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Overview on administrative and legal conditions as well as on financial and other support programs, for small to medium scale biomethane production and supply

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1 Summary

In this task a review of framework conditions for small to medium scale biomethane production and supply in 15 EU countries has been conducted. From this study it is evident that policies around biomethane, i.e. biogas upgraded to natural gas grid and/or vehicle fuel standard are missing in many countries. It was for example found that all but one of the studied countries has specific policy targets for reducing fossil fuels. In spite of this less than half of the countries have any kind of supporting framework for using biomethane as a vehicle fuel.

2 Overview of Framework Conditions of Small to Medium Scale Biomethane Production and Supply

In this task a review of framework conditions for small to medium scale biomethane production and supply in various EU countries has been conducted to provide an overview of similarities and dissimilarities between countries. Another objective of this task was to find common elements of the policy framework that may be missing as well as elements that are particularly good and that through raised awareness may spread. A total of 15 countries was included in the analysis. A very short introduction to what countries are included in the review and what framework conditions apply in what country can be found in table 1 and 2 on the next two pages.

The information in the tables are based on our understanding and some subjective interpretation on our part of the information that we have been able to find and may not be exhaustive.

Table 1: Reviewed countries and applicable regulatory framework conditions to the best of our knowledge. ✓= policy in place, X= policy not in place, ✓X= policy in place on paper but too weak to have an impact, X✓= Policy not in place but the spirit of it accomplished through other means

Country	Austria	Belgium	Czech republic	Denmark	Estonia	France	Germany	Italy	Lithuania	Poland	Slovak republic	Spain	Sweden	The Netherlands	UK
ABP-reg. implemented?	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓
Sewage sludge allowed substrate?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Any restriction for use of agricultural substrates?	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓
Any restrictions on use of other bio-materials?	✓	X	X	✓	X	✓	✓	✓	X	X	X	✓	✓	✓	✓
Regulations to prevent landfilling of organic waste?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓
Guidelines for construction of AD-plants?	✓	✓	✓	✓	X	✓	✓	✓	X	✓X	X	X	✓	✓	✓
Fast-track for building permits for small scale AD?	X	✓	X	✓	X	✓	✓	✓X	✓X	✓	X	X	✓	✓	X
Regulations for spreading digestate?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓
Regulations for transporting digestate?	X	X	X	✓	X	✓	✓	✓	X	X	X	X	✓	X	✓
Certification system for digestate?	X	X	✓	✓	✓	✓	X	X	X	X	X	X	✓	X	✓
Sale of electricity to grid from AD regulated?	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓
Sale of heat to grid from AD regulated?	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
Standard for using biomethane in vehicles?	✓	X	X	✓	X	✓	✓	✓	X	X	X	X	✓	X	X
Standard for injecting biomethane into the grid?	✓	X	X	✓	X	✓	✓	✓	✓	X	✓	✓	X	✓	✓
Sale of standardized biomethane regulated?	✓	X	X	✓	X	✓	✓	X	✓	X	X	X	✓	X	X
National Biomethane Register existing?	✓	X	X	✓	X	✓	✓	X	X	X	X	X	X	✓	✓

Table 2: Reviewed countries and applicable economic framework conditions to the best of our knowledge. ✓= policy in place, X= policy not in place, ✓X= policy in place on paper but too weak to have an impact, X✓= Policy not in place but the spirit of it accomplished through other means

