomethane.[6] The precise composition of biogas depends on the type of feedstock and the production pathway; these include the following leading technologies:

- **Biodigesters**: These are airtight systems (e.g., containers or tanks) in which organic material, diluted in water, is broken down by naturally occurring microorganisms. Contaminants and moisture are removed before the use of the biogas.
- **Landfill gas recovery systems**: The decomposition of all types of waste (MSW) under anaerobic conditions at landfill sites produces biogas. This biogas can be captured using pipes and extraction wells along with compressors to induce flow to a central collection point.
- **Municipal wastewater treatment plants:** These plants can be equipped to recover organic matter, solids, and nutrients such as nitrogen and phosphorus from sewage sludge. With further treatment, the sewage sludge could be used as an input to produce biogas in an anaerobic digester.

[3] https://f3centre.se/en/fact-sheets/biogas-biomethane-sng/

[4] IPPC 2012: https://www.ipcc.ch/

[5] Biowaste to Biogas, The German Biogas Association (Fachverband Biogas e.V.) 2017: https://issuu.com/fachverband.biogas/docs/brosch__re_abfallverg__rung

[6] https://f3centre.se/en/fact-sheets/biogas-biomethane-sng/

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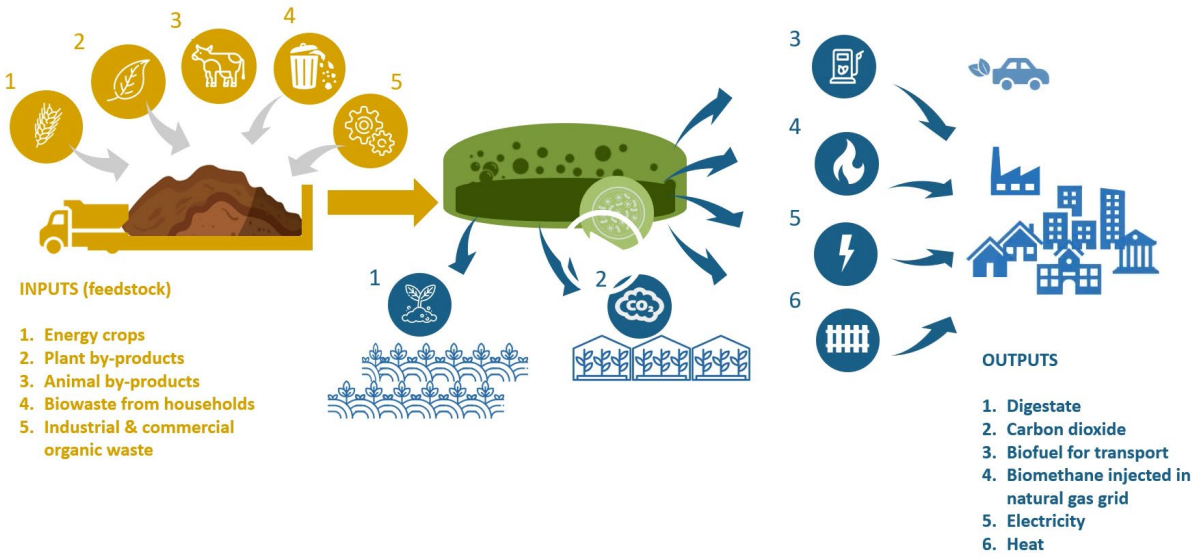

Chart 1: Process description of production and use of biogas and biomethane[7]

3.2. Review of different feedstocks used for the production of biogas and biomethane

A wide variety of feedstocks could be used to produce **biogas** and **biomethane**. In this Guidebook, we group the different individual types of residue or waste into five broad feedstock categories: crop residues; sequential (catch) crops; animal manure; the organic fraction of municipal solid waste (MSW), including industrial waste; and municipal wastewater sludge.

- **Crop residues:** Residues from the harvest of wheat, maize, rice, other coarse grains, sugar beet, sugar cane, soybean, and other oilseeds.
- **Sequential (catch) crops** grown between two harvested crops as a soil management solution that helps preserve soil fertility, retain soil carbon, and avoid erosion; these do not compete for agricultural land with crops grown for food or feed. If the catch crops' growth is used in biogas plants, generally only 70 to 75% of the feedstock's carbon is used for biogas production. The remaining carbon and many nutrients are recovered in the digestate, which is usually brought back to the field, which means that there are many environmental benefits to digesting catch crops.[8]
- **Animal manure:** From livestock including cattle, pigs, poultry, and sheep;
- **The organic fraction of Municipal Waste:** Food and green waste (e.g., leaves and grass), paper and cardboard, and wood that is not otherwise utilized (e.g., composting or

[7] European Biogas Association (EBA): https://www.europeanbiogas.eu/about-biogas-and-biomethane/

[8] BIOSURF Report on current and future sustainable biomass supply for biomethane production – 2015: http://www.biosurf.eu/en_GB/

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recycling). Municipal waste also includes some industrial waste from the food-processing industry;

- **Wastewater sludge:** Semi-solid organic matter recovered in the form of sewage gas from municipal wastewater treatment plants.

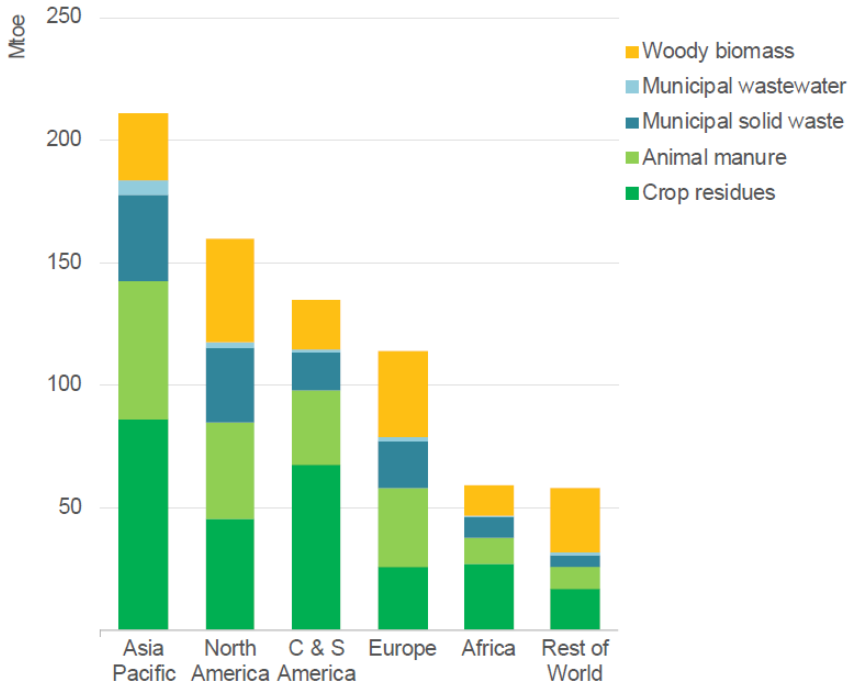

Chart 2: Production potential for biogas or biomethane by feedstock source, 2018; Source: IEA (C&S America = Central and South America)[9]

The energy crops, grown solely for energy production rather than food (e.g., low-cost and low-maintenance crops), have played an essential role in the rise of biogas production in some parts of the world. However, they have also triggered debates about potential land-use impacts, so they are not considered in this Guidebook.

Using waste and residues as feedstocks avoid the land-use issues associated with energy crops. Energy crops also require fertilizer (typically produced from fossil fuels), which needs to be considered when assessing the life-cycle emissions from different biogas production pathways. Using waste, manure, and residues as feedstocks can capture methane that could otherwise escape to the atmosphere as they decompose. In the biomethane usage as a fuel, different sustainability criteria apply to the feedstock. Nowadays, it is not possible to use 100% dedicated crops. Most of the feedstock is from residues, manure, secondary crops, and others with a significant impact on sustainability, GHG emission reduction, etc.

[9] https://www.iea.org/data-and-statistics/charts/production-potential-for-biogas-or-biomethane-by-feedstock-source-2018

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3.3. The revenue stream of biomethane investment projects

The principal source of revenue for biomethane plants is feeding the produced renewable gas into a distribution or transport grid or the sales of a bio-CNG or bio-LNG substitute. The biomethane plants can generate revenues in the following ways:

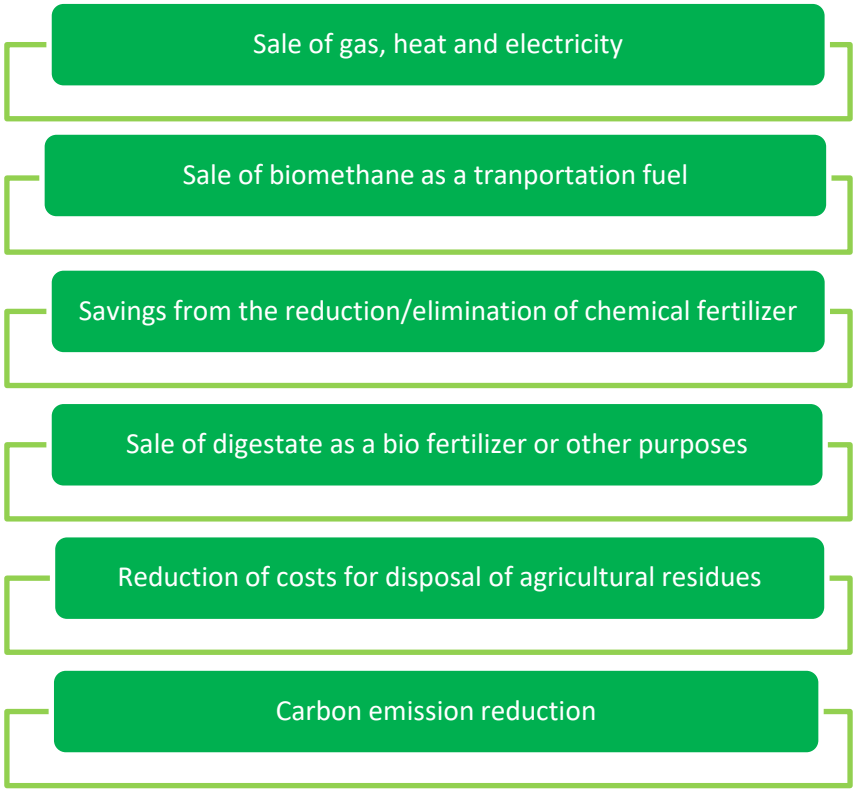

Chart 3: Revenue streams of biomethane

In rare cases, a disposal fee can be charged for substrates used in the biomethane plant. However, such a possibility must be carefully examined and, if necessary, contractually secured before being factored into the biomethane plant's cost/revenue projections.

3.4. The potential of the biomethane industry

Today, most biomethane production is concentrated in Europe and North America, although these regions upgrade only a small share of their overall biogas output. The biomethane industry is currently very small, although it is generating growing amounts of interest in several countries for its potential to deliver clean energy to a wide array of end-users, mostly when this could be done using existing infrastructure.

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Currently, around 35 Mtoe of biomethane is produced worldwide. Some countries, such as Denmark and Sweden, are boasting more than 10% of biogas/biomethane shares in total gas sales. Countries outside Europe and North America are catching up quickly, with the number of upgrading facilities in Brazil, China, and India tripling since 2015.

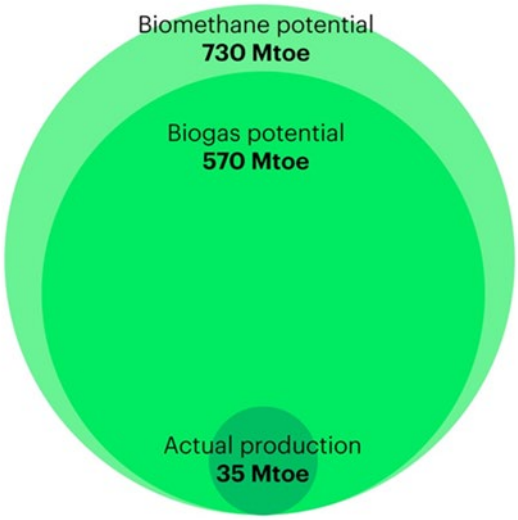

Chart 4: Biomethane and biogas production in 2018 against the sustainable potential today; Source: IEA[10]

Biomethane could be used mixed with natural gas without any technical changes in all the natural gas end-user applications (heating and cooling, power, transport, etc.). In the case of the transport sector, it is used as a biofuel in the form of a compressed natural gas (CNG) or liquified natural gas (LNG) substitute, called bio-CNG or bio-LNG. Biomethane in transport is highly performant when it comes to the reduction of GHG emissions, if we consider the full carbon footprint of the vehicles (Well-to-Wheel). Biomethane can be liquefied, for example, in heavy-duty transport and marine, which are difficult sectors to electrify on the one hand and high contributor of CHG emissions on the other hand.[11]

Therefore, biomethane is one of the most promising contributors to sustainable mobility and decarbonization of transport. It's usage as a transport fuel for passenger cars and heavy vehicles and building of a larger network for distribution at the biomethane filling stations, would need further efforts and support by stakeholders across Europe. The transition to carbon neutrality shall be easier for fleet operators of heavy trucks by developing a Europe-wide network of public access biomethane stations on major trucking routes and key logistics terminals.

Biomethane represents about 0.1% of the global natural gas demand today. However, an increasing number of government policies support its injection into natural gas grids and usage in the transport.

[10] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth#key-findings

[12] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane

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For example, Germany, Italy, the Netherlands, and the United Kingdom have all introduced biomethane support in transport.[12] The percentage of biogas produced that is upgraded varies widely between regions: in North America, it is around 15% while in South America it is over 35%; in Europe, the region that produces the most biogas and biomethane, approximately 10% of biogas production is upgraded (although in countries such as Denmark and Sweden the percentages are much higher); in Asia, the figure is 2%.

The interest in biomethane is rising. The number of operating plants worldwide (both biogas upgrading and biomass gasification facilities) could exceed 1,000 in the course of 2020. Around 60% of plants currently online and in development inject biomethane into the gas distribution or the transport gas grid, with a further 20% providing vehicle fuel. The remainder includes methane for a variety of local end uses. Almost two-thirds of biogas production in 2018 was used to generate electricity and heat (with an approximately equal split between electricity-only facilities and co-generation facilities). Around 30% is the consumption of buildings, mainly in the residential sector for cooking and heating. The remainder is upgraded to biomethane and blended into the gas networks or used as a transport fuel.

The European Biogas Association (EBA) and Gas Infrastructure Europe (GIE) have released in July 2020 the second edition of the 'European Biomethane Map' (see Appendix I).[13] The analysis (based of the data collected) shows the number of biomethane plants in Europe increased by 51% in 2 years (from 483 in 2018 to 729 in 2020). There are currently 18 countries producing biomethane in Europe. Germany has the highest share of biomethane plants (232), followed by France (131) and the UK (80). The biomethane industry in Europe is already producing 23 TWh of this green gas. By 2030, the sector could substantially enlarge the production to 370 TWh and reach 1,170 TWh by 2050, according to Susanna Pflüger, EBA Secretary General.[14]

The levelised cost of generating electricity from biogas varies according to the feedstocks used and the plant's sophistication. It ranges from EUR 42 (USD 50) per megawatt-hour (MWh) to EUR 160 (USD 190/MWh). A substantial part of this range lies above the generation's cost from wind and utility-scale solar photovoltaic (PV), which have come down sharply in recent years. The relatively high costs of biogas power generation mean that the transition from feed-in tariffs to technology-neutral renewable electricity auction frameworks (such as power purchase agreements) in many countries could limit the prospects for electricity-only biogas plants.

However, unlike wind and solar PV, biogas and biomethane plants can flexibly generate power and so provide balancing and other ancillary services to the electricity network. Recognizing the value of these services would help spur future deployment prospects for biogas plants. Furthermore,

[12] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane

[13] https://www.gie.eu/maps_data/downloads/2020/GIE_EBA_BIO_2020_A0_FULL_471.pdf

[14] https://www.europeanbiogas.eu/the-european-biomethane-map-2020-shows-a-51-increase-of-biomethane-plants-in-europe-in-two-years/

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biomethane could generate income from other positive externalities such as GHG emission reductions, sale of digestate, ease of storage, etc.

3.5. Benefits of biomethane

Unlike wind and solar, generation from biomethane is not intermittent and can be dispatched to fill-in the gaps and promote system reliability. Some of the most information benefits of biomethane are:

- Reduces GHG emissions by displacing natural gas and reducing the release of methane emissions into the atmosphere by the utilisation of manure, organic waste, and other residues;
- The biomethane can be converted into a liquid biofuel (also known as Bio-CNG and Bio-LNG), and this provides an excellent opportunity for clean fuel supply of long-range heavy transport (trucks, ferries, etc.) and supports in this way for the de-carbonisation of this sector that is one of the largest air contaminators at present;
- Biomethane from renewable sources like dairy digesters and landfills can be a reliable source of renewable fuel that can power the cleanest and most efficient electricity generation facilities in Europe.
- The opportunity to use a low-cost renewable fuel (biomethane) when firing in combined-cycle generator thus producing balanced renewable electricity of over 7,000 hours throughout the year at the highest efficiencies;
- Biogas has a very low carbon footprint, according to the European Biogas Association[15], and avoided emissions from biogas and biomethane can lead to a negative carbon footprint;
- Creates local jobs by keeping local power plants operating and maintaining electricity costs lower, which helps local businesses to prosper and add jobs;
- Compost and digestate which could be used in organic fertilizers, soil improvers, and growing media since 15 July 2019, according to the approved EU Fertilising Products Regulation (FPR) (EU) 2019/1009;
- Injection of biomethane utilizes existing natural gas pipelines, thus optimizing private and public investments into the natural gas distribution infrastructure.

Biomethane is one of the most flexible elements in the mix of renewable energies. It can be stored in the natural gas system. This flexibility makes biomethane an ideal supplement for balancing power to solar or wind energy, which both fluctuate in reliability and are challenging to regulate.

[15] https://www.europeanbiogas.eu/avoided-emissions-from-biogas-and-biomethane-can-lead-to-a-negative-carbon-footprint/

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4. Challenges for biomethane investment projects

Facilitating access to private financing is critical to overcome challenges and meet the investment needed for biomethane projects. Full engagement of the government and private sector is key to fulfilling climate-related objectives over the long term. The private sector's involvement in economic undertakings will reduce energy consumption in the economy. The establishment of sound support frameworks is necessary to enable a fully sustainable energy market. The participation of financiers to support the biomethane market is also required. This chapter contains a review of the key challenges and problems for biomethane investment projects in Europe.

4.1. Key challenges and problems

Many countries in Europe have recognized that biomethane as an energy source is an essential component of a sustainability transition. However, biomethane's total production volume remains relatively low compared to other renewable energy technologies (e.g., sun, wind, hydro, etc.). Also, the social acceptance of biomethane is often challenged by environmental and health protection organization. The biomethane industry's main objective is to reduce fossil fuel consumption, with the final goal of mitigating global warming. Methane is both a potent greenhouse gas and a valuable energy resource. Consequently, dedicated measures are taken to avoid potential methane emissions from the gas-tight production units. Summarized below are the main challenges preventing the broader uptake of biomethane as a source of energy in Europe and the REGATRACE countries.

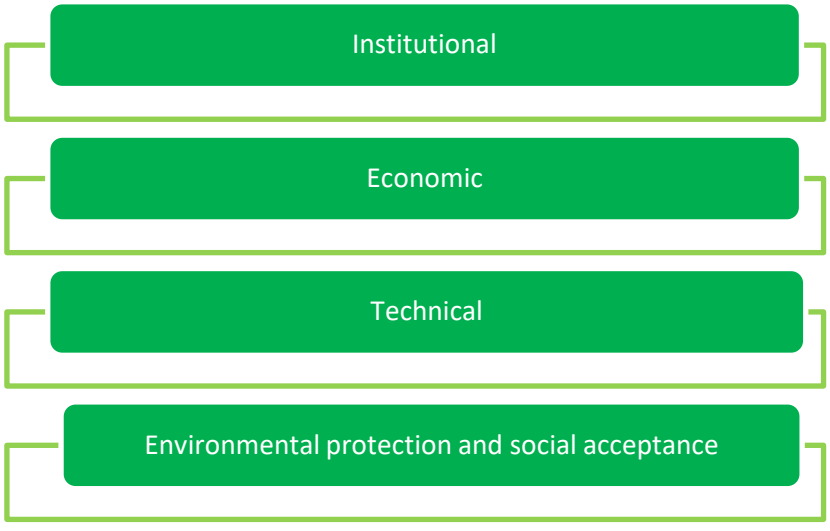

Chart 5: Key Challenges for Biomethane Investment Projects

4.1.1. Institutional

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The main institutional challenges for biomethane investment projects could be outlined as:

- Government environmental policies and programs in Europe are fragmented and sometimes conflicting. Need for coordination among various government and EU agencies and stakeholders, and the most critical issues here are: i) imported biomethane is not treated equally with domestic production in most European countries, ii) there are no clear regulations for counting grid imported biomethane towards national renewable energy targets in the importing EU member state;
- Arduous and complicated permitting process;
- Limited public awareness of the benefits of biomethane;
- Jurisdictional concerns should be addressed regarding waste ownerships, disposals, landfill gas concessions, etc.;
- Mandatory obligations of gas infrastructure operators to get biomethane should be implemented;
- Lack of stable long-term economic and financial incentives;
- Lack of uniform biomethane quality standard and pipeline interconnection solutions, and regulatory hurdles for biomethane pipeline injection in Europe;
- Guarantees of Origin (GOs) registry and trade should be improved and facilitated;
- Missing mandatory biomethane blade-in targets on the European level too.

4.1.2. Economic

Costs of biogas/biomethane generation systems (including cleaning and pipeline interconnection using biomass sources such as dairy wastes, food wastes, and other organic wastes) are high compared to traditional forms of energy generation and other forms of renewable energy generation (e.g., solar, wind, etc.). However, biomethane comparison with other renewable energy technologies must consider the multiple economic, environmental, and social benefits of biomethane. The main economic challenges for biomethane investment projects could be outlined as:

- The low price of natural gas on the European market – resulting from the oversupply, is likely to keep in the medium-term period. The gap between the natural gas prices and biomethane production costs is in the magnitude of 200-300%;
- Cost of biomass wastes (and other feedstock for co-digestion) including transportation cost of these feedstocks are high;
- A sustainable supply of feedstocks; securing and reliability of long term supply;
- The recent economic downturn due to the COVID-19 shall threaten to finance of biomethane projects, but the limitation of the negative effect is possible with the new support instruments

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of the European Union launched to respond to the COVID-19 crisis and assuring meeting of the renewable energy targets, according to the Green Deal[16];

- For dairies, the price of milk (in some of the European countries or specific cases) is low, making farmers reluctant to invest and install digesters. However, installation of digesters could be an extra revenue source and to help in mitigation of the milk price fluctuations;
- The current cost of CO2 emissions (€25 – €28 per tonne) is not sufficient to finance biomethane projects where approximately €200 per tonne are required for feasible projects with low dependence on subsidies;
- The cost to interconnect small biomethane/biogas projects to the existing natural gas pipelines in Europe is high.

4.1.3. Technical

The main technical challenges for biomethane investment projects could be outlined as:

- Investment in research, development, and demonstration (RD&D) is insufficient to help resolving the challenges related to next-generation biogas to biomethane upgrade and power-to-X technologies;
- Sustainable feedstock sourcing and provision of the reliable transportation of substrates and guarantee of uninterruptable supply;

4.1.4. Environmental protection and social acceptance

Environmental protection issues and social acceptance of biogas/biomethane projects are crucial for their development. Living in an area that hosts a biogas/biomethane plant can raise concerns about safety, noise, odour, flies (insects), and local transport of feedstock (biowaste). Local communities sometimes organize public strikes against the building of new biogas/biomethane plans. The primary environmental protection and social acceptance challenges for biomethane investment projects could be outlined as:

- Remaining issues with air quality and water quality;
- Lack of knowledge by citizen and often by local authorities on biomethane technologies;
- Public health protection – odour, flying insects;

[16] https://www.eib.org/en/press/all/2020-126-eib-board-approves-eur-25-billion-pan-european-guarantee-fund-to-respond-to-covid-19-crisis

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4.2. Overcoming challenges

Mapping of all the positive economic, social, and environmental benefits from biomethane production and use in Europe could positively impact the entire biomethane value chain. Actions recommended to leading stakeholders in Europe to overcome biomethane investments' challenges are summarized in the next table below.

Cost of biomethane	Environmental concerns	Policy
Reduction of cost of biogas-to biomethane purification from CO2 and other gases	Addressing problems with health and safety issues	Pipeline injection and recognizing of biomethane as one of the possible futures of the natural gas network, and as a clean transport fuel
Taking into biomethane cost the additional benefits of biomethane, such as rural development, local job creation, reduced chemical fertilizer use, and avoided CO2 emissions	To discuss well at all levels (citizens, developers, government, etc.) that rules in the RED II prevent the competition for food and land	Extension of existing support policies, an extension of country members of the European Renewable Gas Registry (ERGaR), and national biomethane industry development plans to be implemented by countries
	Provision of effective methods for management of odours & flies (Insects)	National policymakers should support locally-produced sources of renewable energy over imported fossil fuels

Table 1: Overcoming Challenges for Biomethane Investment Projects

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5. The impact of state aid on financing

The granting of state aid or subsidies is a traditional and essential tool of public policy. When the profitability of biomethane projects is negative or less profitable on a private scale, but on a national scale leads to positive results, state support measures are required. By reallocating funds – on a selective basis – to biomethane projects or firms, governments may aim at compensating for market failures or market imperfections, thereby improving market allocations and social welfare. In the Eastern European countries, such selective reallocations are not only generally suspected of causing incremental societal costs by damaging competition and distorting trade, but may also be guided by less altruistic alternative governmental motives. However, in Central, Western, and North Europe, support schemes, like SDE+ in NL, EEG in DE, RHI in the UK, are transparent, objective, and free from distortions. This ambivalence in the motivations – together with increasing political pressures to reduce government spending – has led many countries to tie such transfers to the fulfillment of strict conditions.

Many different economic instruments are in place, from fiscal instruments to financial mechanisms, used by governments to support the biomethane investments. We have categorized the main economic instruments in the next table:

Fiscal instruments	Financial mechanisms
Financial measures, e.g., guarantees for loans, grants, **tax relief**	Public financing mechanisms, e.g., feed-in tariff, grants, guarantees, public loans,
Trading schemes, e.g., emission trading schemes, green certificate schemes, green bonds, guarantees of origin (GOs)	Private financing mechanisms, e.g., loans, investment schemes, leasing
Tax relief and reduction of taxes, charges, levies	Direct investments, e.g., public procurement rules, public infrastructure, research and development investments

Table 2: Economic instruments to support biomethane financing

First of all, governments should provide efficient financial support to private investments. Therefore, we suggest the following main pillars of the state financial support, which can contribute to the distribution of biomethane projects to such an extent that would make them macro-economically feasible and socio-politically desirable:

- the creation or alteration of structural conditions for individual investment decisions in favour of biomethane plants, e.g., more critical control of firewood consumption and tree-felling regulations concerning the treatment and disposal of substrates (wastewater, faeces);
- the subsidizing of private and institutional community biomethane plants utilizing grants or inexpensive credits;
- the construction and operation of biomethane plants as public utility enterprises, especially as municipal community plants.

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5.1. Research and development

Financial promotion from public or development funds is always necessary for research and development and for the organizations concerned with implementing biomethane programs. Only in exceptional cases have private companies carried out research and product development, but even then, they sometimes relied on assistance from external donors and state support. Research and development on the following aspects of biomethane technology are particularly worthy of sponsorship:

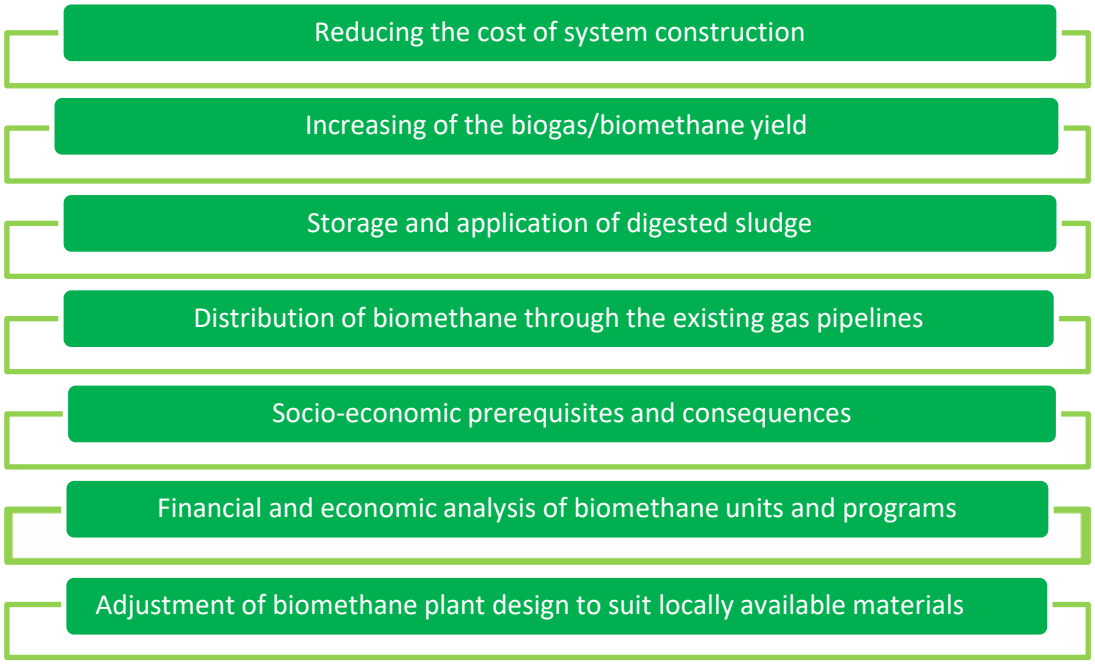

Table 3: Main research and development aspects to support the development of biomethane technology

5.2. Subsidies for biomethane

Subsidies for biomethane plants may consist of grants, low-interest or no-interest loans, or supplies in kind (materials). The target group's response will usually depend mainly on the types of subsidies, the amounts available, and bureaucratic obstacles in gaining access to funding. The popularization of a subsidy program naturally plays an important role, too. The perceived reliability of the subsidy program is essential. Subsidy arrangements should, therefore, be underpinned by binding agreements with several years of validity. Graduated subsidies, the granting of which depends on, for example, the type of fuel in use before system installation or on the social situation of the applicant, are conceivable. In practice, this leads to socially justifiable differentiation in the extent of support granted.

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In some cases, investment grants for biomethane technologies with a limited time frame may be called to break the momentum toward continuing preferences for energy systems powered by fossil fuels. Tax incentives, investment grants, or government purchasing programs could support the development and use of innovative biomethane technologies. Subsidies designed to overcome market barriers that impede the commercialization, financing, and distribution of biomethane technologies could make markets work more efficiently. Over time, these transitional subsidies could be reduced as competitive market opportunities for biomethane expanded.

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6. The business environment for financing

The biomethane project developers can not work in a vacuum. Governments of the European countries play a crucial role in promoting renewable technologies and creating the right business environment for financing. Project developers will develop their biomethane projects only if they operate in a business environment that supports their efforts. Public policies and public investments foster this environment. The development of biogas and biomethane power plants in the last three decades has been uneven across Europe. It depends not only on the availability of feedstocks but also on policies that encourage the biomethane's production and use.

One of the more fundamental aspects of creating a well-functioning business environment for biomethane financing in Europe is the need for appropriate legal, regulatory, and technical infrastructure. The financial and development community well understands a need for transparency in legislation and regulation, privatization, full disclosure of economic and financial information, and accountability for this to happen. This chapter contains a review of the business environment for biomethane financing in Europe.

6.1. Europe-wide

The financing of private and state biomethane projects in Europe in the past decade has been focused on electricity generation in Germany, while in other countries like the United Kingdom, Netherlands, France, Denmark, the focus was on distribution through the existing gas network. The private sector feels that reasonable returns are possible from offering biomethane supply to new areas. Governments can implement reforms to improve the business environment to increase private and state projects' profit potential. These reforms can present various energy choices for biomethane use or proactively promote biomethane adoption in Europe. The underlying premise behind these policy reforms is that a free market best decides energy and fuel choice.

There is a relevant perspective in the next decade of those biogas plants in Europe suitable for conversion from electricity production to biomethane production to be upgraded. In the cases of operating anaerobic digestion plants with proven performance, financing of the additional investments (upgrading technology, pipeline injection facility, etc.) might be easier than finance greenfield biomethane projects.[17] In some European countries, the existing biogas power plants are small (less than 0.5 MW capacity), built with old technologies, and more considerable distances to the natural gas grid. However, in Italy, a good percentage of biogas plants are compatible with biomethane technology and have proximity to the country's natural gas grid.[18] In Germany, approximately 980 biogas plants are expected to phase out of the feed-in tariff, according to data of

[17] Dr. Attila Kovács, Secretary General - ERGaR

[18] Dr. Carlo Pieroni, CIB-Consorzio Italiano Biogas e Gassificazione

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Deutsches Biomasseforschungszentrum Gemeinnützige GmbH (DBFZ)[19], with the peak expected in 2026-2027. If the German government does not adequately improve the national incentives' framework, many of these biogas plants should look for a new alternative. Turning to upgrade biomethane to biogas could be a viable solution for those having a proven performance.

