Biogas Policies in the EU: Levelling up or locking in?

This report was undertaken by:

The report synthesises findings from an extensive report authored by the consultancy group, Profundo. www.Profundo.nl

Profundo's full report *Biogas in the EU: A policy and financial analysis* can be found in the reference list.

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About this briefing

This briefing is largely based on Biogas in the EU: A policy and financial analysis report undertaken by Profundo on behalf of the Methane Matters coalition,[1] a consortium of European non-governmental organisations working to reduce methane emissions in the agriculture, waste, and energy sectors.[2]

This briefing summarises the report's key findings and includes some additional research conducted by coalition members, primarily on methane leakages. It reviews existing EU policies relevant to biogas and biomethane production, assessing gaps, potential lock-ins for current unsustainable practices, and policy strengths to replicate elsewhere. Given the significant industry engagement in the EU's RePowerEU target and the Biomethane Industrial Partnership set up to help implement it, it also looks into company finances, identifying the largest companies engaged in biogas production, their investments and any public financing.

To illustrate how EU policies impact biogas production at the national level, the briefing includes six case studies from EU member states, reflecting a balance of geographies within the EU and a range of biogas production capacities. In addition, a case study focused on the UK is included, as the country is a key player and champion of the Global Methane Pledge (GMP).

Methane a climate emergency brake

Methane is a greenhouse gas 80 times more powerful than C02 over a 20-year time frame.[3] Tackling methane is the best emergency brake we have to limit near-term warming and thus avoid climate tipping points, which are edging ever closer. The agriculture, energy and waste sectors are methane's largest polluters.

In 2021, the EU and the US launched the GMP at COP26, now endorsed by 159 countries and the European Commission. Through the pledge governments commit to a 30% reduction in global methane emissions by 2030 (compared to 2020 levels), and are encouraged to develop National Methane Action Plans to implement the commitment.[4] At half way to the GMP deadline of 2030, emissions continue to rise and these plans remain elusive for many countries.[1],[5] Other policy areas continue to impact the likelihood of signatories reaching the pledge target, including commitments on biogas production.

As founders of the pledge, and now GMP Global Champion, the EU and the UK are central to the global leadership and action on methane emission reduction.

Why biogas regulation is important

Biogas is regularly promoted as a 'renewable' energy by the biogas industry and as a central way to reduce methane emissions. However, on a closer look, biogas and biomethane production can have significant negative impacts on methane emissions and wider sustainability areas if not implemented with strict, regularly monitored and enforced regulations.

Agriculture, energy and waste have different solutions to mitigating methane emissions and all are vital to achieving the GMP. While the waste sector has benefited from the implementation of biogas and biomethane to reduce emissions from organic waste, other sectors have yet to find the 'sustainable niche' for biogas and biomethane production. It is not a one size fits all approach.

1 Countries with National Methane Action Plans or Roadmaps according to the CCAC include: Brazil, Cambodia, Canada, China, Costa Rica, the EU, Finland, Iceland, Liberia, the Netherlands, New Zealand, Norway, Panama, Republic of Korea, Sweden, Ukraine, the UK, the USA, and Vietnam.

The EU launched its RePowerEU target in 2022 in response to Russia's accelerated invasion of Ukraine,[6] aiming to increase biomethane production in the EU to 35 billion m3 (bcpm3) annually by 2030.[7] The EU aims to do this through the Biomethane Industrial Partnership (BIP), which "is an industrial partnership in which policymakers, industry and other stakeholders team up with the goal to support the achievement of the target of 35 billion cubic meters annual production and use of sustainable biomethane by 2030, and to create the preconditions for a further ramp-up of its potential towards 2050." [8]

However, something critical is missing from RePowerEU and the BIP's ambitious plans. An environmental impact assessment of any kind.

Biogas Investment Partnership

The BIP is made up of over 175 organisations, primarily biogas, energy, and agriculture organisations, as well as investors, agricultural ministries at the EU level and national agencies such as the Danish Embassy in Berlin and the Irish agricultural research agency, Teagasc.[9] Companies include Cargill, Cooperl and Eneg, some of which are members of the BIP task forces, smaller groups of companies and organisations working toward the BIP goals, including on 'accelerating biomethane project development' and 'assessing potentials for sustainable feedstocks'.[10] Task force members meet regularly to move the BIP towards achieving these goals.[11] Its board includes representatives from DG Ener, DG Agri, Directors of the Spanish and Irish Ministries, the CEO of the European Biogas Association, Snam and Total Energies.[12]

Despite this, the biogas sector continues to grow with governmental support, both through legislation promoting biogas (for example, setting national biogas targets, or easing grid connection for biogas plants) and by directly subsidising the industry using public money. The International Energy Agency (IEA) reports that between 2020 and 2025, over 50 new policies were introduced to support biogas globally.[13] As with any fast-growing sector, investments and financing by banks and investors have also played an enabling role. The biogas industry has, in effect, been written a blank cheque to expand without any assessment on how this can be done sustainably. This puts the EU's climate goals at risk, and has the potential to lock-in unsustainable practices and feedstocks.

While biogas and biomethane[2] can have positive impacts for methane emission reduction when implemented well, significant concerns remain on its sustainability and its use as a 'renewable' form of energy. These include methane leaks from existing biogas plants (many of which go unrecorded), water pollution, air quality, land-use and wider concerns about feedstocks such as manure, which have driven increases in industrial livestock farming in the US where biogas has been scaled rapidly.[14] Despite this, Big Meat and Dairy regularly promotes biogas as a 'renewable energy' solution to its methane emissions.[15] For the fossil fuel industry, biomethane can be an opportunity to further entrench the industry, focusing on shifting to a new 'renewable' gas, rather than investing in systems change solutions for energy production. This echoes the 'natural gas' narrative historically pushed by fossil fuel companies and further enables the industry to continue producing fossil gas, as it is needed to mix with biomethane in the grid.

2 This briefing uses the term biogas to refer to both biogas and biomethane, unless referring only to biomethane, where relevant for particular policies. Outside of this biogas production will be used as an interchangeable term.

Biogas and biomethane

Biogas can be used directly for generating heat and power, and can also be upgraded to biomethane. Similar to fossil gas, methane is the main component of biogas, usually accounting for around 60% of its volume. By upgrading biogas - removing CO_2 and other gases - it is turned into biomethane with a methane content comparable to that of fossil gas (above 90%). Biomethane can be injected into existing fossil gas grids, for use in households and businesses, and used as transport fuel. The latter requires liquifying the biomethane at low temperatures, to turn it into bio liquid natural gas (BioLNG).[16,17]

Biogas has been used in domestic and agricultural applications for centuries,[18] and has significantly increased in scale over the last 25 years. In the year 2000, global biogas output made up 7.5 billion m3, and by 2020, annual production had reached 38.1 billion m3. Europe has played a leading role in this, and the region accounts for more than half of all global production.[19]

Summary of findings

The RePowerEU 35bcm3 target for scaling up biomethane production has no clear environmental impact assessment and other EU policies relevant for biogas are insufficient to prevent unintended negative consequences for climate, the environment and communities under the target. New biomethane plants are being built with waste in mind, responding to the land-use concerns from energy crops, but potentially creating a new problem. Organic waste streams from food waste, must be reduced in line with the Waste Framework Directive, and agricultural waste such as manure cannot become an unlimited feedstock. Giving the biogas industry significant funds to maximise production on these waste streams, without an environmental impact assessment could have devastating consequences for the EU's methane reduction and wider environmental targets.

Within the EU's sustainability measurement, the Renewable Energy Directive (RED III), manure is calculated as a zero-emission waste product, even receiving 'manure credits' for 'emissions saved' from raw manure management.[20] This means that associated land-use change for feed, enteric fermentation and other emissions sources from livestock production are not accounted for. This could potentially lock in unsustainable practices across the region and lead to missed opportunities to reduce methane emissions in more effective ways, including a reduction in herd sizes and a switch to less intensive models of animal agriculture.

Biogas production cannot be considered 'sustainable' without a clear environmental impact assessment. Negative environmental, climate and social impacts could be avoided with a clear assessment, and the implementation of relevant regulatory updates. This can ensure that biogas and biomethane production in the EU is managed sustainably and appropriate investment is provided to other forms of renewable energy such as solar, wind, and heat pumps to better support climate goals, alongside energy security, and wider environmental and biodiversity targets. Biogas made up around 1% of final energy consumption in the EU in 2023,[21] a more holistic approach to the EUs energy security will be imperative to meet its energy security and climate goals.

Main findings

↘ No EU policy sufficiently mitigates the environmental and social impacts of biogas and biomethane production.

- The report assesses eight EU policies relevant to biogas and biomethane production and compared these against six environmental and social impacts linked to biogas production, including local community impacts, methane leaks, and feedstock related land-use change.
- None of the six identified impacts are adequately covered by existing policy on biogas to support more sustainable engagement with this sector.
- At the national level some negative impacts of biogas production such as the incentivisation of the use of manure as a feedstock, which can have unintended consequences driving industrial livestock production, are actively encouraged in the EU member states of Ireland, Germany, and the Netherlands, as well as the UK.

↘ Perverse incentives to invest in biogas production exist in several EU financial frameworks, creating a risk of channelling over €37 billion into projects without robust sustainability checks.

- RePowerEU makes available €37 billion from the EU's Recovery and Resilience Facility and other financial instruments.[22] In addition, the Climate, Energy and Environmental Aid Guidelines, the EU Modernisation Fund, and the European Agricultural Fund for Rural Development all set biogas and biomethane as 'sustainable' investments, supporting energy efficiency, and as part of renewable energy for rural development, making further funds available.
- Setting biogas as sustainable without assessing its sustainability through a full environmental impact assessment risk incentivising a massive scale up of plants, which could lead to an unsustainable lock in, if there are not enough sustainable feedstocks available in the future.
- In conjunction with industry investment, these are funds that could be spent on policies likely to support greater methane emission reductions in the EU.

↘ Private investment in biogas has increased since the RePower EU target was set, including from companies directly involved in the assessment of what is considered 'sustainable' biogas feedstocks in the BIP.