Country	Austria	Belgium	Czech republic	Denmark	Estonia	France	Germany	Italy	Lithuania	Poland	Slovak republic	Spain	Sweden	The Netherlands	UK
Grants covering part of CAPEX for AD plants available?	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓X	✓	✓	✓
Is the CAPEX grant larger for small scale projects?	✓	✓	X	X	X	✓	X	✓	X	✓	✓	✓	✓	✓	X
Other support systems to help cover CAPEX?	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
Feed-in-tariff for biogas derived electricity?	✓	X	X	✓	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓
Other production support for biogas derived electricity??	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
Feed-in-tariff for biogas derived heat?	✓	X	X	X	X	X	X	✓	✓	X	X	X	X	✓	✓
Other production support for biogas derived heat?	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓	X	✓
Feed-in-tariff for injecting biomethane into the grid?	✓	X	X	X	X	✓	X	✓	X	X✓	X	X	X	✓	✓
Subsidies for selling or using biomethane as vehicle fuel?	✓	X	X	✓	X	✓	X	✓	X	X	X	X	✓	✓	✓
Are there taxes on fossil fuels?	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓
Support for making biomethane available at filling stations?	✓	X	X	X	X	✓	✓	✓	X	X	X	X	✓	X	X
Any other support for biomethane as a vehicle fuel?	✓	X	X	✓	X	✓	X	✓	✓	X	✓	X	X	✓	X
Specific goals for reducing GHG emissions?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓X	✓X	✓	✓	✓
Specific goals for renewable fuels in transportation sector?	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓X	✓X	✓	✓	✓

Looking at table 1 and 2 it is evident that policies around biomethane, i.e. biogas upgraded to natural gas grid and/or vehicle fuel standard are missing in many countries. Another issue that stands out is the significant difference between eastern and western Europe in terms of the extent to which regulatory and financial frameworks have been built out for biogas and biomethane production and supply.

3 Synopsis of regulatory and financial frameworks for the reviewed countries

3.1 Austria

Austria has one of the most comprehensive regulatory and economic frameworks of the investigated countries with policies and support systems in place for all the areas we focus on in this review. The negative side effect of having a comprehensive set of policies is that regulatory approvals processes often get complicated and lengthy, which is the case for Austria. Austria has ambitious targets with respect to biomethane, even utilization of biomethane as a vehicle fuel. What is missing is just some streamlining of the existing framework.

3.2 Belgium

Compared to its neighboring countries Belgium has surprisingly underdeveloped regulatory and financial frameworks for biogas and biomethane production. The development of suitable policy seems to be hampered by the regulatory division between the two major regions Flanders and Wallonia. Even though Belgium has some measures for both CAPEX support and production support through green certificates for electricity production it is at a lower level than most other countries. In spite of this, one company has successfully built 71 micro digesters over the last couple of years based on a modular design of either 11 kW or 22 kW. Another part of the policy framework that stands out is the very strict nutrient management regulations stemming from a 2005 ruling by the European Court of Justice that Belgium was in violation of the Nitrate Directive.

3.3 Czech Republic

The Czech Republic stands out as a country that had a comprehensive economic support framework for expansion of the biogas industry but not the right control mechanisms. As a result all financial support programs were halted in 2014 as the booming industry was deemed to cause unintended negative environmental impacts. It has over the past three years gone from one of the most expansive markets to the one with the least favorable economic policy framework for biogas and biomethane.

3.4 Denmark

Denmark has a fairly classic feed-in-tariff system but with a bit of a twist as they have set specific restrictions on how much energy crops is allowed in the substrate mix. The proportion of energy crops must also decrease over time as facilitate depreciates. Denmark also has a direct feed-in-tariff on biomethane that is injected into the grid and extra support and streamlined process for small scale projects. Denmark appears, together with France to become the hottest biogas markets as we move forward.

3.5 Estonia

Estonia's regulatory framework seems to lack most of the biogas specific policies that we see in other countries. The economic conditions for biogas projects appear to be among the worst of the reviewed countries and there is even less support, or even interest, in biomethane. Perhaps this is due to the fact that Estonia feels that it has already made good progress on its RES targets through other means than biogas related energy generation.

3.6 France

France's policies are currently probably the most comprehensive in Europe in terms of incentivizing and at the same time regulating the biogas industry. It is a large and complex collection of rules and support systems and that is also its Achilles heel with a significant administrative burden to be carried by anyone wanting to realize a biomethane project. France is together with Sweden unique in the sense that they have support systems in place for using biomethane as vehicle fuel in a high blend form via purpose-made filling stations. Our guess is that France will be one of the hottest biogas markets in Europe if they can continue to streamline the regulatory process.