The most recent data gathered by the European Biogas Association (EBA) show that 2018 saw a total of 18,202 biogas installations, a Europe-wide installed electric capacity (IEC) of 11,082 MW, and 63,511 GWh of biogas produced.[20] Biomethane, the upgraded form of biogas, has been increasingly in the spotlight, and 2018 was no exception, as the European biomethane sector continued its dynamic growth, to reach a total of 660 plants producing 2.28 bcm of biomethane. The EBA analysis shows that the deployment of biogas and biomethane power plants is mainly linked to the moment of the shift in the support framework, the maturity of tenders, and the feasibility of long-term objectives.

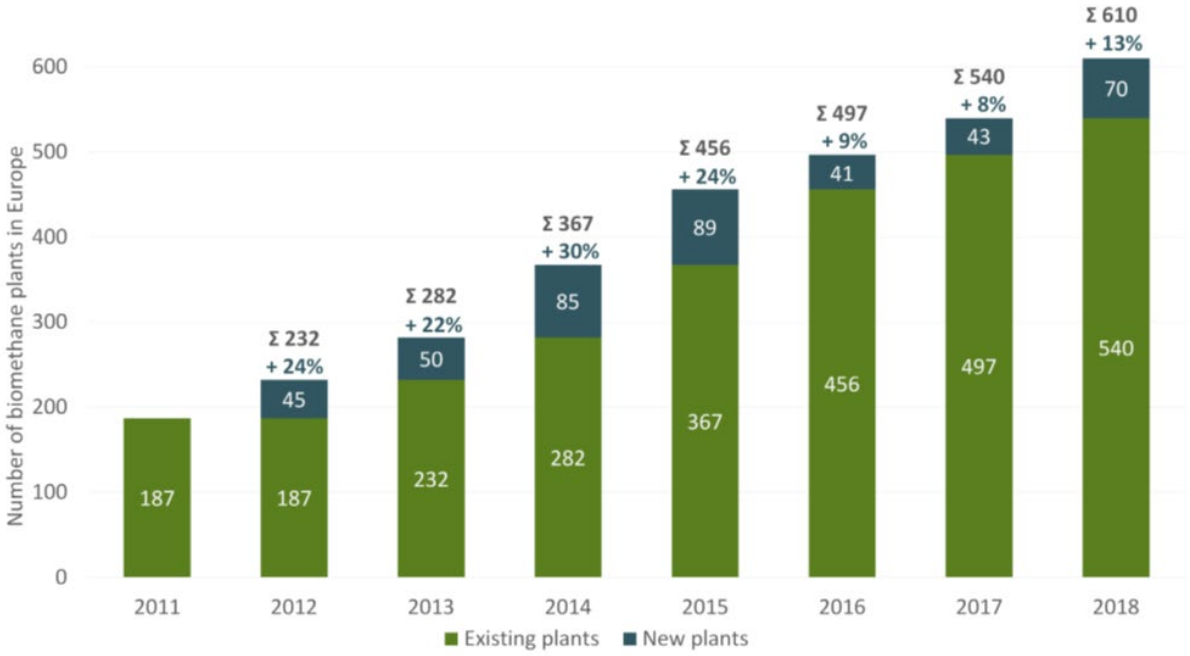

Chart 6: Development of the number of biomethane plants in Europe. Source: European Biogas Association[21]

The countries with the most significant production of biomethane are Germany (10,018 GWh in 2018), United Kingdom (3,300 GWh in 2018), the Netherlands (2,226 GWh in 2018), Denmark (1,425 GWh in 2017), Sweden (1,281 GWh in 2018) and France (1,207 GWh). At the same time, countries with well-developed biogas markets like Poland and Spain have minor biomethane developments. The cross-border trade of biomethane is still limited. Awaiting European harmonization, bilateral and

[19] Deutsches Biomasseforschungszentrum gemeinnützige GmbH (DBFZ): https://www.dbfz.de/

[20] https://www.europeanbiogas.eu/

[21] https://www.europeanbiogas.eu/eba-statistical-report-2019/

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multilateral cooperation is set-up to transfer minimal volumes of biomethane cross-border. Issuing bodies for the end consumer disclosure (so-called GoOs), according to RED II Article 19, are slowly being established in the European Member States.

The European countries have considerable potential for the development of biomethane projects. In this connection, the EU governments are proposed to consider coordinating a common biomethane energy strategy. They have to improve the quality of their support schemes, which can become a significant component of sustainable energy development for many countries in Europe, most of which are importers and dependent on fossil fuel sources.

6.2. North Europe (incl. Ireland and the Baltics)

North Europe has the most developed and friendlier business environment for financing of biomethane projects. The leading countries are Germany, the United Kingdom, the Netherlands, Denmark, Sweden, and France, which also have the most significant biomethane production numbers in Europe.[22] **Germany** (+5 plants), reached the 206-plant milestone at the end of 2019[23], and reportedly giving the green light to 13 further biomethane plants[24]. The construction of new plants that feed biomethane into Germany's natural gas network continues to stagnate because the Renewable Energy Act 2014 doesn't provide enough support for biomethane sector development[25].

The biomethane market has just started the development in **Belgium** with only one small producer in Flanders.

France has an ambitious target of 1,000 biomethane plants injecting into the national gas grid by 2020. With the subsidy scheme pushing towards biomethane production, France shows no sign of slowing down. By January 2019, over 600 new French biomethane projects were at varying stages of development.

The biogas and biomethane sector in **Ireland** is at the initial stage of development, with just 38 biogas plants in 2018 and only one biogas-to-biomethane upgrading plant with grid injection, although other projects are underway.

In Baltic countries, biomethane sector development started after 2015. In **Estonia**, two biomethane plants are working since 2018, and several new plants are planned to start operation by the end of 2020. In **Latvia**, one biomethane plant started operation in 2020. Frequent changes in the legal and regulatory framework in Latvia are an obstacle to developing the biomethane market. In **Lithuania**,

[22] https://www.europeanbiogas.eu/eba-statistical-report-2019/

[23] https://biogas.org/edcom/webfvb.nsf/id/DE-Ausgabe-03_2020/$file/Biogas_3_2020.pdf

[24] https://www.europeanbiogas.eu/eba-statistical-report-2019/

[25] https://biogas.org/edcom/webfvb.nsf/id/DE-Ausgabe-03_2020/$file/Biogas_3_2020.pdf

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currently, there are around 40 biogas plants producing heat and electricity. It is expected that the first biomethane plant will be connected to the Lithuanian gas transmission system in the first half of 2021.

The biomethane sector in **Finland** is in the early development stage. There are currently no government strategic targets for biogas or biomethane, but there is a target for the number of gas vehicles: 50,000 passenger cars by 2030. The national biogas action plan (published in January 2020) defines the sector's measures until 2024. Only three biogas plants in Finland are connected to the gas grid. The Finnish gas market opens to competition at the beginning of 2020. At the same time, Finland, Estonia, and Latvia constitute a common gas market, which represents a good ground for developing the biomethane market. However, in 2018, only about 10% of the biomethane was injected into Finland's gas grid.

6.3. Central and Central East Europe

The business environment for financing of biomethane projects in the EU Central-East Europe is not established. However, the maturing biomethane markets in Germany, Sweden, UK, Italy, and Denmark shall allow investors to look for new opportunities in EU Central-East European nations. This might present a good option for the improvement of the biomethane investment environment in the region.

There are no biomethane plants built in **Poland**, due to unclear legislation and lack of financial support (both investment and operating costs). However, there are several biomethane projects under development in the country. Poland shall improve the environment for biomethane financing. The government introduced on 14 August 2019 a zero-excise tax for CNG, LNG, biomethane, biogas, and hydrogen. Furthermore, the Fund for Low Emissions Transport foresees investment support for alternative fuels infrastructure, NGV, and support for local authorities investing in clean public transport.

In **Austria**, the first biogas plant upgrading to biomethane plant was installed in 2005, followed by other plants in 2007 and 2008. Today, there are 15 biomethane plants in Austria. All biomethane plants are connected to the gas grid. Currently, there are no direct national incentives for Austria's biomethane production.

Switzerland has pioneered the production and injection of biomethane into the natural gas grid since the end of the 1990s. In 2003, gas distributors agreed with biomass suppliers, committing to developing the CNG market while blending in at least 10% of biomethane to CNG used as motor fuel. Current legislation does not give specific targets for the development of biomethane. Still, Swiss gas distributors, organized in the Swiss association of Gas Industry (VSG), have set a target for a share of 30% of biomethane for gas consumed in the heating market (excluding industry) by 2030.

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The biomethane sector is not existing in the **Czech Republic**. There is no subsidy scheme related to biomethane production. Only one pilot biomethane power plant is operational in the country. The largest public network of CNG stations in the Czech Republic has announced its plan to test 100% renewable gas in its 63 CNG filling stations located throughout the country.

In the draft of the Energy Development Strategy of the Republic of **Croatia** until 2030 with an outlook for the period until 2050, October 2019 strategic goals for the biomethane sector are not explicitly mentioned. The strategy does not specify how much biomethane should be in a natural gas mixture or its share in transport, or anything similar.

The biomethane sector is not existing in **Romania**, where the biogas industry is in the early stage of development, and the market is stagnating. The support system with „green" certificates in the country has expired on 31.12.2016. Since then, only the already commissioned biogas projects can benefit from support (until 31.12.2031). In Slovenia, there is no support scheme for biomethane and no biomethane production. There are currently 23 biogas plants or power plants that work on biogas in the national support scheme.

At least 18 agricultural biogas plants were under operation in **Ukraine** in 2018, with more than 27 MW of total installed electric capacity. The individual projects ranged from 0.125 MW to 5.7 MW. Additionally, there were 20 landfill gas (LFG-to-E) projects with a total electric capacity of 18.4 MW. However, up to now, there are no examples of biogas-to-biomethane upgrading facilities in Ukraine, as there is no sufficient legal and regulatory framework for its production and use. By now, there are no government strategic targets regarding biomethane in Ukraine.

In **Serbia** the biogas sector has made considerable progress quickly, creating a favourable business environment for investors, and more than 20 biogas power plants have been built in the country between 2010 and 2020. Owing to the Serbian Biogas Association (SBA) efforts and the Ministry of Mining and Energy's support that remains committed to fulfilling the goals concerning the Energy Community, significant steps have been made towards the strengthening and stabilization of the biogas sector. Despite the progress of the installed biogas capacity in Serbia, there is still not biomethane plant working in the country. The new legislative changes are necessary to create a favourable environment for financing biomethane projects in Serbia.

6.4. South Europe

The most developed business environment for financing of biomethane projects across South European countries exists in **Italy**. At the beginning of 2018, the Italian government published Decree 02 March 2018 that encouraged biomethane production. In the previous years, seven small biomethane demonstration plants (< 50 m3 biogas/ h), not connected to the natural gas grids, had been built. There are eighteen full-scale biomethane plants (the largest one is 3.750 m3 biomethane/h, close to Milan) with a capacity of 18,000 m3/h in the country. The Italian market is expected to lead the change in South Europe's biomethane generation in the next years.

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The first biomethane plant injecting into the grid in **Spain** was inaugurated in 2009: P. T. Valdemingómez (Madrid), while the second one started its operation in December 2019 in Butarque. There are other demonstrative biomethane projects, mainly pilot projects associated with R & D EU funded initiatives, such as Life, H2020, or CEF programs. There is no incentive in place to support new biogas or biomethane plants in the country. However, new biomethane projects are expected to be launched into operation in Spain.[26] The first ones are likely to be plants based on existing small and medium-sized biogas installations.

Biomethane is unknown as an energy source or carrier in all sectors of energy in **Greece**. This is reflected in the current status, where no biomethane production takes place. The biogas sector is still in the pre-2010 era, where the main focus was electric power production. The current regulatory framework and subsidy scheme are only relevant to electricity production where, despite favourable incentives, the progress has been slow.

6.5. COVID-19 (coronavirus) impact on the business environment for financing of renewable energy projects in Europe

The COVID-19 post-financial crisis will seriously impact the power market (including biogas and the biomethane sector) in Europe. The postponement, revoke, and reduction of some planned investments in renewable energy projects (including biogas and biomethane) are expected in many countries between 2020 and 2022. To maximize the impact and long-term sustainability of its policies, EU member and non-member countries should also make proper adjustments in the regulatory frameworks needed to facilitate the energy transition, especially in the context of limited financing expected. The European Commission has recognized the pandemic's economic consequences and the measures being taken to contain it and indicated that it would use all tools at its disposal to make sure that the European economy shall manage with this challenge.

Besides fighting with the health, the social, and financial impact of COVID-19 on the economy and power market, the European countries' governments have to manage to take appropriate measures to continue their country's engagements under the EU's Green Deal. The European Commission (EC) can force the introduction of Gas Purchase Agreements (GPAs) in the EU member countries' national legislation. Adopting a framework for contracts for difference (CfDs) for clean energy sources and elaborating a tool for organizing auctions for renewable energy capacities is pending in many countries.

6.6. Barriers to finance biomethane projects

[26] https://www.europeanbiogas.eu/developing-biomethane-production-in-spain-interview-with-our-spanish-member/

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Many barriers prevent lenders from providing finance and borrowers from receiving funds for biomethane investments. The different beneficiaries (e.g., farmers, SMEs, municipalities, governments, etc.) have different needs, and therefore financial products have to be adjusted to their requirements.

Top barriers for recipients	Top barriers for financiers
Lack of awareness or knowledge of biomethane products and benefits	Small size and geographically dispersed projects
Limited internal funds and borrowing capacity	Lack of track record of biomethane project developers
High investment cost of biomethane projects	Market immaturity
Lack of understanding of financial products	Return on investment of biomethane projects less profitable compared to other renewables
The difficult application process for finance	Lack of communication between financiers and recipients

Table 4: Barriers to finance biomethane projects

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7. Financing mechanisms

High specific costs characterize biomethane projects. In many cases, a single farmer or even a consortium of investors cannot finance the whole project by equity capital. Therefore, borrowed capital is essential for the implementation of a biomethane plant. In this chapter, the most crucial financing mechanisms and options for biomethane investment projects are described. This chapter aims to explain different financing mechanisms and their way of working for biomethane investors. The advantages and disadvantages presented for most of the options make different financing options comparable.

7.1. Debt finance

Debt from private or government-owned banks is a typical and traditional financing option for biomethane investment projects. The main types of typical financing for biomethane projects are: i) traditional financing by loans; ii) project financing (limited recourse or non-recourse), and iii) green bonds). Debt financing includes both secured and unsecured loans (credits). Security involves a form of collateral as an assurance of the loan repayment. In addition to secured or unsecured loans, most debt will be subject to a specific period. There are three types of loans based on their longevity, illustrated in the chart below:

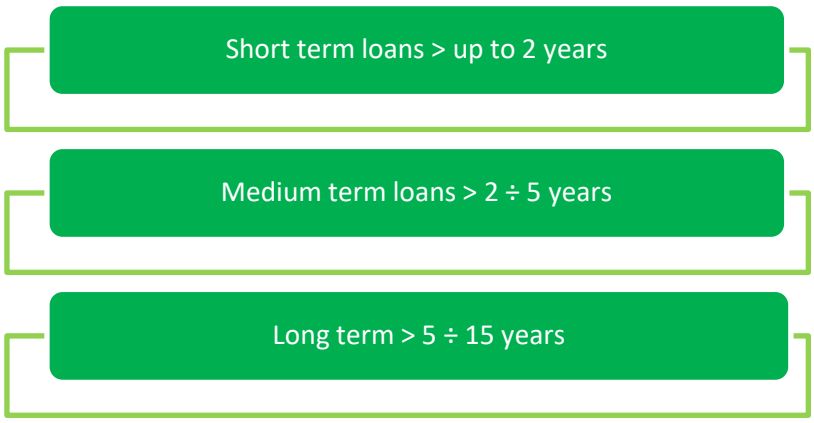

Chart 7: Typical duration of loans

Bank financing is critical for developing biomethane projects at scale. Therefore, the EU Member States and non-EU member states' ability to reach their carbon reduction targets by 2030 shall be reliant on the deployment of the private sector and public finance in the right packages and at the correct scale.

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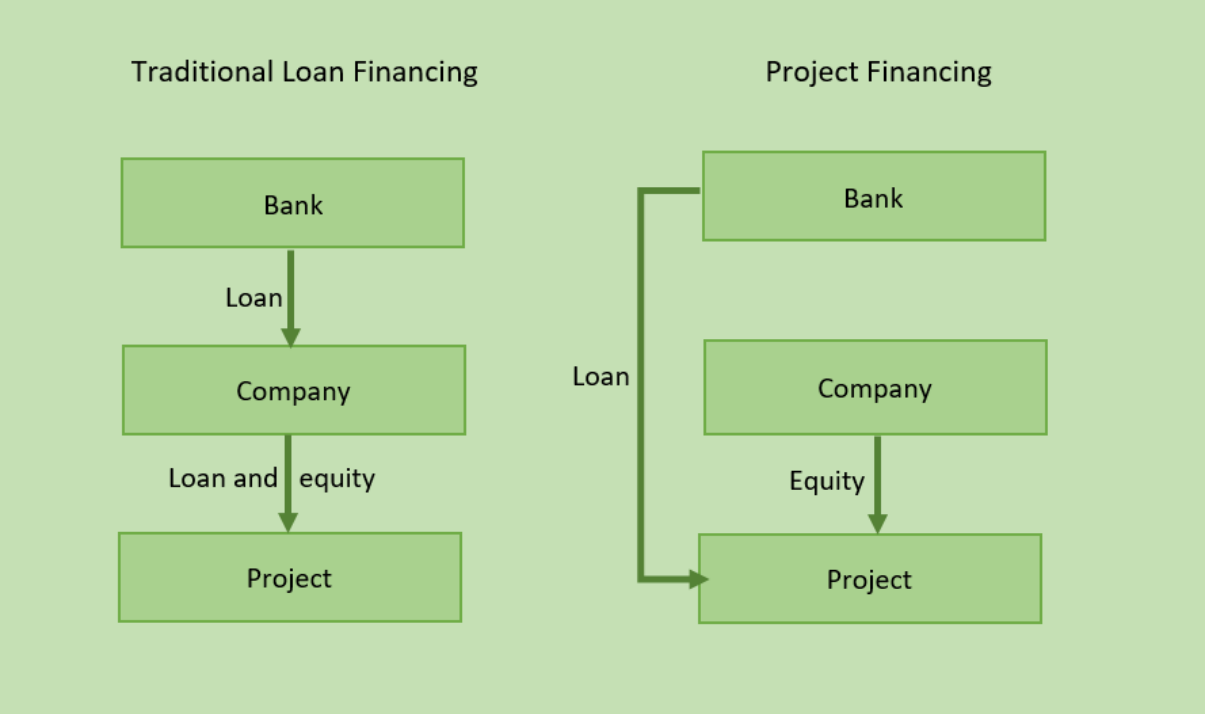

Chart 8: Difference between traditional loan financing and project financing

7.1.1. Loan financing

The simplest and most common source of finance for biomethane projects is a loan from a bank. The financier checks the borrower's financial background to decide on the reliability and risk of the engagement. Of particular interest for financial institutions are securities in case the project fails. Such securities consist of real estate, components, and equipment of the biomethane plant, private – and company assets, and all other assets that cover the loan amount. Furthermore, the prospects of the success of the project are analyzed. The success is usually estimated by checking several criteria that influence the economy of the future biomethane plant.

Since lenders are taking a risk that you may not repay the loan, they have to offset that risk by charging a fee - known as 'interest'. The 'principal' is the amount you borrowed, and the interest is the amount charged for receiving the loan. Loans typically are secured or unsecured. An unsecured loan option is preferred by borrowers but is not a standard option for lenders. If the borrower doesn't pay back the unsecured loan, the lender doesn't have the right to take anything in return (See the next Chapter 7.1.2. Project financing).

Interest payments on the loans are sometimes fixed for the loan term, but they are often adjusted up or down as the general level of interest rates changes. The estimated economy and risk of the biomethane plant influence the amount of the interest rate. When the loan contract is signed, the borrower must pay back a pre-defined monthly amortisation rate consisting of principal and interest rates. Often banks also offer a grace period, usually one or two years, during which the borrower only has to pay back the interest rate, but not the borrowed money (principal). The duration of loans for biomethane projects and grace periods strongly depends on each biomethane project's capability. However, loan periods are about 5 ÷ 15 years, and typically one or two grace years are granted.

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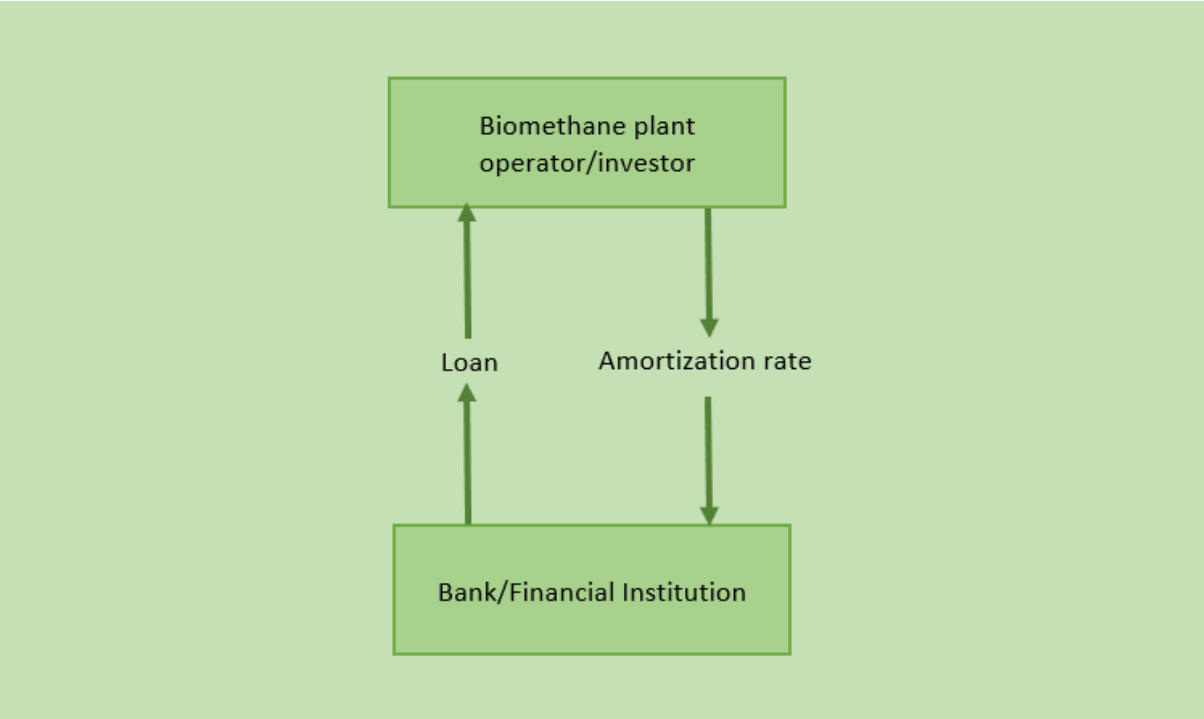

Chart 9: Traditional loan financing scheme

A particular form of traditional loan financing is low-interest loans provided by national authorities, European financial institutions, or international financial institutions (IFIs). These loans are granted for investments in the renewable energy sector, such as biomethane projects, and work as a market support program to stimulate the renewable energy sector. These loans have considerably low-interest rates (e.g., between 0.5% to 2% per year). The more information about such loans may be red in the next chapter.

Advantages	Disadvantages
Low administrative complexity	Financial capacity to act is constrained, as private real estate is charged.
Formation of a special purpose company (SPC) is not required	The investor is liable with a private asset in case of project failure.
Sufficient securities can be provided by the estate and reduce the amount of the interest rate	

Table 5: Advantages and disadvantages of loan financing

7.1.2. Project financing

Project finance, also called limited-recourse finance, is a form of financing for companies and governments where lenders are repaid only through the project's revenues (e.g., the gas, heat or electricity generated by a biomethane plant). Lenders do not have 'recourse' to the borrower's assets

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if a project fails to generate the projected revenue. Project finance is most commonly directed at large biomethane projects. In contrast to conventional loan financing, the bank (financier) usually has little or no access to private or company's capital, but has access to all the assets of the project's special purpose company (SPC).

In financing a biomethane project, the financier's investment is secured by the estimated cash flow of the plant selling gas (biomethane, bio-CNG, and bio-LNG), heat, electricity, digestate, or the plant components, and by the property of the plant site. To receive the project financing, the biomethane plant developer (investor) should register a dedicated special purpose company (SPC) for the project. Project financing provides considerably higher risks for financiers than conventional financing since the loan can only be repaid when the project is operational. Therefore, banks are interested in minimizing potential risks. All aspects of the project are analyzed very carefully. This leads to an increased administrative burden for both parties.

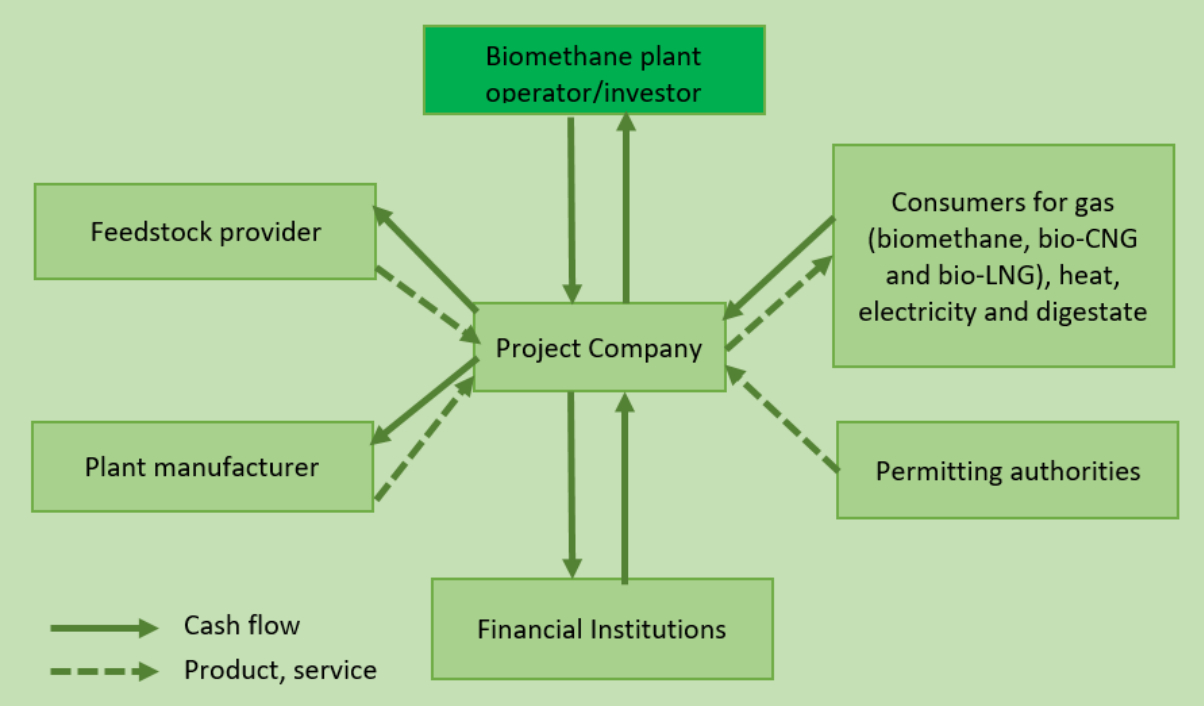

Chart 10: Project financing scheme

The investor/project developer must prepare all project documentation in great detail (see Chapter 11: Tasks for project developers for securing financing). This procedure can be considerably time-consuming. Biomethane plants represent banks' primary financial security due to greater administrative efforts, usually only large-scale biomethane plants with a loan amount of a minimum EUR 5 million typically can be financed by project financing.

Advantages	Disadvantages
The investor is not liable with a private asset in case of project failure	High administrative complexity.

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The financial institution helps to identify and to allocate potential week points of the project	A project company has to be founded.
Sufficient securities can be provided by the real estate (the site where the project is taking place) and reduce the amount of the interest rate	Not every bank provides the option of project financing.
It does not matter how many entities join the special purpose company for the project. Thus, a consortium of farmers can jointly operate a biomethane plant	Interest rates might be higher.
Capacity for further loans is not constrained when the private real estate project site) is not charged	Usually applicable only for projects with an investment volume of 5+ million EUR.

Table 6: Advantages and disadvantages of project financing

7.1.3. Non-recourse financing

Investment and commercial banks can lend money on a non-recourse basis, which means that they have no claims other than on the assets of the project's special purpose company (SPC) itself in the event of default on loan. Based on long-term commercial contracts, this type of financing is usually underpinned by indirect sovereign government guarantees. Non-recourse financing is not typically used for biogas and biomethane projects. This type of financing has not been used much because of the lack of interest by conventional financial institutions in the smaller, more specialized loans required for agricultural biomethane projects. Also, the long-term loan structures (e.g., repayment over ten years) used in non-recourse financial instruments are not generally available for renewable energy projects because of the perceived higher risks and the unfamiliarity of the investment community with the technologies.

Many biomethane projects have identified the lack of long-term loan availability as a significant barrier to industry growth. Governments may commit to renewable energy development the kind of underlying guarantees required by investment banks. In that case, non-recourse financing could be considered for biomethane investment projects. This would be more viable with the aggregation of smaller biomethane projects. The overall project size and associated capital requirements would be larger enough to help mitigate transaction costs. Financiers also may have an opportunity for securitisation of a pool of loans.

7.1.4. Green bonds

A bond is a debt instrument where the issuer (the borrower) is obligated to pay a fixed or floating interest rate and the principal during a fixed period. A bond's return is made up of interest calculated

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based on the bond's nominal value and capital gains/losses.[27] Green bonds can contribute to overcoming the gap between capital providers and green assets. Therefore, green bonds can support governments, corporations, and biomethane entrepreneurs to raise finance for projects to meet climate targets and enabling investors to achieve sustainability objectives. Along with other innovative capital market instruments, green bonds can be implemented for new or existing biogas and biomethane projects to access the long-term capital.

A “green bond“ is differentiated from a regular bond by its label, which signifies a commitment to exclusively use the funds raised to finance or re-finance "green" projects, assets, or business activities. Green projects are projects that promote progress in environmentally sustainable activities. Green bonds provide an opportunity to mobilize capital for green investments. They offer a chance for investors to make informed, explicit decisions to invest in green projects. Green bonds are a means of attracting new investors and hence mobilizing liquidity for green investments.[28] The green bond market can provide an additional financing source to bank lending and equity financing of biomethane investment projects. Furthermore, bond investors, especially long-term and responsible investors, are supplied with an emerging class of green assets and more opportunities to actively engage with issuers on ESG (Environmental, Social, Governance) factors related to the financed projects.

An example of green bonds at the country level is Sweden’s Sovereign Green Bond Framework. Swedish National Debt Office is instructed by the Government to issue green bonds in 2020 at the latest. The framework differentiates between green bonds and other bonds and will demonstrate how the bonds' proceeds are linked to the green expenditures in the central government budget. The framework was presented 5 June 2020.[29] The framework is projected to support methane emissions reductions through the production of biomethane in agriculture in Sweden.[30]

An example of a green bond scheme issued by a company is the E.ON Green Bond Framework presented on the 15th of April, 2019. In line with E.ON’s objective of providing a sustainable and secure supply of electricity to society, E.ON has established this Green Bond Framework under which the Group intends to issue Green Bonds to finance or refinance projects promoting environmental progress, including biomethane projects.[31]

[27] https://danskebank.no/PDF/Business/MiFid/Factsheet_Bonds.pdf

[28] https://yoursri.be/news/study-on-the-potential-of-green-bond-finance-for-resource-efficient-investments

[29] https://www.government.se/government-policy/financial-markets/the-green-bond-framework/

[30] https://www.government.se/49ca3c/globalassets/government/dokument/finansdepartementet/pdf/green-bond-framework/green-bond-second-opinion-cicero

[31] https://www.eon.com/content/dam/eon/eon-com/investors/bond/E.ON_Green_Bond_Framework.pdf

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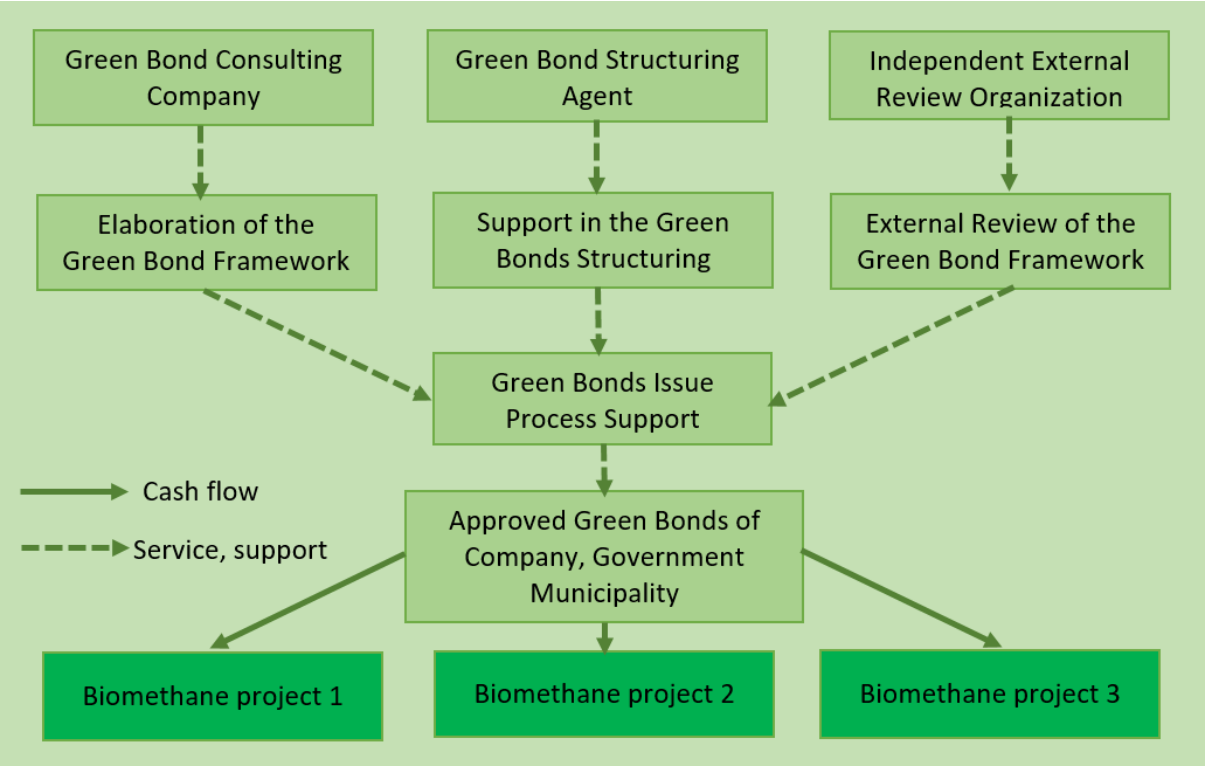

Chart 11: Green bonds issuance and investment scheme

An example of a green bond scheme issued in June 2020 by a bank is the Mediobanca's Green and Sustainable Bond Framework of the Italian Mediobanca Group. An amount equivalent to the net proceeds from the Green and Sustainable Bonds issued under the Framework serves to finance or refinance Green and Sustainable Assets belonging to the eligible categories where renewable energy and biogas particularly are included.[32]

7.2. Equity finance

Equity financing is the process of raising capital through the sale of shares. Developers of biomethane projects usually raise money because their projects have a long-term goal and require funds to invest in their realization. By selling shares, they sell ownership in their company in return for cash, like stock financing. Equity financing comes from many sources, such as investment funds or an initial public offering (IPO). While the term equity financing refers to the financing of public companies listed on an exchange, the term also applies to private company financing.