- Private investment is increasing into the sector, including to and from some of the companies involved in the BIP, set up to help implement the RePower EU goals. Several companies appear in our research as making significant investments into biogas and biomethane production, sometimes covered partly by government subsidies, who are also members of the task forces of the BIP, Enea, EnviTec, and Future Biogas.[23]
- For example, BIP member, Cargill one of the largest agricultural polluters in the world, with a long history of derailing and delaying climate regulation,[24] is investing heavily in biogas in the Netherlands. This has led to concerns on the potential to 'lock-in' to unsustainable extraction and manure production. The Netherlands already has three-times higher nitrogen pollution than other European countries, mostly coming from intensive livestock farms.[25]

- Based on a survey of 28 of its members (project developers and investors), the European Biogas Association (EBA) identified investment commitments with a total value of €28 billion in biomethane production for the period until 2030.[26]

↘ Manure is increasingly used as a feedstock in biomethane production, despite its significant life cycle emissions and wider environmental pollution.

- Since 2019, the use of manure as a feedstock has increased exponentially as a share of biomethane feedstocks. This risks increasing intensive animal agriculture systems, as has happened in the US where subsidies for manure feedstocks incentivised increased herd sizes in intensive dairy systems.[27]
- While beef and dairy farming leads to significant emissions from enteric fermentation (cow burps), responsible for around 49% of the EU's agricultural emissions, manure accounts for a further 17%.[28] While this is still significant and must be addressed, increasing manure's use as a feedstock for biogas production could lead to negative climate and environmental outcomes, if this corresponds with an increase in intensive animal agriculture. An increase in intensive animal agriculture would be misaligned with scientific consensus on the need for livestock emissions in high- and middle-income countries to peak this year (2025).[29]
- Moreover, as the EU's sustainability methodology, REDIII counts manure as a zero-emissions waste product (up until the point of collection) it overlooks its life cycle emissions and those from land-use for animal feed.

Recommendations

Based on the findings of this briefing, detailed below, the Methane Matters coalition recommends EU policymakers conduct an immediate environmental impact assessment of RePower EU. This includes ensuring appropriate regulation of the biogas sector to maximise the application of best practices and minimise environmental harm along the supply chain, preventing the lock-in of investments into potentially harmful practices.

Recommended measures:

↘ Reconsider the 35 billion m3 biogas and biomethane target set by REPowerEU after a full environmental impact assessment, to avoid locking in unsustainable production practices, negative land-use impacts or potential intensification of livestock farming.

↘ Agree that in the absence of a thorough impact assessment, public funds must not be used to promote a technology that can potentially cause significant environmental harm. The EU must adhere to precautionary and polluter pays principles, ensuring that negative impacts are mitigated.

↘ Define where the use of biogas is and isn't appropriate: while it can be used for peak load electricity production and for heavy industry, it should not be used for heating, baseload electricity and road transport, as better alternatives exist.

↘ Ban crops grown on fertile land, which could be used for food or feed crops, as acceptable biogas feedstocks from RED III and other policies, to avoid contributing to food insecurity, monoculture expansion, and indirect land-use change.

↘ Ensure sustainable limits on the use of manure as biogas feedstock in RED III, REPowerEU and other policies, ensuring manure's life-cycle emissions are accounted for in sustainability calculations and guaranteeing an overall policy goal to reduce the number of animals and prevent the intensification of livestock farming. This is essential to avoid perpetuating the environmental and animal welfare harms of the current animal protein sector, moving instead towards agroecological farming models.

- Reduce methane emissions from landfills, among others by making sure that the pre-treatment of waste prior to landfilling, mandated by the Landfill Directive, is implemented and enforced by member states.
- Independent comprehensive methane measurements and rigorous EU wide leak detection and repair (LDAR) requirements must be implemented and consistently enforced by national and subnational authorities. These should be complemented by clear methane loss limits, such as Denmark's 1 % cap for biomethane upgrading equipment.
- Avoid the weakening of the nitrogen limit from Recovered Nitrogen from manure (RENURE) under the Nitrates Directive during transposition of the flawed Renure decision. This is incompatible with environmental and water protection goals and properly treated digestate can be applied to fields replacing existing fossil fertilisers and does not require a lifting of the RENURE safe limits for water quality to be utilised.
- Retain the Nitrates Directive without amendment, and step up impactful implementation and enforcement of both the Nitrates Directive and the Water Framework Directive. This should include mechanisms to achieve outcomes such as post-composting of digestate (what remains of the feedstock after anaerobic digestion for biogas production) before its application on land, in order to reduce nitrogen runoff and water pollution.
- Stop and reverse the Omnibus Package for the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD), as the 'simplification' of sustainability regulations would make sustainable biogas production more difficult to achieve.

The Methane Matters coalition further recommends policymakers in EU member states, and the UK, take necessary steps at the national level. This includes implementing relevant EU regulations and supplementing them with additional criteria and safeguards in their countries, to regulate the biogas sector, maximise the application of best practices and minimise environmental harm along the supply chain. A full list of national recommendations can be found in Biogas in the EU: A policy and financial analysis.[30]

Why it matters that biogas and biomethane are managed sustainably

RePower EU, while setting a target for biomethane production for energy use in the EU, does not fully address the environmental and social impacts of biogas/biomethane production. Current policies use RED III methodologies to analyse emissions savings from biogas production, however, at the emissions level these do not provide the whole picture. Land-use change from animal agriculture feed for example is not calculated under RED III and feedstocks such as manure from livestock are counted as a 'waste' product, meaning the emissions polluted through the creation of manure, for example from enteric fermentation in ruminant livestock, are not included. Moreover, the wider environmental impacts of key aspects of biogas production are not considered in current assessments of its sustainability, including the impacts of industrial livestock systems used to create manure to use in biogas plants, local pollution impacts of biogas plants, and the implications for financial investment that could displace other more sustainable energy solutions. Six environmental and social impacts are highlighted below:

1. Methane leaks

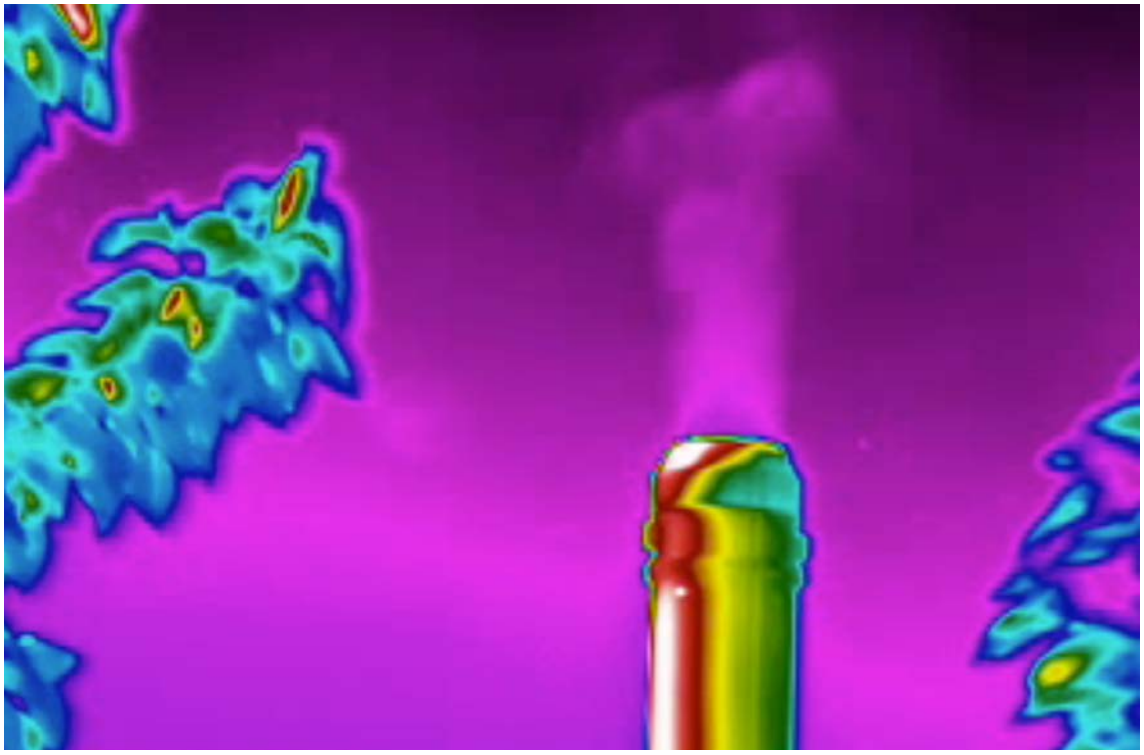
Methane emissions from biogas and biomethane pose a growing threat to the climate, public health, and the environment. In addition to its considerable climate impact, methane contributes to air pollution by forming ground-level ozone, worsening asthma and other respiratory conditions, reducing crop yields and harming ecosystems.

While methane leakage from fossil fuels are now regulated under the EU's Methane Regulation (2024), no such regulations are in place for biogas and biomethane plants for leakage detection and repair. RED III requires life cycle GHG emissions of biofuels to be 65% lower than fossil fuels, with a methodology accounting for waste and leakages. In practice this is difficult to measure from the multiple leak sources from accidental discharges, unintended leaks, and poor operational management.[31]

Research by the EU Joint Research Centre estimates that around 5% of methane produced in biogas and biomethane supply chains in the EU is lost to leakage,[32] equating to enormous methane losses.[33] Real-world measurement studies suggest the true figures could be even higher with the International Energy Agency reporting these could be as high as 12% during production alone.[34]

In Germany alone, up to 370,000 tonnes of methane escape annually from biogas plants, equivalent to around 31.8 million tonnes of CO_2 over 20 years (GWP20) and comparable to the annual greenhouse gas emissions of smaller EU member states such as Malta or Cyprus.[35] Recent studies show that methane leakage is a systemic issue across Europe, with high loss rates found not only in emerging markets but also in countries with mature biogas industries such as Denmark and the UK. Official inventory factors likely "substantially underestimate real-world emissions".[36] This highlights the urgent need for mandatory, third-party leak detection and repair (LDAR) as well as harmonised EU-wide monitoring and reporting frameworks.

A recent investigation in Denmark showed methane leaks at double the regional atmospheric average at the Shell-owned Nature Energy plant, and methane levels at 16 times higher than background levels outside the Tønder biogas plant, spiking at 35,000 ppb.[37] Shell ranks as the fourth largest oil and gas company with biogas involvement in our analysis.