3.7 Germany

In terms of regulations and regulatory processes Germany has a well-functioning and thoroughly built up system for approvals. It is well known that the country has had a very generous feed-in-tariff system for electricity for many years. However, due to some debate over unintended negative environmental impacts this program is being rolled back. Perhaps, due to the backlash of late concerning biogas from energy crops, Germany has not transitioned well into supporting biomethane production and use. This means that the country has lost the leadership position in terms of being the main growth market for biogas installations to countries such as Italy, France, Denmark and Great Britain.

3.8 Italy

Italy has a comprehensive set of framework conditions to incentivize both biogas and biomethane production. However, the progress is hampered by slow bureaucracy and the fact that each region has created its own authorization process. If Italy can streamline authorization processes while maintaining all the financial support for the sector the country should be one of the strongest growth markets for biomethane in the coming years. A specific point in the framework that stands out as positive in the context of this project is the simplified permitting procedure for biogas plants <200 kW. Another strength is that Italy already has a very significant fleet of NGV-vehicles that can run on biomethane.

3.9 Lithuania

Lithuania has a reasonably comprehensive set of regulations and support systems that favour development of biogas production in general. However there is a lack of clear policies around biomethane and the threshold for fast-track approvals processes is too low at only

10 kW. A policy characteristic that stands out as positive is a regulation that explicitly favours anaerobic digestion for treatment of biodegradable residues.

3.10 Poland

There is a significant push to incent biogas production in Poland, especially micro installation <40 kW. One policy that stands out is very strict restrictions on the use of animal by-products regulated in the ABP-regulation. There exists a very good grant system to cover part of CAPEX and on the production support side Poland has chosen an auction system rather than a feed-in-tariff. No policies or support systems exist to promote biomethane production and use and in general the environmental goals appear to be expressed as expected developments rather than hard targets.

3.11 Slovak Republic

Of the countries reviewed within this project Slovakia has one of the least developed regulatory frameworks related to biogas production. It looks a little bit better in the area of the economic framework with some investment grants and a fairly rudimentary feed-in-tariff system. What stands out is that Slovakia does not seem to have any ambitions of their own regarding GHG mitigation and replacement of fossil fuels in the transportation sector and is deferring to minimum standards set by the EU joint commitment. As is the case with most countries the area around biomethane and its use is underdeveloped and lacks specific policies and incentives.

3.12 Spain

It is evident that biogas production is not a priority in Spain. The existing framework has some controls on activities related to biogas production this is not matched by anything to incent biogas projects. Goals and targets with respect to GHG-emissions and renewable fuels are also set to the absolute minimum a country can get away with within the international agreements that have been signed.

3.13 Sweden

Policies promoting biogas production in Sweden has always focused waste as feedstock and biomethane as vehicle fuel as product. In general, when it comes to biogas production Sweden's policy framework is heavy on the regulatory side and light on the financial support side. The financial support programs consist of CAPEX grants, tax incentives and green certificates. The country has never had a feed-in-tariff system per se but instead incents biogas production from manure through a direct societal service payment for preventing methane emissions from manure – a so-called EGNS (Ecological Goods and Service) payment system.

3.14 The Netherlands

The Netherlands have a full suite of both regulatory and economic framework conditions that facilitate the production and use of biogas and biomethane. The only thing missing is perhaps some streamlining and a fast-track for smaller biomethane projects.

3.15 United Kingdom

The UK put the bulk of their regulatory frameworks and financial support systems in place for the biogas sector at a later date than most of the other reviewed countries. It is evident in that the legislations that have been passed are reasonable thought through. It is still a bit of a patchwork but the frameworks are comprehensive and include all elements including a specific focus on facilitating biomethane production and use. It seems like the Renewable Obligations Certificates and the energy Guarantees of Origin have made the deepest impact on making projects economically feasible.