Equity financing involves selling common equity and other equity or quasi-equity instruments such as preferred stock, convertible preferred stock, and equity units that include ordinary shares and warrants. The equity-financing process is governed by rules imposed by a local or national securities authority in most jurisdictions. Such regulation is primarily designed to protect the investing public

[32] https://www.mediobanca.com/static/upload_new/med/mediobanca_green_sustainable_bond_framework.pdf

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from unscrupulous operators who may raise funds from unsuspecting investors and disappear with the financing proceeds.

Debt financing	Equity financing
Debt financing involves the borrowing of money.	Equity financing involves selling a portion of the equity in the company.
The business owner does not give up any control of the business as they do with equity financing.	There is no obligation to repay the money acquired through it.
Creditors look favorably upon a relatively low debt-to-equity ratio, which benefits the company if it needs to access additional debt financing in the future.	Equity financing places no additional financial burden on the company. However, the downside is quite large.

Table 7: Differences between debt and equity financing

Equity financing is often accompanied by an offering memorandum or prospectus, which contains extensive information that should help the investor make an informed decision on the financing merits. The memorandum or prospectus will state the company's activities, report on its officers and directors, how the financing proceeds will be used, the risk factors, and financial statements.

7.2.1. Joint ventures

A joint venture (JV) structure is a formal agreement between two or more partners (companies, investment funds, individuals, etc.) to put their financial and other resources to realize a biomethane plant.

In most cases, the partners establish a new company by all contributing equity and then share the registered company's revenues, expenses, and control. Typical for the joint venture is that each entity included keeps its separate legal status. Policies and regulations can be put in place to encourage joint venture partnerships to develop Europe's biomethane sector. The partnership's forms may include technical assistance, distributorship, licensing arrangements, manufacturing, and joint venture agreements (see example in Chapter 7.7.2.).

Joint ventures between foreign entities such as biogas and biomethane equipment manufacturers and in-country partners can support European countries' clean development goals and accelerate the economic benefits of investment. Also, by having access to advanced energy technologies and equipment through the joint venture, biomethane project developers can use the most advanced systems that are more efficient, better for the environment, and usually more cost-effective.

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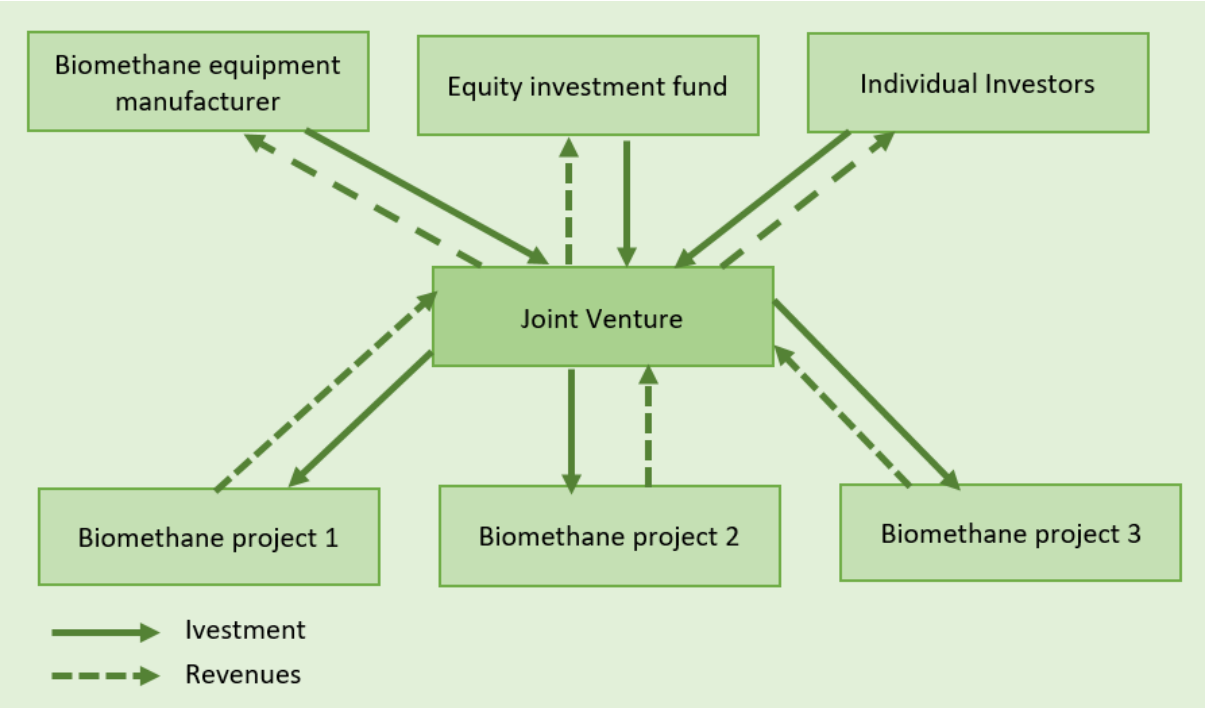

Chart 12: Investment in biomethane projects through a joint venture structure

Also, by having access to advanced energy technologies and equipment through the joint venture, biomethane project developers can use the most advanced systems that are more efficient, better for the environment, and usually more cost-effective. Farmers can form a cooperative joint venture structure. In this sctructure, each farmer shares biomethane's plant investments and revenues proportionally to the provided feedstock (substrate) and the received biogas and biomethane yield.

7.2.2. Equity investment funds and investors

An equity fund is an open or closed-end fund that invests primarily in company shares of publicly listed or non-listed companies. It allows investors to buy into the fund and thus buy a basket of shares easier than purchasing the individual securities.[33] Often financing for biomethane projects comes through an equity investment fund. An equity investment fund is a legal entity that combines money from several investors. Their investors might be private or institutional (World Bank, EBRD, EIB, KfW, etc.) or other international finance institutions. All of them are investing in one or more biomethane projects.

[33] https://investinganswers.com/dictionary/e/equity-fund

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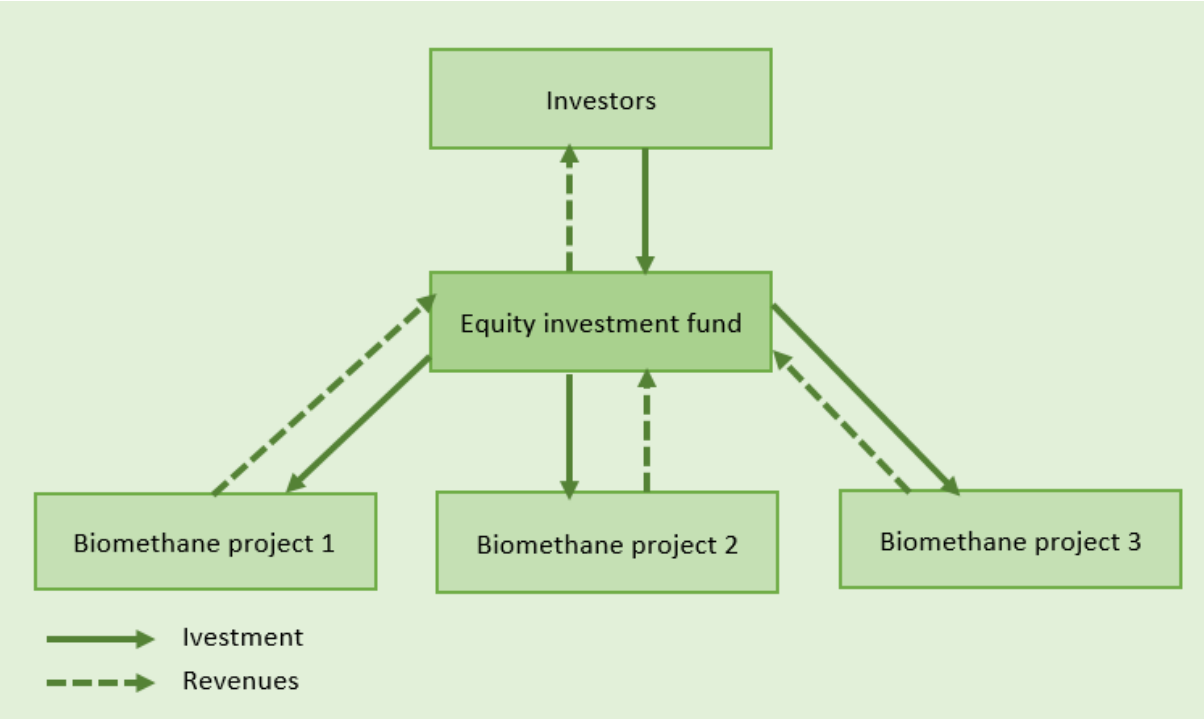

Chart 13: Equity finance process through the equity investment fund

By that means, equity capital for the construction and operation of a biomethane plant is gathered. Benefits from biomethane utilisation and risk-sharing among the investors are similar to the consortium or joint venture agreement (see the previous chapter).

Advantages	Disadvantages
The farmer or plant operator does not have to take out a loan and charge estate.	Investors are regularly liable with all of their asset invested in the fund.
The revenue share of each partner exactly represents the money he invested in the fund.	Investors have no influence on the operation of the biomethane plant as the control is into the equity investment fund.
The plant operator must not necessarily provide securities.	Equity investments do not require interest payments. However, they usually have a higher overall cost than traditional loan finance. The equity investors take more risk from their perspective than banks because they are last in the payment queue in case of default.
The investors' confidence in renewable energy funds is continuously rising due to the excellent performance of such funds within the last years.	Investors may lose control in the project company if the private equity fund obtain a majority stake.

Table 8: Advantages and disadvantages of equity financing

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7.2.3. Venture capital

Venture capital financing distinguishes itself from traditional financing forms by representing a true partnership between capital and management. Venture capital firms invest in and participate in early-stage (under development) to late-stage (grid-connected) biomethane projects. It is available to companies when more conventional sources of financing are not suitable. This might be either because of the high level of risk inherent in the investment or because the company cannot offer the type of collateral that traditional institutions usually demand. Venture capital firms may combine their equity investment with debt, convertible debt, or convertible preferred to leverage their risk and exposure. Access to venture capital is based on the relationship between the investor and the developer. Usually, venture capital firms play an active role in the management and strategic decisions. Venture capitalists often are involved in founding new companies.

Investors in venture capital funds are typically large institutions such as pension funds, financial firms, insurance companies, and university endowments—all of which put a small percentage of their total funds into high-risk investments. They expect a return of between 25% and 35% per year over the investment's lifetime. That is much higher than the interest rates charged for loans by commercial or development banks.

7.3. Leasing

Acquiring leasing partners is a frequently applied method for reducing the necessity of equity capital for biomethane investment projects. Leasing is characterized by the distinction of plant constructor (leasing company) and plant operator (lessee). The leasing company constructs and finances the plant by company capital or equity capital from leasing partners.

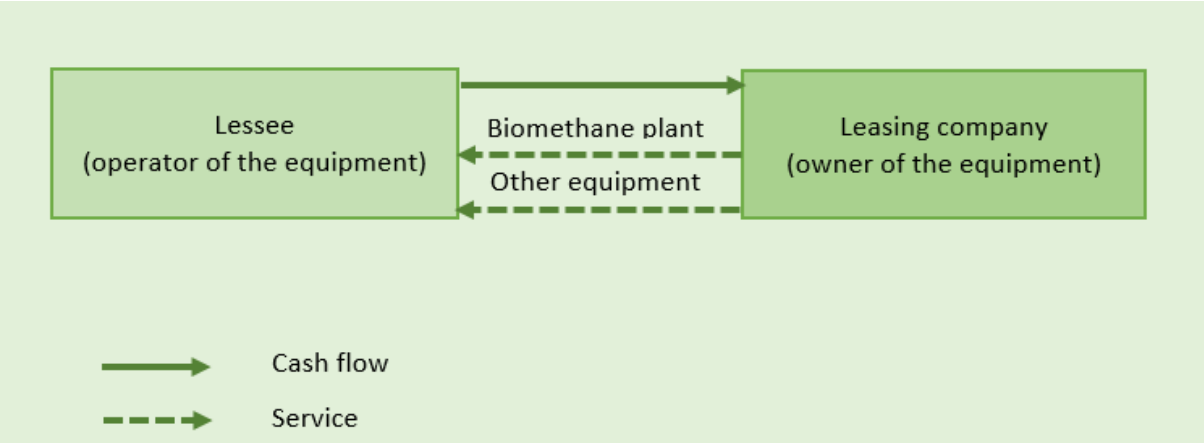

Chart 14: Leasing financing process

Afterward, the leasing company has two primary options: i) to leave the plant to the lessee who has to take the operational risk; ii) to leave the plant to the lessee, but to continue to be responsible for

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operation and maintenance as well. The lessee keeps all revenues from the biomethane plant's operation but has to pay leasing rates to the leasing company.

Advantages	Disadvantages
Leasing partners provide expertise in biomethane plant implementation and operation.	The leasing company does not directly influence the plant's operation, except in the cases when it provides operation and maintenance. Thus, the success or failure of the project lies in "someone else's hand" (lessee).
External investors have the opportunity to join the leasing company.	After the contract expired, the biomethane/biogas plant might have a considerable residual value, which makes removal uneconomic for the leasing company.
Project developers and the existing biogas plant owners with low equity capital have the opportunity to operate a biomethane plant to upgrade their biogas plant to biomethane.	Interest rates for leasing financing might be higher than traditional debt finance.

Table 9: Advantages and disadvantages of leasing financing

7.4. Combining financing instruments (syndicated finance)

When financing biomethane investment projects is not possible through a single finance source, combining financing instruments is necessary. A syndicated loan (syndicated finance), also known as a syndicated bank facility, is financing offered by a group of lenders—referred to as a syndicate—who work together to provide funds for a single borrower. The borrower can be a private company, municipality, or a sovereign government. This form of finance can involve a fixed amount of funds, a credit line, or a combination of the two.

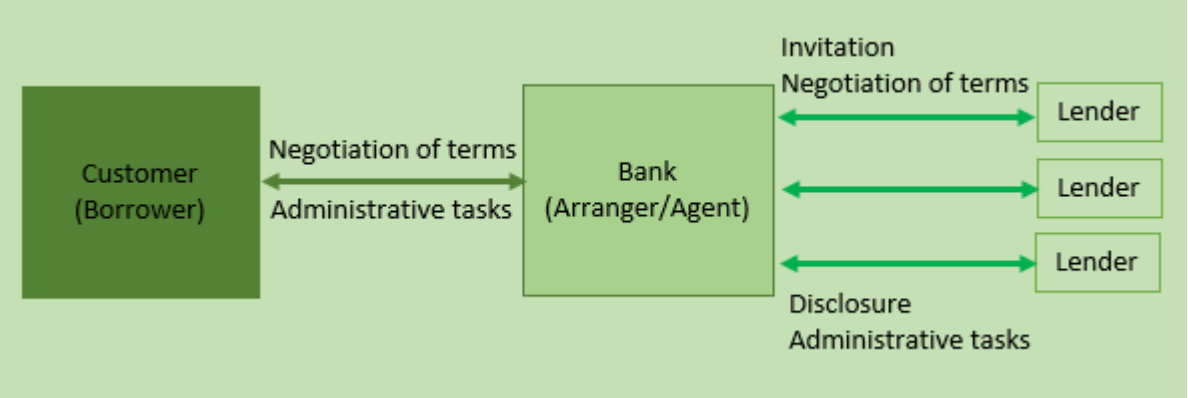

Chart 15: Structure of a typical syndicated finance

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Syndicated finance is usually used when a biomethane project requires too large loan for a single lender, or when a project needs a specialized lender with expertise in a specific asset class.

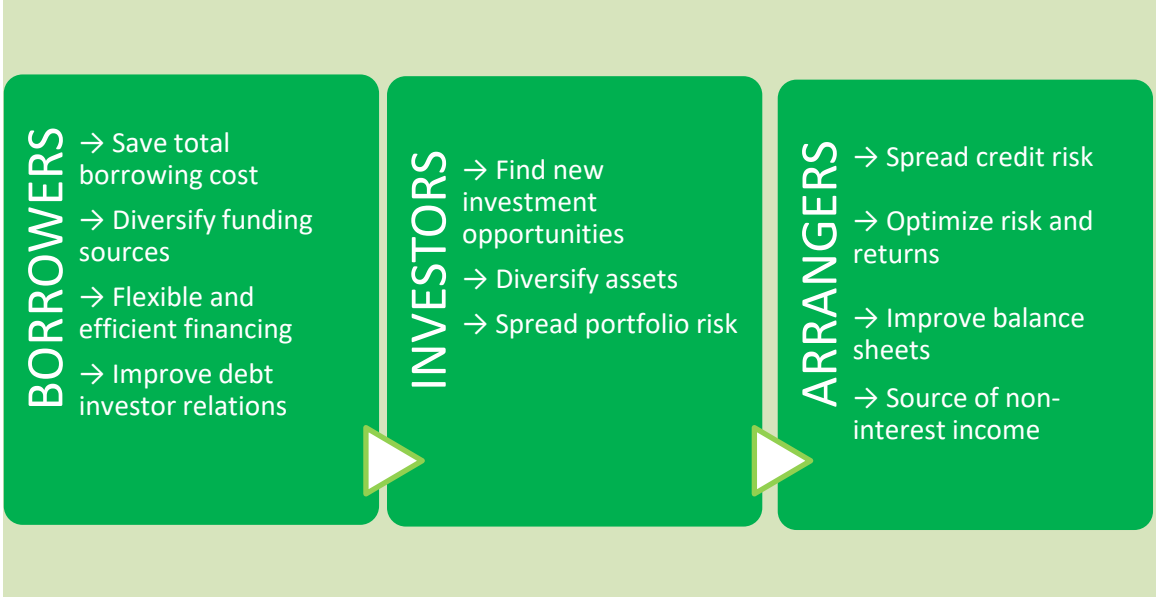

Chart 16: Benefits of syndicated loans

Syndicating the loan allows lenders to spread risk and take part in financial opportunities that may be too large for their capital base. Interest rates on this type of finance (loan) can be fixed or floating, based on a benchmark rate such as the Euro Interbank Offered Rate (EURIBOR). The EURIBOR rates are based on the average interest rates at which a large panel of European banks borrow funds from one another. There are different maturities, ranging from one week to one year. There is typically a lead bank or underwriter in syndicated loans, known as the arranger, the agent, or the lead lender. The lead bank may put up a proportionally bigger share of the loan or perform duties such as dispersing cash flows among the other syndicate members and administrative tasks. The main goal of syndicated lending is to spread the risk of a borrower default across multiple lenders or banks or institutional investors, such as pension funds and hedge funds.

Because syndicated loans tend to be much larger than standard bank loans, the risk of even one borrower defaulting could cripple a single lender. Syndicated loans are also used in the leveraged buyout community to fund large corporate takeovers with primarily debt funding. Syndicated loans can be made on a best-efforts basis, which means that if enough investors can't be found, the amount the borrower receives is lower than initially anticipated. It is possible to split these loans into dual tranches for banks that fund standard revolving credit lines and institutional investors that support fixed-rate term loans.

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Advantages	Disadvantages
Because they involve large amounts, syndicated loans are spread out among several financial institutions to mitigate the risk in case the borrower defaults.	Not suitable for small size biomethane/biogas projects.
Syndicated finance is suitable for a corporation, a large project, or a sovereign government.	Complex and difficult administrative procedure.

Table 10: Advantages and disadvantages of syndicated financing

7.5. Crowdfunding

Besides traditional financing forms, there is also a non-traditional way to finance a biomethane plant, like 'crowdfunding'. Crowdfunding has created entrepreneurs' opportunity to raise hundreds of thousands or millions of dollars from anyone with money to invest. Crowdfunding provides a forum for anyone with an idea to pitch it in front of waiting investors. In most jurisdictions, restrictions apply to who can fund a new business and how much they can contribute. Similar to the restrictions on hedge fund investing, these regulations are supposed to protect unsophisticated or non-wealthy investors from putting too much of their savings at risk. Because so many new businesses fail, their investors face a high risk of losing their principal.[34]

Crowdfunding uses small amounts of capital from many individuals to finance a new business initiation/project or raise funds to expand or transform the existing business. It could be used to raise funds for biogas-to-biomethane upgrade equipment in the existing and operating biogas plants (see Chapter 7.7.5. for a good crowdfunding example). Crowdfunding makes use of the easy accessibility of vast networks of people through social media and crowdfunding websites to bring investors and entrepreneurs together, with the potential to increase entrepreneurship by expanding the pool of investors beyond the traditional circle of owners, relatives, and venture capitalists.[35]

7.6. Risk mitigation measures

7.6.1. Nature of the risk

Risk management is an obligatory element of the overall process of control of a biomethane investment project. It is well known that each project is dynamic and related to constant external effects, and hence changes in investment flows or participants' staff engaged in designing, realization, or maintenance. Therefore, there is always a specific risk from unexpected or unforeseen external impacts, which need to manage.

[34] https://www.investopedia.com/terms/c/crowdfunding.asp

[35] https://www.investopedia.com/terms/c/crowdfunding.asp

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The risk for a biomethane project investment as a whole is related to an event or condition that may provoke either positive or negative consequences by its future manifestation. Risk opportunities by the realisation of the project may vary: from late accession of a new participant in the project, unqualified staff, poor management practices, strong influence of external participants, unsecured feedstock supply over the project lifetime, sharp change to the social or economic circumstances in the country, amendments to primary strategic government documents (e.g., national renewable and clean energy action plans that may prioritize one renewable energy sector and to neglect others), etc. This project's risk rate is manifested both in the endangered realisation and exploitation of the project sites and in the opportunities for reducing the impact or even forestalling such threat. Risk management is a systematic process of identifying, analyzing, and adopting measures as regards identified threats. Risk management's objective in a project is to maximally increase the degree of probability for positive impacts and maximally decrease the likelihood of negative impacts.

7.6.2. Risk assessment and management process

Risk management in its nature is implementing accurately described processes aiming not to let any changes occur to the negative direction of major planned and approved parameters related to the investment project (extending the project term, exceeding the project budget, deviation from the project scope, amendment to the income and expenses part in the period of exploitation, etc.). These processes, which are also called management processes, are as follows:

- Defining factors of impact – analysis, and assessment of factors that may provoke amendment to the project elements.
- Risk identification – defining and documenting the variables that characterize the major elements of the project and which amendments may occur due to the impact of defined factors.
- Qualitative risk analysis – defining possible ways to change risk variables already identified.
- Quantitative risk analysis – the setting of quantity values to quality analysis already performed.
- Risk assessment. Risk assessment is mainly performed at two levels. Level one of risk assessment is related to the project's specific implementation within the timeframe and budget set. Risk assessment there is performed from the viewpoint of managing the investment project. Level two comprises the risk assessment of the estimated project effectiveness. An actual quantitative measurement of the risk is derived only by the evaluation of economic parameters. Risk assessment is performed through qualitative measurements for the other types of effectiveness – social, cultural, political, etc.
- Defining permissible risk level – applying procedures and techniques for increasing possibilities and decreasing impediments in front of management subjects.
- Risk monitoring and control – performing constant control of risk activities identified, defining new risk activities, and implementing activities planned regarding the risk.

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7.6.3. Recommendations for risk management and risk mitigation of biomethane investments

Where it has already been decided that a particular risk has to be managed, such management can be done in one of four ways possible:

- Avoidance – sometimes, it is possible to make such changes to avoid the risk at the planning and designing stages. It also may be possible to change the organization in the future in such a way to avoid the risk.
- Transfer – transfer involves moving an identified risk to an external organization. Insurance is a typical example of that.
- Mitigation – If the risk cannot be avoided, an acceptable alternative might be to have it mitigated through measures, which would minimize the damages to occur, should the risk materialize.
- Acceptance – where nothing can be done in response to a risk, the only alternative left would be to have it realized and accepted.

The tables below contain a classification of risk types and our recommendation for mitigation regarding each one of them. The tables include all risks (disputable and acceptable, inclusive). The substantiation is as follows: even if a particular risk is minor and acceptable, its management is not unnecessary, provided the costs of such management are one-time or low.

Recommendations for natural disaster risk mitigation are as follows:

Risk type	Mitigation
Floods	1. Insurance of the biomethane plant.
Lightning and fire	1. Lightning protection should be installed by all means. 2. Insurance of the biomethane plant. 3. Installation of a regular gas leak detection system and appropriate remediation measures at the plant is recommended.
Hailstorms and hurricanes	1. Insurance of the biomethane plant.

Table 11: Recommendations for natural disaster risk mitigation

Our recommendations for economic risk mitigation are as follows:

Risk type	Mitigation
Currency risk	1. All calculations should be made in Euro. 2. Membership in the EU

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Country risk	1. It is advisable to use highly professional and approved country assessments like the ratings of Standard & Poor's or Moody's, which should be called in to minimize financial losses due to political crises or economic turbulences. 2. Contact export credit insurance companies often provide their own assessments of the export risk into foreign countries, which are especially suited for exporting technologies and services.
Credit risk	1. Provide an opportunity for regular payment of the loan from at least one source of funding. 2. Do not rely on the assumption that the biomethane plant will be productive 100% of its hours. Biomethane plants can work for approximately 7,000 to 7,500 hours per year, while in the rest of the time of the maximum possible 8760 per year, they need maintenance. 3. Contact multilateral and country guarantee funds (e.g., Multilateral Investment Guarantee Agency, Pan-European Guarantee Fund, etc.).
High initial investment	1. Private investment may grow if incentivized through appropriate regulation and redistribution of risks. 2. Public investment and support would need to be considerable.
Business risk	1. Prepare a detailed and realistic business plan and coordinate both with the crediting bank and the supplier company. 2. Use suppliers of biomethane equipment, which are established and proven.
Gas and Power off-take	1. Select a reliable and stable gas and power off-taker (utility companies, gas, and power trading companies, etc.). 2. Giving the preference to long-term contracts 3. Select insurance for the company to protect your income from the signed GPA or PPA.
Regulatory and legislation risk	1. Monitor all amendments to legislative documents. 2. Use external consultants or legal advisor teams to overcome or avoid effects from unexpected new normative acts. 3. Take an active part in discussions on future amendments to legislative documents related to the activity. 4. Participate in stakeholders, professional associations, and other industry groups.
Feedstock supply chain	1. To sign a long-term feedstock supply contract 2. To enable the opportunity for alternative feedstock supply in case of interruption of the primary feedstock channel. 3. Insurance of the feedstock supply if it comes from a third-party supplier.

Table 12: Recommendations for economic risk mitigation

Recommendations for technological risk mitigation are as follows:

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Risk type	Mitigation
Poor quality of biomethane equipment	1. Use biomethane equipment and modules produced by established producers and suppliers. 2. The equipment and modules used should always be accompanied by European certificates of conformity and have sufficient warranty terms.
Failures to the gas and electricity distribution grid	1. Use biomethane injection equipment whose grid parameters have been set following the European standards' requirements for the gas distribution grid. 2. Use inverters whose grid parameters have been set following the European standards' requirements for the electrical distribution grid. 3. Install an information system, which will warn of failures that occurred to the system.
Biogas-to-biomethane upgrade units and CHP units	1. In case your options for biomethane plant is to upgrade biogas to biomethane or combined heat and power (CHP) generation, then use upgrade units and CHP units produced by established producers and suppliers. 2. Upgrade units and CHP units used should always be accompanied by European certificates of conformity and have sufficient warranty terms. 3. Upgrade units and CHP units used should have signed maintenance contracts with reliable suppliers of O&M services.
Operation and maintenance (O&M) and monitoring of the biomethane plant	1. It is common practice O&M of the biomethane plants, upgrade units, and CHP units to be provided by specialized companies different from the equipment suppliers. Therefore, your attention to terms and conditions in the professional O&M agreement. 2. Provide regular monitoring and prepare together with the O&M company's long-term preventive plan of maintenance (PPM) to avoid failures in digesters, biomethane upgrade units, or CHP units.
Loss from the imperfection of data and technologies used	1. Use the data and recommendations from the feasibility analysis or technical due diligence of the biomethane plant. 2. Special attention should be paid to designing the biomethane plant, and you should also look for options to maximize the avoidance of energy losses and investment costs for the realization of the project. 3. Installation of pressure relief valves to protect the gas network from excess overpressure or under pressure. 4. Installation of flares for excess biogas burning during high biogas production, when the production surpasses recipient demand for biogas or during emergencies.

Table 13: Recommendations for technological risk mitigation

Recommendations for social and environmental risk mitigation are as follows:

Risk type	Mitigation

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War, the act of terrorism	1. Insurance of the biomethane plant
Unfavorable amendments to labor legislation	1. Use external companies or organizations where necessary to meet legislative requirements.
Occupational accident	1. Observe all safety measures during the mounting and operation of the biomethane plant. 2. Keep a Book of Instructions and periodically instruct the staff at the biomethane plant. 3. Define clear rules regarding the rights and obligations of each staff member.
Harmful leakages	1. Do not install digesters without hydrogen sulphine filtering and membranes. 2. Observe regularly for methane leakages through digesters and burn the produced biogas if the current level endangers leakage. 3. Sign insurance policy to cove eventual third party damages.
Vandalism, equipment plundering	1. Take security measures, such as external fencing, physical security guarding and video monitoring system 2. Insurance of the biomethane plant.

Table 14: Recommendations for social and environmental risk mitigation

7.7. Case studies

Many banks and financial institutions have recognized the potential of biogas and biomethane project financing and have developed specific programs to support it. A selection of several case studies for the financing of biogas and biomethane investment projects in Europe is reported below.

7.7.1. Belgium's first biomethane-to-grid plant

Belgium's first-ever biomethane-to-grid plant became operational at the end of November 2018.[36] The new digester, a DRANCO reactor from OWS, will digest 35,000 tons of VGF waste with an estimated production of 3.5 million m³ biogas. About 75% of the biogas is valorised in a CHP to meet the local heat and electricity demand. The digestate is composted together with other green waste on the existing installation. The biogas-to-biomethane upgrade installation was ordered by IOK Afvalbeheer, a waste management business owned by several municipalities in the north of Belgium.[37]

The remaining biogas is purified to natural gas quality. In the short term, IOK Afvalbeheer aims for an annual production of 500,000 m³ biomethane, a first in Belgium.[38] IOK Afvalbeheer will inject biomethane directly into the natural gas network. The biomethane will supply a nearby 'Kolonie' site

[36] https://bioenergyinternational.com/biogas/belgiums-first-bright-biomethane-to-grid-plant-now-operational#:~:text=Belgium's%20first%20ever%20biomethane%2Dto,grid%20of%20net%20operator%20Eandis.

[37] https://www.europeanbiogas.eu/belgiums-first-biomethane-plant-unveiled/

[38] https://www.biogas-e.be/node/582

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in Merksplas with green heat and green electricity. Besides, the CO2 that is separated during the purification of the biogas will be used in greenhouse horticulture as 'fertilizer' in greenhouse cultivation. The total investment cost amounts to more than 15.5 million euros. This project is co-financed by the European Regional Development Fund (ERDF)[39] and the Flemish Government. Within ERDF, € 3,750,000 was contributed as project costs, with a subsidy of € 1,500,000. The project also received investment support from OVAM (€ 1,500,000) and VEA (€ 920,000).

7.7.2. TerraX and Swen capital partners invest more than € 100 million in biomethane projects in Italy

Private equity investment group Swen Capital Partners[40] has entered a joint venture with the Italian biogas group TerraX[41] to finance sustainable natural gas (SNG) development.[42] The new venture, which has over € 100 million of initial capital, will build and operate over ten biomethane projects, to be operational by 2022. The money has been released under the SWEN Impact Fund for Transition, the first European fund dedicated to financing renewable gas infrastructure, to be managed by SWEN Capital Partners.