Source of methane release identified at Nature Energy, Videbæk

Although Denmark and Germany have introduced advanced national policies to reduce leakage, weak enforcement and insufficient oversight limit their effectiveness, 69% of inspected biogas plants in Germany still showed significant deficiencies in 2023.[38] This is worrying not only for countries with little regulation, but also for those considered leaders in the sector. If biogas production expands rapidly in regions without strong safeguards, as promoted by REPowerEU, leakage is likely to intensify.

Cost-effective technical measures to reduce the risk of leakage already exist and have been shown they can benefit plant operators financially.[39,40] The fact that they remain underused points to a major policy failure and underscores the need for regulation and strict oversight of biomethane facilities.

2. Impacts on local communities and environment

Depending on production technologies and feedstocks, biogas production can negatively impact local communities through exposure to volatile organic compounds (VOCs), particular matter and microbial agents in occupational settings, and potential exposure to endotoxins and fungi associated with respiratory symptoms.[41] In addition, local communities can experience unpleasant smells (also associated with industrial composting) and increased traffic.[42]

In addition, burning biogas for use in transport can emit up to three times higher nitrogen oxide emissions fossil gas used for the same purpose, which can have significant impacts on human health.[43] The most recent available data (2023) shows that no biogas is being used for transport in the EU. This must remain the case.[44]

Alongside direct impacts on human health and wellbeing, the digestate produced as a by product of biogas production can lead to nutrient run-off and leaching when used as a fertiliser, polluting soils and waterways with nitrogen and phosphorus exceeding safe planetary limits.[45] Without stringent controls, biogas systems risk intensifying systemic environmental pressures.[46] To avoid these downsides of direct application of digestate on land, post-composting of digestate is an effective option to reduce nutrient run off and leaching effects.[47] This has already been considered by some Member States, and should be enforced under the current Nitrates Directive for example through an obligation to include post-composting, or by applying coefficients to determine the lower mineralization/release of nitrogen from compost compared to digestate in each year following application.

The biogas industry and others have pushed for the current restrictions on digestate spreading to be relaxed by expanding the limits of the Nitrates Directive, under the guise of enabling the replacement of synthetic fertilisers and supporting the circular economy.[48] The claim that this would allow farms to replace synthetic fertilisers with recycled nitrogen is misleading. In reality, the revision would result in an increased limit allowing farmers to use recycled nitrogen in addition to synthetic fertilisers already used.

3. Incentivisation of industrial animal farming

Biogas production in the EU depends significantly on manure and slurry as one of the key feedstocks.[49] The (subsidised) usage of these feedstocks is creating an additional source of income for the large-scale dairy and meat sectors. This practice runs the risk of locking in industrial animal agriculture systems which are harmful for the planet, for food security and for animal welfare.[50]

Agriculture accounts for around 56% of the EU's methane emissions, with 67% of this coming from enteric fermentation from cattle.[51] This does not include the indirect impacts of the sector on global heating, as feed crops such as maize and soy are imported into the EU accounting for land-use change and deforestation.[52,53] The world will not stay within the 1.5° temperature increase limit without significantly reducing the consumption and production of animal products.[54,55]

As manure from animal farming needs to be collected for biogas production, it is most applicable in intensive systems where slurry is regularly collected from indoor livestock like dairy cattle and pigs. This could lock-in intensive production systems with high absolute emissions, incentivising farming to stock more animals and undermining agroecological models. This also impacts animal welfare, with high stocking density on farms, the use of cages, and welfare issues, such as routine mutilations.[56] As manure is classified as 'waste' and having zero upstream emissions at the point of collection, and even credited for the 'negative' emissions

avoided through raw manure management in REDIII, the stimulation of manure as a feedstock could skew the proposed emissions savings from biogas production considerably when accounting for the full life-cycle emissions from animal manure.

A 2024 study suggested that relying on manure in this way, could increase the EU's dependence on imported animal feed, undermining the EU's strategic autonomy and protein plans, and potentially reinforcing neocolonial patterns of resource extraction.[57]

Despite these strong negative externalities, the meat and dairy sectors in Europe benefit enormously and disproportionately from EU agricultural subsidies. A total of 82% of the Common Agricultural Policy (CAP) subsidies go to animal production, most of which is intensive. Of these, 38% go directly to animal production (mainly dairy) and 44% support intensive animal production indirectly through the production of feed for animals kept indoors (mainly for pigs and poultry).[58]

In 2019, manure made-up 24% of feedstocks in the EU. However, according to the European Biogas Association (EBA), new biomethane plants are using significantly higher proportions of manure and agricultural residues to make up their feedstocks (see figures 1 and 2 below). The EBA states that since 2020, the majority of new plants were built to run on waste, primarily from agriculture, manure, slurry and sewage.[59] Without clear regulation in place to prevent lock-in, this could mirror a future growth in biodigesters in the US following subsidy incentives for farmers, which resulted in a 3.7% increase in herd sizes on farms (usually intensive farms) with digesters year on year.[60]

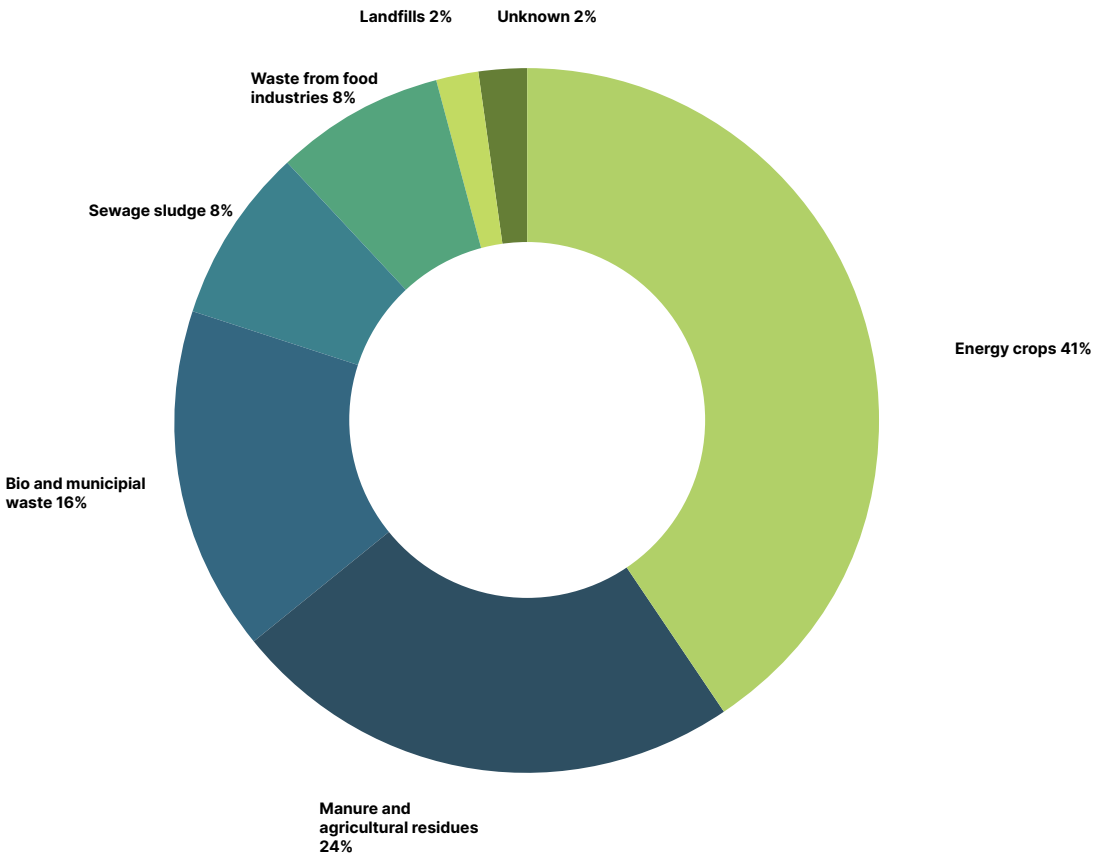


Figure 1. Feedstocks for biomethane production in the EU, 2019

Source: *Wouters, C., M. Buseman, J. van Tilburg, T. Berg, J. Cihlar, A. Villar Lejarrta, J. Jens, A. Wang, D. Peters, and K. van der Leun, K. (2020, December), "Market state and trends in renewable and low-carbon gases in Europe", Gas for Climate & Guidehouse, online: https://www.europeanbiogas.eu/wp-content/uploads/2020/12/GfC_MSTReport_2020_final.pdf.*

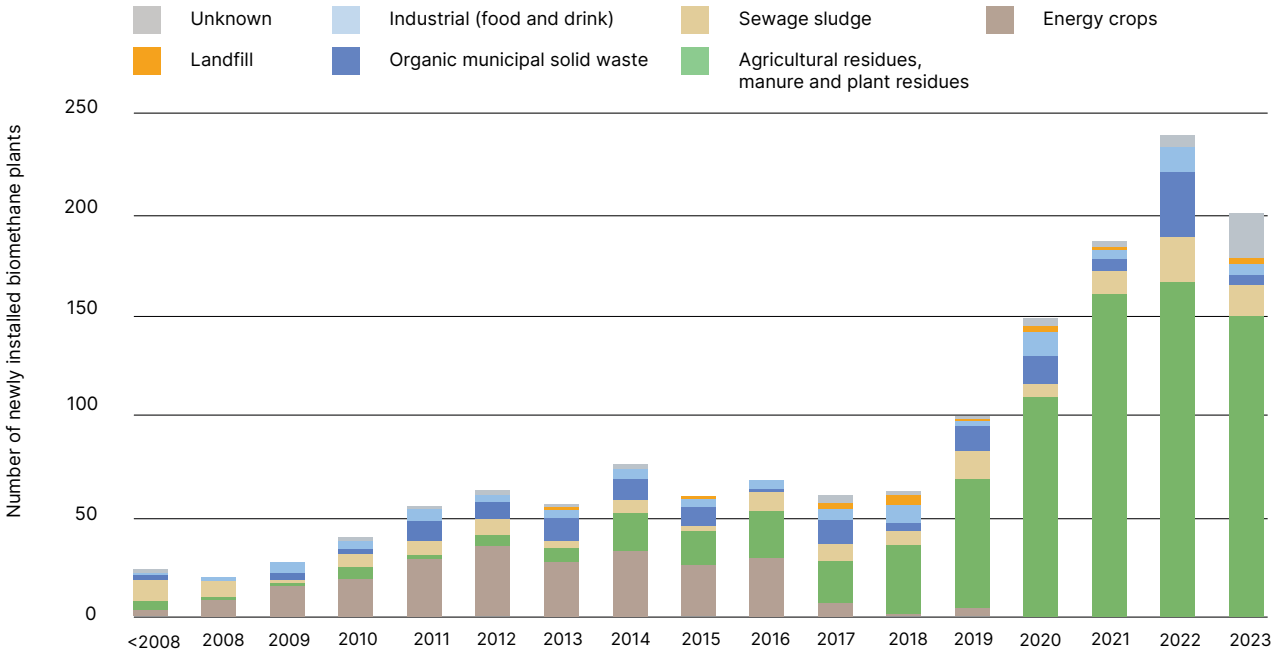


Figure 2. Feedstocks used by new biomethane plants in Europe, 2008-2023
Source: *European Biogas Association (2024, December 4), "Webinar: EBA Statistical Report 2024 unveiled", p. 22.*