4 Biomethane registries

National biomethane registries are important for countries which produce biomethane for grid injection. So far there are national biomethane registries established in the following European countries:

- Germany (“Biogasregister”)
- Austria (“Biomethan Register Austria”)
- Switzerland (“Federation of Swiss Gas Industry”)
- Denmark (“Energinet”)
- France (“Gaz Réseau Distribution“)
- The Netherlands (“Vertogas”)
- UK (“Green Gas Certification Scheme” / “Biomethane Certification Scheme”)
- Finland (“Gasum”)

The biomethane registries are independent and neutral organisations which monitor, confirm and document/certify the biomethane transactions.

When discussing biomethane production of any scale in Europe it is important to be aware of the biomethane registry initiative that is an outcome of the Horizon 2020 project Biosurf. The intention of the biomethane registry is to open up for a cross border market for biomethane. The initiative is based on three basic principles: 1. Independent third party verification of sustainability of biomethane production prior to grid injection; 2. The whole natural gas network in Europe viewed to be a single logistical facility with regard to injected biomethane, and; 3. Keeping track of the mass balance of injected and withdrawn biomethane. This would in theory enable production in regions where it makes most economic sense (most cost effective production) for use in regions with the highest demand (highest willingness to pay).

To this end the Biosurf project suggest the formation of independent, neutral and professional organisations established with government mandate to track, confirm and document the biomethane transactions along the value chain. These organisations would also provide administrative support to meet regulative requirements, procure independent audit controls and assist in development of trade through building market confidence.

It is the opinion of the Record Biomap project group that the idea behind a cross border trading scheme for biomethane is a good idea, but only if national and regional incentive policies are prevented to distort the market. A fair cross border market would require all participating countries to agree on a joint policy framework, both in terms of the regulatory side and in terms of financial incentives. This would among other things mean that participating countries would have to agree on a common acceptance level for the use of energy crops for biomethane production, the level of direct production support and in general what is- and what is not sustainable biomethane production. Given agreement on the above the suggested system of national biomethane registries and cross border biomethane trading has some merit.

5 Conclusions

To implement small to medium biomethane projects it is important that suitable regulatory and economic frameworks are in place. It is striking to see for example that all but one of the studied countries have specific policy targets for reducing fossil fuels in the transport sector while less than half of the countries have any kind of framework for using biomethane as a vehicle fuel. Only 5 out of 15 countries support making biomethane available at fueling stations.

Some specific policies that seem to work for getting small to medium scale biomethane projects up and running are:

- fast-track for regulatory approvals of small scale projects (motivated by limited environmental risk)
- standards for biomethane as a fuel and for grid injections must be in place
- a significant difference in how fossil fuels (gasoline, diesel and natural gas) are taxed in comparison to biomethane or other means to compensate for higher production and distribution costs
- aggressive national targets on replacing fossil fuels for transportation and back-up power for the electrical grid
- guaranteed grid access and reduction or elimination of grid connection costs so that also smaller biomethane producers can participate in the gas market.

Finally, another characteristic that becomes clear in this overview is that it is an extremely fractured policy landscape for biogas production in the EU. Both the regulatory and economic framework is a patchwork of generations of policy incentives and special regional solutions in response to local circumstances. The result is a situation where every installation has to be

adapted to a specific set of framework conditions which is one of the reasons the biogas industry has not reached scale economy from a macroeconomic point of view. There is simply no one-size-fits-all solutions that can be sold in bulk to drive cost of production down. This is even true within countries where significant regional differences exist in regulatory process and in some cases these differences goes all the way down to municipal level. To come to terms with this, perhaps it is time for some EU-level standardization around biogas policies, at least to set minimum levels that needs to be met by all member countries.

Because of the fractured policy landscape it may be difficult to introduce a fair cross border trading scheme for biomethane based on national biomethane registries. However, if we can get to a point where policies are more homogenous a cross border trading system may be the single most important development to ensure the growth and success of a biomethane industry.