The group is a leading player in responsible investment in unlisted assets in Europe with over €5 billion under management. The management company integrates ESG criteria in all its asset management activities and has been implementing a climate strategy since 2017. In 2019, it reinforced its actions in favour of fairer and sustainable growth by launching a strategy of direct equity impact in infrastructure. SWEN Capital Partners is owned by the OFI Group (mainly Macif, Matmut), Arkea Investment Services (ARKEA Group), and its team.[43]

7.7.3. The second biomethane plant has been launched in Spain

This biomethane plant started operation in December 2019[44] within the ECO-GATE (European COrridors for natural GAs Transport Efficiency) project. ECO-GATE[45] is a European consortium co-financed by the European Union through the CEF program, composed of 38 companies from 4 countries (Spain, Portugal, France, and Germany), which is led by NEDGIA[46], the gas distribution company of the Naturgy Group. It aims to develop the market for conventional and renewable natural gas for the mobility sector along the Atlantic Corridor and its interconnection with the Rhine-Danube Corridor and the Spanish Mediterranean Corridor. Within the scope of ECO-GATE, the biomethane

39 https://ec.europa.eu/regional_policy/en/funding/erdf/

40 https://www.swen-cp.fr/en

41 https://terrax.it/

42 https://www.worldbiogasassociation.org/terrax-attracts-e100m-private-equity-investment-as-fund-accelerates-investment-in-biogas/

43 https://www.europeanbiogas.eu/terrax-srl-and-swen-capital-partners-invest-more-than-100me-in-biomethane-projects-in-italy/

44 https://www.europeanbiogas.eu/developing-biomethane-production-in-spain-interview-with-our-spanish-member/

45 https://eco-gate.eu/

46 https://www.nedgia.es/conocenos/en/the-european-eco-gate-consortium-starts-the-injection-and-distribution-of-renewable-gas-in-the-nedgia-network/

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plant in Butarque has been put into operation. It will inject into the distribution network the biomethane generated from the Canal Isabel II wastewater treatment plant.

The European ECO-GATE is one of the most ambitious global mobility plans with conventional and renewable natural gas. ECO-GATE uses new technologies and applies innovative solutions to enable the rapid and massive deployment of this alternative fuel, thanks to a significant reduction in the unit cost and a better understanding and more excellent knowledge of customers' needs. The project includes the construction of 21 natural gas refueling stations along the Atlantic and Mediterranean Corridors in Germany (1), France (1), Portugal (6), and Spain (13). To this end, the funding provided to ECO-GATE will be shared among the four countries. It will allow the development of gas stations in Barcelona, Cordoba, Cartagena, Irun, La Junquera, Madrid, Salamanca, Tordesillas, Aveiro, Lisbon, Setúbal, Tours, and Heddesheim, among other cities. Also, it contemplates the realization of another pilot project for the supply of renewable gas and hydrogen.

7.7.4. Two biogas upgrading plants started operation in Estonia

Just six months separated order placement and the first feed-in into the Estonian gas network for the two latest gas upgrading plants, located in Vinni and Tartu, from the German biogas plant operator and technology provider EnviTec Biogas AG.[47] Both biogas upgrading plants are operated by a joint venture of local energy companies (AS EG Ehitu - a subsidiary of gas network operator AS Eesti Gaasand) that have been built as extensions to existing biogas facilities. Rated at 465 Nm3/h, the gas upgrading plant in Vinni runs on biogas from wet and solid manure, flotates, vegetable, harvest, and food residues.[48] In Tartu, the 425 Nm3 EnviThan plant operates using biogas produced from wet and solid manure, and harvest residues. Both plants will feed their biomethane into the existing natural gas network.

7.7.5. Peters Biogas used a crowdfunding campaign for biogas-to-biomethane upgrade installation

Peters Biogas, owns and operates a biogas plant in the Netherlands and produces green electricity and sustainable heat. Peters Biogas BV is a collaboration between the Peters family and the company Agradu BV from Sint Nicolaasga. Together they guarantee responsible, sustainable production of electricity, heat, renewable natural gas, and CO2 in a very innovative way. The company's location is on the Oosterringweg in Luttelgeest. The company started a crowdfunding campaign in the fourth quarter of 2018 to raise funds for a new production installation that can produce renewable natural gas (biomethane) and sustainable CO2. Peters Biogas has proven over the past decade that it can produce sustainable energy with a healthy financial return and is sure that this will continue in the coming years. With this expansion, an important step is taken towards non-fossil energy and fossil natural gas replacement. Sustainable investment is also sustainable financing. For this reason, a financing mix with ABN Amro Bank, National Green Fund, and this crowdfunding via Oneplanetcrowd

[47] https://www.envitec-biogas.com/infocenter/press-releases/delivery-of-two-envithan-biogas-upgrading-plants-to-estonia

[48] https://bioenergyinternational.com/biogas/first-envithan-biogas-upgrading-plants-in-estonia-brought-online

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[49] has been chosen. The campaign was successful, and the company raised three times more funds than previously planned.

The production of Peters Biogas in March 2020 was more than 1,000 cubic meters of biogas per hour. According to the company's business plan, it was planned to produce 450 cubic meters of renewable natural gas (biomethane) and 700 kWh of electricity. However, the reality was even better for the company. Because the prices for unsubsidized gas have been excellent, Peters Biogas currently only produces renewable natural gas (biomethane) and sells part of their renewable natural gas (biomethane) to the transport sector. The biomethane is used by the major fuel suppliers to meet their fossil-free fuel blending obligation. As a result, Peters Biogas can now produce even more renewable natural gas, about half of which without the aid of operating subsidies [50].

7.7.6. Almi Invest AB provided finance to Biofrigas Sweden for liquifying of biogas to biomethane fuel

Biofrigas Sweden AB[51] offers facilities with a unique technology that makes it possible to upgrade and liquefy biogas for small-scale production in agriculture, smaller treatment plants, and industry. By using Biofrigas facility to process manure into motor fuel, natural gas is collected, and its negative impact on the greenhouse effect is significantly reduced. The small scale of the production unit makes it suitable for agriculture farms, small wastewater treatment plants, and the food industries. The facility is housed in a 40-foot container. In 2014 Biofrigas Sweden AB received an investment from Swedish government development organization Almi Invest AB. Currently, Almi Invest AB holds 9.50 % of the shares of the company. On the 18th of June, 2020, Biofrigas Sweden AB made an IPO at the Spotlight Stock Market.[52]

7.7.7. Biogest financed biogas power plant in Romania

Biogest Energie- und Wassertechnik GmbH[53], a well-established Austrian biogas equipment manufacturer and integrator, provided 51 % own finance of the total investment cost to a biogas power plant that the company built in Romania in 2015. The plant had 1.48 MW electrical and 1.47 MW thermal capacity and is located in the county of Satu Mare in north-western Romania. The electricity generated by the biogas facility is fed into the grid and can thus supply around 4,500 households.[54]

The heat from the plant is used for an existing grain dryer and a fish farm. Given the general economic situation and considerable agricultural resources available, Romania is a worthwhile location for biogas renewable energy investments. In a recent interview Georgi Kirov, Head of Sales of Biogest

[49] https://www.oneplanetcrowd.com/nl/project/200339/description
[50] https://www.petersbiogas.nl/2903/0/wat-levert-het-op
[51] https://biofrigas.se/en/about-biofrigas/
[52] https://spotlightstockmarket.com/
[53] http://www.biogest.at/info/en/1/About-us.html
[54] http://www.biogest.at/page/en/91/Official-opening-of-our-first-company-owned-biogas-plant-in-Romania.html

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said that biomethane support is still not existing in Romania, but the plant is ready to start the generation of biomethane as soon as proper legislation is established in the country.

7.7.8. Small Biogas Demonstration Programme (SBDP) in Ireland

Irish Agricultural is experiencing significant intensification, particularly in dairying and following significant recent intensification in pigs and poultry. There is a need for agriculture to reduce its emissions impact on the local and global environment (principally carbon emissions). Recent EPA reports on freshwater quality highlight that agriculture is of the main culprits for deteriorating water quality. Irish agriculture is making strides to reduce its impact through initiatives like Origin Green and Dairy Sustainability Ireland, however, there is a need for specific tools to assist in this goal. Small scale biogas is seen as one potential tool to reduce environmental impact. The project 'Small Biogas Demonstration Programme (SBDP) in Ireland[55] aims to stimulate the deployment of innovative on-farm small-scale biogas production by providing support and a capital contribution to three demonstration projects. The research will assist in understanding how biogas can drive sustainability improvements at the farm level. This project will pursue the following objectives:

- Develop the capacity of technology providers in the delivery of farm-scale biogas production.
- Demonstrate compliance with sustainability criteria in the context of the EU renewable energy directive.
- Raise awareness amongst the farming community of the increasing challenges of addressing climate change.
- Demonstrate that the results are widely deployable.

In recent years, following requests and submissions by the Irish BioEnergy Association, the Department of Agriculture has issued licensing arrangements for on-farm digesters subject to far less regulation than industrial digesters. The project partners hope that this project will assist in developing biogas technological know-how in Ireland. It is envisaged that this project through the demonstration farms will ultimately be leading to wide-scale adoption of biogas technology in Ireland. It is hoped that the project will serve as a template and testbed for future support mechanisms that will allow the biogas technology users to be rewarded for the positive environmental impacts achieved by biogas.

[55] https://ec.europa.eu/eip/agriculture/en/find-connect/projects/small-biogas-demonstration-programme-sbdp

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8. Sources of capital

The global financial system is the worldwide framework of legal agreements, institutions, and both formal and informal economic actors that together facilitate international flows of financial capital for purposes of investment and trade financing. Since emerging in the late 19th century during the first modern wave of economic globalization, its evolution is marked by establishing central banks, multilateral treaties, and intergovernmental organizations to improve the transparency, regulation, and effectiveness of international markets. The objective of this chapter is to explain the main sources of capital for biogas and biomethane investors. What follows are descriptions of the various programs and institutions that provide funding and support for renewable energy projects and biomethane projects particularly.[56]

8.1. Global institutions

Currently, significant amounts of capital for biogas/biomethane energy projects in Europe are provided by multilateral development banks and agencies operating at global, regional, and country levels. However, more and more innovative financial institutions, private equity funds, and entrepreneurs are also actively engaged in commercial financing of biogas/biomethane energy projects. As barriers are broken down so that private investors are committed and ready to invest in projects, the biogas/biomethane sector will be an important emerging market in Europe. Traditionally at the global level, multilateral international financial institutions (IFIs) have an essential role in the establishment of programs on climate change and the economic development of countries with developing or transition economies. That includes advisory service in the development phase of renewable energy projects, their financing, and support in the commissioning and exploitation phase. Multilateral institutions have AAA credit ratings and have cross-related memberships in lending unions and country financing frameworks.

IFIs achieve these objectives through loans, credits, and grants to national governments. Such funding is usually tied to specific renewable energy projects that focus on economic, socially, and environmentally sustainable development. IFIs also provide technical and advisory assistance to their borrowers and conduct extensive research on development issues. In addition to these public procurement opportunities, in which multilateral financing is delivered to a national government to implement a project or program, IFIs are increasingly lending directly to non-sovereign guaranteed (NSG) actors. These include sub-national government entities, as well as the private sector. The main role of the multilateral IFIs in access to capital for biogas/biomethane investment projects is to act as a catalyst for investment. They have been involved in activities that support the development of local capital in Europe for renewable energy through direct financing, co-financing, and the provision of loan guarantees.[57]

[56] https://en.wikipedia.org/wiki/Global_financial_system

[57] https://www.tradecommissioner.gc.ca/development-developpement/mdb-overview-bmd-apercu.aspx?lang=eng

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In most European countries, there are existing offices of liaison with IFIs to help entrepreneurs learn more about IFIs, including information on where and how funds are spent and how to find and pursue these opportunities. All IFIs use country strategy documents, which are fundamental to establishing an IFI's lending priorities for a particular country. Based on the country's own vision for its long-term development and written by the IFI, the document lays out the IFI's support program for the nation. On the next links, there are country strategy documents of the two major IFIs, and examples of biomethane projects financed with their support, you will find in the next chapters '9.Forms of financial assistance by international financing institutions' and '10. Selected financing actors':

- European Bank for Reconstruction and Development (EBRD) - Country Strategies
- World Bank (WB) - Country Partnership Framework (CPF)

In recognizing the private sector's important role in catalyzing climate change and carbon emissions reduction, the IFIs have increased their focus on direct financial lending to the private sector. Some of the IFIs also lend directly to non-sovereign guarantee actors such as municipal or local governments and other financial institutions. IFIs offer this lending through various financial instruments, including direct financing and private equities, as well as other innovative financing mechanisms.

8.2. Government bilateral support

The governments in Europe can support local districts and municipalities for renewable energy development and biomethane mainly. Although this is a way to infuse capital into the renewable energy sector, care should be taken to avoid market distortions and difficulties in sustaining the projects. Typically a government allocates funds to an in-country regional agency structure responsible for procuring renewable energy systems.

8.2.1. Bilateral agreements of the European Union (EU)

The EU works closely with other countries and regions to advance dialogue and cooperation on climate change. Climate action is an integral part of the EU's foreign policy agenda. Through climate diplomacy and cooperation initiatives, the EU aims to build political will and trust to advance global action, ensure the effectiveness of development cooperation, and build capacity to support partner countries in their efforts.[58] The Commission has bilateral arrangements with key partners and works with a number of regional organisations:

- OECD countries – e.g., US, Canada, Japan, Australia;
- Other UNFCCC Annex I countries – e.g., Russia, Ukraine;

[58] https://ec.europa.eu/clima/policies/international/cooperation_bg

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- Emerging economies – e.g., Brazil, China, India, South Africa, South Korea;
- Regional groupings – e.g. African, Caribbean and Pacific (ACP) countries, African Ministerial Conference on the Environment (AMCEN), Asia Europe Meeting (ASEM), Association of South East Asian Nations (ASEAN), Gulf Cooperation Council (GCC), Latin American and Caribbean (LAC) countries, Organisation of the Petroleum Exporting Countries (OPEC).

All these agreements actively support the EU's policy for dialogue and cooperation on climate policy development and implementation under the UN Climate Convention, Paris Agreement, and other international conventions and initiatives.

8.2.2. Interreg Europe

Interreg[59] is a funding program to stimulate cooperation between regions in the European Union, funded by the European Regional Development Fund. Interreg Europe offers opportunities for regional and local public authorities across Europe to share ideas and experience on public policy in practice, including also adaptation. Interreg Europe helps regional and local governments across Europe to develop and deliver better policies. Interreg creates an environment and opportunities for sharing solutions and policy learning. Interreg aims to ensure that government investment, innovation, and implementation efforts all lead to an integrated and sustainable impact for people and places. Interreg is financed by the European Regional Development Fund (ERDF).[60] To achieve its goal, Interreg Europe offers opportunities for regional and local public authorities across Europe to share ideas and experience on public policy in practice, therefore improving strategies for their citizens and communities. Interreg Europe exists to assist **three types of beneficiaries:**

- **Public authorities –** local, regional and national;
- **Managing authorities/intermediate bodies** - in charge of the Investment for Growth and Jobs programs or European Territorial Cooperation[61];
- **Agencies, research institutes, thematic and non-profit organizations** – although not our main target group, these types of organizations can also work with Interreg Europe by *first* engaging with their local policymakers to identify options for collaboration with Interreg Europe.

Organisations that work with Interreg Europe must also be based in one of the 27 EU Member States, Norway, Switzerland, or the United Kingdom. Any actions developed with financial support from Interreg Europe must fall into one of the following four categories:

[59] https://www.interregeurope.eu/about-us/what-is-interreg-europe/
[60] https://ec.europa.eu/regional_policy/en/funding/erdf/
[61] https://ec.europa.eu/regional_policy/en/policy/cooperation/european-territorial/

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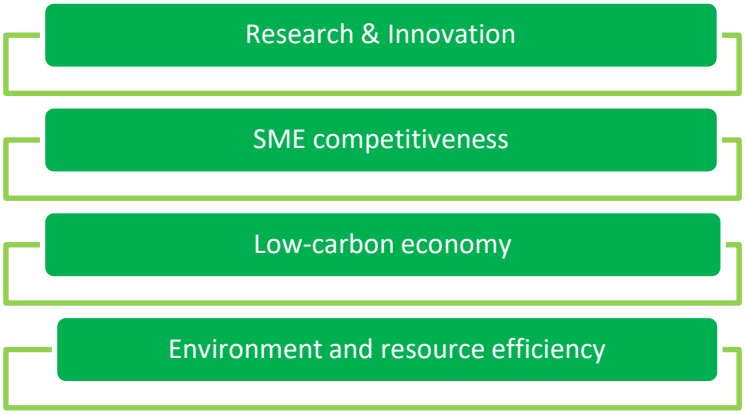

Chart 17: Eligible categories for Interreg Europe finance

As there is the pressure these days to 'do more with less', Interreg has taken a streamlined approach this time around to create much more focused actions and therefore offer a greater chance for success. An example of a biomethane funded project with the support of Interreg Europe is Poland's first operational installation of biogas purification, compression, storage and distribution of biomethane. It is located at the closed landfill in Niepołomice. The gas from the inoperative landfill in Niepolomice was used only in the aggregate generator when the local operator launched the pilot program together with external experts. The project's object was installing two containers of a research installation to purify the gas coming from the inoperative landfill in Niepołomice (approx. 94 m^3/h). The facility of upgrading biogas is designed for vehicles fueled by compressed purity biomethane (CBG). The refueling of vehicles is carried out in this same way as CNG vehicles.

During the 2021-2027 programming period, Interreg will continue to support interregional cooperation among regions from all across Europe. The first draft version of the Cooperation Programme Interreg Europe (2021-2027) was published at the end of July 2020.[62]

8.2.3. The Nordic environment finance corporation (NEFCO)

The Nordic Environment Finance Corporation (NEFCO)[63] is an international financial institution (IFI) governed by its constituent documents: the Agreement between Denmark, Finland, Iceland, Norway and Sweden concerning NEFCO, the Statutes of NEFCO as well as the Host Country Agreement between the Government of Finland and NEFCO. Each Nordic country has endorsed the Agreement on NEFCO following its respective national procedures. As an IFI, NEFCO has the status of an international legal person with the full legal capacity to enter into agreements; to acquire and dispose of immovable and movable property; and to be a party to legal proceedings. As an international legal person, NEFCO is not entered into the trade register in any of the owner countries. In its governance

62 https://www.interregeurope.eu/fileadmin/user_upload/documents/Programming_Committee/2021-2027_Interreg_Europe_Cooperation_Programme.pdf
63 https://www.nefco.org/about-nefco/legal-framework-and-guidelines/

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principles, NEFCO promotes sustainability, equality, transparency, predictability, accountability and responsibility.

NEFCO was established after the collapse of the Soviet Union to support the Nordic countries in their efforts to increase environmental awareness in Eastern and Central Europe by financing projects to reduce the number of harmful emissions to the environment. Cost-efficiency remains a hallmark of all of NEFCO's activities. The Ukrainian agricultural company VERBACOM-ENERGY LLC applied for funding to NEFCO for a biogas power plant with a biomethane upgrade option that is planned for realization in 2020 – 2021.[64]

8.3. Private sector: debt or equity – private investment funds

Biomethane plant developers have an option to seek for private financing (debt or equity) regarding their projects. The private investment funds have much more flexibility than IFIs, EU funding structures, or local banks. In most cases the application process starts with a brief description of the company and an information memorandum of the proposed biomethane investment project. For your convenience, you will find at the end of this Guidebook included a selection of private investment funds and companies that provide debt and equity to biogas and biomethane investment projects. To get into contact with any of the listed funds and companies, please see 'Appendix II. Contact details of banks, international financial institutions, investment funds, and companies'.

8.4. Regional and national development banks

8.4.1. Austria

Austria Wirtschaftsservice Gesellschaft mbH (aws)[65] is the Austrian federal promotional bank. It is government-owned and assists companies (mainly SMEs and Start-ups) in implementing innovative or growth-oriented projects by issuing guarantees, granting loans, and awarding subsidies, particularly in cases in which these companies can't obtain the necessary funds in a sufficient amount from other sources of financing. Also, aws provide support in specific information, advisory, and other services to prospective, established, and expanding companies[66]. The bank offers online assistance through the Funding Manager[67] to facilitate funding and submit applications. With the support of Austria Wirtschaftsservice Gesellschaft mbH was financed biomethane based work and transport vehicle

[64] https://www.biobased-ukraine.nl/assets/uploads/sites/10/2018/11/14-15-Yovzhenko_Business-case_biogas_Pro-Energy_EN.pdf
[65] https://www.aws.at/
[66] https://aecm.eu/aws-austria-wirtschaftsservice/
[67] https://www.aws.at/en/service/web-services/aws-foerdermanager/

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CH4PA project in 2014[68] and a know-how transfer event in the field of biogas technologies in September 2020.[69]

8.4.2. Belgium

PMV[70] is a state-owned company in Flanders, Belgium, supporting the development of the Flemish economy. It provides funding for promising companies' businesses, from the day they first open their doors, through their various growth stages, and even on to operating internationally. PMV is convinced that entrepreneurship is crucial for developing a prosperous future for Flanders and everyone who lives there. PMV/z-Waarborgen NV[71] is an independent investment company. It invests in the economy and enterprises of Flanders. PMV/z collaborates with private partners via funds and public-private partnerships. Within the PMV-group, PMV/z provides the financial levers through issuing guarantees for promising projects and investments. Also, it manages and stimulates subordinated loans between private individuals and companies.

The SOWALFIN Group[72] responds to Walloon entrepreneurs' financial needs in Belgium and now offers them support solutions at critical moments in their existence. SOWALFIN is a public interest limited company set up by the Walloon Government in 2002 to facilitate access to finance for businesses. The constitution of this state company reflects the desire for coherence and coordination of Wallonia's financial tools in favor of SMEs. New service enables project leaders and entrepreneurs to be effectively informed and guided, whatever their profile and their needs - via the site 'www.1890.be'.[73]

8.4.3. Croatia

Established in 1992, the Croatian Bank for Reconstruction and Development (also known as an "HBOR")[74] supports sustainable development, economy, and Croatia's social development. In its activities, HBOR pursues the Republic of Croatia's strategic goals, promotes environmental protection, covers market gaps, and acts as a market developer in underserved sectors of the economy. HBOR is fully a state-owned[75] bank. HBOR pays special attention to the establishment and development of small and medium-sized entrepreneurship as the main driving force of each modern economy's development. Favorable terms and conditions of finance provided for SMEs' growth result in the highest lending volume for this sector. Throughout its loan programs, HBOR promotes agriculture development, the implementation of new technologies and innovations, investments in the tourism sector, and the utilization of available EU funds. HBOR participated in the financing of 3 biogas power

68 http://www.spiritdesign.com/work/r-d-startups/ch4pa

69 https://www.prodanube.eu/news/183-know-how-transfer-in-the-field-of-austrian-biogas-technologies

70 https://www.pmv.eu/en/about-pmv

71 https://aecm.eu/pmv-waarborgregeling-flemish-guarantee-fund/

72 http://www.sowalfin.be/

73 https://www.1890.be/a-propos

74 https://www.hbor.hr/en/

75 http://www.nefi.eu/our-members/croatia-hbor/

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plants in Croatia[76] of the agricultural company Agrokor, and provides loans to biogas plant developers under the 'Environmental Protection Programme of the HBOR'.[77]

8.4.4. Czech Republic

Czech-Moravian Guarantee and Development Bank a.s. (CMZRB)[78] was established on the 28th of January, 1992, as a specialized state-owned banking entity to contribute to the Czech Republic's efficient and sustainable economic development. The Bank´s shareholder – the Czech Republic - is represented by three ministries: Ministry of Industry and Trade, Ministry of Regional Development, and the Ministry of Finance.

During its existence, the Bank has become an essential partner for the central state administration authorities, state funds, some regions, and municipalities. At present, CMZRB's primary mission is to facilitate primarily small and medium-sized enterprises' access to financing. The bank provides specialized banking products and, following the government's economic policy aims and the Czech Republic regions, to assist in developing other selected areas of the economy that require public support. CMZRB offers its clients, mainly SMEs, with bank guarantees, preferential loans, and related banking services.

8.4.5. Denmark

IFU – the Danish Development Finance Institution[79] – was founded in 1967 by the Danish government. The Minister of Foreign Affairs appoints the board of IFU and the CEO. IFU's objective is to promote economic activity in developing countries in collaboration with Danish trade and industry. Danish investor, a Danish interest in the project or a DFI investor is required for IFU's participation. IFU also has offices in: China, India, Kenya, Nigeria, South Africa, Ghana, Colombia, Ukraine, and Singapore.[80] IFU and IFU managed funds have co-invested in 1,300 companies in 100 countries in Africa, Asia, Latin America, and Europe. Furthermore, IFU is the fund manager of several other investment funds, including the Danish Sustainable Development Goals (SDG) Investment Fund.

8.4.6. Estonia

KredEx[81] was founded in 2001 by the Estonian Ministry of Economic Affairs and Communications to improve financing possibilities of enterprises, manage credit risks connected with export, enable people to build or renovate their homes and develop an energy-efficient way of thinking. Through the years, KredEx has become a considerable link between the Estonian financing institutions and loan applicants, exporters, and foreign buyers. KredEx offers financing services managing financial risks and

[76] https://serbia-energy.eu/croatia-agrokor-builds-three-biogas-plants-this-year/

[77] http://www.res-legal.eu/search-by-country/croatia/single/s/res-e/t/promotion/aid/loan-in-the-hbor-bank-scheme/lastp/359/

[78] https://aecm.eu/cmzrb-czech-moravian-guarantee-and-development-bank/

[79] https://www.ifu.dk/en/about-ifu/

[80] https://www.edfi.eu/member/ifu/

[81] http://www.nefi.eu/our-members/estonia-kredex/

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implements the development plan of the Estonian housing area. The task of KredEx is to provide solutions based on the strengths of all interested parties, coordinating and supporting the relevant development activities to the possible extent, first of all through state guarantee, as well as knowledge and skills.

Estonia's Alexela Varahalduse AS, part of the Alexela Grupp, and the state-owned credit institution KredEx have signed a 37-million-euro loan agreement, which will enable the company to preserve over 500 jobs in its chemical company Kivioli Keemiatoostus. Alexela also develops LNG terminals in Paldiski, Estonia, and Hamina, Finland. The group also produces biomethane[82] from local raw material in its biogas plants in West-Viru County, Tartu County, and Jarva County.

8.4.7. Finland

Finnvera PLC[83] is a specialized financing company owned by the State of Finland, which supplements the private sector's financial services. Finnvera provides financing for various stages in an enterprise's life: for its start, growth, and internationalization, and exports. Finnvera has an official Export Credit Agency (ECA) status. The Finnvera Group reinforces Finnish enterprises' capacity and competitiveness by offering loans, domestic guarantees, export credit guarantees, interest equalization, and funding for export credits. Finnvera has 27,700 clients and employs 360 experts. Finnvera is present at 15 locations throughout Finland and representation offices in St. Petersburg, Russia, and Oslo, Norway. Finvera financed in 2018 a Finnish craft brewery start-up based in Savonlinna that planned to recycle spent grains to produce their own biogas, which will provide energy for their production. Any excess biogas can be used to generate electricity or be upgraded to biomethane for use in transportation[84].

8.4.8. France

Bpifrance[85] is a state-owned organization. As a trusted partner for entrepreneurs, it promotes competitiveness and provides growth services for companies on behalf of the French State, acting in support of the public policy.[86] Bpifrance assists businesses of all sizes, primarily micro-businesses, SMEs, and mid-caps, and big firms that are considered strategic in terms of the national economy, territories, or employment. Bpifrance offers a funding continuum encompassing every stage of a company's development: From the seed phase to transfer to stock exchange listing, Bpifrance supports entrepreneurs with loans, guarantees, and equity.

Acting in the French Regions, Bpifrance relies on a decentralized network of 43 regional offices, directly contacting the entrepreneurs and their partners. Thus, 90% of all decisions to provide finance come through the regional offices. Bpifrance has a special loan program dedicated to small agricultural biogas (smaller than 500 KWel) and biomethane installations (smaller than 50 Nm3/h maximum

82 http://www.baltic-course.com/eng/energy/?doc=160326

83 https://www.finnvera.fi/eng

84 https://bioenergyinternational.com/opinion-commentary/crafty-finnish-brewers-aim-worlds-first-carbon-negative-craft-brewery

85 https://www.bpifrance.com/

86 http://www.nefi.eu/our-members/france-bpifrance/

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injection capacity for a facility producing biomethane injected into the natural gas network)[87]. The amount of loans available is from € 100,000 to € 500,000. The duration of loans is from 3 to 12 years, with a deferred capital amortization of a 2-year maximum.

8.4.9. Germany

The association of German guarantee banks (Verband Deutscher Bürgschaftsbanken, VDB) represents 17 guarantee banks (Bürgschaftsbanken) and 15 SME-oriented investment companies (Mittelständische Beteiligungsgesellschaften or MBGs) in Germany. Guarantee banks support small and medium-sized companies (SMEs) and founders of new business enterprises in their respective federal state. MGGs grant guarantees of up to Euro 1.25 million for any type of short, medium- and long-term loan. In 2018 the guarantee banks supported nearly 5,800 companies with guarantees worth more than Euro 1.1 billion. These guarantees secured loans of almost Euro 1.7 billion. As one of their core businesses guarantee banks finance start-ups and company takeovers. SME-oriented investment companies (Mittelständische Beteiligungsgesellschaften or MBGs) were created from the 1970s onwards by private business as support institutions.

As with the guarantee banks, their objective is to provide support "by a business for business". They work closely with the guarantee banks. As with the guarantee banks, their shareholders are chambers of commerce and trades and business federations of all sectors, credit institutes, and insurance companies. In their position as regional societies, they support commercial SMEs in their respective federal state. MBGs provide equity capital in amounts ranging from Euro 50,000 up to Euro 1.25 million or sometimes up to Euro 2.5 million. In 2018 the MBGs promoted over 500 small and medium-sized companies in Germany with equity capital amounting to more than Euro 148 million. They also allocated over 200 participations through the micro mezzanine fund Germany (Mikromezzaninfonds Deutschland).

8.4.10. Greece

The Hellenic Development Bank SA (HDB or also known as „ETEAN“)[88] is the only 100% state-backed financial institution in Greece, at the Bank of Greece's supervision, functioning in reciprocity with the Greek banking sector.[89] It seeks to harmonize EU regulation and local banking practices for the benefit of the national MSMEs, through the provision of low –cost financing solutions for business entities with limited access to customized bank financing. Currently, ETEAN SA manages three portfolio funds, co-financed by the European Union with administrative discretion: i) Enterprise Fund (Loan Fund and Guarantee Fund); ii) Energy Efficiency Fund (or Fund for Energy Efficiency); iii); Fund ENALION (Guarantee Fund). The Hellenic Development Bank SA has been assigned at the end of 2019 by the state to implement co-investments via venture capital schemes in enterprises operating in Greece's territory for renewable energy sources, including biogas plants[90] under the Greek Green Fund investment framework.

87 https://www.bpifrance.fr/Toutes-nos-solutions/Prets/Prets-thematiques/Pret-methanisation-agricole

88 http://www.etean.gr/PublicPages/Company.aspx

89 https://aecm.eu/etean-sa-credit-guarantee-fund/

90 https://taneo.gr/wp-content/uploads/2020/08/GREEN-GREEK-FUND-CALL-HDBI-03_08_20.pdf

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8.4.11. Republic of Ireland

The Strategic Banking Corporation of Ireland (SBCI)[91] is a state promotional institution for Ireland established in 2004. The SBCI was mandated to identify market failures and deliver access to finance solutions through lower-cost longer-term finance to Irish business while increasing competition to the market place. The SBCI's initial funding was sourced from the KfW, the EIB, and the Irish State through the Irish Strategic Investment Fund (ISIF). Additional funding has been sourced from the Council of Europe Development Bank and the Funding and Debt Management Office of the National Treasury Management Agency.

8.4.12. Italy

Cassa Depositi e Prestiti (CDP)[92] has been established in 1850. CDP supports sustainable development in Italy, using the country's savings responsibly to support growth and boost employment, supporting innovation, business competitiveness, infrastructure, and local development. In 2015, CDP was confirmed as the National Promotional Institute (NPI) by the Italian Government and the European Union. This new role has enabled CDP to expand the scope of its business activities. CDP is the entry point for the Investment Plan for Europe ("Junker Plan"), a financial advisor for public administrations using national and European funds, and an investment catalyzer for public and private entities. In this role, CDP aims to become a key player in promoting sustainable development globally.

CDP and the Italian company Eni, have signed in 2019 a collaboration agreement for the identification and joint promotion of initiatives in Italy related to the circular economy, decarbonization, and sustainability, to be undertaken through the revitalization of industrial sites. Specifically, Eni and CDP will evaluate the potential construction of new plants to produce fuel (such as bio-oil and biomethane) using organic municipal solid waste, closing the waste cycle in local areas, and promoting resource efficiency as part of a drive towards a broader circular economy. They will also look at constructing renewable energy plants in Italy, particularly at the potential to convert abandoned industrial sites and therefore minimize the use of land that could be used for other purposes.