4. Waste production and processing

Producing biogas from organic waste is generally less controversial than from other feedstocks. However, this does not mean that scaling up biogas production from European waste should be the main focus. The waste hierarchy must be followed first – efforts, funding and attention should be primarily directed towards prevention organic waste, which remains the most cost-effective and environmentally sound policy priority.[61]

For organic waste that cannot be prevented, composting (home, community, or centralised plants) and biogas are the most preferable options.[62] Composting is generally considered slightly preferable to biogas because it returns discarded organic materials back to soils, improving their capacity to sustain or enhance plant and animal life, and is robust, scalable, and particularly suitable for small-scale, low-tech, or temporary applications in communities, businesses, and institutions[63]. When these processes are applied to separately collected waste, they are considered forms of recycling. It's imperative that in promoting biogas in Europe, we avoid creating incentives for continued waste generation solely as feedstock for biogas. Biogas production in the EU must ensure that it complements, rather than replaces, prevention and composting strategies.

5. Crops as feedstock

Energy crops grown for the production of biofuels and biogas previously accounted for a significant share of production at 41%, according to a 2020 study (see Figure 1).[64] While some policies prohibit the use of feed and food crops for biogas production (see Table 1), competition for land between food and feed crops on the one hand, and energy crops on the other, is considered a significant negative impact of the bioenergy industry in the EU. It expands cropland and displaces natural ecosystems, further contributing to biodiversity loss and habitat fragmentation. This practice contradicts the Paris Agreement, requirement for signatories to work towards a "*climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production*".[65] However, as shown in Figure 2, many new biomethane plants are focused on waste feedstocks and are avoiding the use of energy crops in their systems, in part due to RED III's discouragement of using food and feed crops for transport fuels. While this can be positive

for land-use change related to energy crop use, the current production of biomethane can contribute to land-use change and cement unsustainable diets via large-scale animal farming.[66] Ensuring biogas production is within sustainable limits is essential to avoid these negative outcomes. This must include considering the implications of land-use change for energy crops and for feed for intensive animal production where most manure for biogas comes from.

6. Postponing the transition to sustainable energy systems and phasing out fossil fuels

Biogas should not be considered a silver bullet for decarbonisation of the energy system. It will be impossible to replace all present fossil gas consumption with sustainably produced biomethane, creating space for fossil gas production to fill the gap using the same infrastructure to mix fuels. While investment and subsidies focus on biogas and biomethane production, other more sustainable solutions to the energy transition could lose out. A 2021 assessment commissioned by the European Commission concluded that around 24 billion m^3 of biomethane could be produced sustainably by 2030 in the EU. However, the experts also concluded that it should not be used for the heating of buildings or terrestrial transport.[67,68]

While energy experts agree biogas can play a role when it is produced sustainably – for example using feedstocks from separately collected organic waste, how this can be implemented differs. Some coalitions suggest a focus on local production should be the priority, supporting circular systems for example.[69] However, biomethane is increasingly attractive to investors, with many setting up new funds dedicated to this, including the Spanish insurance company, Mapfre, which aims to raise €100 million for 20-25 biomethane plants in Spain over a 5-year period. The Dutch pension fund ABP allocated €250 million into bioenergy infrastructure firm BioticNRG via its asset manager APG. In addition, investors such as KK Invest, DBC Invest, Copenhagen Infrastructure Partners, Goldman Sachs Asset Management, amongst others are seeking opportunities to invest in biomethane production.[70]

RePowerEU's €300 billion commitment, €37 billion of which has so far been dedicated to biomethane and other EU financial support mechanisms,[71] are funds that could otherwise be spent on initiatives that are likely to support greater methane emission reductions in the EU. These areas need to be fully assessed by the EU as part of an environmental impact assessment and above all, must not be used as an excuse to delay the abandonment of fossil gas before 2030.

Regulatory Frameworks in the EU

Numerous regulatory frameworks in the EU are currently relevant for biogas production or could become relevant when in place – e.g. the carbon removals and carbon farming framework. For the purposes of this briefing, the analysis focused on the following:

- The **Renewable Energy Directive** (RED III) mandates a 42.5% share of renewable energy in the EU's energy mix by 2030. REDIII promotes the production of biomethane, its use as transport fuel and its injection into the existing fossil gas grid but discourages its use for electricity production.
- The **REPowerEU** plan outlines the target of producing 35 billion m^3 of biomethane annually by 2030.
- The **Waste Framework Directive** obliges separate bio-waste collection and prioritises its conversion into compost or biogas.
- The **Landfill Directive** requires the pre-treatment of waste before sending it to a landfill and encourages biogas production through anaerobic digestion of organic waste.
- The **EU Industrial Emissions Directive** lays down comprehensive rules for preventing and reducing pollution from industrial and livestock-rearing activities across the EU. After strong industry

lobbying, cattle were excluded from the revised Directive, excluding beef and dairy - the largest contributors to the EU's agricultural methane emissions.

- The **Nitrates Directive** limits spreading digestate (a by-product of biogas production) across arable land, but a proposed amendment (see below) would allow higher nitrogen levels if digestate is processed into so-called RENURE fertilisers.
- The **Alternative Fuels Infrastructure Regulation** promotes refuelling points for heavy-duty motor vehicles using BioLNG.
- The **EU Taxonomy Regulation** provides a classification system for the sustainability of economic activities which align to a net zero trajectory by 2050. Biogas and biomethane are included in this for use as transport fuel enabling investors and companies to share a common definition of sustainability and protecting them from claims of greenwashing and creating security for investors in the sector.

Financial support mechanisms:

- The **Climate, Energy and Environmental Aid Guidelines** set biomethane and biogas projects as eligible for State aid, provided they meet the sustainability criteria in RED II and REDIII.[72]
- The **EU Modernisation Fund** is designed to facilitate the modernisation of energy systems and the enhancement of energy efficiency across 13 lower-income EU Member States, including Poland and Romania. Poland has already benefited from the Fund via the Rural Energy priority programme support scheme with a total allocation of €700 million. It aims at increasing the use of renewable energy sources in rural and semi-rural municipalities, including from biogas.[73] The Romanian government also plans to support the anticipated expansion of biogas-based power generation through the Fund.[74]
- The **European Agricultural Fund for Rural Development** channels EU support to rural development programmes contributing to the competitiveness of agriculture, enhancing sustainable management of natural resources and climate action, and achieve balanced development of rural communities and economies.[75] Under Rural Development (CAP Pillar II), member states can designate funding for investments in renewable energy, including biogas plants, upgrading to biomethane, digestate use and related infrastructure.[76] Some biogas plants in Germany are receiving support through this fund.

In addition to these existing EU policies, some new proposals are under discussion at the EU level:

- **EU Energy Taxation Directive Revision**: An Energy Taxation Directive revision proposed in 2021, but still under discussion, instructs member states to set a tax rate of EUR 0.15 per GJ for biogas and some other energy sources. This compares with a tax rate of EUR 10.75 per GJ for traditional fossil fuels.
- **EU Nitrates Directive**: The EU Nitrates Committee has approved the use of RENURE fertilisers above the Nitrates Directive limit of 170 kg/ha, without any proper impact assessment being undertaken.[77] If approved by the Parliament and Council, this could lead to an increase in nitrogen of up to 80 kg/ha, putting the limits at 250 kg/ha.[78]
- The **Corporate Sustainability Due Diligence Directive** fosters responsible corporate behaviour in global value chains, including the imports of feedstocks and feed crops for animal farming. It does not specifically mention biogas, but covers sectors involved in the biogas value chain. It's transposition into national laws has been postponed by the **Omnibus Package** and the ensuring Stop-the-clock Directive. If and how the CSDDD will be further weakened is still being debated.
- **Carbon Removals and Carbon Farming:** the CRCF and its possible expansion could include manure management in its framework of carbon farming, which would apply to biogas production as a feedstock. This is currently being discussed by the Commission and could have significant implications for biogas production in the EU.

↘ The Corporate Sustainability Reporting Directive (CSRD) was not covered in this research but could require companies to report on significant scope 3 emissions.[79] 13 out of 15 of the biggest meat and dairy companies globally would need to report their emissions under the directive as it was proposed,[80] however, this is also under threat from the omnibus proposals, limiting the number of companies required to report.[81]

How do EU policies on sustainable biogas shape up?

Key European policies were assessed against the six identified environmental and social impacts of biogas production. Of the six identified, none are adequately covered by existing policy on biogas to support more sustainable engagement with this sector. Two key areas are not addressed at all by existing policies and four are addressed only in part.

Table 1. How do existing policies address the environmental and social impacts of biogas production in the EU?