8.4.13. Latvia

The Joint-stock Company Development Finance Institution Altum (AS "Attīstības finanšu institūcija Altum" – ALTUM)[93] is a state-owned enterprise. It provides efficient and professional support to specific target groups in the form of financial instruments (loans, guarantees, investments in venture capital funds, etc.) and non-financial instruments (consulting, training, mentoring, etc.). It also performs other functions delegated by the government. ALTUM was established on 15 April 2015, an integrated institution via the merger of three institutions until then providing support in the form of financial instruments (Latvian Development Finance Institution Altum (ALTUM), Latvian Guarantee

[91] https://sbci.gov.ie/

[92] https://www.cdp.it/sitointernet/en/homepage.page

[93] https://www.altum.lv/lv/

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Agency and Rural Development Fund). State aid in the form of financial instruments, until then provided by the above mentioned three separate institutions, is since 15 April 2015 provided by Development Finance Institution ALTUM. The State of Latvia owns ALTUM's shares. The holders of the shares are the Latvian Ministries of Finance, Economics and Agriculture. Altum provides a loan for the company's energy efficiency for sustainable transport - mobility, electric vehicles, biogas fuel. Amount of the loans could be up to 2 850 000 EUR, with up to 7 years term and annual interest rate from to 4.3% to 6.5%.[94]

8.4.14. Lithuania

INVEGA[95] is a state-owned entity. The main objectives of the entity's operations are as follows: provision of financial services and implementation and administration of financial and other support measures for SMEs. On 17 October 2018, the Republic of Lithuania granted the status of a national promotional institution to INVEGA; by the decision of the Supervision Service of the Bank of Lithuania, INVEGA was included on the List of National Promotional Institutions starting from 3 December 2018. INVEGA has established the subsidiary UAB Kofinansavimas engaged in incorporating and managing venture capital funds, investment of venture capital and investment, and financial consultancy. UAB Kofinansavimas manages the public venture capital fund Koinvesticinis Fondas. This fund intends to develop the Lithuanian venture capital market, educate new participants of the venture capital market and ensure better access to capital to new promising Lithuanian companies with limited access to business financing instruments offered by banks.

8.4.15. The Netherlands

The Netherlands Enterprise Agency (RVO)[96] encourages entrepreneurs in sustainable, agrarian, innovative, and international business. It helps with grants, finding business partners, know-how, and compliance with laws and regulations. RVO is a government agency that operates under the Ministry of Economic Affairs and Climate Policy's auspices.[97] Its activities are commissioned by the various Dutch ministries and the European Union. Netherlands Enterprise Agency is part of the Ministry of Economic Affairs. The organization is established in 2014 and results from a merger between NL Agency and the Dienst Regelingen. Some activities of the Commodities Boards are also included. RVO also manages subsidies under the Sustainable Energy Transition (SDE++). This subsidy is intended for companies and organizations (non-profit and otherwise) in industry, mobility, electricity, agriculture, and the built environment. A budget of € 5 billion is available, and renewable gas projects using biomass (from fermentation and gasification) can apply for a subsidy.

[94] https://www.altum.lv/en/services/enterprises/loans/a-loan-for-the-company-s-energy-efficiency/a-loan-for-the-company-s-energy-efficiency/
[95] https://invega.lt/en/about-invega/
[96] https://english.rvo.nl/about-us
[97] https://aecm.eu/the-netherlands-enterprise-agency-ministry-of-economic-affairs/

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8.4.16. Poland

Bank Gospodarstwa Krajoweg (BGK)[98] is Poland's state development bank, owned to 100% by the State. BGK was established in 1924 and reactivated in 1989 during the political transformation process. BGK's mission is to support Poland's social and economic growth and provide services to the public finance sector. It is supervised by the Ministry of Economic Development and overseen by the National Financial Supervision Authority. BGK enjoys a high rating of A- (Fitch), equal to the state. BGK supports investments, especially with long-term tenors, by offering various financial products to private and public sectors. BGK supports the SME sector, mainly in the form of guarantees and loans. In 2013 BGK launched a governmental large-scale guarantee program in the framework of which it grants to commercial banks portfolio guarantees for SME loans. BGK also cooperates with the European Investment Bank Group to support SMEs by providing portfolio guarantees to commercial banks counter-guaranteed by the guarantees of the European Investment Fund under COSME. This co-operation constitutes part of the activities of the European Fund for Strategic Investment.

The thermal rehabilitation grant scheme of the Bank Gospodarstwa Krajoweg supports building renovations, which increase energy efficiency or the use of renewable energy sources (incl. biogas) for heating purposes. Lenders may receive grants to pay off part of the loan taken out to implement such measures. Eligible measures shall reduce a building's annual energy demand, annual energy losses, or yearly costs of heat production or replace existing heat generation plants with renewable or high-efficiency CHP plants. The amount of grant is equal to 20% of the loan received to implement thermal rehabilitation undertakings. However, the subsidy may not exceed 16% of the total costs of the modernization work. It may not exceed twice the anticipated annual savings in energy costs identified in the energy audit.[99]

8.4.17. Romania

EximBank[100] is a specialized financial institution actively involved in supporting and promoting the Romanian business environment. Its financial instruments exclusive target to the corporate segment. EximBank is a partner for entrepreneurs looking to develop their businesses. Following the recent operational adjustments that support the bank's adaptation to the national and international challenges as well as its increase in efficiency and responsiveness to clients' needs, EximBank is now a complex financial institution having an accessible portfolio, available to any kind of company either SME or large company, involved in international transactions or only operating locally.

8.4.18. Serbia

Serbia plays a decisive role in political stability in South-Eastern Europe and is one of the most important partner countries for German Development Cooperation in the region. Germany accompanies Serbia above all on its way into the European Union. In one of its priority areas, KfW

98 https://www.bgk.pl/

99 http://www.res-legal.eu/search-by-country/poland/single/s/res-hc/t/promotion/aid/subsidy-thermo-modernisation-grants/lastp/175/

100 https://www.eximbank.ro/en/general-informations/

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Development Bank[101] supports Serbia in achieving the goals agreed with the EU in the energy sector, water supply, sanitation, and the waste and environmental sector. KfW also promotes sustainable economic development by providing credit lines for micro, small and medium-sized enterprises and municipalities.

Credit Agricole Serbia has signed on February 2020, an EUR 25 million loan agreement with KfW bank to finance projects in Serbia's energy efficiency and renewable energy sources. Entrepreneurs, small and medium-sized businesses, and agricultural producers will have the opportunity to get grants and free assistance from technical consultants who assess the project's feasibility and cost-effectiveness. The investment should be for renewable energy sources (biogas and solar power plants) or other efficiency measures (insulation for buildings, lighting replacement, heating system reconstruction). The clients need to submit a business plan. It will be used to determine if the investment secures a reduction of CO2 emissions or a reduction of primary energy consumption of at least 20%.[102]

8.4.19. Slovenia

SID - Slovenska izvozna in razvojna banka, d.d., Ljubljana (Slovene Export and Development Bank Inc.)[103] operates as a promotional, development, and export bank and as a national export credit agency which performs insurance against non-marketable risks. SID Bank was established in 1992 and performs promotional and development activities in the area of economic and development cooperation, entrepreneurship (mainly active in the area of SME financing), innovation, education, ecology, energy, and infrastructure, international trade, with the primary aim to cover market gaps in the mentioned areas. SID Bank is the SID Bank Group's parent company, which provides a wide and comprehensive range of services aimed at promoting competitiveness in international economic cooperation.[104] SID Bank provides financing of renewable energy sources, such as solar power, power from biomass and biogas, geothermal energy, wind power, and hydropower.[105]

8.4.20. Spain

Instituto de Crédito Oficial (ICO)[106] is a state-owned bank, attached to the Ministry of Economic Affairs and Competitiveness via the State Secretariat for Economy and Enterprise Support. The debts and obligations it enters into with third parties benefit from the explicit, irrevocable, unconditional, and direct guarantee of the Spanish state. ICO aims to promote economic activities contributing to growth, the country's development, and improving the distribution of the national wealth.[107] Particularly, those social, cultural, environmental, or innovative significance activities receive special attention. Apart from the Institute, the ICO Group comprises Axis, a venture capital firm, and the Fundación ICO.

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101 https://www.kfw-entwicklungsbank.de/International-financing/KfW-Development-Bank/Local-presence/Europe/Serbia/

102 https://balkangreenenergynews.com/credit-agricole-serbia-kfw-secure-eur-25-million-for-loans-for-energy-efficiency-renewables/

103 https://www.sid.si/en/about/about-sid-bank

104 http://www.nefi.eu/our-members/slovenia-sid/

105 https://www.sid.si/en/financing/areas-financing

106 https://www.ico.es/en/web/ico_en/what-ico-is

107 https://www.ico.es/web/ico/home

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Axis was the first venture capital firm to be established in Spain in 1986 and currently provides equity or quasi-equity instruments to companies to finance their growth. ICO also participates as a shareholder in other companies such as the Compañía Española de Reafianzamiento (CERSA) and the Compañía Española de Financiación del Desarrollo (COFIDES), as well as the European Investment Fund (EIF).

8.4.21. Sweden

The Almi Group[108] was founded in 1994 and is owned by the Swedish government and regional authorities.[109] Almi operates all over Sweden through 40 locations around the country. Almi has a complementary role in the Swedish market. The Almi operation aims to help develop and finance small and medium-sized businesses, thus promoting sustainable growth. Almi has customers in all commercial phases, from ideas to successful companies. It invests in ideas with potential for growth in the early stages and existing companies that are investing in growth and expansion. The basic concept is that customers receive the best possible service and expertise based on their needs. Almi is organized into two business areas: i) business development; and ii) venture capital. Almi offers loans to companies with growth potential and assists in their business development. This applies to businesses in the start-up phase as well as established companies. Almi Invest provides venture capital for early-stage, emerging companies with high growth potential, and a scalable business concept. For an example of the financing for a biogas-to-biomethane project, please refer to Chapter 7.7.6.

8.4.22. Switzerland

SIFEM (Swiss Investment Fund for Emerging Markets)[110] is the development finance institution of the Swiss Confederation. SIFEM encompasses investments primarily in local or regional funds and financial intermediaries to benefit SMEs, fast-growing companies, and private infrastructure projects in developing and emerging countries. SIFEM invests through shareholdings (risk capital) or loans and often in conjunction with other European development finance institutions. SIFEM is part of the Interact Climate Change Facility, an initiative of the European Development Finance Institutions (EDFI). The organization finances private sector projects in renewable energies and energy efficiency in developing and emerging countries.

8.4.23. Ukraine

The Ukrainian state-owned Ukrainian Bank for Reconstruction and Development JSC has been sold in 2016 Ukraine to the Tianjin Limited Liability Company Bohai Commodity Exchange (BOCE) of China. Therefore, Ukraine does not have a state development bank. Instead, international financial institutions play the role of a development bank: European Bank for Reconstruction and Development,

108 https://www.almi.se/en/almi-invest/

109 http://www.nefi.eu/our-members/sweden-almi/

110 https://sifem.ch/about-us/partners

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KfW, European Investment Bank, International Bank for Reconstruction and Development (World Bank).

As a consequence, the number of people living below the poverty line even increased over recent years. KfW Development Bank[111] supports Ukraine on behalf of the German Federal Government, especially in the following areas: Good governance, improvement of internally displaced persons, increased energy efficiency, support to the development of small- and medium-sized enterprises, vocational training, and nature conservation. The KfW bank supported the project SEEMLA (Sustainable exploitation of biomass for bioenergy from marginal lands in Europe) and the Round Table Discussion "Substitution of Natural Gas by alternative fuels in Ukraine".[112]

8.4.24. The United Kingdom

The British Business Bank[113] is a government-owned financial institution set up to support economic growth by making finance markets work better for smaller businesses in the UK[114]. It uses funding and guarantees backed by the UK government to bring more private sector resources into small business lending and investment. Smaller businesses don't obtain finance directly from the British Business Bank – it makes its impact from generating more activity by the private sector. The British Business Bank provides finance and applies guarantees through commercial lenders and investors, who use these financial resources – together with their own money – to lend to or invest in smaller UK businesses. It operates right across financial markets, from supporting early-stage equity funding, through the provision of growth capital, to senior debt for established SMEs, and will share in any returns on investments made. It then recycles these back into further lending and investment. Its commercial arm, British Business Investments[115], aims to earn a commercial return by investing debt and equity into finance providers to smaller businesses and small mid-caps on a fully commercial basis, without receiving any advantage from the government.

8.5. Selection of sources of capital by biomethane project types

Entrepreneurs developing biomethane projects may select capital sources (see contacts and application procedures in Appendix II and III), depending on the type of their biomethane projects. During the process of identification of potential capital sources, developers (owners) of biomethane projects are recommended to select sources of capital, according to the presented table:

111 https://www.kfw-entwicklungsbank.de/International-financing/KfW-Development-Bank/Local-presence/Europe/Ukraine/
112 https://saee.gov.ua/sites/default/files/Matiyuk.pdf
113 https://www.british-business-bank.co.uk/
114 http://www.nefi.eu/our-members/united-kingdom-bbb/
115 www.bbinv.co.uk

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Project type	Relevant financial institutions and funding sources
Agricultural biogas	National Rural Development Programme, EBRD, SEFF, KfW
Solid biomass	EBRD, SEFF, LIFE, KfW, Innovation Norway, private equity funds
Municipal biogas/biomethane	EIB, EBRD, EIF, CTF, BSTDB, World Bank, IFC, KfW, GEF, private equity funds
Landfill biogas/biomethane	GEF, EIB, EBRD, EIF, CTF, BSTDB, World Bank, KfW, IFC
Biomethane in transport	Connecting Europe, Horizon Europe, EBRD, LIFE
Waste-to-energy	EIB, EBRD, EIF, BSTDB, CTF, World Bank, IFC
Wastewater biomethane	GEF, EIB, EBRD, EIF, BSTDB, CTF, World Bank, IFC, private equity funds
Biomethane innovations	EIT Climate-KIC, LIFE, Innovation Fund, Innovation Norway

Table 15: Relevant financial institutions and funding sources for biomethane and biogas investment projects

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9. Forms of financial assistance by international financing institutions

The existing opportunities for financing of renewable energy projects have been realised by many International Financial Institutions (IFIs), and products to support sustainable energy investments have been developed over time. Many entrepreneurs are now aware of specific financial products available from IFIs to help the delivery and financing of renewable energy projects and biomethane projects.

Multilateral and bilateral agencies and IFIs are providing loans and grants to leverage capital from the private sector because the returns on biomethane projects are still not attractive enough at the point to create a fully commercial venture. Most project developers see a need for seed funding from these IFIs to help overcome the first-cost barriers associated with biomethane technologies, helping jumpstart their businesses.

Although the current profit margins for biomethane projects remain relatively small, there is a sense that there is great potential and that the margins will reach a point to attract large amounts of capital in the medium-term to long-term. As good business models are replicated and markets expand, the biomethane energy sector will mature and purely commercial ventures will likely replace aid-based ventures. Attention should be paid to programs where systems are introduced at below cost because this can seriously undermine the entrepreneur's efforts and can destroy any potential for a competitive market. What follows are detailed descriptions of the various programs and institutions that provide funding and support for renewable energy projects and are suitable for biomethane projects particularly.

9.1. Regional or country-specific IFI loans, or credit lines to local banks

9.1.1. EBRD SEFF Facility

The EBRD SEFF facility[116] partners with local financial institutions such as banks, to establish sustainable energy financing channels. These partnerships help direct more finance towards investment opportunities where energy and other resources are used more rationally. By integrating sustainable resource use into everyday investment opportunities, the EBRD SEFF facility stimulates competitiveness, autonomy, innovation, welfare, pollution mitigation, and climate resilience. Finance for sustainable energy projects is provided for two key areas: energy efficiency and small-scale renewable energy. Local financial institutions on-lend the funds they have received from the EBRD to their clients, including small and medium-sized businesses, corporate and residential borrowers, and renewable energy project developers.

In addition to financing, each SEFF establishes a Project Implementation Team comprising local and international experts supporting local financial institutions and their clients' participation. They

[116] http://seff.ebrd.com/about-seff.html

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undertake a range of activities, such as training staff in promoting the new financial product and recognising technically eligible projects, marketing of the facility, providing technical advice and studies, and supporting the creation of standards for environmental due diligence. These experts also provide borrowers with support in identifying energy-saving opportunities, developing financing applications, enhancing project design, and advising on high-performance technologies.

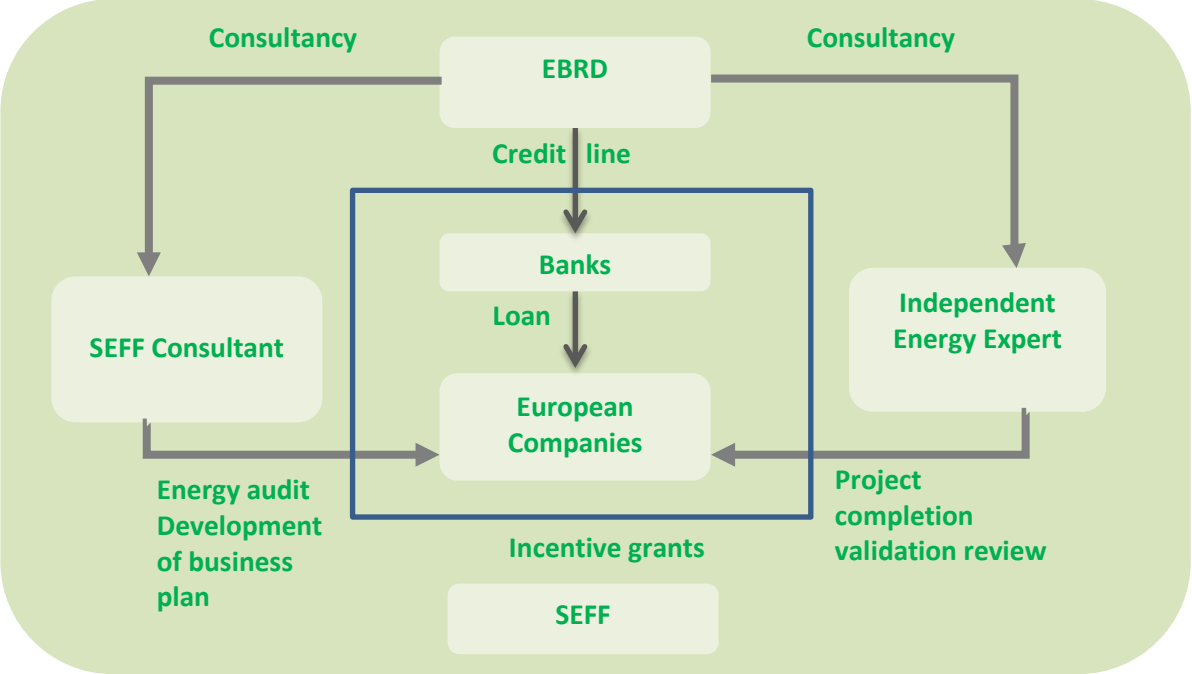

Chart 18: Chart SEFF structure and financing process

SEFF financing for businesses typically ranges from a few hundred thousand to a few million euros to support the purchase and installation of equipment, systems, or processes. Across the EBRD region, SEFF financing has supported diverse projects in virtually all sectors, ranging from agribusiness, food processing, and manufacturing to industry, construction, and services. Where necessary, the EBRD is working closely with donors to provide financing for the technical support and investment support to overcome affordability constraints and address cost and risk barriers.

9.1.2. EBRD Green economy financing facility (GEFF)

Green Economy Financing Facility (GEFF) [117] supports businesses and homeowners wishing to invest in green technologies. The GEFF programme operates through more than 140 local financial institutions across 26 countries supported by more than EUR 4 billion of EBRD finance. This has enabled more than 130,000 clients to collectively avoid almost 7 million tonnes of CO_2 emissions per year. GEFF goes beyond providing simple lines of finance. An experienced EBRD team of bankers and technical programme managers ensures consistent quality and innovation in the GEFF product and

[117] https://ebrdgeff.com/about-seff/

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service delivery. In addition, advisory services are available to help to participate of financial institutions and their clients enhance their market practices.

GEFF is also supported by a number of donors and provides finance for renewable energy projects (incl. biogas and biomethane) in: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Egypt, FYR Macedonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyz Republic, Moldova, Mongolia, Montenegro, Morocco, Poland, Romania, Russia, Serbia, Slovak Republic, Tajikistan, Turkey and Ukraine.

9.1.3. European investment bank (EIB) loan facility

European Commission presented at the end of May 2020 its proposal for a public sector loan facility[118] under the Just Transition Mechanism. The EIB loan facility is the third pillar of the Just Transition Mechanism. The facility will be implemented with the involvement of the European Investment Bank and will encourage investments that support the transition towards a climate-neutral economy by public sector authorities to the benefit of coal- and carbon-intensive regions. The facility will include €1.5 billion in grants from the EU budget and up to €10 billion in loans from the European Investment Bank's own sources. The facility will mobilize up to between €25 and €30 billion of investments for helping territories and regions most affected by the transition to a climate-neutral economy, prioritizing those with less capacity to deal with the costs of the transition.

The Just Transition Fund will provide funding primarily in the form of grants. However, the two other financing streams planned as part of the Just Transition Mechanism (InvestEU scheme and EIB public sector loan facility) will leverage public and private investment by backing financial partners' investment projects such as the EIB.

9.1.4. Western Balkans investment framework (WBIF)

The Western Balkans Investment Framework (WBIF)[119] is a regional blending facility supporting EU enlargement and socio-economic development in Albania, Bosnia and Herzegovina, Kosovo*[120], Montenegro, North Macedonia and Serbia. The WBIF provides financing and technical assistance to strategic investments in the energy, environment, social, transport, and digital infrastructure sectors. It also supports private sector development initiatives. The WBIF was established in 2009 as a joint initiative of the European Commission, the Council of Europe Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, and several bilateral donors. The World Bank Group, the KfW Development Bank and the AFD (Agence Française de

[118] https://www.eib.org/en/press/all/2020-130-commission-proposes-a-public-loan-facility-to-support-green-investments-together-with-the-eib

[119] https://www.wbif.eu/

[120] * This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

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Développement) subsequently joined the Framework. In December 2018, the AFD became a participating organization in the WBIF.

9.2. Regional technical assistance funds

9.2.1. Clean technology fund (CTF)

The Clean Technology Fund (CTF)[121] is part of the Climate Investment Funds (CIF) of the World Bank Group. The CTF promotes scaled-up deployment and transfer of clean technologies by funding low-carbon programs and projects that have significant potential for long-term greenhouse gas (GHG) emissions savings. It was established in 2008 and follows the principles outlined under the Revised CTF Results Framework and includes five core indicators that help determine whether and to what extent the CTF interventions achieve the proposed project/ program outcome objectives involving:

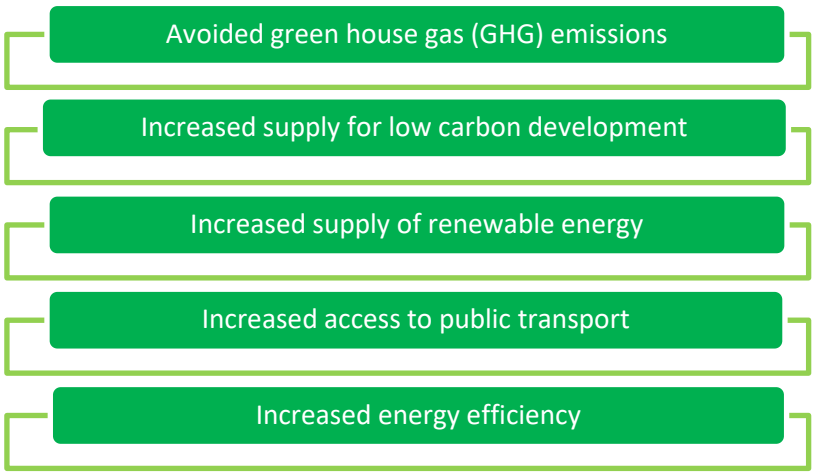

Chart 19: Chart of main funding program objectives of the Clean Technology Fund

Investments may include, among others, low carbon actions addressing the power sector (renewable energy, as well as increased efficiency in generation, transmission, and distribution); transportation (modal shifts to public transportation, improved fuel economy, and fuel switching); and large scale adoption of energy-efficient technologies and other demand management techniques in the industrial and commercial and residential building sectors.

9.2.2. EBRD's technical cooperation funds

[121] https://www.climateinvestmentfunds.org/sites/default/files/meeting-documents/ctf_governance_framework_revised_2014_0.pdf

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The Technical Cooperation Funds Programme (TCFP)[122] provides funding to improve the preparation and implementation of the EBRD's investment projects and provide advisory services to private and public sector clients. Each year the Programme provides about €80 million to finance the activities of a wide range of consultants and other experts. Through the TCFP, the EBRD has built a solid partnership with donors and clients in the Bank's countries of operations.

The programme enables the EBRD to: make thorough preparations for its investments, undertake its investments more effectively, pursue investment opportunities in higher-risk environments by reducing the credit risks, increase the impact of EBRD projects on the transition process by supporting structural and institutional changes assist legal and regulatory reform, institution-building, company management, and training. Technical cooperation funds for the renewable energy projects (incl. biogas and biomethane) are provided by the following sub-structures and co-operations under the EBRD's technical co-operation funds:

- Finance and Technology Transfer Centre for Climate Change (FINTECC)

The EBRD's FINTECC programme[123] is designed to transfer technology in climate change mitigation and adaptation and technology transfer to countries in transition. FINTECC (Finance and Technology Transfer Centre for Climate Change) is a programme that helps companies in participating EBRD countries of operations to implement innovative climate technologies. The FINTECC programme is active in seventeen countries in several areas within the overall EBRD region of operations.

- Japan-EBRD Technical Cooperation Fund

Japan is the second-largest shareholder of the EBRD and is the largest bilateral contributor to the Bank's Technical Cooperation Funds Programme.[124] To date, Japan has contributed over €135 million to this programme, which improves the investment climate in the Bank's countries of operations and prepares the way for future EBRD investment. The EBRD administers the Fund with its standard rules and procedures for technical co-operation operations.

- Central European Initiative (CEI) Fund

In 1992 the Italian Government established the Central European Initiative (CEI) Fund[125] at the European Bank for Reconstruction and Development (EBRD), acknowledging the great opportunity the newly created multilateral development bank presented for the CEI's objectives. The Fund was created "to assist the Bank's countries of operation in central and eastern Europe in their economic and social transformation process." Since its inception, Italy has allocated 47.5 million EUR

[122] https://www.ebrd.com/Search.html?srch-term-user=Technical+Cooperation&srch-term=Technical%2520Cooperation&srch-pg=srch&srch-type=all&pg=1&sort=relevant
[123] http://fintecc.ebrd.com/index.html
[124] https://www.ebrd.com/downloads/research/brochures/japan.pdf
[125] https://www.cei.int/cei-fund-ebrd

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to the Fund. Through its Technical Cooperation Programme, the Fund offers grant-type assistance to support specific components of investments and operations of the EBRD. Since its inception, the technical cooperation activities include support for the feasibility and pre-feasibility studies, sector and environmental engineering, management training, capacity building, pre-loan audits.

In 2019 the CEI fund granted to Modus Energy EUR 59,775 for technical due diligence about 4 biogas power plants in Belarus.[126] Furthermore, the CEI fund is a financial contributor to the European Technology and Innovation Platform activities on Bioenergy (formerly, European Biofuels Technology Platform - EBTP). ETIP Bioenergy has been supporting the development of cost-competitive bioenergy, advanced biofuels and renewable fuels value chains. In the medium-term perspective, these are the only renewable energy carriers that can significantly contribute to the decarbonisation of the transport sector, particularly in heavy-duty road transport and aviation.

9.3. Country grant funds

9.3.1. LIFE programme for the environment and climate action 2014-2020

The LIFE Programme for Environment and Climate Action 2014-2020[127], with a budget of € 864 million, is dedicated to addressing climate change challenges across the EU. For the next long-term EU budget for 2021-2027, the Commission proposes increasing funding by almost 60% for LIFE.[128] The funding will focus on protecting the environment and mitigating climate change, supporting a clean energy transition with increased energy efficiency, and a higher share of renewables in the energy mix. This will be one of the tools enabling the EU to meet its climate goals and seek to become climate-neutral by 2050.

An example of the project support funded through LIFE is the EffiSludge[129] of the Biokraft AS[130] from Norway, that in 2018 inaugurated the world's largest liquefied biomethane plant. The aim is to implement the integrated operation condition allowing energy and chemicals saving for the wastewater treatment plant processing effluents from the pulp mill. EffiSludge is a joint project between Biokraft, Scandinavian Biogas and Norske Skog.

LIFE Programme for Environment and Climate Action supports the implementation of EU climate policy's strategic priorities, including Climate Change Adaptation. The programme aims explicitly: 1) to support the development and implementation of adaptation policies, including mainstreaming across policy areas; 2) to improve the knowledge base for the development, assessment, monitoring,

126 https://www.cei.int/sites/default/files/publications/downloads/CEI%2520Fund%2520at%2520the%2520EBRD_AR2019_final.pdf

127 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2013.347.01.0185.01.ENG

128 https://ec.europa.eu/commission/presscorner/detail/en/IP_19_1434

129 EffiSludge Project: https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5253&docType=pdf

130 https://bioenergyinternational.com/biogas/biokraft-inaugurate-worlds-largest-liquefied-biomethane-plant

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evaluation, and implementation of adaptation measures; 3) to facilitate the development and implementation of integrated approaches; and 4) to contribute to the development and demonstration of innovative climate change adaptation technologies, systems, methods and instruments.

There are a number of instruments through which adaptation-related projects are implemented:

- Traditional projects (action grants) for climate-resilient action with demonstrative, best practice or pilot nature, as well as information, awareness, and dissemination projects that promote awareness-raising.
- Integrated projects on a large territorial scale (regional, multi-regional, national or trans-national) implementing climate plans or strategies required by specific Union legislation, developed according to other Union acts or developed by Member States' authorities, ensuring involvement of stakeholders and coordination with and mobilisation of at least one other relevant Union, national or private funding source. Technical Assistance is available for the preparation of integrated projects.
- The Natural Capital Financing Facility (NCFF), a financing instrument managed by the European Investment Bank.
- Operational grants to non-governmental organisations (NGOs) operating in the field of climate action and policy development at European level.

The LIFE Multiannual Work Programme 2018-2020 dedicates €123,85 million to Climate Change Adaptation. Applicants may be public bodies, private commercial organisations, and private non-commercial organisations. The European Commission announced in February 2020 an investment of €101.2 million for the latest projects under the LIFE programme for the Environment and Climate Action. The funding will support 10 large-scale environment and climate projects in nine Member States, helping Europe's transition to a sustainable economy and climate neutrality. These projects are located in Cyprus, Estonia, France, Greece, Ireland, Latvia, Slovakia, Czechia, and Spain.

9.3.2. EIT climate-KIC

EIT Climate-KIC[131] is a Knowledge and Innovation Community (KIC), working to accelerate the transition to a zero-carbon, climate-resilient society. Climate-KIC is Europe's largest public-private innovation partnership, working together to address the challenge of climate change. The aim is to drive innovation in climate change through creative partnerships, large and small, local, and global, between the private, public, and academic sectors. The main office is located in the City of London, UK. An example of a project that received funding from the EIT Climate-KIC is 'Alchemilla' in France in 2016. The project's main target was to collect and recycle biomethane from the slurry pits on several farms[132]. AgroParisTech coordinated the project work in partnership with Air Liquide and Nénufar

131 https://www.climate-kic.org/who-we-are/what-is-climate-kic/

132 https://www.agrisource.org/en/7_113/5c332f7107c805cd14cf5e9f/Alchemilla%20.html

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between May 2016 and December 2016. The project validated the technical and economic feasibility of such a biomethane production configuration for injection into the natural gas network.

Another interesting project funded by the EIT Climate-KIC is 'Biogas ETC' of the Netherlands based Utrecht Sustainability Institute. The project goal is to transform agricultural waste into biogas economically viable on a small scale, allowing farmers in remote locations to create and market biogas, increase their income, and reduce their greenhouse gas emissions[133]. This will be achieved by developing a small-scale gas upgrading system with relatively low running costs, which could be installed on individual farms to create a high-quality fuel from their waste products, suitable for transportation or injection into the gas grid. The system could be made available to smaller and less profitable farms on a rental basis to reduce investment risk.

9.3.3. The national rural development programme

The National Rural Development Programme offers subsidy programmes in the agricultural sector: Measure 4 "Investment in physical assets". These promote, amongst others, the use of renewable energy sources for the applicant's own consumption. The subsidy measure 4, encompassing the sub-measures 4.1. and 4.2., is part of the National Rural Development Programme and it is financed by the European Agricultural Fund for Rural Development (EAFRD). The National Rural Development Programme's new financing period operates from 2014 to 2020. The programme targets are to promote the use of renewable energy sources for the farm's own consumption.

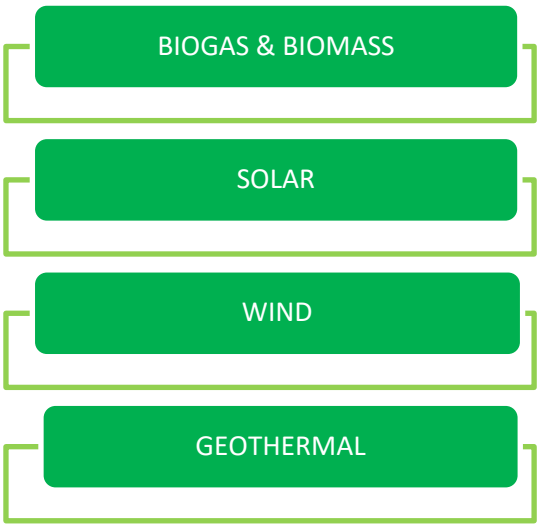

Chart 20: Eligible renewable energy technologies for financing under National Rural Development Programme

Under the current call for proposals, the subsidy programme's total budget is € 150,000,000. The subsidy is to a certain percent (30 to 50%) irredeemable. The percentage depends on the size of the

133 https://biogas-etc.eu/the-project/

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farm or the project. The maximum eligible sum is € 2 million (Call for proposals – Measure 4). Eligible applicants are farmers and agricultural cooperatives. On the above chart are illustrated the eligible renewable energy technologies. The responsible and competent authority for application under the National Rural Development Programme for each of the EU member states usually is the respective Ministry of agriculture or equivalent.

9.3.4. Horizon 2020 and Horizon Europe

Horizon 2020[134] is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative to secure Europe's global competitiveness. Horizon 2020 reflects the Europe 2020 strategy's policy priorities and addresses major concerns shared by citizens in Europe and elsewhere through a challenge-based approach. Horizon 2020 was the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. Approximately 35% of the Horizon 2020 budget have been allocated for climate-related expenditure.

Through the Horizon 2020 have been funded projects like i) BIOSURF (BIOmethane as SUstainable and Renewable Fuel)[135] with goal to increase the production and use of biomethane (from animal waste, other waste materials, and sustainable biomass), for grid injection and as a transport fuel, by removing non-technical barriers and by paving the way towards a European biomethane market; ii) Bin2Grid[136] with a goal to turn unexploited food waste into biomethane supplied through local filling stations network. The overall objective of Bin2Grid is to promote the segregated collection of food waste as energy source, conversion to biogas, and its upgrading to biomethane and utilization in an associated network of filling stations; ii) ISAAC (Increasing Social Awarness and ACceptance of biogas and biomethane) with the main goal to remove non-technical barriers, such as lack of public acceptance and coordination for the biogas facilities diffusion, normative and legislative inadequacies, to support biogas/biomethane market penetration in Italy and make plants implementation easier within the national context; iv) UBI[137] project developed cutting-edge technology for upgrade of biogas to biomethane in a cost- and energy-efficient for small-scale biogas plants upgrading; v) other projects.

The Commission has published its proposal for Horizon Europe[138], an ambitious €100 billion research and innovation programme that will succeed Horizon 2020. The proposal was made as part of the EU's proposal for the next EU long-term budget, the multiannual financial framework (MFF). The EU institutions reached a provisional agreement on Horizon Europe on 20 March 2019. The European Parliament endorsed the provisional agreement on 17 April 2019.

134 https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020

135 http://www.biosurf.eu/en_GB/

136 https://cordis.europa.eu/project/id/646560

137 https://cordis.europa.eu/article/id/422513-cutting-edge-technology-upgrades-biogas-to-biomethane-in-a-cost-and-energy-efficient-way

138 https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme/commissions-proposal-horizon-europe_en

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9.3.5. Connecting Europe facility

The Connecting Europe Facility (CEF)[139] is a key EU funding instrument to promote growth, jobs, and competitiveness through targeted infrastructure investment at the European level. It supports the development of high performing, sustainable, and efficiently interconnected trans-European networks in transport, energy, and digital services. CEF investments fill the missing links in Europe's energy, transport, and digital backbone. The CEF benefits people across all Member States. It makes travel easier and more sustainable. It enhances Europe's energy security while enabling more extensive use of renewables, and it facilitates cross-border interaction between public administrations, businesses, and citizens.

The 2020 CEF Energy call for proposals makes € 979.6 million available to finance projects of common interest. On the 20th of July, 2020, Titan LNG, one of the leading suppliers of LNG to the marine and industrial markets in Europe, has been granted € 11.000.000 funding from the EU's Connecting Europe Facility (CEF)[140]. Titan's Bio2Bunker project develops and expands a (Bio)-LNG (BLNG) bunkering supply chain by introducing three bunker barges in Zeebrugge, Rotterdam, and Lübeck.

In addition to grants, the CEF offers financial support to projects through innovative financial instruments such as guarantees and project bonds. These instruments create significant leverage in their EU budget use and act as a catalyst to attract further funding from the private sector and other public sector actors. To apply for funding, you have to check for an open call on the web site of Innovation and Networks Executive Agency at the Connecting Europe Facility section[141].

9.4. Country guarantee funds

9.4.1. Pan-European guarantee fund

The Board of Directors of the European Investment Bank (EIB) has on 26 May 2020 agreed on the structure and business model of the new Pan-European Guarantee Fund[142] to tackle the economic consequences of the Covid-19 pandemic. The European Council on 23 April endorsed the Fund as part of the overall EU Covid-19 response package.

All 27 EU Member States have been invited to contribute to the Pan-European Guarantee Fund (EGF), with a share of € 25 billion equal to their share of EIB capital. The Fund will become operational as soon as Member States accounting for at least 60% of EIB capital have signed their contribution agreements and a Contributors Committee has been set up. The Contributors Committee will decide

139 https://ec.europa.eu/inea/en/connecting-europe-facility/cef-energy/calls/2020-cef-energy-call-proposals

140 https://titan-lng.com/titan-lngs-ambitious-bio-lng-breakthrough-project-receives-eu-funding/

141 https://ec.europa.eu/inea/en/connecting-europe-facility

142 https://www.eib.org/en/press/all/2020-126-eib-board-approves-eur-25-billion-pan-european-guarantee-fund-to-respond-to-covid-19-crisis

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on the use of the guarantee. EIB Group rules will apply for all Fund operations, including, for example, the new Energy Lending Policy approved in 2019.

Member State contributions to the EGF will take the form of guarantees and may include an upfront payment. Such guarantees will cover losses incurred in the operations supported by the EGF. Any losses will be borne pro rata by the participating Member States. The fund will initially approve operations until the end of 2021, but the Member States can extend this period. It will enable the EIB Group to scale up its support for mostly small and medium-sized European companies, mobilizing up to € 200 billion of additional financing.

The EGF will provide finance to viable companies in the long-term but are struggling in the current crisis. At least 65% of the financing are earmarked for SMEs. A maximum of 23% will go to companies with 250 or more employees, with restrictions applying to larger companies with more than 3,000 staff. A maximum of 5% of the financing can go to public sector companies and entities active in health or health-research or provide essential services related to the health crisis. Another 7% of EGF-supported financing can be allocated to venture and growth capital and venture debt to support SMEs and midcaps.

9.4.2. COSME - loan guarantee facility (LGF)

Through COSME LGF[143], EIF offers guarantees and counter-guarantees, including securitisation of SME debt finance portfolios, to selected financial intermediaries (e.g., guarantee institutions, banks, leasing companies, etc.) in all EU member states to help them to provide more loans and leases to SMEs. By sharing the risk, COSME guarantees allow the financial intermediaries to expand the range of SMEs they can finance, facilitating access to debt finance for many SMEs who might be having difficulties in accessing the traditional banking system. The EIF and EC are launching specific COVID-19 support under the COSME Loan Guarantee Facility (COSME LGF), supported by the European Fund for Strategic Investments (EFSI). Under this scheme, the EIF will provide enhanced terms and conditions for guarantees and counter-guarantees to incentivize financial intermediaries to provide working capital financing to European SMEs hit by the economic impact of the coronavirus pandemic. These guarantees are open to existing financial intermediaries (i.e., those already operating under COSME LGF) and new applicants.

9.4.3. Horizon 2020 guarantee fund

The Horizon 2020 Guarantee Fund[144] is similar to an insurance scheme for all H2020 beneficiaries by providing security against certain defaults in payment. The beneficiaries' liability towards the EU Commission/funding agency is thus limited to their debts. The settlement of financial claims between project participants requires an internal solution within the consortium. Five percent of the maximum EU grant is deducted from the pre-financing payment at the start of the project and paid into the Guarantee Fund. This amount will be invested profitably and transferred to the coordinator at the end of the action. The Guarantee Fund uses proceeds from interest to intervene in the event of

143 https://www.eif.org/what_we_do/guarantees/single_eu_debt_instrument/cosme-loan-facility-growth/index.htm

144 https://www.ffg.at/en/europe/legalandfinancialmatters/h2020_guarantee-fund

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defaults in payment. It is expected Horizon 2020 Guarantee Fund to be continued in the new Horizon Europe framework 2021 – 2027.

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10. Selected financing actors dedicated to biomethane financing

This chapter contains detailed descriptions of the main financing actors that provide funding and support for renewable energy projects.

10.1. EBRD

The European Bank for Reconstruction and Development (EBRD) is an international financial institution founded in 1991[145]. As a multilateral developmental investment bank, it was initially focused on the countries of the former Eastern Bloc, but it expanded to support development in more than 30 countries from Central Europe to Central Asia. It has since played a historic role and gained unique expertise in fostering change in the region - and beyond - investing more than €145 billion in a total of over 5,700 projects. Headquartered in London, the EBRD is owned by 69 countries and two EU institutions.

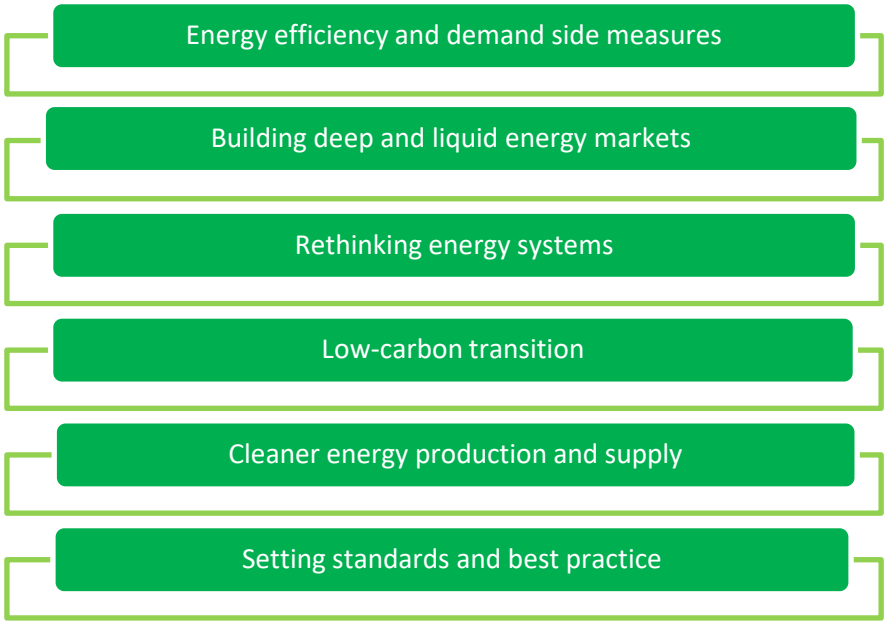

Chart 21: Main pillars of EBRD's response to energy transition challenges

The EBRD's vision for the development of the energy sector is of a partnership between industry, governments, and consumers that delivers the essential energy needs of societies and economies in a manner that is sustainable, reliable, and at the lowest possible cost[146]. The EBRD and the Global

145 https://en.wikipedia.org/wiki/European_Bank_for_Reconstruction_and_Development

146 https://www.ebrd.com/what-we-do/sectors-and-topics/power-and-energy-overview.html

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Environment Facility (GEF) started in the Q4 of 2019 programme „Ukraine: Sustainable Bioenergy Value Chain Innovations“[147]. The Programme shall provide investments in innovative bioenergy technologies (including biogas and biomethane)[148] and practical ways of agricultural residues and waste usage through promoting and sustainable bioenergy value chain development. The Programme's initial budget amounts to EUR 47.9 million ($ 55.8 million). Furthermore, the EBRD is considering the possibility of other donors' involvement[149].

10.2. European structural and investment funds (ESIF)

Over half of EU funding is channeled through the 5 European structural and investment funds (ESIF)[150]. They are jointly managed by the European Commission and the EU countries. The purpose of all these funds is to invest in job creation and a sustainable and healthy European economy and environment. The ESIF mainly focuses on five areas: i) research and innovation; ii) digital technologies; iii) supporting the low-carbon economy; iv) sustainable management of natural resources, and v) small businesses.

The 5 European structural and investment funds are:

European regional development fund (ERDF)[151] – promotes balanced development in the different regions of the EU. For ERDF, the inclusion of an additional EUR 47.5 billion from the Next Generation EU fund, the EU has allocated more than EUR 370 billion to its economic, social, and territorial cohesion policies for the 2021-2027 period[152].

The biomethane project produced from farming waste supplied by neighboring farms was co-funded by the European Regional Development Fund (ERDF) in 2013 with the amount of € 195,000. AgriBioMéthane (ABM) in France is a company created and supported by 4 farms from the Vendée region. Due to the contribution of the ERDF, it has a biomethane unit operating since 2014 that produces biogas from livestock manure and agri-food industry waste. Purified thanks to a technology called "Pressure Swing Adsorption", it turns to biomethane, and 447,209 Nm3 has been produced

147 https://saf.org.ua/en/news/853/

148 https://en.interfax.com.ua/news/economic/538260.html

149 https://www.ebrd.com/work-with-us/projects/tcpsd/12114.html#:~:text=The%20EBRD%20intends%20to%20launch,significant%20greenhouse%20gas%20emissions%20reductions.&text=Developing%20an%20action%20plan%20for,National%20Energy%20Strategy%20of%20Ukraine.

150 https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/european-structural-and-investment-funds_en#investmentareas

151 https://ec.europa.eu/regional_policy/en/funding/erdf/

152 https://www.fi-compass.eu/esif/erdf

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during the first year of functioning. The biomethane is consumed locally by a big bakery, but certificates of origin (to identify and record biogas) are sold to local authorities[153].

European social fund (ESF)[154]- supports employment-related projects throughout Europe and invests in Europe's human capital – its workers, its young people, and all those seeking a job.

Cohesion fund (CF)[155] – funds transport and environment projects in countries where the gross national income (GNI) per inhabitant is less than 90% of the EU average. In 2014-20, these are Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, and Slovenia.

European agricultural fund for rural development (EAFRD)[156] – focuses on resolving the particular challenges facing the EU's rural areas.

European maritime and fisheries fund (EMFF)[157] – helps fishermen to adopt sustainable fishing practices and coastal communities to diversify their economies, improving quality of life along European coasts.

About 80% of the EU funding is granted through programmes managed in the EU countries themselves. Where the European Commission (EC) directly manages funding, it does so by awarding grants, launching tendering procedures, etc. The more information on how to apply for the available EU funding programs managed by the EC, you will read at the 'Funding and Tenders'[158] section of the EC's web portal. You are allowed to browse funding opportunities by topic[159] or to search for the available funding programs[160]. In the beginning, it is recommended to get familiar with key steps in an application for EU funding programs[161].

153 https://www.interregeurope.eu/policylearning/good-practices/item/2484/biomethane-from-anaerobic-digestion-of-agricultural-wastes/

154 https://ec.europa.eu/esf/home.jsp?langId=en

155 https://ec.europa.eu/regional_policy/en/funding/cohesion-fund/

156 https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development

157 https://ec.europa.eu/fisheries/cfp/emff/

158 https://ec.europa.eu/info/funding-tenders/how-eu-funding-works/how-get-funding/find-funding-opportunity_en

159 https://ec.europa.eu/info/funding-tenders/funding-opportunities/find-calls-funding-topic_en

160 https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes_en

161 https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/how-to-participate/1/1

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10.3. The European fund for strategic investments (EFSI)

The European Fund for Strategic Investments – the EFSI[162] – is the central pillar of the Investment Plan for Europe. It aims to tackle the lack of confidence and investment resulting from the economic and financial crisis, and to make use of liquidity held by financial institutions, corporations, and individuals when public resources are scarce.

The Commission works together with its strategic partner, the European Investment Bank (EIB) Group. The EFSI supports strategic investments in key areas such as infrastructure, energy efficiency, and renewable energy, research and innovation, environment, agriculture, digital technology, education, health, and social projects. It also helps small businesses to start-up, to grow, and to expand by providing risk finance. The EFSI is an EU-budget guarantee providing the EIB Group with first loss protection. This means that the EIB Group can provide financing to higher-risk projects than they usually would. An independent Investment Committee uses strict criteria to decide whether a project is eligible for EFSI support. There are no quotas – by sector or by country. Financing is purely demand-driven.

10.4. European investment bank (EIB)

The European Investment Bank (EIB)[163] is the lending arm of the European Union. This is the biggest multilateral financial institution globally and one of the largest providers of climate finance. An example of the country level's contribution is the agreement between the EIB and Greek banks signed on the 30th of September, 2019 to provide EUR 650 million for essential infrastructure investments. Sustainable projects shall be considered for investment under the new Fund of Funds scheme, including biomass and biogas plants. Another example of financing provided to the private equity fund comes from France. The EIB signed an agreement on the 6th of July 2020 to provide EUR 50 million to the Eiffel Biogas Fund (see Chapter 8.3.3.) to focus on production units where primary feedstock are agricultural by-products (cattle manure, pig slurry, etc.)[164]. This fund will invest in biomethane projects, transport, storage, and distribution of Bio-LNG.

The EIB Group has two parts:

- the European Investment Bank
- the European Investment Fund (EIF)

[162] https://ec.europa.eu/commission/priorities/jobs-growth-and-investment/investment-plan-europe-juncker-plan/european-fund-strategic-investments-efsi_en

[163] https://www.eib.org/en/index.htm

[164] https://www.eib.org/en/projects/pipelines/all/20190771

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The European Investment Fund (EIF) [165] specialises in finance for small businesses and mid-caps. The fund has more than 60 years' experience and expertise in project financing. Headquartered in Luxembourg, it has a network of local and regional offices in Europe and beyond.

The European Investment Fund EIF is not directly financing and investing in SMEs. The EIF supports Europe's SMEs by improving their access to finance through a wide range of selected financial intermediaries (banks, equity investment funds, national government programs, etc.). To this end, the fund designs, promotes, and implements equity and debt financial instruments that specifically target SMEs. Some useful links for access to equity finance and venture capital are:

- Equity finance of EIF: https://www.eif.org/what_we_do/equity/index.htm
- EIF for Venture Capital & Private Equity funds (how to submit an investment proposal):
    - Venture Capital Equity Funds:

      https://www.eif.org/EIF_for/venture_capital_equity_funds/index.htm
    - SME finance: https://www.eif.org/EIF_for/sme_finance/index.htm
- EIF-NPI Equity Platform: https://www.eif.org/what_we_do/equity/NPI/index.htm

10.5. The EEA and Norway grants (Innovation Norway)

Iceland, Liechtenstein, and Norway fund the EEA and Norway Grants. The Grants have two goals – to contribute to an equal Europe, both socially and economically – and to strengthen the relations between Iceland, Liechtenstein and Norway, and the 15 beneficiary countries in Europe (Bulgaria, Croatia, Czech Republic, Cyprus, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, and Slovenia). The objective of the Grants is to reduce social and economic disparities and strengthen bilateral relations. The EEA Grants are funded jointly by all three donor countries – Iceland, Liechtenstein, and Norway. The donor countries contribute according to their size and GDP – Norway provides approximately 95.8%, Iceland 3%, and Liechtenstein 1.2%. During the 2014-2021 funding period, the EEA Grants amount to €1.5 billion.

The Norway Grants are funded by Norway alone shall consist of €1.3 billion during the 2014-2021 funding period and target to improve and make positive change to the environment, energy, climate change and low carbon economy in the beneficiary countries[166]. A reference case of a project funded in 2016 by EEA Grants with a contribution of € 359,893 in Hungary is the 'Environmentally friendly

[165] https://www.eif.org/

[166] https://eeagrants.org/topics-programmes/environment-energy-climate-change-and-low-carbon-economy

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utilisation of thermal water rich in salt and methane in a zero-emission system' [167]. This project's primary goal is to use the thermal water in a two-unit system that is sustainable in both environmental and economic sense. The first unit is a gas engine that utilizes the thermal water's methane content to gain electricity. The second unit is an algae bioreactor that utilises the nutrients of the gas engine's combustion gases.

[167] https://eeagrants.org/archive/2009-2014/projects/HU09-0003

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11. Selected financing actors, EU institutions, IFIs and technical assistance funds supporting renewable energy

11.1. World bank

The World Bank Group (WBG)[168] works in every major area of development. The bank provides a wide array of financial products and technical assistance to help countries share and apply innovative knowledge and solutions to the challenges they face. Established in 1944, the World Bank Group is headquartered in Washington, D.C. We have more than 10,000 employees in more than 120 offices worldwide. Since 1947, the World Bank has funded over 12,000 development projects via traditional loans, interest-free credits, and grants. The WBG supports and finances all forms of renewable energy, depending on the country's resource endowment, institutional and technical capacity, policy environment, availability of financing for cost differences, and trade-off. The bank also provides or facilitates financing through trust fund partnerships with bilateral and multilateral donors. The World Bank Group comprises five institutions managed by their member countries.

11.1.1. International bank of reconstruction and development (IBRD)

The International Bank for Reconstruction and Development (IBRD)[169] is a global development cooperative owned by 189 member countries and is part of the World Bank Group's structure. As the largest development bank globally, it supports the World Bank Group's mission by providing loans, guarantees, risk management products, and advisory services to middle-income and creditworthy low-income countries and coordinating responses to regional and global challenges. Through its partnership with MICs and creditworthy poorer countries, IBRD offers innovative financial solutions, including financial products (loans, guarantees, and risk management products) and knowledge and advisory services (including on a reimbursable basis) to governments at the national and sub-national levels. IBRD finances investments across all sectors and provides technical support and expertise at each stage of a project.

11.1.2. International finance corporation (IFC)

International Finance Corporation (IFC)[170] — a sister organization of the World Bank and a member of the World Bank Group — is the largest global development institution focused on the private sector in developing countries. IFC works with the private sector in developing countries to create markets that open up opportunities for all. The Bank Group has set two goals for the world to achieve by 2030: end extreme poverty and promote shared prosperity in every country. IFC leverages provided products and services—as well as products and services of other institutions across the World Bank

168 https://www.worldbank.org/en/about/what-we-do

169 https://www.worldbank.org/en/who-we-are/ibrd

170 https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/about+ifc_new

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Group—to create markets that address the biggest development challenges of our time. IFC applies the available financial resources, technical expertise, global experience, and innovative thinking to help our clients and partners overcome financial, operational, and other challenges. IFC is also a leading mobilizer of third-party resources for projects. The willingness of this arm of World Bank Group to engage in challenging environments and their leadership in crowding-in private finance allows to extend the footprint and have a development impact well beyond their direct resources.

11.1.3. International development association (IDA)

Funds of the International Development Association (IDA)[171] are allocated to the recipient countries in relation to their income levels and record of success in managing their economies and their ongoing IDA projects. IDA's lending terms are highly concessional, meaning that IDA credits carry no or low-interest charges. The lending terms are determined regarding recipient countries' risk of debt distress, the level of GNI per capita, and creditworthiness for the International Bank for Reconstruction and Development (IBRD). IDA-financed operations address primary education, essential health services, clean water and sanitation, environmental safeguards, business climate improvements, infrastructure, and institutional reforms. These projects pave the way toward economic growth, job creation, higher incomes, and better living conditions.

11.1.4. International centre for settlement of investment disputes (ICSID)

ICSID offers services for resolving international disputes, primarily between investors and States, and in State-to-State disputes. In addition, it provides fact-finding proceedings to examine and report on facts before a dispute arises. The Centre is also available to act as an administrative registry for investment treaties and free trade agreements. As a non-profit organization, ICSID can provide a cost-effective and transparent fee structure for its services. It offers first-class hearing facilities at World Bank premises around the world at no additional cost.

11.1.5. Global environment facility (GEF)

The **Global Environment Facility (GEF)**[172] is established in 1992. The GEF unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. Since 1992, the GEF has provided close to $20.5 billion in grants and mobilized an additional $112 billion in co-financing for more than 4,800 projects in 170 countries. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, persistent organic pollutants (POPs), mercury, sustainable forest management, food security, sustainable cities. The funding for projects is available through national governments.

171 https://ida.worldbank.org/financing/ida-financing

172 https://www.thegef.org/

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GEF projects and programs are managed through the three implementing agencies: i) the United Nations Development Programme (UNDP); ii) the United Nations Environment Programme (UNEP), and iii) the World Bank. In most cases, the GEF provides funding to support government projects and programs. Governments decide on the executing agency (governmental institutions, civil society organizations, private sector companies, research institutions) to manage the distribution of funds to the applicants. An example of the GEF's support is the EUR 6 million (US$7 million) of grant funding provided to the EBRD's FINTECC programme for Ukraine in 2016 for technical support to biogas and other renewable energy projects.

11.2. Black Sea trade and development bank (BSTDB)

The Black Sea Trade and Development Bank (BSTDB)[173], an international financial institution with headquarters in Thessaloniki, Greece, was established by Albania, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Moldova, Romania, Russia, Turkey, and Ukraine. BSTDB started operations in June 1999 and has an authorized capital of €3.45 billion. The Bank supports economic development and regional cooperation in the Black Sea Region through trade and project finance lending, guarantees, and equity participation in private enterprises and public entities in the member countries. BSTDB is rated A-/A-2 by Standard & Poor's, and A2/P1 by Moody's.

An example of a project funded by BSTDB is the long-term corporate loan in 2014 to Terna Energy S.A. (Greece) in the amount of Euro 8,5 million with the use of proceeds earmarked for implementation of the borrower's investment program involving the construction and operation of 8 biogas power plants in Greece. The proposed loan supported Terna's Energy investments in the biogas sector[174].

11.3. EU institutions

The fundamental issue in stimulating investment in the biogas/biomethane sector is to create a coherent and well-communicated market among financial institutions. The conditions should assure (amongst others) not crowding out available financing sources, using adequate levels of public finance intensity, and facilitating the interest of private funding to participate in the market by reducing the risk. Using European financial institutions and EU funds to stimulate more private financing institutions' participation can also be essential to trigger a sustainable biomethane market. The leading financial institutions of the European Union are the following:

11.3.1. Main financial institutions of the EU (ECB, EIB, and EIF)

- **European Central Bank (ECB)**

[173] https://www.bstdb.org/who-we-are

[174] https://www.bstdb.org/our-projects/project-search/project-summary?ProjectID=OP/14/0007

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The European Central Bank (ECB) is founded in 1988 and located in Frankfurt (Germany) is one of the main institutions of the EU. The ECB's primary tasks are to maintain price stability in the Eurozone and the purchasing power of the euro and support economic policies contributing to a high level of employment and sustainable growth. The ECB's primary functions are the definition and implementation of monetary policy for the euro area, the conduct of foreign exchange operations, the holding and management of the official foreign reserves of the euro area countries, and the promotion of the smooth operation of payment systems. Together with central banks of all Member States, the ECB comprises the European system of central banks and conducts cooperation of central banks of the Eurozone countries comprising the Eurosystem.

- **European Investment Bank (EIB)**

The European Investment Bank (EIB) was established by the Treaty of Rome in 1958 in Luxembourg. The EIB provides long-term loans and guarantees for investment projects.

- European Investment Fund (EIF)

The European Investment Fund (EIF) was established in Luxembourg in 1994. The EIF is owned by the European Investment Bank (principal shareholder), European Commission, and a number of European public and private financial institutions. The main purpose of the EIF is to support small and medium-sized enterprises by providing risk capital and guaranties. The EIF does not finance the companies directly, but through various financial intermediaries – financial institutions, banks, private equity funds, etc. The EIF carries out its activities in the EU Member States, in EU candidate and potential candidate countries, and in the European Free Trade Association member countries.

11.3.2. The ECB's list of the main groups of financial institutions in the EU

The ECB maintains lists of the following **five groups** of institutions, based on information provided regularly by all ESCB members.[175]

- **Monetary financial institutions (MFIs)**

"Monetary financial institutions" (MFIs) are resident credit institutions as defined in European Union (EU) law, and other resident financial institutions whose business is to receive deposits and/or close substitutes for deposits from entities other than MFIs and, for their own account (at least in economic terms), to grant credits and/or make investments in securities. More precisely[176], MFIs are defined in Regulation ECB/2013/33 concerning the balance sheet of the monetary financial institution's sector (recast).

[175] https://www.ecb.europa.eu/stats/financial_corporations/list_of_financial_institutions/html/index.en.html

[176] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1071R(01)

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- **Investment funds (IFs)**

"Investment funds" (IFs) according to the Regulation (EC) No 1073/2013 of the European Central Bank of 18 October 2013, are collective investment undertakings that: i) invest in financial and non-financial assets, within the meaning of the European system of national and regional accounts in the Community (ESA 95), to the extent that the objective is to invest the capital raised from the public; and ii) are set up under Community or national law. Included within the definition of IFs are: undertakings whose units or shares are, at the request of the holders, repurchased or redeemed directly or indirectly out of the undertaking's assets; and undertakings which have a fixed number of issued shares and whose shareholders have to buy or sell existing shares when entering or leaving the fund. Not included in the definition of IFs are pension funds and money market funds (which come under the MFIs).

- **Financial vehicle corporations (FVCs)**

"Financial vehicle corporations" (FVCs) are undertakings set up under national or Community law which primarily:

  - to carry out securitisation transactions and which are insulated from the risk of bankruptcy or any other default of the originator; and which
  - issue securities, securitisation fund units, other debt instruments and/or financial derivatives and/or legally or economically own assets underlying the issue of securities, securitisation fund units, other debt instruments and/or financial derivatives that are offered for sale to the public or sold based on private placements.

The legal framework for FVCs is set out in Regulation (EC) No1075/2013 of the European Central Bank of 18 October 2013 concerning statistics on the assets and liabilities of financial vehicle corporations engaged in securitisation transactions (ECB/2013/40).

- **Payment statistics relevant institutions (PSRIs)**

"Payment statistics relevant institutions" (PSRIs) are payment service providers (including electronic money issuers) and payment system operators. PSRIs offer payment services and are entitled to do so. They can be classified into different institutional sectors. Payment system operators are entities that are legally responsible for operating a payment system.

- **Insurance corporations (ICs)**

"Insurance corporations" (ICs) are financial corporations or quasi-corporations that are principally engaged in financial intermediation as a consequence of the pooling of risks, mainly in the form of

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direct insurance or reinsurance. The legal framework for ICs is set out in Regulation (EU) No 1374/2014 of the European Central Bank of 28 November 2014[177] on statistical reporting requirements for insurance corporations.

11.3.3. The network of European financial institutions for small and medium-sized enterprises (NEFI)

The Network of European Financial Institutions for Small and Medium-Sized Enterprises (NEFI)[178], founded in 1999, consists of 18 financial institutions from 18 European Union Member States. In 2015, NEFI members actively supported and financed approximately 454 000 SMEs all over Europe with more than EUR 60.9 billion of financing, mainly in the form of loans and guarantees. NEFI pursues the objective of following the information of financial, political, and legal developments and measures adopted by the European Institutions in the fields of European economic and monetary policies that are relevant for promotional financial institutions focusing on the facilitation of SMEs' access to finance. NEFI serves as a contact for the European Institutions, providing know-how and information on all promotional banking issues. In the next chapter, you will find profiles of the regional and national development banks, and most of them are members of NEFI.

11.4. InvestEU program

The InvestEU Programme[179] builds on the successful model of the Investment Plan for Europe, the Juncker Plan. It will bring together, under one roof, the European Fund for Strategic Investments and 13 EU financial instruments are currently available. Triggering at least €650 billion in additional investment, the Programme aims to boost investment, innovation, and job creation in Europe. InvestEU is one of the programmes of the next EU budget (2021-2027). It is both a policy instrument and a delivery tool:

- as a **policy instrument**, the InvestEU Programme's overall objective is to support the policy objectives of the Union by mobilising public and private investment within the EU;
- as a **delivery tool**, the InvestEU Fund aims to implement the EU budget through a budgetary guarantee more efficiently, achieve economies of scale, and increase the EU's visibility.

The programme consists of three pillars: the InvestEU Fund, the InvestEU Advisory Hub, and the InvestEU Portal. Since the start of 2018, EVPA has been closely following the InvestEU negotiations, focusing on the InvestEU Fund and Advisory Hub.

177 https://eur-lex.europa.eu/search.html?qid=1598857338913&text=1374/2014&scope=EURLEX&type=quick&locale=en?skey%3D1374/2014

178 http://www.nefi.eu/the-network/

179 https://evpa.eu.com/policy/the-eu-budget/investeu

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Through **the InvestEU Fund**, the European Commission will provide an EU guarantee of €38 billion, divided over four windows which define the policy areas that InvestEU supports:

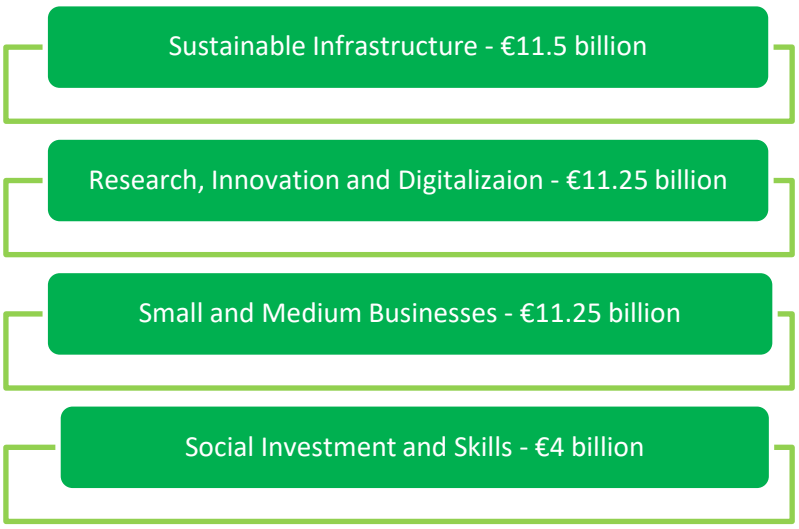

Chart 22: Four funding windows of the InvestEU Fund

11.5. Modernisation fund

The Modernisation Fund[180] is a dedicated funding programme to support 10 lower-income EU Member States in their transition to climate neutrality by modernizing their energy systems and improving energy efficiency. The beneficiary Member States are Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia. The Modernisation Fund will support investments in:

- Generation and use of energy from renewable sources;
- Energy efficiency;
- Energy storage;
- Modernisation of energy networks, including district heating, pipelines, and grids;
- Just transition in carbon-dependent regions: redeployment, re-skilling and upskilling of workers, education, job-seeking initiatives, and start-ups.