Environmental and social impacts linked to biogas production	Addressed by existing policy: Yes, No, In part	Description
Methane leaks	In part	RED III requires the lifecycle GHG emissions of biofuels (including BioLNG) to be at least 65% lower than those of conventional fuels. But the assessment methodology does not take into account that methane leakages are difficult to measure and does not account for other life cycle emissions from livestock manure or land-use change from energy crops.
Waste production and processing	In part	The Waste Framework Directive and the Landfill Directive address methane leakages from landfills by promoting the separate collection of organic waste for use in biogas production and requiring pre-treatment of waste before being sent to a landfill. However, current biogas policies do not prioritise the overall reduction of food waste and composting before the remainder is utilised as feedstock in biogas production.
Impact on local communities and environment	In part	No specific policy exists relevant for community engagement in biogas production. While some aspects of community impacts have been addressed through the Nitrates Directive via restrictions on nitrogen levels from fertiliser application, which could mitigate negative impacts on waterways, nature and health, this has been weakened under pressure from highly intensive livestock producing countries such as the Netherlands. Other policies, such as the EU Taxonomy, recommends post-composting of digestate from biogas as the preferred option, which would limit the environmental impacts of run off from digestate used on fields post biogas production. The Environmental Impact Assessment (EIA) Directive and the Industrial Emissions Directive (IED) address topics such as odour, air quality, and human health, but without specific biogas criteria these are less effective in regulating biogas production. Moreover, the absence of cattle farming from the IED creates a regulatory gap.
Incentivisation of industrial animal farming	No	RED III stimulates the use of manure for biogas and the European Agricultural Fund for Rural Development (EAFRD) supports farm-based biogas financially. As no impact assessment was done for the REPowerEU goal to increase annual biomethane production to 35 billion m3, this policy could ramp up manure production and incentivise unsustainable intensification of livestock farming. Figures 1 and 2 show how this is may already be taking place in the EU.
Food security and crops as feedstock	In part	RED III still allows the use of (energy) crops to produce biogas but discourages these feedstocks for transport fuels. The EU Taxonomy excludes crops for biogas production, but the REPowerEU plan still allows their use as feedstock.
Delaying the transition to phase out fossil fuels	No	RED III, AFIR and the EU Taxonomy incentivise injecting biomethane in the EU gas grid and using liquefied biomethane in the current transport infrastructure. All EU policies ignore that locking-in fossil gas infrastructure could lead to the postponing of the energy transition and prolonging of the demand for fossil gas.

Summary of national policies and regulation in seven case study countries

The Biogas in the EU report includes case studies from seven European countries, six EU member states, Denmark, Germany, Ireland, the Netherlands, Poland, and Romania, chosen to reflect a balance of geographies within the EU, and the UK. The UK was included as it is a key player in the wider region and a champion of the Global Methane Pledge. The study reviewed both national regulations and EU policies which have been transposed at country level.

All seven countries look favourably towards biogas as a component of the future energy mix, but the levels of regulatory support vary. In line with private investments (see financing section below), the UK comes out on top with the highest growth targets (3-4 billion m3 per year by 2050), Ireland (572 million m^3 per year by 2030) and the Netherlands (2 billion m^3 per year by 2030).

Most countries target upgrading of biogas to biomethane and injecting it into the fossil gas grid, with Denmark being the most ambitious by aiming to increase the share of biomethane in the gas grid to 100% in 2030. Germany, although at present leading biogas production in the EU, has no clear expansion plans, but still has legal incentives that direct biogas use to both the transport and the heating sectors. All countries apart from Romania offer subsidies or other forms of financial support to biogas producers. These come in the form of feed-in premiums and feed-in tariffs in Germany, the Netherlands, Poland and the UK, and direct biogas subsidies in Denmark, Ireland, the Netherlands and the UK.

Germany remains Europe's largest biogas producer, followed by Italy, France, and Denmark, with strong growth in the UK over the last decade and in recent years in the Netherlands, Ireland and Poland. The sector remains in its early stages in Romania.[82]

Table 2. How do existing policies address the environmental and social impacts of biogas production in the case study countries?

We analysed national policies, laws and regulations on biogas production and related environmental concerns, and the transposition of EU regulations where relevant. While some countries had regulations in place for key environmental concerns like methane leaks, Ireland, the Netherlands, Romania and Poland had no such regulations in place. Local community and environmental impacts were partially addressed across national contexts, but not in full, suggesting a need for more comprehensive policy to protect and engage local communities. Most concerningly, Germany, Ireland, the UK, and the Netherlands actively encourage manure as feedstock despite most methane emissions coming from enteric fermentation of ruminant livestock, which is not considered in the RED III methodology. Where manure from biogas is coming from pig farms, wider environmental and animal welfare concerns that apply to all types of animal farming are also not addressed in the current methodology. None of the countries assessed have considered the impact of biogas production on maintaining fossil fuel infrastructure and delaying the phase out of fossil fuels.

Potential impacts of biogas production	Addressed: Yes / In part	In which countries?	Overview	Not addressed
Methane leaks	Yes	Denmark, UK	• In Denmark, the 2023 regulation on methane leakage from biogas plants requires yearly leak detection and reporting by third party controllers to the Danish Energy Agency as well as implementation of a customised leak detection and repair program. Moreover, Denmark has a 1% methane loss cap specifically on biomethane upgrading equipment, which they plan to extend to combined heat and power (CHP) units. • In the UK, the Environmental Permitting Regulations (EPR) in 2016 introduced Leak Detection and Repair (LDAR) measures for biogas plants, landfills, and biomethane upgrading facilities.	No policies in Ireland, the Netherlands, Poland, or Romania could be found.
	In Part	Germany	In Germany, methane leakage is regulated through national technical standards such as TRAS 120, TRGS 529, and TA Luft, whose implementation lies with the individual federal states. While these standards are generally robust, they focus primarily on safety and operational reliability rather than on climate-relevant methane control. Moreover, official reports from the Kommission für Anlagensicherheit (KAS) show that these regulations are not being consistently enforced with over two-thirds of all inspected biogas plants exhibiting significant deficiencies in 2023.[83]	
Impact on communities	In part	Ireland - in development. Germany - covering water pollution and transport. The Netherlands - covers them but with exceptions. Romania includes do not harm principles.	• In Ireland, a Biomethane Sustainability Charter is under development and should include safeguards on land use, water quality, biodiversity, fertiliser use, carbon sequestration, and other lifecycle sustainability issues. • In Germany, the Federal Water Act (WHG) ensures that water bodies are protected against nitrogen contamination. The Manure Ordinance (WDüngV)) deals with the handling and transportation of manure, including for biogas production. • In the Netherlands, Environmental Impact Assessment requirements deal with these impacts. But they are envisioned to be reduced in certain so-called "acceleration areas" as part of the Dutch transposition of RED III. • In Romania, the National Recovery and Resilience Plan require biogas plants to adhere to Do No Significant Harm principles.	No policies in the UK or Denmark.

Potential impacts of biogas production	Addressed: Yes / In part	In which countries?	Overview	Not addressed
Incentivisation of industrial animal farming	In part	Denmark	With its Green Tripartite Agreement, Denmark has agreed to impose a climate tax on the agriculture sector to reduce greenhouse gas emissions. The implementation of the agreement, including the tax, is currently being negotiated.	• Germany, Ireland, the UK, and the Netherlands actively encourage manure as feedstock. • In Germany, the Integrated National Energy and Climate Plan (NECP 2024) actually encourage biogas plants to use greater volumes of liquid manure. • In Ireland, the National Biomethane Strategy promotes the use of animal manure as feedstock for biogas production. • In the Netherlands, to deal with the Dutch 'manure crisis', expansion of manure-based biogas production is encouraged. • In the UK, the Green Gas Support Scheme (GGSS) explicitly supports biogas projects that use manure. • Poland and Romania have no relevant policies.
Food security and crops as feedstock	Yes	Denmark, Germany, Romania and the UK	• In Denmark, since 2012, regulations limit the use of energy crops in biogas production. A ban on the use of maize as a feedstock has been in effect since August 2025. • In Germany, the 2012 Renewable Energies Act (EEG) limited the use of maize or cereal grains as feedstock in new biogas plants. In early 2025, a further lowering of this "maize cap" was proposed. • In Romania, the National Recovery and Resilience Plan requires biogas plants to restrict the use of food and feed crops, in line with RED III. • In the UK, the Renewable Transport Fuel Obligation and the Green Gas Support Scheme include limits on the use of food and feed crops.	• No policy in Poland or the Netherlands. • Ireland encourages the use of agricultural feedstock for biomethane production, including grass silage.
Delaying the transition to phase out fossil fuels	No	Denmark, Germany, Ireland, the Netherlands, Poland, Romania, the UK	There are no policies in place that address these risks.	

The Growth of the Biogas Market in the EU

Biogas and biomethane production continue to grow across the UK and the EU with investments from banks and public subsidies supporting its development as a 'sustainable practice'. Although biogas production can be sustainable if managed with clear environmental regulations and limits on its production growth, feedstocks and potential lock-ins addressed, the current policy environment at a regional and national level is missing these safeguards.

Nonetheless, the RePowerEU target has contributed to increased interest in biogas and biomethane from investors and companies alike, potentially leading to a vast growth in the sector beyond sustainable means.

Between 2000 and 2015, the biogas sector grew tenfold, and since then has increased by 24% from 18.4billion m3 to 22.8billion m3 in 2024.84 While most of the EU's output is still biogas and not upgraded to biomethane, the growth in the last five years is caused by an increase in biomethane production. According to the European Biogas Association, in 2023 alone, biomethane accounted for 4.9billion m3 of production volume.[85]

As shown in Figure 4, Germany is still by far the largest producer of biogas and biomethane in the EU with a share of 48%, but its production growth in the past 10 years was only 5%. Among the other top five producers, especially Denmark (+413%) and France (+203%) showed strong growth in their biogas production in the past 10 years.

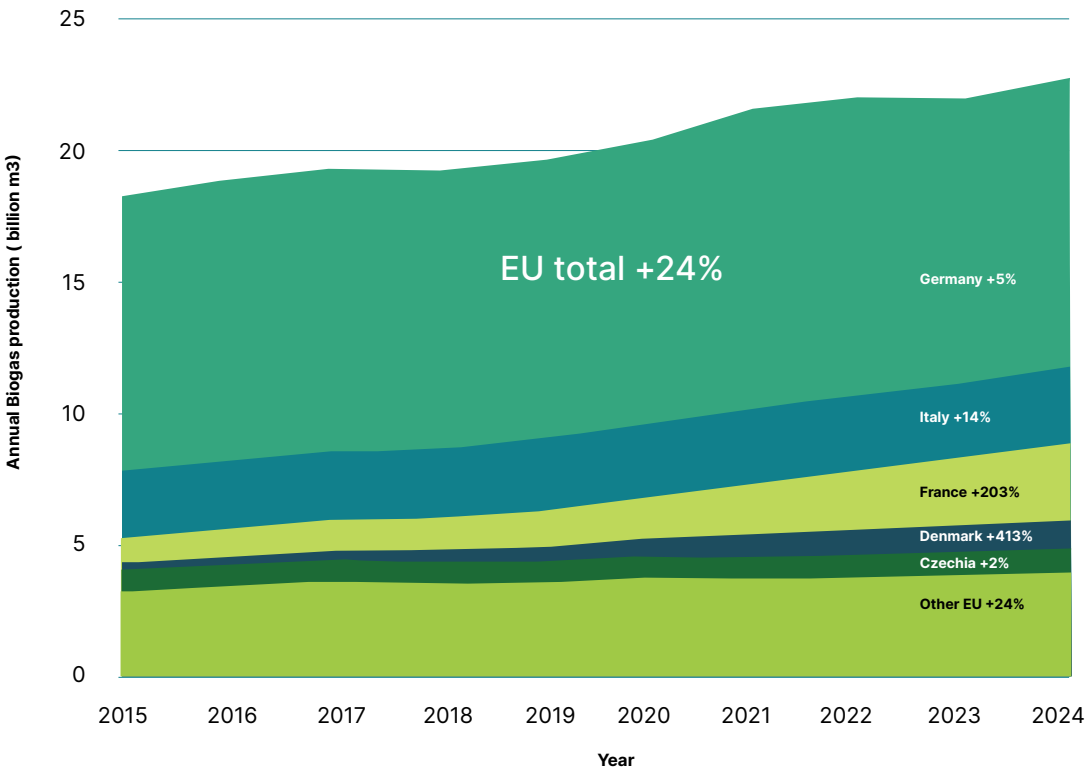


Figure 3. Growth of biogas and biomethane production in case study countries, 2015-2024
Source: *Eurostat (2025, June 25), "Supply, transformation and consumption of renewables and wastes 2015-2024", online: https://doi.org/10.2908/NRG_CB_RW, viewed in July 2025.*

Future investments

Based on a survey of 28 of its members (project developers and investors), the European Biogas Association (EBA) identified investment commitments with a total value of €28 billion in biomethane production for the period until 2030.[86]

According to the EBA, the main recipient countries inside Europe will be Spain (expected investment of €4.8 billion), followed by Denmark (€3.1 billion), the United Kingdom (€2.4 billion), and France (€1.7 billion). Spanish companies appear across all sectors covered in the report, including pork producers that aim to use the manure for biomethane. Pork is intensively farmed in Spain and has come under significant local scrutiny due to ongoing air and water pollution.[87]

According to the EBA's own reporting only 2% of these funds will go to converting existing biogas plants to biomethane, with 85% of investments intended for 'greenfield' plants.[88] This means that the predicted expansion of European biomethane production will be almost entirely additional to the existing production volumes for biogas (17.9 billion m3) and biomethane (4.9 billion m3) in the EU27 in 2024.[89,90]

Big meat and dairy, fossil fuels, waste and utilities – who benefits?

To build a better picture of the private sector engagement with biogas and biomethane production in the EU the report analysed meat and dairy, oil and gas, waste and utility companies with either headquarters in the EU and the UK or major operations. Companies were analysed by comparing their involvement in the biogas value chain measured by revenue or market capitalisation at the EU (+UK) wide level, and at the national level. The top ten companies across all sectors were analysed using the same criteria. Current production capacity and investment plans were considered in the analysis, depending on the available information. Some companies listed below, such as CooperI, EnviTec and Enea, are also members of the RePowerEU BIP.[91]

Table 3. Major European oil and gas companies involved in the biogas sector

Source: *Profundo (2025), based on data from multiple sources (see the last column). For conversion factors used, see Appendix 1 in Biogas Policies in the EU report.*

#	Company	HQ Country	Annual production, capacity or supply	Estimated biogas supply (in mln m3/yr)	Notes
1	BP		23 mboe/d biogas	2,187	Increased biogas supply volumes by around 5% year on year.[1]
2	Orlen		1 bln m3biogas (planned)	1,000	Investment in biogas or biofuels for use in transport: 200 mln in 2024.[2]
3	Centrica		15 TWh (managed) biogas in 5 years	480	This company trades, nominates, and transports biogas in Denmark, the UK and Netherlands.[3]
4	Shell		~1,500 GWh biomethane	241	Nature Energy, which Shell acquired in 2023, is one of Europe's largest producers of RNG. Together with its partners, Nature Energy also owns and operates 13 biogas plants in Denmark and one in the Netherlands. Planned investment in biogas: USD 254 mln.[4]
5	Repsol		1.5 TWh/ year (planned) biomethane	241	Repsol entered biomethane production with acquisition of 40% stake in Genia Bioenergy. Operations include 19 biomethane plants under development, with a total capacity of 1.5 TWh/ year, which will generate renewable gas from agricultural and livestock waste in Spain and Portugal.[5]

#	Company	HQ Country	Annual production, capacity or supply	Estimated biogas supply (in mln m3/yr)	Notes
6	Total Energies		1.1 TWh/ year biomethane	177	TotalEnergies' gross biomethane production capacity has almost doubled compared with 2022. It plans to pursue a 2030 target of 10 TWh of net production, mainly in Europe and the US. Leading biogas producer in Poland, Polska Grupa Biogazowa, with a production of 0.4 TWh/y, was acquired by Total in 2023.[6]
7	Eni		50 mln m3biomethane	80	With the purchase in 2021 of 22 plants in Italy, of which 21 for the generation of electricity from biogas and one OFSMW (municipal solid waste) treatment plant, Enibioch4in has laid the foundations for significant growth in the biomethane sector.[7]
8	Cepsa		100 GWh (planned) biomethane	16	Cepsa and PreZero joint development of plants for biomethane produced from organic waste. The first plant, with an expected capacity of up to 100 GWh, will be located at Cepsa's facilitiesin Huelva.[8]
9	MOL Group		12.5 mln m3/ year biogas	12.5	MOL has prepared its biogas roadmap with the ambition to build a unique position in CEE by 2030. It has acquired its first biogas plant near Szarvas, Hungary. The plant processes more than 100,000 tonnes of feedstock, producing more than 12.5 mln m3 of biogas per year.[9]
10	OMV		n/a	n/a	Manufacture of biogas and biofuels for use in transport and in bioliquids is the largest planned investment category (30 mln EUR in 2024, 1.416 bln EUR planned in 2025-2029.[10]

Table 4. Major European utitlities companies involved in the biogas sector
Source: *Profundo (2025), based on data from multiple sources (see the last column). For conversion factors used, see Appendix 1 in full report.*

#	Company	HQ Country	Annual production, capacity, or supply	Estimated biogas supply (in mln m3/yr)	Notes
1	Suez		1,684 GWh biogas	269.4	Total production of biogas from landfill, WWTP and organic digestors (converted into electricity, heat or injected) across multipole sites.[1]
2	E.On		1 TWh (traded) biomethane	160.5	E.On Bio Natural Gas supplies the national markets for CHP, heat and transportation as well as the international market.[2]
3	Engie		700 GWh biomethane	112.3	Engie is among the leaders in biogas production in France, through its subsidiary /y/ BIOZ, which develops, finances, and operates AD units. Currently, ENGIE operates 36 production sites in France.[3]
4	Veolia		271 GWh	43.5	Two facilities in France (73 GWh and 163 GWh of biomethane) and 35 GWh of biogas in Brazil.[4]
5	Pre-Zero		170 GWh biogas and 70 GWh biomethane	34.2	170 GWh biogas in Spain, plus development of 70 GWh biomethane with Waga Energy and Nedgia. Other countries (e.g. Sweden) are not reported.[5]
6	Remondis		158.6 GWh biogas	25.4	Production figures for Germany. No consolidated global reporting identified. Assuming biogas production.[6]
7	Paprec		7.2 mln m3biogas	7.2	Production of biogas from organic waste recovery.[7]
8	Biffa		40 GWh biomethane	6.4	Food waste processing biogas plant in the UK, generating up to 6.5MW of electricity – enough to power 15,000 homes, according to Biffa's sustainability report.[8]
9	Renewi		6.3 mln m3 biogas	6.3	Renewi converts organic waste into biogas, part of which is converted into bio-LNG.[9]
10	FCC		n/a	n/a	FCC Medio Ambiente is conducting various production projects for clean energies like biogas, biomethane and biohydrogen from waste.[10]

Eighteen meat and dairy companies were included in the analysis, comprising the largest meat and dairy companies in the EU and those with the highest engagement in the biogas sector using the above criteria. Final inclusion was based primarily on quantitative data (reported in GWh, boe or m3) relating to their biogas production activities.[3] In many cases, information was sourced directly from a company's website, as no centralised or third-party data repositories are currently available.