The Modernisation Fund is recognised in the European Green Deal Investment Plan as one of the key funding instruments contributing to the European Green Deal's objectives. The Modernisation Fund

[180] https://ec.europa.eu/clima/policies/budget/modernisation-fund_en

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is funded from revenues from the auctioning of 2% of the total allowances for 2021-30 under the EU Emissions Trading System (EU ETS) and additional allowances transferred to the Modernisation Fund by beneficiary Member States – 5 opted to do so (Croatia, Czechia, Lithuania, Romania, and Slovakia). The total revenues of the Modernisation Fund may amount to some €14 billion in 2021-30, depending on the carbon price.

The applicants for funding under the Modernisation Fund shall submit after 01.01.2021 their proposals at their country level to the local administrations responsive to the management of the EU funding progams. Member States shall submit the proposed investments of the project aplicants to the EIB, the Investment Committee and the Commission. Submissions can be made on a rolling basis, but the Investment Committee will meet twice a year, as of 2021. No direct applications by project proponents can be sent to the EIB or the Commission.

11.6. Innovation fund (IF)

The Innovation Fund (IF)[181] is one of the world's largest funding programmes to demonstrate innovative low-carbon technologies. Since 15 June 2020, the Innovation and Networks Executive Agency (INEA) is managing a part of Innovation Fund programme via grants. The Innovation Fund (IF) contributes to greenhouse gas (GHG) reduction by focusing on:

- Innovative low-carbon technologies and processes in energy-intensive industries (steel, cement, glass, chemicals, paper, etc.), including products substituting carbon-intensive ones;
- Carbon capture and utilisation (CCU);
- Construction and operation of carbon capture and storage (CCS);
- Innovative renewable energy generation;
- Energy storage.

The Fund aims to finance a varied project pipeline to achieve an optimal balance of a wide range of innovative technologies in all eligible sectors (energy-intensive industries, renewable energy, energy storage, CCS, and CCU) in EU Member States, Iceland, Norway.

For the period 2020-2030, the Fund may amount to about €10 billion, depending on the carbon price. In parallel, the EU ETS offers the main long-term incentive for the above technologies to be deployed. The IF is a key funding instrument for delivering the EU's economy-wide commitments under the Paris Agreement and supporting the European Commission's strategic vision of a climate-neutral Europe

[181] https://ec.europa.eu/inea/en/innovation-fund

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by 2050, as recognized in the European Green Deal Investment Plan. It is also open to small-scale projects where total capital costs are under €7.5 million and for which there will be specific calls for proposals.

The information and documentation needed for application to the Innovation Fund (IF) can be found at the Funding and Tenders Portal[182] of the European Commission, and more detailed information with tutorials and other supporting documents can be found at the website of the Innovation and Networks Executive Agency (INEA)[183]. The application process is direct (not necessary to pass through the EU local funding structures of the applicant's country) has two stages (for small-scale projects, the application process will have only one stage).

- Expression of interest, with a first assessment on the project effectiveness, innovation and maturity level. Projects that meet only the first two criteria may qualify for project development assistance.
- Full application, where projects are assessed on all the criteria, including scalability and cost efficiency.

11.7. Just transition fund

The Just Transition Fund[184] is the first pillar of the Just Transition Mechanism. The fund will be equipped with €40 billion. This amount corresponds to fresh money made available to support EU countries in their transition, out of which €10 billion should come from budget appropriations, while the remaining additional resources of €40 billion, covering the period from 2021 to 2024, will constitute external assigned revenue stemming from the European Recovery Instrument. In order to unlock funding from the JTF, EU countries will have to match each euro received from this Fund, for the share financed from the Union budget (€10 billion) with €1.5 to €3 from their resources of the European Regional Development Fund (ERDF) and the European Social Fund Plus (ESF+). This spending from the EU budget will be supplemented by national co-financing according to cohesion policy. This way, the JTF overall financing capacity exceeds €89 billion and may reach €107 billion.

The fund will support the economic diversification and reconversion of the territories concerned. This means backing productive investments in Small and Medium-sized Enterprises, creation of new firms, research and innovation, environmental rehabilitation, clean energy, up- and reskilling of workers, job-search assistance and active inclusion of jobseekers programmes, as well as the transformation of existing carbon-intensive installations when these investments lead to substantial emission cuts and job protection. The Just Transition Fund's proposed budget is to be complemented with resources from the European cohesion policy funds and national co-financing per each country. In the Territorial Just Transition Plans, EU countries will need to identify the territories and sectors eligible for funding

182 https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/innovfund

183 https://ec.europa.eu/inea/en/innovation-fund/calls-proposal

184 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/actions-being-taken-eu/just-transition-mechanism/just-transition-funding-sources_en

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under the Just Transition Fund. The identification of these territories will be carried out through a dialogue with the European Commission. There is still no official application procedure published for the Just Transition Fund.

11.8. Marguerite Fund

The first fund managed by Marguerite[185], the 2020 European Fund for Energy, Climate Change and Infrastructure ("Marguerite I"), was established in 2010 with the backing of six major European public financial institutions and the European Commission, with EUR 710 million of commitments, to make capital-intensive infrastructure investments within the EU. Marguerite I is now fully invested and has accomplished its initial targets, having committed over EUR 700 million equity and quasi-equity capital to 20 investments in 13 member states across all target sectors, acting as a catalyst for projects with an aggregate size of over EUR 10 billion.

The European Investment Bank has committed EUR 200 million, of which EUR 100 million are guaranteed by the European Fund for Strategic Investments (EFSI), alongside EUR 100 million each from five National Promotional Banks. Marguerite II has a capacity to invest in projects across the EU and in the pre-accession countries and has a 10-year fund life (with up to 2 one year extensions). According to the fund's management company Marguerite Adviser S.A., the biomethane projects could be considered by the fund.[186]

11.9. KfW

The development of KfW Group[187] has been closely connected to the economic development of the Federal Republic of Germany. Since its founding in 1948 and according to its statutory mission, KfW has been supporting change and encouraging forward-looking ideas - in Germany, Europe and throughout the world. For this purpose, it has provided more than 1.7 trillion euros in loans over seven decades. Sustainability is one of KfW's primary business targets.[188] As a bank committed to responsibility, it is promoting environmental and climate protection worldwide. Supporting the federal government, the KfW Development Bank business area finances development projects around the world.[189] In Germany, KfW provides financing for biogas and biomethane projects. The top priorities are improving people's prospects for a better life, protecting the environment, and combat climate change. DEG (Deutsche Investitions- und Entwicklungsgesellschaft GmbH) finances the establishment and expansion of private sector entities. This subsidiary of KfW advises and finances

185 https://www.marguerite.com/about-us/background/

186 https://setis.ec.europa.eu/publications/setis-magazine/funding-low-carbon-technologies/nicolas-merigo-ceo-of-marguerite-adviser

187 https://www.kfw.de/KfW-Group/

188 https://www.kfw.de/nachhaltigkeit/KfW-Group/Sustainability/Sustainable-Banking-Operations/Sustainable-Investment/2016_Sustainable-Investments.html

189 http://www.nefi.eu/our-members/germay-kfw/

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private companies investing in sustainable projects from both a commercial and developmental perspective. To do this, DEG provides long-term financing from its own funds.

11.10. German corporation for international cooperation (GIZ)

The German Corporation for International Cooperation GmbH (abbreviated as GIZ, that is an abbreviation from German 'Gesellschaft für Internationale Zusammenarbeit')[190], is a German development agency headquartered in Bonn and Eschborn that provides services in the field of international development cooperation.[191] GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment promotion, energy and the environment, and peace and security. This German enterprise's diverse expertise is widely used around the world – from the German Government, European Union institutions, the United Nations, the private sector, and governments of other countries. GIZ works with businesses, civil society actors, and research institutions, fostering successful interaction between development policy and other policy fields and activity areas. The GIZ is subordinated by the German Federal Ministry for Economic Cooperation and Development (BMZ). In 2019, the organization generated a business volume of around EUR 3.1 billion. GIZ has 22,199 employees, almost 70 percent of whom are national staff, who work in around 120 countries.

GIZ is a partner providing financial support in the Digital Global Biogas Cooperation (DiBiCoo).[192] This is a cooperation project between biogas technology exporting and importing countries. This cooperation's overall objective is to support the European biogas/biomethane industry by preparing markets to import sustainable biogas/biomethane technologies from Europe to developing and emerging countries.[193] Furthermore, GIZ and KfW supported the bioenergy sector's development in Serbia between 2013 and 2017, including the biogas.[194]

11.11. The technical assistance to connectivity in the Western Balkans (CONNECTA)

The Technical Assistance to Connectivity in the Western Balkans (CONNECTA)[195] is an EU-funded technical assistance contract whose overall objective is to assist in the development and completion of the core transport and energy networks in the Western Balkans region and to support the Digital Agenda for the Western Balkans in line with the Western Balkans strategy COM(2018)65. The CONNECTA facility contributes to the preparation of high priority transport, energy, and digital connectivity infrastructure projects, ensuring their technical and economic viability, to bring them to

190 https://www.giz.de/en/html/index.html
191 https://en.wikipedia.org/wiki/Deutsche_Gesellschaft_f%C3%BCr_Internationale_Zusammenarbeit
192 http://dibicoo.org/?page_id=18
193 https://cordis.europa.eu/project/id/857804
194 https://www.giz.de/en/worldwide/26153.html
195 https://connecta-info.eu/about-us/

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maturity for investment co-financing and provides support for the preparation and implementation of short and medium-term regional connectivity reform measures (CRMs). CONNECTA can get involved in any project phase from for example, feasibility studies, and cost-benefit analyses through designs, assistance in tendering, and studies on e.g., maintenance of built infrastructure. It generally does not get involved in the supervision of works. Within its technical sectors of transport, energy and digital, it can work on all modes of transport and on several facets of energy.

11.12. Secretariat technical assistance to regions in transition (START)

The secretariat's technical assistance to regions in transition (START)[196] aims to leave a legacy of enhanced transition-related expertise, capabilities, and capacities in the coal regions that receive support. Therefore, the delivery of support will follow a co-creation approach that engages recipients as active participants, contributing with their own resources alongside those provided by the secretariat in order to jointly pursue supported activities. START addresses gaps in already existing technical assistance available to EU coal regions. It is designed to provide targeted, needs-oriented expertise and capacity building to help regions take practical steps in two main areas: i) economic diversification; and ii) decarbonisation. START will notably focus on the following key moments of the transition life cycle:

- the development of transition strategies and governance arrangements;
- the identification of relevant 'priority projects';
- the design and development of identified 'priority projects', including appropriate financing strategies.

Following an open call for applications, seven regions were selected for Initiative support through the Secretariat's Technical Assistance for Regions in Transition (START) initiative:

- Asturias, Spain;
- Jiu Valley, Romania;
- Karlovy Vary, Czechia;
- Małopolska, Poland;
- Megalopolis (Peloponnese), Greece;
- Midlands, Ireland;
- Silesia, Poland.

196 https://ec.europa.eu/energy/topics/oil-gas-and-coal/eu-coal-regions/secretariat-technical-assistance-regions-transition-start_en

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These seven recipients of START support represent a diverse cross-section of regions and communities.

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12. Tasks for biomethane project developers for securing financing

While preparing to develop your biomethane project, there is nothing more valuable than the organisation, planning, and execution of all tasks necessary to secure financing. Take every step you can to make sure you're financially secure enough to tackle the investment. Your level of preparation is critical to obtain the requested finance. The next sub-chapters outline the essential tasks and development milestones to secure finance for biomethane project finance.

12.1. Identification of available financing sources and their requirements

As soon as you structure your investment intention for a biomethane project, it is necessary during the feasibility analysis stage to identify available financing sources and to check their requirements. To find such sources, you may use the information in this Guidebook or explore various platforms providing access to funding sources for renewable energy projects. An excellent example of such a platform is *fi-compass.*[197] This is a platform for advisory services on financial instruments under the European Structural and Investment Funds (ESIF). *fi-compass* is provided by the European Commission in partnership with the European Investment Bank. *fi-compass* is designed to support ESIF managing authorities and other interested parties by providing practical know-how and learning tools on financial instruments. These include 'how-to' manuals, factsheets, and case study publications, as well as face-to-face training seminars, networking events, and video information.

Biomethane project total investment size	Biomethane Production Capacity in Nm^3/h	Relevant financial institutions and funding sources
< €1 million	< 20 Nm^3/h	National Rural Development Programme, Local development banks, SEFF, EIT Climate-KIC, Innovation Norway, Leasing companies and equipment suppliers, crowdfunding, green bonds
> €1 million < €2 million	> 20 Nm^3/h < 40 Nm^3/h	Local development banks, SEFF, EIT Climate-KIC, Innovation Norway, Leasing companies and equipment suppliers, crowdfunding, green bonds
> €2 million < €5 million	> 40 Nm^3/h < 150 Nm^3/h	EBRD, EIF, CTF, KfW, GEF, Innovation Fund, Connecting Europe, LIFE, Modernisation fund, green bonds, private equity funds
> €5 million < €10 million	> 150 Nm^3/h < 300 Nm^3/h	GEF, EIB, EBRD, EIF, CTF, LIFE, KfW, GIZ, IFC, Just Transition Fund, BSTDB, green bonds, private equity funds

197 https://www.fi-compass.eu/about-fi-compass

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> €10 million < €30 million	> 300 Nm^3/h < 1500 Nm^3/h	GEF, EIB, EBRD, BSTDB, EIF, CTF, World Bank, KfW, IFC, ESIF, InvestEU, EFSI, private equity funds
> €30 million < €50 million	> 1500 Nm^3/h < 3000 Nm^3/h	EIB, EBRD, EIF, BSTDB, CTF, World Bank, IFC, ESIF, InvestEU, EFSI
> €50 million	> 3000 Nm^3/h	EIB, EBRD, EIF, World Bank, IFC, IDA, IBRD, ESIF, InvestEU, EFSI

Table 16: Selection of sources of capital by investment size (incl. anaerobic digestion plant) and production capacity in Nm^3/h of a new biomethane project

As the next step, you should review the main application documents and requirements for providing finance, identify the key decision-makers, and contact them to express your interest in participating. All multilateral, IFIs and local financial institutions assign loan/investment officers to each project. These individuals serve as the managers and supervisors who implement the project on behalf of the financial institution. They are key contacts for seeking opportunities where to invest and provide finance, and they will be much more interested in your company if you can present them with a viable biomethane project.

Whether you are meeting with staff of financial institutions or with representatives of the EU or other executing agencies, be well prepared and have specific topics to discuss; making general inquiries about business opportunities or asking for readily available information will be seen as a waste of time. You should be prepared to demonstrate your biomethane project's technical capability and financial viability, provide appropriate information about your experience, select biomethane power plant technology and the type of feedstock you intend to use.

12.2. Identification of potential investment partners

Once you've determined how much money your biomethane project requires from your financing roadmap and that outside investment is the strategy for you and your business, you should determine which investment partners to contact about the investment opportunity. Entrepreneurs must realize that each investor group or venture capital fund has a unique investment focus. During the process of identification of potential investment partners, developers (owners) of biomethane projects have to perform check according to their main selection and admission investment criteria:

- Geography

  Investment funds and financial institutions have a geographic focus, except the multilateral ones. You have to check whether the announced geographic focus of investments corresponds to your project location.

- Technology

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Often investment funds and financial institutions accept financing for only some of the existing renewable energy technologies. Before starting the application process, you have to check whether your potential investment partner provides finance for biomethane technology.

- Investment size

Investment funds and financial institutions often have limits and borders for investment size (e.g., min. €1 million/max. €5 million per investment).

- Stage of development

Some investment funds and financial institutions invest only in biomethane projects at a particular development stage (e.g., early-stage, building permit, operational).

12.3. Feasibility analysis and energy yield assessment

Investors in biomethane projects should undertake a feasibility analysis and energy yield assessment in the early project development phase or hire a professional and experienced company to conduct it. The feasibility analysis and the valuation of available and estimated potential resources for energy production from renewable and alternative energy sources are an integral part of investment research. They are required by law in many countries. The feasibility analysis and energy yield assessment include identification of project development risks before the client invested in the project and is recommended to contain the following general structure:

- Basic concepts and abbreviations;
- Description of investment intentions and their relevance with the existing legal and regulatory framework for biomethane projects;
- Evaluation of the terrain (site visits);
- Assessment of feedstock resource and its sustainability;
- Feedstock supply diagram;
- Assessment of theoretical and technological potential for biomethane generation;
- Technologies for utilization of the accessed biomethane resource potential;
- Energy yield forecast (power, heat and gas) based on feedstock mix selection;
- Financial analysis and Risk analysis;
- Evaluation of reliability of information;
- References;
- Appendices.

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The biogas yield and the plant's respective energy yield depend mainly on the type of feedstocks used as input and less on the type of selected anaerobic digestion technology. Biogas yield will also depend on the feedstocks' retention time in the reactor (and thus on the reactor's size in relation to the amount of substrate). Retention time will determine how much of the "total energy potential" in the feedstock will be realised. The selected substrate mix should be analyzed in a biogas laboratory during the feasibility analysis stage to assess the total biogas/energy potential before the investment. It has to be considered that higher retention times mean larger reactors and thus higher capital costs.

The investment cost of the biomethane plant should also be considered in the feasibility stage of the project. In the next table, you will find a breakdown of a biomethane plant's key cost structure elements with 400 Nm³/h raw biogas production capacity in Germany[198] with a biomethane-to-biogas upgrade unit.[199]

Biomethane plants cost elements	Value in €
Substrate storage, mobile equipment, and technological appliances, initial costs	920,215
Digester (fermenter)	682,048
Gas utilization and control (including biogas processing and feeding)	1,954,337
Digestate storage	432,736
Total AD technology assembly cost	**3,989,336**
Planning, approval, and commissioning	281,708
Property costs, property development, Road and path construction	438,131
Biomethane upgrade unit	**1,320,000**
Total investment cost	**6,789,175**

Table 17: Breakdown of key cost structure elements of a biomethane plant with 400 Nm³/h raw biogas in Germany

12.4. Legal, regulatory issues and permits

The biomethane investment projects need to be sufficiently mature in terms of planning, permitting, and legal structure. The main legal, regulatory issues and permits are as follows:

198 Page 159: http://www.fnr.de/fileadmin/allgemein/pdf/broschueren/Leitfaden_Biogas_web_V01.pdf

199 Page 21 - 24: https://www.fnr-server.de/ftp/pdf/berichte/22402411.pdf

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- Shareholders agreement;
- Company constitutional documents, including Memorandum of Incorporation;
- Land/site use agreement (i.e., lease agreement, concession agreement for landfill biogas, etc.;
- Environmental Impact Assessment (EIA) and accompanying Environmental Approval;
- Detailed zoning plans (DZP);
- Technical design of the biomethane plant (electrical design, mechanical design, etc.)
- Connection agreements with the utility company for electricity, heat, and gas export;
- Licenses (e.g., power generations license, waste license, etc.) and authorizations;
- Building permit.

12.5. Power off-take, heat off-take, gas off-take, digestate off-take, and feedstock supply agreements

The power off-take, heat off-take, gas off-take, digestate off-take, and feedstock supply agreements are essential requirements to obtain loans or finance for biomethane projects. The main power off-take and feedstock supply agreements are as follows:

- Power Purchase Agreement/s
- Heat Purchase Agreement/s
- Heat Purchase Agreement/s
- Digestate Purchase Agreement/s;
- Feedstock supply agreements;
- Demonstration of off-takers ability to fulfill offtake – the business case for power demand, affordability, sustainability, etc.;
- Concessions for landfill gas.

12.6. The information memorandum layout and structure of the biomethane investment project

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The project information memorandum usually contains between ten and twenty pages of information about the biomethane investment project. It is intended for review by financial institutions and investment funds and is recommended to have the following general structure:

- Executive summary;
- Project structure diagram (all key stakeholders: Lenders, Shareholders, Contractors, Concessionaire, etc.) detailing project gearing;
- Shareholder organogram;
- Sponsors background and experience;
- Technical partner background and experience;
- The energy yield of the biomethane project;
- Key financial indicators of the biomethane project (e.g., IRR, pay-back period, etc.)
- Project timeline diagram;
- Schedule of all project risks and mitigants;
- Project company structure description (if applicable)
- (i) ownership (%SH1, %SH2,3…, EU/non-EU, etc.), (ii) management team, (iii) value add to project/operational involvement, (iv) value (amount) of own contribution to project;
- Acknowledgement letter for a credit check.

12.7. Short information memorandum (teaser)

Suppose your proposition for a biomethane investment project can't be summarised in one to four-page format. In that case, you are not ready to speak to potential financing sources and investors, most of whom prefer such a summary. If they are interested, they'll ask for more details. Therefore, the teaser is the correct format to present your biomethane plant project in initial contacts with banks or other financial institutions. For this reason, you should be ready with the main information memorandum before the teaser, which is recommended to keep the following general structure:

- A summary of the opportunity;
- The amount of investment being sought;
- The kind of economic and environmental benefits going to be generated; and
- The potential return.

12.8. Business plan

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At the same time, the biomethane investment projects need to be sufficiently mature in terms of planning, business model, and financial structure. The business plan is an essential document in the process of securing financing and is recommended to contain the following general form:

- Executive summary;
- Introduction;
- Framework conditions for biomethane projects in the country of application;
- Project site(s) description;
- Feedstock availability;
- Conceptual design of the biomethane power plant
- Investment cost;
- Yield assessment;
- Economic benefits and return on investment;
- The feed-in tariff, feed-in premium, and other energy off-take requirements for gas, heat, or electricity;
- The layout of the subsequent steps in project development;
- References and appendices.

12.9. Financial model of the biomethane investment project and sensitivity analysis

12.9.1. Financial model

Financial modeling is a mathematical representation of key financial and operational relationships. Comprising of one or several sets of equations, the financial model is used to analyze how a new business enterprise developing the biomethane project will react to different economic situations or events. It is estimating the outcome of financial decisions before committing any funds. A financial model generally includes cash flow projections, depreciation schedules, debt service, inventory levels, inflation rate, etc. It may also quantify the financial impact of the firm's policies, and of restrictions or covenants imposed by investors and/or lenders.

Financial modeling is the task of building an abstract representation (a model) of a financial decision-making situation. This is a mathematical model, such as a computer simulation, designed to represent (a simplified version of) the performance of a financial asset or a portfolio of a business, a project, or any other form of financial investment. Base case financial model for the biomethane power plant with no expected material changes comprised of at least the following general structure:

- Key inputs to the financial model as:

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  - Inputs sheet that contains all financial, revenue, and technical assumptions;
  - Detailed capital cost estimates CAPEX and operating expenses (OPEX), and proposed capital draw-down schedule;
  - Monthly construction and operations workings;
  - Quarterly model forecasting income statement & balance sheet for the duration of Power Purchase Agreement (PPA);
  - Debt schedule with monthly capital and interest repayments – shorter than Power Purchase Agreement (PPA);
  - A quarterly cash flow statement.
- Key financial covenants in financial model per lender term sheets – debt service coverage (DSCR), the loan life coverage ratio (LLCR), project life coverage ratio (PLCR);
- Sensitivity analysis – minimum prescribed sensitivities: date of commission (COD) delay (factoring penalties where applicable); changes in output, CAPEX, OPEX, interest rates, inflation, foreign exchange, working capital assumptions, etc.;
- Financial summary with the presentation of calculated key financial indicators and rations of the biomethane project, including a source and application of funds, project and equity returns – internal rate of return (IRR), payback period, net present value (NPV), benefit-to-cost ratio energy production cost, etc.;
- Justification of all assumptions and inputs

12.9.2. Sensitivity analysis

Performing the sensitivity analysis procedure of the biomethane power plant involves studying changes in the indicator, considering the remaining constants. All the factors influencing the project effectiveness can be divided into two groups: (i) the first group includes general ones (independent of technological features of the investment project) and (ii) the second group (dependent on technology). The initial investment values, additional capital investment, lifetime, and discount rate belong to the first group. The values of the biogas plant load factor, revenue from energy resources as a biomethane, electric, and heat power belong to the second group. The actual investment costs may deviate from the established ones according to the initial prognosis. They may be a result of changes in the cost of biomethane equipment, tax legislation amendments, etc.

№	Parameters in the sensitivity analysis model	Value	Deviation range for increase and decrease in %	
1	Initial investment	€ 6,789,175	+ 10	- 10
2	Biomethane plant life	20 years	+5	-5
3	Discount rate	7.5 %	+3	- 3
4	Substrate (feedstock) cost value	€ 0.22/Nm³	+ 10	- 10
5	O&M expenses	€ 0.07/Nm³	+20	-20

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6	Electricity sale price	€ 0.13/kWh	-10	-10
7	Biomethane sale price	€ 0.09/kWh	+ 10	- 10
8	Digestate sale price	€ 560/tonne	+ 20	- 20

Table 18: Sample sensitivity analysis inputs of a biomethane plant[200]

Calculations for sensitivity are necessary for each of the parameters influencing the profitability of the biomethane plant project over the Internal Rate of Return (IRR) and Net Present Value (NPV). They are vital indicators measuring the financial viability. The IRR and NPV are indicators that are often used by banks, financial institutions, and investment funds when they make decisions to finance a project. A specialized software should be used to run and perform sensitivity analysis of a biomethane plant project (see Chapter 12.12 for more information) with selecting thresholds in per cent for positive or negative change of the main selected parameters depending on how much increase or decrease of their value we can accept.

12.10. Due diligence process

Due diligence is the process of factual and legal, technical and financial investigation, research, analysis, and discovery into the relevant borrower, asset, sponsor, and other principal parties typically undertaken by a prospective buyer, lender, or investor before entering into a transaction. The purpose of requiring separate reports for different due diligence areas (legal, technical, and financial) is to ensure that the best quality advice is available. Furthermore, independent due diligence reports are often required by multilateral or international financial institutions to finance biomethane power plants. Individual areas can be very specialized and require special training and expertise – a buyer/lender/investor should always satisfy itself that the professionals or persons responsible for these are competent and experienced in the area concerned.

The biomethane plant developer can check the due diligence provider's credentials with the provider's relevant professional organisation or regulator. The due diligence process's precise scope will vary depending upon: i) the nature and value of the financing and asset; ii) the lender's existing knowledge of the borrower; iii) timing and cost considerations. In the context of the investment in or loan secured on, biomethane projects, typically follows the scope described in the following sub-chapters:

12.10.1. Legal due diligence

Legal due diligence (LDD) is an integral part of a proposed loan or finance for a biomethane investment project. The primary goal of an LDD is to find legal risks. Then, to analyze, assess, and describe those risks. Finally, to recommend mitigating measures. When done correctly, an LDD review provides valuable information to further the process of financing. An LDD review looks at all the legal

[200] The initial investment is for a biomethane plant with 400 Nm³/h raw biogas in Germany as desbribed in Table 17 in Chapter 12.3.

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documents a company possesses. It is essential to see how these legal documents are structured and the obligations for a borrower (biomethane project developer). It is recommended an LDD to contain the following general structure:

- An analysis of the buyer's/borrower's business plan cost projections, appraisals, and cash flow forecasts with particular regard to the buyer's/borrower's ability to service the debt and repay the loan at maturity;
- A review of the buyer's/borrower's solvency, funding and tax position, principal fiscal issues, and other liabilities affecting the property, borrower, or buyer;
- Enquires into the background, experience, and credit record of the buyer/borrower, sponsors and other principal parties (for development of biomethane power plant, this could extend to the contractors and professionals engaged);
- A physical inspection of the property (site) where biomethane power plant should be built;
- A valuation of the property/project site (and/or, in the case of a joint venture partnership, the value of the shares in the property-owning company);
- An investigation of/report on the title to the property (project site) and legal restrictions affecting its use;
- An analysis of any risks associated with owning the relevant property (project site) arising from a legal or structural perspective and an assessment of the likely impact of other creditors, tenants, or other persons also having interests in or rights over the property;
- Where property (project site) is let, a review of the terms of the occupational leases and insurance and asset management arrangements;
- A "health check" on the physical condition of the property (project site) and any facilities located on it, typically comprising reports on structural, measurement, planning, and environmental risks;
- Consideration of the principal insurances;
- An assessment of the impact of the financing/loan upon existing contractual arrangements or permits;
- Consideration of the nature of the security to be granted and enforcement issues;

12.10.2. Technical due diligence

The Technical due diligence (TDD) is taken to identify all technical and technological risks to the investors and financiers in the biomethane power plant and assess relevant mitigating factors. It is recommended a TDD to contain the following general structure:

- Key contractors (EPC, O&M, etc.) detailed background and experience with their references;

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- An assessment of the technology being proposed and the overall biomethane plant design and fatal flaw analysis;
- Feedstock analysis and quantity measurements;
- Engineering, Procurement and Construction (EPC) heads of terms for a fixed price and date-specific construction of the facility, security package (performance bond, parent guarantees, advance payment guarantees, etc.) with a detailed description of:
  - penalties - delay, performance, aggregate liquidated damages thresholds
  - price
  - implementation schedule
  - defects period & testing regime
  - Spares, termination, etc
- A review of the project capital cost estimates and major equipment contracts
- O&M heads of terms;
- Biomethane equipment supplier profile and heads of terms;
- Structure of EPC and OM if there is a joint venture (JV) available;
- Management Services Agreement (including fees);
- Construction and operations jobs - detailed breakdown (number and months);
- A review of current and required licenses and permits and license procedures needed for project completion and operation;
- Local content percentage and breakdown of local components (if required by law to obtain licenses and permits for biomethane plant operation, and a feed-in tariff for gas, heat or power, or another type of investment support or preference);
- Completion Risk (cost overrun and start-up delay risk) including engineering, procurement, construction, testing & commissioning;
- A risk analysis identifying capital cost inflation risks, permitting concerns, construction and contract risks, and risk mitigation strategies;
- A review of the interconnection arrangements (power, heat, and gas).

12.10.3. Financial Due Diligence

The financial due diligence (FDD) involves an investigative analysis of a business, assessing the key issues facing the business and the drivers behind maintainable profits and cash flows, identifying the

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key financial risks and potential deal breakers of financing a biomethane investment project. It is recommended an FDD to contain the following general structure:

- An assessment of development cost breakdown – to be audited before Financial Close;
- An assessment of development fee breakdown (if applicable);
- A review of proposed insurance package & quotation for the contract, including key cover terms;
- A review of off-takers audited Annual Financial Statements for the past 2-3 years;
- A review of sponsors/shareholders Annual Financial Statements for the past 2-3 years;
- A review of technical Partner, EPC, O&M Annual Financial Statements for the past 2-3 years;
- A review of the entity providing Parent Company guarantee Annual Financial Statements for the past 2-3 years;
- Finance department walkthrough, including internal controls (For SPV, detail internal controls to be put in place);
- Details of company auditors of the borrower (biomethane project developer);
- A review of bank facility letter(s) (detailing all facilities available, security, interest rates/fees, and other terms);
- A review of all loan agreements of the borrower (biomethane project developer);
- A review of details of all off-balance sheet funding/arrangements of the borrower (biomethane project developer);

12.11. Virtual data room structure for due diligence and project finance

During the preparation process for due diligence and financing of biomethane projects, the developer is recommended to create a virtual data room where to upload all the project information. Therefore, this data room provides convenient access to companies conducting due diligence or institutions providing financing. We recommend the following general structure of the folders with project documentation stored in the virtual data room:

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Chart 23: Virtual data room structure for due diligence and project finance

12.12. Software for financial modelling of biogas and biomethane investment projects

Many different software packages for the facilitation of financial modelling are available on the market. We would provide an overview of one established and well-accepted software for renewable energy project financial modeling and feasibility analysis.

- Overview of RETScreen Financial Model Tool

RETScreen[201] empowers professionals and decision-makers to rapidly identify, assess, and optimize potential clean energy projects' technical and financial viability. This decision intelligence software platform also allows managers to easily measure and verify their facilities' actual performance and find additional energy savings/production opportunities. This objective is achieved by developing decision-making tools (i.e., RETScreen Software) that: i) reduce the cost of pre-feasibility studies; ii)

201 https://www.nrcan.gc.ca/maps-tools-publications/tools/data-analysis-software-modelling/retscreen/7465

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disseminate knowledge to help people make better decisions; iii) and train people to better analyze the technical and financial viability of possible projects.

The RETScreen Clean Energy Project Analysis Software is a unique decision support tool developed with the contribution of numerous experts from government, industry, and academia. The software could be used worldwide to evaluate the energy production and savings, costs, emission reductions, financial viability, and risk for various renewable energy and Energy-efficient Technologies (RETs). The software (available in multiple languages) also includes the product, project, hydrology, and climate databases, a detailed user manual, and a case study based college/university-level training course, including an engineering e-textbook. The software has a free version, which could be used with limitation on the file exporting and saving capability.

12.13. The procurement process of biomethane equipment and construction works

Before a biomethane project developer pursues a contract related to a project funded by a multilateral, IFI, or EU funding institution, it has to understand the respective institution's requirements. These requirements, regulations, and their related procedures are similar for all IFIs. The best sources of such information are tender and procurement web portals of the IFI's, EU, or private web portals. On these web portals along with the information for procurement notices and funding opportunities, is contained contact information for the staff engaged with procurement and tendering procedures per countries. These web portals have advanced search features, and some may automatically notify of opportunities that match the specific interests. Some are by subscription only, but most are free. Reviewing this information will help to biomethane project developers to monitor the progress of active calls for proposals, projects and assess future developments (and therefore opportunities) per country.