Table 5. Major European meat and dairy companies involved in the biogas sector
Source: *Profundo (2025), based on data from multiple sources (see the last column). For conversion factors used, see Appendix 1 in full report.*

#	Company	HQ Country	Annual production, input or supply	Estimated biogas supply (in mln m3/yr)	Notes
1	Valio		1,000 GWh (planned)	160	Valio is a Finnish dairy company. It entered a partnership with St1, an energy company. The initiative aims to produce 1,000 GWh of biogas by 2030.[1]
2	Danish Crown		28 mln m3	28.0	Danish Crown is a Danish pork meat company. The company collaborated with Bigadan, a biogas company, to supply residuals for biogas production.[2]
3	Atria		100 GWh (planned)	16.0	The company is a Finnish meat producer, producing beef, pork and poultry. The company is currently building a biogas plant to utilise manure and slurry from production – it will produce 100 GWh of energy annually.[3]
4	PWH		80 GWh (planned)	12.8	PWH is one of the leading meat producers in Germany. The company specialises in poultry production. It is currently renovating its biogas plant, which will reach a capacity of 80 mln kWh biomethane.[4]
5	Cooperl		79 GWh	12.7	Cooperl is a leading French pork supplier. The company has a network of 100 farms supplying raw materials for biogas production.[5]
6	Goodvalley		55 GWh	8.8	Goodvalley is Polish pork producer. The company owns eight biogas production plants and utilises manure from its pork production to produce biogas.[6]
7	Arla Foods		50 GWh	8.0	Arla Foods is a Swedish-Danish company and one of the world's leading dairy producers. It is active in its biogas lobbying efforts and engages in multiple biogas initiatives across different countries.[7]
8	Lactalis		30 GWh	4.8	Lactalis is a major French dairy producer. On the Torre Santamaría dairy farm in Lleida, Spain, which has been supplying milk to Lactalis, a biogas plant was established on the farm to process cow manure into biomethane, in collaboration with Axpo and Nedgia.[8]
9	Grupo Fuertes		4.8 mln m3	4.8	Grupo Fuertes is a leading Spanish pork producer. The company partnered with a biogas production facility to supply manure and waste for biogas production. The estimated biogas production will be 549.4 Nm3/h.[9]
10	Vion Food		4.6 mln m3	4.6	Vion Food is a Dutch meat (pork and beef) producing company. The company engages in biogas production through its subsidiary Ecoson.[10]
11	Coren		23 GWh	3.7	Coren is one of the largest meat producers in Spain. The biogas plant operates at the poultry processing center, producing a production of 9,000 m3 per day, with a 70% biomethane content. Coren produces poultry, pork and beef.[11]

3 GWh (Gigawatt-hour), boe (Barrles of Oil Equivalent) or m^3 (cubic meter)

#	Company	HQ Country	Annual production, input or supply	Estimated biogas supply (in mln m3/yr)	Notes
12	Danone		36,000 tonnes of manure	3.2	Danone is a large French dairy and food company, supplying manure for biogas production. A notable project in France is Terragre'eau, where a biodigester to turn cattle manure and organic waste was developed.[12]
13	Groupe Bigard		70,000 tonnes of organic waste	3.1	French meat producer Groupe Bigard supplies waste to external methanisation circuits as part of its 'circular economy' scheme. The group produces beef, mutton and pork.[13]
14	Gruppo Veronesi		17.54 GWh	2.8	Gruppo Veronesi is an Italian meat production company that is actively engaged in biogas production. It uses 100% of the sludge for biogas production.[14]
15	Campofrío		15 GWh	2.4	Campofrío is a Spanish meat production company, which utilises manure from its production for biogas generation.[15]
16	Nestlé		4 GWh in Switzerland, 0.27 GWh in Pakistan, 980,000 m3in Finland	1.7	Nestlé is one of the largest food and beverage producers globally. The company is registered in Switzerland and active in multiple biogas projects in countries outside of the EU - Switzerland, the UK, Brazil, Indonesia, India, and other countries. As a result, it remains difficult to determine the exact quantitative values of the company's contribution.[16]
17	Unilever		638,750 m3	0.6	Food and personal care company Unilever engages in various local biogas initiatives. In the Netherlands, Ben & Jerry's factory partnered with Paques, a biogas producer, producing an average of 1,750 m3 of biogas per day. In Romania, Unilever partnered with Genesis Biopartner, a plant currently supplying 2.13 MW of electricity, but Unilever's contribution is not clear.[17]
18	Friesland Campina		3.5 GWh	0.6	Since 2011, dairy company Friesland Campina has encouraged member dairy farmers to invest in renewable energy sources, including biogas. The company engages in various initiatives, including Jumpstart, which led to the production of 40 Nm3/h of biomethane with an efficiency of 99.5%).[18]

While these companies are the most active in the biogas sector according to the criteria, biogas does not represent a large share of their total assets or revenues. However, to better understand how financing supports each company's work, their total credit financing was analysed for the period 2016-2025. Between January 2015 and May 2025, €800billion of credit financing went to selected oil and gas, meat and dairy and utilities companies, compared to less than €10billion to the largest biogas producers in each of the seven countries in the same period.

Table 6. Credit financing to groups of biogas companies (2016-2025, Euro billion)
Source: *Profundo calculations based on information obtained in Annex 1.*

Company groups	Underwriting	Loans	Total
Oil and gas	242.5	118.8	361.3
Meat and dairy	104.4	128.7	233.1
Utilities	115.7	95.4	211.1
(Dedicated) Biogas companies	7.6	2.1	9.7

Table 7 provides an indication of the main banks financing companies engaged in the biogas value chain, based on both biogas and non-biogas funding.[4]

4 Overall credits and financing were analysed per company, this does not include a breakdown of the specific projects funding was used for due to the level of detail available and the proportion of funding to biogas vs. other investments.

Table 7. Main creditors of groups of companies engaged in the biogas value chain (2016-2025)
Source: *Profundo calculations based on information obtained in Annex 1.*

Company groups	Bank	Country
Oil and gas	Citigroup	United States
	Barclays	United Kingdom
	BNP Paribas	France
	Bank of America	United States
	Goldman Sachs	United States
Meat and dairy	HSBC	United Kingdom
	BNP Paribas	France
	JPMorgan Chase	United States
	Citigroup	United States
	UBS	Switzerland
Utilities	Deutsche Bank	Germany
	Société Générale	France
	BNP Paribas	France
	Mitsubishi UFJ Financial	Japan
	UniCredit	Italy

At a national level, biogas companies on average received €500 million a year between 2016 and 2021, mainly through loans. Since then, financing increased dramatically from €1.1. billion in 2022, €2.2 billion in 2023, and €2.9 billion in 2024, primarily through loans with only a small contribution via underwriting. The information provided for 2025 is only for the first part of the year, so this can be expected to rise. It is likely that the significant increase in biogas investment could be due to the RePowerEU Plan launched in 2022. The UK also saw significant increases in biogas investment over this time, which could be in part due to similar commitments to reduce dependence on Russian fossil fuels.

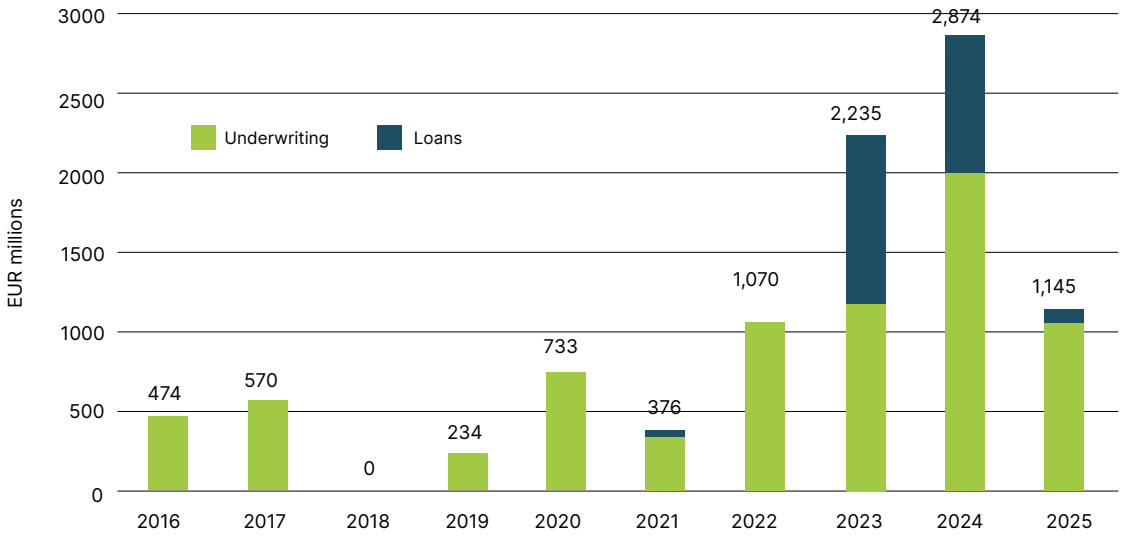


Figure 4. Loans and underwriting to biogas companies per year (2016-2025, Euro millions)
Source: *Profundo calculations based on information described in Appendix 1.*

Most of the credit financing identified has been received by two companies: Severn Trent (based in UK), which received at least €7.1 billion (or 73% of the identified financing) and Enea (based in Poland), which received at least €1.5 billion (16%). Enea is not only a member of BIP, but sits on the taskforce of the partnership, working to meet the partnership's goals to go beyond the RePowerEU target and assessing potential sustainable feedstocks.[92]

The largest financier to biogas companies between 2016-2025 is NatWest Bank, which provided €1.1 billion in loans and underwriting services to three biogas companies.

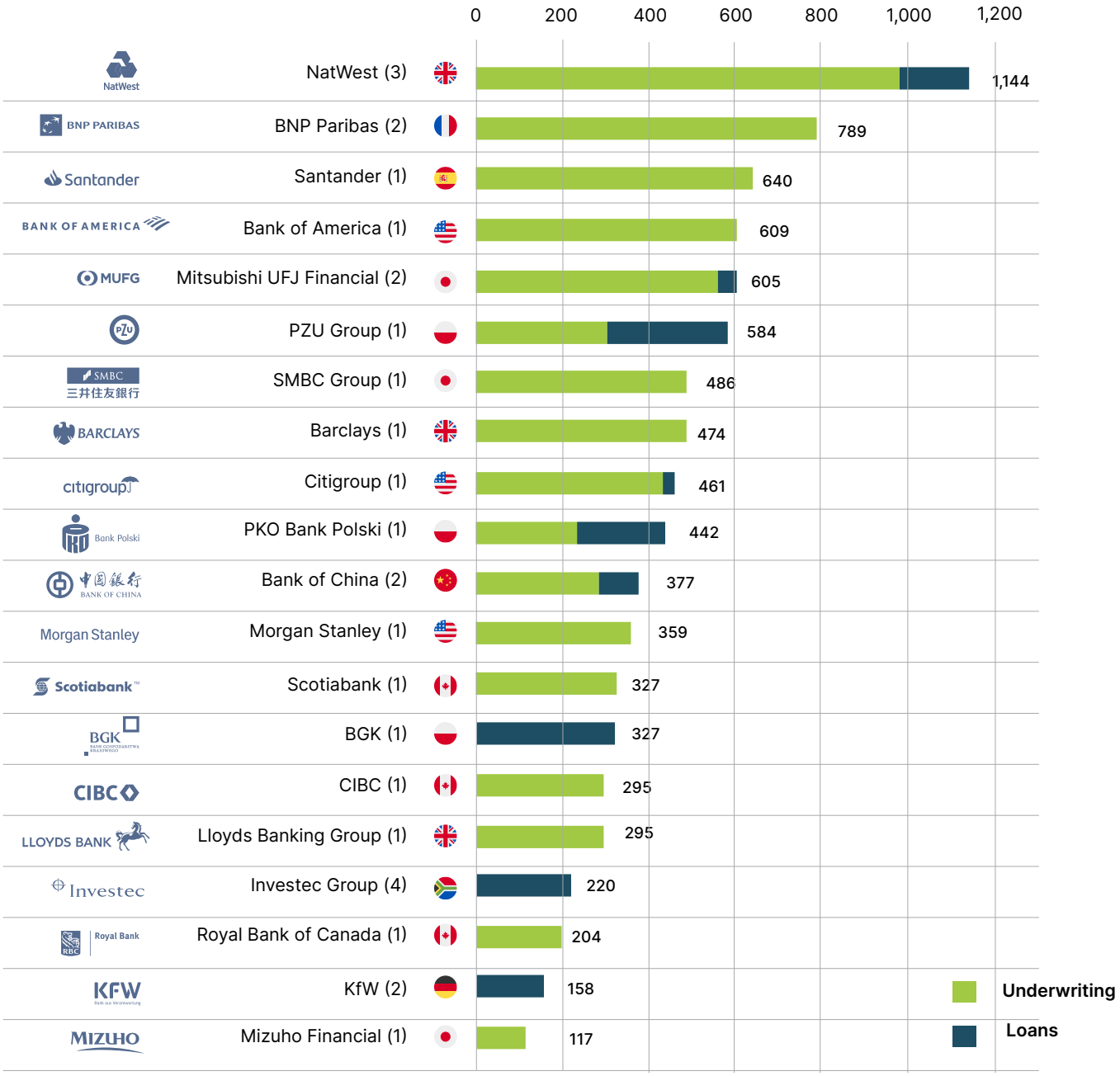


Figure 5. Main creditors of biogas companies (2016-2025, Euro millions)
Source: *Profundo calculations based on information obtained as described in appendix 1.*

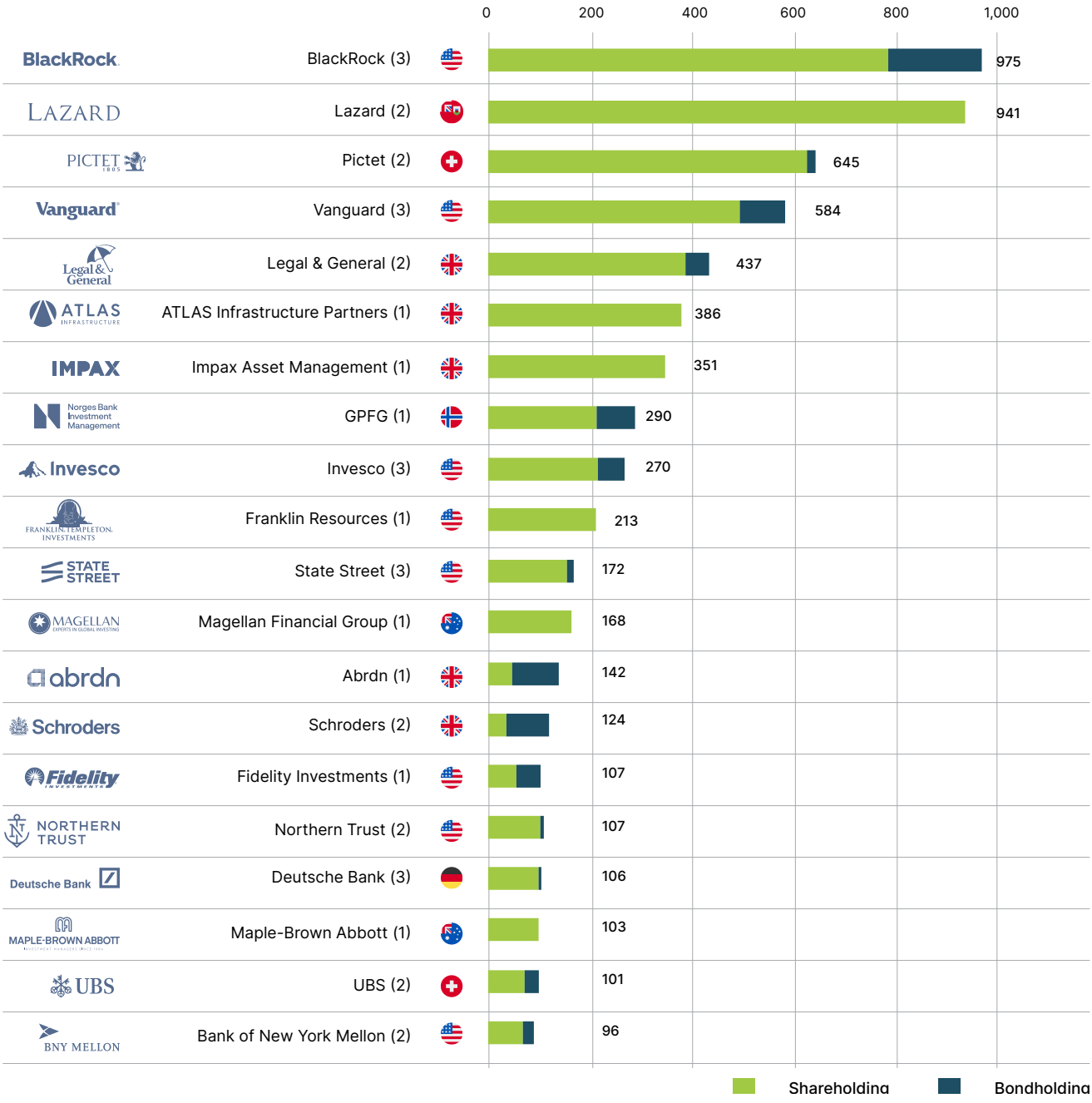


Figure 6. Main investors in bios companies (May 2025, Euro millions)
Source: *Source: Profundo calculations based on information obtained and described in Appendix 1.*

Biomethane is increasingly attractive to investors, with many setting up new funds dedicated to this, including Mapfre, a Spanish insurance company who aim to raise €100 million for 20-25 biomethane plants in Spain over a 5-year period. Other investors such as the Dutch pension fund , Goldman Sachs Asset Management and others as mentioned above, are also looking actively for opportunities to invest in biomethane production.[93]

As EU regulations and financing mechanisms include biogas and biomethane as sustainable investments, this sends a signal to the wider investor industry that these investment projects can be included in their own sustainability funds, regardless of the feedstocks used, or the potential lock-in effects for animal agriculture or local pollution. Without an Environmental Impact Assessment on biogas and biomethane production in the EU, clear guidance for sustainable investors remains absent.

Conclusion

This briefing finds that the negative environmental and social impacts of biogas and biomethane production are being disregarded. If biogas expansion is not managed sustainably, then it is likely to lead to perverse outcomes for the EU's energy security, sustainable feedstock uses and wider climate and environmental goals, such as transitioning to a more sustainable food system.

Many of the rules governing biogas and biomethane production and use are either directly regulated by EU policies or depend on how these policies are transposed into the national legislation of the member states. Improving the EU-level regulatory landscape provides leverage to impact how biogas is treated in all member states. The analysis is clear, the lack of an impact assessment of RePowerEU targets could lead to unintended consequences, such as land-use change and intensification of livestock production due to increased demand for manure, currently treated as a 'waste' product, ignoring its upstream emissions. The BIP was set up to implement and exceed the RePower EU target, but without clear environmental safeguards and regulations companies and investors with a financial stake in biogas production might become stuck in an unsustainable lock-in.

Despite persistent concerns about its overall sustainability, biogas receives significant financial support at the EU level. Regulatory frameworks are needed to ensure that biogas deployment is targeted to sectors where its use is technically and environmentally justified, while its application in the heating and transport sectors should be largely phased out to prevent the lock-in of additional fossil-based infrastructure. Moreover, methane leakage remains a systemic issue across Europe and real-world measurement studies indicate that actual leakage rates may be significantly higher than the estimates published by the EU Joint Research Centre. Without substantial, sector-wide improvements in leakage control, the production expansion planned under REPowerEU could lead to large-scale fugitive methane emissions. If biogas is to play a meaningful role in the EU's future energy mix, it must be held to the same standards of scrutiny and accountability as other energy sources. As in the fossil fuel sector, a dedicated biogas regulation is needed to safeguard environmental integrity. Operators should be required to conduct regular emissions monitoring and transparent reporting. Comprehensive leak detection and repair (LDAR) obligations must also be implemented and consistently enforced across the EU to effectively limit fugitive methane emissions.

The relationship between biogas production and the waste sector is more nuanced and requires an approach which considers biogas as a potential solution to reducing methane, but only after other policy actions have been taken or considered at least. There is a vast amount of organic waste which remains uncollected within Europe today, therefore providing a potentially large feedstock opportunity for biogas production. However, EU legislation and guidance must ensure that waste hierarchy is implemented with prevention remaining the main priority, followed by composting or anaerobic digestion as treatment methods for collected organic waste. Only then should biogas enter the conversation and done so in a phased way that does not create a lock-in effect for continued organic waste generation, as this report highlights. Waste prevention and composting are the cheapest, most community-centred options which also deliver the best results in terms of methane avoidance (as well as other benefits of composting such as improved soil health and job creation).

Based on the findings of this report, the Methane Matters coalition makes a clear recommendation to EU policymakers to conduct a full environmental impact assessment of the RePowerEU target of 35 billion m3 biomethane by 2030 and reconsider the target if needed to avoid locking us into unsustainable production practices and land-use impacts.

A more detailed overview of each country case study, financial analysis and policy analysis can be found in the Biogas in the EU: A policy and financial analysis report.

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