IFIs Online Project Information

- EBRD - Project Summary Documents
- WB - Project Database

IFIs Online Procurement Information

- EBRD - Project Procurement
- EU - Funding & tender opportunities
- WB - Procurement Notices
- Development Executive Group (Devex and DevelopmentAid) Projects & Tenders*
- dgMarket and DevelopmentAid - Tenders and Procurement Opportunities*
- UN Development Business Online and DevelopmentAid online*

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* indicates subscription required

12.14. Tenders and bid evaluation

Funding of biomethane and other renewable energy projects by multilateral, IFI, or EU funding institutions in most cases requires suppliers of equipment, works, and services to bid on tenders. Contracts are awarded to the lowest-evaluated bid, based on the evaluation criteria of the tender organizer. Furthermore, a preference may be granted to bidders, according to criteria as: i) domiciliation in the borrowing country; ii) locally manufactured goods with a minimum required percentage of domestic content; iii) hiring of local people for civil or other works; and others. Such a bidding procedure is known in practice as an 'international competitive bidding (ICB) ', and is a bidding process required in financing arrangements involving the World Bank-funded projects, but also used in many of the international financial institutions (IFIs).

When international competitive bidding is not the most appropriate method for specific biomethane projects, then other methods may be used; these are national competitive bidding (NCB), shopping, and direct contracting. What method of bidding to select depends on the type of the biomethane project. NCB is considered the appropriate method for projects that are not expected to attract foreign bidders. Invitations for such bidding could be limited to domestic publications, and bidding documents can be only in the national language. The suppliers of biomethane equipment, works, and services bidding to supply biomethane plants using EU financing have to read carefully the contract notice at the 'Funding & tender opportunities portal' for international cooperation of the European Commisison (EC)[202], and in the TED (Tenders Electronic Daily)[203] that is the online version of the 'Supplement to the Official Journal' of the EU, dedicated to European public procurement. The contract notice is published at the earliest 30 days after the prior first information notice. It defines the scope, type, and budget of the contract and the procurement procedure applied. A detailed description of the EU tender procedures are available on the 'Tender'[204] page of the 'Funding & tender opportunities portal'.

202 https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/funding-updates

203 https://ted.europa.eu/TED/main/HomePage.do

204 https://ec.europa.eu/international-partnerships/tenders_en

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13. Conclusions and recommendations

Biomethane projects can receive finance by many different options. Each financing model of a biomethane plant has particular advantages and disadvantages for investors and financing bodies. However, each biomethane project is implemented under different circumstances and may require a unique form of financing. Developers of biomethane plants may use this Guidebook to navigate in the sourcing of finance and proper organization of the preparation and application process.

There is considerable biomethane potential in Europe, and the biogas-to-biomethane upgrading technology is already mature and proven. Biogas transformed into biomethane is a renewable gas that can replace natural gas and could be used for heating or as a fuel for gas vehicles (in the form of Bio-CNG and Bio-LNG). It can be injected into the gas grid or used directly on-site. That is an opportunity for the European gas and transport sectors to decarbonise and incredibly the heavy transport.

The stable legal and political framework at the country level is one of the critical drivers of biomethane production and investments. Furthermore, biomethane's successful development requires strong coordination between all relevant stakeholders and policies (at the country and EU level) from the energy, environment, waste management, transport, agriculture, and food sectors. These stakeholders have to maximize all energy and non-energy services that biomethane technologies can provide and continue harmonizing regulations and standards at the EU level. Continuation of efforts to establish the common European renewable gas market shall benefit the cross-border trade of biomethane and support biomethane investments.

Despite the excellent progress achieved so far and many environmental benefits, the biomethane industry in Europe still faces some challenges in the process of developing and financing biomethane projects. Imported biomethane is not treated equally with domestic production in most European countries. Lack of knowledge by citizens and often by local authorities for biomethane technologies results in problems with communities, municipalities, and environmental protection organizations. The media, stakeholders, and financiers widely compare biomethane with the other renewable energy technologies mainly based on investment costs. These comparisons are incorrect. It is necessary to consider also the multiple economic, environmental, and social benefits of biomethane. The technological, regulatory, and financing know-how of the countries with mature biomethane markets could be used to overcome the existing and challenges and problems and to support the less developed and immature markets.

Several vital steps have emerged from this Guidebook to follow by biomethane plant developers in Europe to ensure the necessary financing for their projects:

1) Identification of available and suitable financing sources and investment partners for the project and selection of the most appropriate financing option

Successful implementation and operation need to select the correct financing option and select the project's right investment partner(s) (see Chapters 8,9,10,11, 12.1,12.2, and Appendix II). The project developer can combine different financing options to create the most sustainable financing structure

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for its biomethane plant. It has to be assessed very carefully, in which revenues can be expected from the operation of the biomethane plant previously to the implementation of the project.

2) Conducting feasibility analysis and energy yield assessment

Developers of biomethane projects should undertake a feasibility analysis and energy yield assessment (see Chapter 12.3) in the early project development phase. This study gives essential information on how viable the biomethane project is from economic and technical perspectives. In the national legislation of some countries, such a feasibility analysis is obligatory. Developers should select reliable and proven biomethane technology for their projects. The technology supplier needs to have references and a good track record in the delivery and implementation of biomethane equipment and plants.

3) Organization and execution of all permitting work required by the law

The quality of organization and implementation of the permitting work (see Chapter 12.4) is critical for the biomethane plant's realization and successful financing. The set of permitting documents is subject to check by banks, financial institutions, distribution and transmission system operators (for gas, heat, and power), and other responsible authorities. If the permitting work is not well executed, this may result in refusals for the connection or operation of the biomethane plant.

4) Power off-take, heat off-take, gas off-take, digestate off-take, and feedstock supply agreements

All these agreements (see Chapter 12.5) are crucial for the biomethane plant’s revenue and profitability. They have to secure an adequate commercial margin to attract the attention of the financiers. Terms and conditions in these agreements should provide long-term security for the off-take and feedstock supply and are subject to check by the financiers.

5) Business planning and information memorandum

By ensuring a tight business planning process, developers of biomethane projects can disrupt their existing weak points enough to reduce the risk to a minimum level. It is crucial to create a realistic financial model for the project with a justification of the assumptions (see Chapter 12.9). The biomethane plant developer must also show financiers how the project's risk is managed (see Chapter 7.6). The critical information from the feasibility analysis report and the business plan is part of the information memorandum (see Chapters 12.6 and 12.7) used to communicate the biomethane project with financiers and other relevant parties.

6) Application for funding

Funding application (see Appendix II and Appendix III) should be sent to the selected financier (bank, investment fund, EU institution, etc.). An informative package for the biomethane plant usually accompanies the funding application process. This package consists of i) company information

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(owners, structure, financial statements); ii) feasibility analysis report; iii) main permitting documents; iv) off-take agreements (gas, heat, power, digestate, etc.); v) feedstock agreement; vi) business plan; vii) information memorandum; and viii) other documents may be required.

7) Passing the due diligence process

The due diligence process (see Chapter 12.10) usually starts before the loan's (funding) final approval. It is highly recommended biomethane plant developers to have all project documentation scanned and uploaded in a virtual data room (see Chapter 12.11). After the due diligence procedure's successful passing, the contract for loan (financing) can be signed, and the procurement and tendering of equipment and works can start.

8) Procurement and tendering

Biomethane plant developers must follow the procurement and tendering procedures strictly (see Chapters 12.13 and 12.14). These procedures are required by banks, financial institutions, and the EU financing institutions also. Defaults in these procedures may result in financial penalties that affect the profitability of the biomethane plant.

A dedicated online-based platform system of advisory and communication to finance biomethane projects could be established at the national and European level. It will gather government stakeholders, industry participants, financial institutions, and developers/investors in biomethane projects in one place. Such a platform shall present excellent communication channels between its participants and significantly contribute to the biomethane financing process.

Finally, the European countries' relevant government bodies could initiate consultations with industry stakeholders, financial institutions, and biomethane project developers. With such talks, they can gather their insights into how existing policies and funding mechanisms could be improved and adapted towards the facilitation of biomethane financing. Furthermore, new policies could be designed to support the practical outcome of financing biomethane investment projects.

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14. List of abbreviations

Some of the following definitions are used throughout this Guidebook:

AD	**means Anaerobic Digestion;**
AMORTIZATION RATE	means Monthly payback rate, consisting of principal and interest;
BCM	means Billion cubic metre
CAPEX	means Capital expenses
CASH FLOW	means Movement of cash into or out of business, a project, or a financial product. It is usually measured during a specified, finite period;
CHP	means Combined Heat and Power;
CO2	means Carbon dioxide;
COD	means Date of the commission of biomethane plant
CONTRACTOR	means Contractor, which finances and operates a biogas/biomethane power plant;
DEBT	means Money acquired from external sources, distinguished from equity capital;
DSCR	Means Debt Service Coverage Ratio
DZP	means a Detailed Zoning Plan;
EC	means European Commission;
EQUITY (CAPITAL)	means The sum of capital from retained earnings;
EU	means the European Union;

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FEED-IN TARIFF (FIT)	means Policy mechanism created and regulated by the government to promote investment in RES (e.g., biogas/biomethane technology). Under FiT schemes, renewable electricity producers are offered long-term contracts. A guaranteed fixed amount of money is paid to them, usually by the utility provider (national or local), for the energy fed into the grid. The FiT rate is typically set above market rates, offsetting inherent risks in renewable energy production;
FINANCIAL INSTITUTION	means Organisation providing borrowed capital to investors. A financial institution can, for example, be a bank or a leasing company;
FINANCIAL RISK	means The financier's risk of loan default. Financial institutions rate each loan request on the possibility of loan default;
FINANCIER	means The financier, which provides debt capital. Financiers can be banks, leasing organisations, or private persons;
GPA	Gas Purchase Agreement (CPPA) is a contract for direct offtake of biogas or biomethane generated from a specific producer. This ensures providence of green gas supply and provides the ability to fix the price for a specified duration;
GHG	means Greenhouse gas;
GRACE PERIOD	means Period during the life of a loan in which borrowed money must not be paid back to the bank. However, interest rates have to be paid;
GREEN CERTIFICATE (GC)	means Paper or electronic representations of electricity generated from renewable energy power plants. Each green certificate has a face value of one megawatt-hour (MWh) of electricity;
INTEREST RATE	means Cost of using money, expressed as a rate per period (usually per year). The value of the interest rate depends on the financial risk of the investment, the loan duration and the amount of the loan;

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INVESTMENT FUND	means a Sum of money, owned by one or more investors, which is managed as one entity;
INVESTOR	means The investor spends money on a particular capital asset;
IFI	means International Financial Institution;
KW	means Kilo Watt, and is a unit for measuring power that is equivalent to one thousand watts
KYOTO PROTOCOL	means the Kyoto Protocol to the United Nations Framework Convention on Climate Change;
LEASING FINANCING	means Financing, which is characterised by the separation of lessor and lessee. The lessor finances the leasing object and commits it to the lessee for operation. The lessee has to pay leasing rates to the lessor. Leasing object within biogas projects is often the CHP plant;
LHV	means Lower Heating Value
LOAN	means Money loaned at an agreed interest rate for a fixed term of years;
MW	means Megawatt energy, and is a unit for measuring power that is equivalent to one million watts; MWel means megawatt electrical energy; MWth means megawatt thermal energy;
NPV	means Net Present Value
OPEX	means Operating expenses
PAYBACK PERIOD	Means The period required to recapture an initial investment by its own cash flow;
PLCR	Means Project life Coverage Ratio
PPA	means the Power Purchase Agreement;
PRINCIPAL	means The total amount of money being borrowed or lent;

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PROJECT	means The biomethane plant project under development on the specific site;
PROJECT FINANCING	means Project financing is intended to finance a very particular investment which is repaid by its own cash-flow. A prerequisite to excess project financing is the foundation of a project company. In the case of financing a biogas project, the financier's investment is secured by the estimated cash flow of the plant selling electricity, the plant components, and by charging the plant site. Project financing provides considerably higher risks for financiers than conventional financing since the loan can only be repaid when the project is operational;
PV	means Photovoltaic;
RATING	means Assessment of the financial risk of a company, bank, or government by defined criteria;
RES	means Renewable Energy Sources;
REVIEWED DOCUMENTS	means All source documents;
SECURITIES	means Property or other assets of the investor that covers the loan sum in case of loan default;
SITE	means the real estate plots over which projects will take place;
SPC	means Special Purpose Company, registered for the financing of the specific biomethane project;
SUBSIDIES	means a Subsidy is a form of financial assistance (contribution) paid to a business or economic sector;
TDD	means Technical Due Diligence;
TRADITIONAL LOAN	means Financing of investment by a private or business loan.;
FINANCIER	means Financial institution, bank, investment fund, etc.;
WBG	means World Bank Group.

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16. Disclaimer

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17. Appendix I. Biomethane map of Europe

This comprehensive map locates and lists all known biomethane installations running in Europe[205]. It has been produced with the information gathered from national biogas associations, energy agencies and companies. The map provides specific details about each biomethane plant, including their connection to the gas grid, feed-in capacity, main substrate used, upgrading process, and date of start of the operation. Cross-border interconnection points and pipelines are also indicated.

The map brings additional data about the European biomethane market evolution, distribution of plants in European countries, and forecasts of natural gas and biomethane indigenous production in Europe until 2037. This is the **second edition** of the map. It has been made in cooperation between two organisations promoting the development of renewable gases: The European Biogas Association (EBA) and Gas Infrastructure Europe (GIE). The first edition of the map was launched in spring 2018.

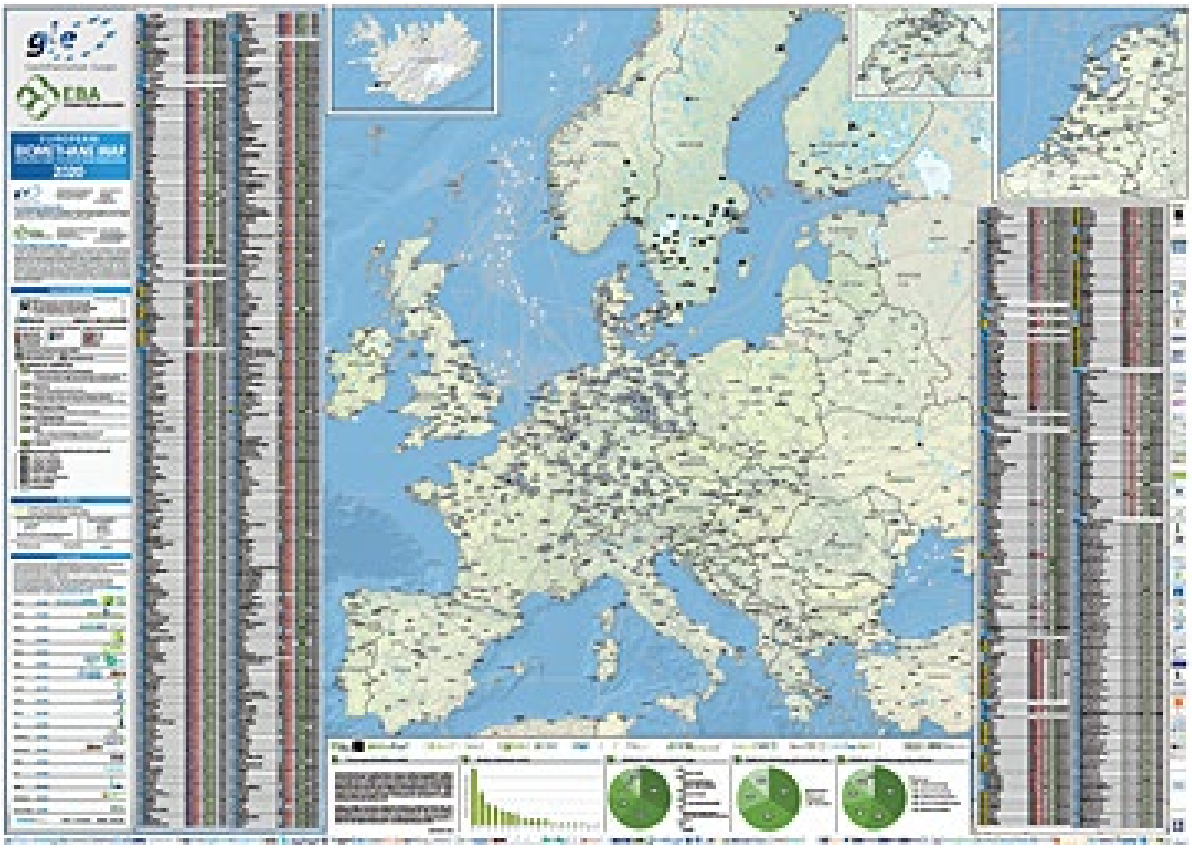

Chart 24: Biomethane Map of Europe 2020, Gas Infrastructure Europe, European Biogas Association[206]

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[206] For the full size Biomethane Map of Europe 2020, please use this link to download: https://www.gie.eu/maps_data/downloads/2020/GIE_EBA_BIO_2020_A0_FULL_471.pdf

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18. Appendix II. Contact details of banks, international financial institutions, investment funds, and companies

National development banks

№	Banks/Financial Institutions	Address	Web Site	E-mail	Phone
1	**Austria** Austria Wirtschaftsservice GmbH	Walcherstraße 11A, 1020 Vienna, Austria	www.aws.at	24h-auskunft@aws.at	+ 43 (1) 50175-0
2	**Belgium** PMV	Oude Graanmarkt 63, 1000 Brussel, Belguim	www.pmv.eu	info@pmv.eu	+32 (2) 229 52 30
3	**Belgium** SOWALFIN	Avenue Maurice Destenay, 13 4000 Liège, Belgium	www.sowalfin.be	info@sowalfin.be	+32 (0) 4 237 07 70
4	**Croatia** HBOR	Strossmayerov trg 9 10000 Zagreb, Croatia	www.hbor.hr	euinfo@hbor.hr	+385 1 4590 403
5	**Czech Republic** Czech-Moravian Guarantee and Development Bank (CMZRB)	Jeruzalémská 964/4, Prague 1, Czech Republic	www.cmzrb.cz	info@cmzrb.cz	+420 255 721 111
6	**Denmark** IFU – Investment Fund for Developing Countries	Fredericiagade 27, DK-1310 Copenhagen, Denmark	www.ifu.dk	ifu@ifu.dk	+45 33 63 75 00
7	**Estonia** KredEx	Hobujaama 4 10151 Tallinn, Estonia	www.kredex.ee	kredex@kredex.ee	+372 667 41 02
8	**Finland**	Porkkalankatu 1, PL 1010, 00101 Helsinki, Finland	www.finnvera.fi	kari.villikka@finnvera.fi	+358 29 460 11
9	**France** Bpifrance	27-31, Avenue du Géneral-Leclerc 94710, Maisons-Alfort Cedex, France	www.bpifrance.fr	christian.dubarry@bpifrance.fr	+33 1 41 79 87 70
10	**Germany** Verband Deutscher Bürgschaftsbanken e.V.	Schützenstraße 6a, 10117 Berlin, Germany	www.vdb-info.de	info@vdb-info.de	+49 (030) 2639 65 40
11	**Greece** Hellenic Development Bank	24 Xenias 11528 Athens, Greece	www.etean.gr	info@etean.gr	+30 (2) 107450400
12	**Republic of Ireland** Strategic Banking	Treasury Dock, North Wall Quay Dublin 1, Ireland	www.sbci.gov.ie	info@sbci.gov.ie	+353 1 238 4000

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	Corporation of Ireland (SBCI)				
13	**Italy** Cassa Depositi e Prestiti (CDP)	Via Goito 4, 00185 Rome, Italy	www.cdp.it	cdpspa@pec.cdp.it	+39 06.4221.40 00
14	**Latvia**	Dome Square 4, Riga, LV-1050, Latvia	www.altum.lv	altum@altum.lv	+371 67 774 010
15	**Lithuania** INVEGA	Konstitucijos av. 7 (16 floor), 09308 Vilnius, Lithuania	www.invega.lt	uzklausos@invega.lt	(+370~5) 2107510
16	**The Netherlands** Netherlands Enterprise Agency (RVO)	PO Box 93144. 2509 AC Den Haag, Netherlands	www.rvo.nl	info@rvo.nl	+31 70 379 80 00
17	**Poland** Bank Gospodarstwa Krajowego	Al. Jerozolimskie 7, 00-955 Warszawa, woj Mazovia, Poland	www.bgk.p l	bgk@bgk.pl	+48 22 599 8888
18	**Romania** EximBank S.A.	Splaiul Independentei, 5th district, Bucharest, Romania	www.eximbank.ro	informatii@eximbank.ro	+40 (0) 21 405 30 96
19	**Serbia** KfW Serbian representative office	Brzakova 20 11040 Belgrade Serbia	www.kfw.de	kfw.belgrade@kfw.de	+381 11 36 98 12 2
20	**Slovenia** SID	Turnograjske 6 1000 Ljubljana, Slovenia	www.sid.si	info@sid.si	+386 1 2007 486
21	**Spain** Instituto de Crédito Oficial (ICO)	4 Paseo del Prado, Madrid, Spain	www.ico.es	registro@ico.es	+34 91 592 16 00
22	**Sweden** Almi Group Almi Invest AB	Box 70394 10724 Stockholm, Sweden	www.almi.se	eva.sjoberg@almi.se	+46 8 070-388 06 04
23	**Switzerland** Swiss Investment Fund for Emerging Markets (SIFEM AG)	SIFEM AG, c/o Obviam DFI AG Helvetiastrasse 17, P.O. Box, 3000 Bern 6, Switzerland	www.sifem.ch	info@obviam.ch	+41 (0)31 310 09 30
24	**Ukraine** KfW Ukrainian representative office	Office Nr. 1 Velyka Vasylkivska Str. 44, 01004 Kyiv Ukraine	www.kfw.de	kfw.kiew@kfw.de	+38 04 45 81 19 55
25	**The United Kingdom** British Business Bank	Fleetbank House 2-6 Salisbury Square EC4Y 8JX London, UK	www.british-business-bank.co.uk/	info@british-business-bank.co.uk	+44 203 772 13 40

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International banks and financial institutions

№	Bilateral Institutions	Address	Web Site	E-mail	Phone
1	**World Bank**	1818 H Street, NW Washington, DC 20433 USA	www.worldbank.org **Regional offices of the World Bank for Europe and Central Asia:** https://www.worldbank.org/en/region/eca/contacts	eds01@worldbank.org	+1 (202) 473-1000
2	**International Financial Corporation (IFC)**	International Finance Corporation 2121 Pennsylvania Avenue, NW Washington, DC 20433 USA	**IFC facilities with contacts by countries:** https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/about+ifc_new/contacts	External relations: MAnnanBrown@ifc.org	+1 (202) 473-1000
3	**European Bank for Reconstruction and Development (EBRD)**	EBRD One Exchange Square London EC2A 2JN, United Kingdom	**EBRD facilities with contacts by countries:** https://www.ebrd.com/where-we-are.html	ASDFrontOffice@ebrd.com	+44 20 7338 6000
4	**EBRD SEFF**	EBRD SEFF One Exchange Square London EC2A 2JN, United Kingdom	**SEFF facilities with contacts by countries** http://seff.ebrd.com/index.html	Project enquiries: newbusiness@ebrd.com	+44 20 7338 7168
5	**EBRD GEFF**	EBRD GEFF One Exchange Square London EC2A 2JN, United Kingdom	**GEFF facilities with contacts by countries:** https://ebrdgeff.com/#	-	-
6	**European Investment Bank (EIB)**	EIB 98-100, boulevard Konrad Adenauer L-2950 Luxembourg	**EIB Contacts:** https://www.eib.org/en/infocentre/contact/index.htm	Capital Markets: investor.relations@eib.org	(+352) 43 79 1

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7	**Innovation Norway (EEA grants)**	EEA grants Pb. 448 Sentrum, Akersgata 13, 0104 Oslo	https://www.innovasjonnorge.no/en/start-page/eea-norway-grants/	-	(+ 47) 22 00 25 00
8	**Marguerite Fund**	Marguerite Fund Marguerite 4 Rue du fort Wallis L-2714 Luxembourg Luxembourg	https://www.marguerite.com/contacts/luxembourg/	vverdet@marguerite.com ssallandre@marguerite.com	+3522686531 +33153859500
9	**KfW**	KfW Group Palmengartenstraße 5-9 60325 Frankfurt Germany	**KfW facilities with contacts by countries** https://www.kfw-entwicklungsbank.de/International-financing/KfW-Entwicklungsbank/Service/Kontakt/	Michael.Helbig@kfw.de	+49 69 74 31 44 00
10	**GIZ**	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Friedrich-Ebert-Allee 32 + 36 53113 Bonn	https://www.giz.de/en/html/contact.html	info@giz.de	+49 228 44 60-0

Bilateral agreements and support

№	Bilateral Institutions	Address	Web Site	E-mail	Phone
1	**Interreg Europe**	Les Arcuriales - Entrée D, 5e étage 45 rue de Tournai 59000 Lille, FRANCE	www.interregeurope.eu	**National Contact Points of Interreg Europe for 30 countries:** https://www.interregeurope.eu/contact-us/national-points-of-contact/	+33 328 144 100
2	**Nordic Environment Finance**	Fabianinkatu 34, Postal address: P.O. Box 241	www.nefco.org	Tita Anttila Vice President	+358 10 6180 634

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	Corporation (NEFCO)	FI-00171 Helsinki, Finland		tita.anttila@nefco.fi	

Private investment funds (debt and equity)

№	Private Debt and Equity Funds	Address	Web Site	E-mail	Phone
1	**BioConstruct GmbH**	Wellingstraße 66 in 49328 Melle, Germany	www.bioconstruct.com	info@bioconstruct.de	+49 (0) 5226 59 32-0
2	**ENGIE BiOZ**	10 bd de la Robiquette – BP 86115, 35761 Saint Grégoire Cedex, France	www.engie.com	info.bioz@engie.com	+33 (0) 2 23 46 17 62
3	**Eiffel Biogas Fund** (managed by Eiffel Investment Group)	9 rue Newton, 75116 Paris, France	Apply for funding here: https://www.eiffel-ig.com/obtenir-un-financement.php	financement@eiffel-ig.com	-
4	**EnviTec Biogas AG**	EnviTec Biogas AG, Industriering 10a, 49393 Lohne, Germany	www.envitec-biogas.com	info@envitec-biogas.com	+49 4442/8016-8100
5	**Greenlane Renewables Inc. (the UK office for Europe)**	Unit 5 Chambers Way, Newton Chambers Road, Thorncliffe Park, Chapeltown, Sheffield S35 2PH, the UK	www.greenlanebiogas.com	saleseu@greenlanebiogas.com	+44 (0) 794 823 7657
6	**JLEN Environmental Assets Group Limited**	PO Box 296, Sarnia House Le Truchot St Peter Port GY1 4NA, Guernsey	www.jlen.com	jlen@PraxisIFM.com	+44 (0) 203 763 6959 +44 (0) 1481 737600
7	**Mirova Eurofideme 4** (Affiliate of Natixis Investment Managers)	21 quai d'Austerlitz, Cedex 13, Paris, Ile-de-France, France	www.mirova.com	-	+33 1 78 40 80 00

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8	**Pioneer Point Partners LLP**	Connaught House, 1-3 Mount Street, London W1K 3NB, UK	www.pioneerpoint.com	info@pioneerpoint.com	+44 (0)20 7290 0640
9	**Swen Impact Fund for Transition**	22, rue Vernier 75017 Paris, France	www.swen-cp.fr/en	contact@swen-cp.fr	+33 1 40 68 17 17

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19. Appendix III. Application procedures for financing and grants

№	Banks Financial Institutions	Information for Financing and Grant Application
	Black Sea Trade and Development Bank (BSTDB)	
	Loan amount	Min. € 10 million (this amount can be smaller in some cases to € 3 million) to € 80 million
	Loan term	3 to a 10-year term
	How to apply	1.Download the Doing Business with BSTDB guide to review the main criteria for companies seeking finance: https://www.bstdb.org/BSTDB_doing_business_2019.pdf 2.Fill the Business Proposal Form: https://www.bstdb.org/work-with-us/apply-for-financing 3. Fill and send a questionnaire for evaluation of loan applicants: https://www.bstdb.org/Basic_Information_Guidelines_for_an_Oper-1.pdf
	Bpifrance	
	Loan amount	Min. € 100,000 to € 500,000
	Loan term	3 to 12-year term
	How to apply	1. Agricultural biomethane projects in France with 125 Nm3/h maximum injection capacity into the natural gas network can apply. See the application information here: https://www.bpifrance.fr/Toutes-nos-solutions/Prets/Prets-thematiques/Pret-methanisation-agricole 2. See the contact points by regions in France: https://www.bpifrance.fr/Qui-sommes-nous/Espace-Region/Bpifrance-en-region
	European Bank for Reconstruction and Development (EBRD)	
	Loan amount	Min. € 5 million (this amount can be smaller in some countries) to € 100 million
	Loan term	1 to a 15-year term
	How to apply	1.Download the Guide to EBRD Financing to review the criteria for companies seeking finance: https://www.ebrd.com/downloads/research/factsheets/guide.pdf 2.Fill the EBRD's financing enquiry form: https://www.ebrd.com/eform/contact/1390580844322 3. See the EBRD's financing process: https://www.ebrd.com/work-with-us/project-finance/funding-process.html
	European Investment Bank (EIB)	
	Loan amount	Up to € 100 million

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	Loan term	1 to a 10-year term (but may be extended to 30-year)
	How to apply	1.Download the EIB energy lending policy: Supporting the energy transformation: https://www.eib.org/en/publications/eib-energy-lending-policy 2. Download the application documents for loans above € 25 million here: https://www.eib.org/en/publications/application-document-for-an-eib-loan.htm 3. For projects where the total cost is under € 25 million, the EIB provides intermediated loans (credit lines) to local, regional, and national banks. See the list and contact details of these banks and financial institutions per country here: https://www.eib.org/en/products/loans/intermediated-loans.htm 4. For venture debt opportunities, get the eligibility form from here: https://www.eib.org/en/products/equity/venture-debt.htm
	European Investment Bank (EIB) – list with official banks and financial intermediaries in most of the REGATRACE countries and contact details of loan officers for loan amounts between € 0.1 million to € 25 million	
	Austria	https://www.eib.org/intermediarieslist/search/result?country=AT
	Belgium	https://www.eib.org/intermediarieslist/search/result?country=BE
	Croatia	https://www.eib.org/intermediarieslist/search/result?country=HR
	Czech Republic	https://www.eib.org/intermediarieslist/search/result?country=CZ
	Denmark	https://www.eib.org/intermediarieslist/search/result?country=DK
	Finland	https://www.eib.org/intermediarieslist/search/result?country=FI
	France	https://www.eib.org/intermediarieslist/search/result?country=FR
	Germany	https://www.eib.org/intermediarieslist/search/result?country=DE
	Greece	https://www.eib.org/intermediarieslist/search/result?country=GR
	Ireland	https://www.eib.org/intermediarieslist/search/result?country=IE
	Italy	https://www.eib.org/intermediarieslist/search/result?country=IT
	Latvia	https://www.eib.org/intermediarieslist/search/result?country=LV
	Netherlands	https://www.eib.org/intermediarieslist/search/result?country=NL
	Poland	https://www.eib.org/intermediarieslist/search/result?country=PL
	Romania	https://www.eib.org/intermediarieslist/search/result?country=RO
	Serbia	https://www.eib.org/intermediarieslist/search/result?country=RS
	Slovenia	https://www.eib.org/intermediarieslist/search/result?country=SI
	Spain	https://www.eib.org/intermediarieslist/search/result?country=ES
	Sweden	https://www.eib.org/intermediarieslist/search/result?country=SE
	Ukraine	https://www.eib.org/intermediarieslist/search/result?country=UA

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	EIT Climate-KIC	
	Grant amount	Between € 300,000 and € 500,000 under the COVID-19 Venture Financing Support Scheme
	Grant term	The grant should be accumulated within the 3-month to 6-month period
	How to apply	Read the information at the Extraordinary COVID-19 Venture Support 2020: https://www.climate-kic.org/get-involved/venture-funding/
	International Finance Corporation (IFC)	
	Loan amount	min. € 5 million (although this can be smaller in some countries) to € 100 million
	Loan term	7 to a 12-year term
	How to apply	1.Read the How to Apply for Financing page: https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/solutions/how-to-apply-for-financing 2.Fill and send the IFC's investment proposal information: https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/solutions/investment-proposals 3. Address the investment proposal to the regional IFC office responsible for your country: https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/about+ifc_new/contacts
	Innovation Norway (EEA Grants)	
	Grant amount	Up to € 1 million
	Grant term	The grant should be accumulated within the 6-month to 24 month-period
	How to apply	1.Read who can apply to review the criteria for companies seeking finance: https://www.innovasjonnorge.no/en/start-page/eea-norway-grants/who-can-apply/ 2. To apply for funding, look for open calls for proposal per country here: https://www.innovasjonnorge.no/en/start-page/eea-norway-grants/funding-options/ or here: https://eeagrants.org/currently-available-funding 3. For questions on how to apply, contact the relevant officers by countries: https://www.innovasjonnorge.no/en/start-page/eea-norway-grants/about/contact/
	LIFE Programme for Environment and Climate Action	
	Grant amount	Between € 0.5 million and € 5 million (maximum € 17 million possible for projects with several partners)
	Grant term	The grant should be accumulated within 5 years
	How to apply	1.Read who can apply to review the criteria for companies seeking finance: https://ec.europa.eu/easme/en/section/life/life-who-can-apply 2. Guide for applicants:

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		https://ec.europa.eu/research/participants/data/ref/other_eu_prog/life/guide/life-guide-applicants_en.pdf 3. To apply for funding, look for open calls for proposal per country here: https://ec.europa.eu/easme/en/section/life/calls-proposals 4. Submit your proposal here: https://webgate.ec.europa.eu/eproposalWeb/ 5. For questions on how to apply, contact the national contact points by countries: https://ec.europa.eu/easme/en/section/life/life-national-contact-points

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20. Appendix IV. Acknowledgments

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