Forsyningstilsynet
Carl Jacobsens Vej 35
2500 Valby

Energinet
Tonne Kjærsvej 65
DK-7000 Fredericia

+45 70 10 22 44
info@energinet.dk
VAT no. 28 98 06 71

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Author:
RFA/RFA

CONSULTATION RESPONSE ON THE FUTURE EU GAS REGULATION (GAS PACKAGE 2020)

Energinet will like to thank the DUR for the timely initiative of launching a process of dialogue on interests and expectations for the upcoming EU gas package. Ultimately, the package will be a crucial piece in the comprehensive regulatory puzzle, which should ensure deliverance on long term political targets for climate and energy throughout the entire European economy – a transition which will have to grow in terms of both ambition and speed of delivery for the EU to deliver on the Paris agreement, as it was presented in the proposal for an EU long term climate strategy 2050 presented by the European Commission November 2018.

With regard to the issues presented in the DUR consultation letter, Energinet will address all the topics raised, but with a special emphasis on market development for new gasses and sector coupling, which holds a great potential to deliver on energy and climate policy objectives in a cost-effective manner and enable wider decarbonization, but likewise entail a number of regulatory challenges.

1. Mirroring exercise

1.1 General

Energinet appreciate the content of the recently adopted Clean Energy Package. Yet we recommend that various aspects should be carefully assessed considering the relevance to the gas market, thereby acknowledging that there are still notable differences to the functioning of the electricity market. Examples where the relevance should be carefully assessed could for example be gas related prosumers, 24-hour supplier shift requirement, etc. As a part of the general discussion on empowering consumers it could however, be considered if obligation of gas suppliers to disclose information on fuel-mix to consumers - as is currently the case for electricity in DK - could be a relevant alignment with electricity market legislation and a tool to create a market based incentive for renewable and decarbonized gases.
Also, the general principle to phase out regulated prices, requirement of neutral certified price comparison tools etc. are elements of the electricity regulation, which are well in line with current Danish approach on the gas side as well.

1.2 New role for DSOs

Likewise, we welcome and see the necessity for the increased focus of the role of the DSO-level in the green transition, which was represented in the electricity regulation. Also in the gas system the introduction of new renewable based gasses will change the value stream and supply chain in a manner, which requires much more flexibility and cooperation between the TSO and DSO level, and where role of the DSO will be more dynamic. Given this increased importance we see merit in the idea of establishing an EU umbrella DSO-gas organization, as it has now been decided for electricity. In the preparation of the gas package it could been discussed and analyzed further how to ensure the best possible linkage and alignment between electricity and gas - including the possible merits of integrating the two, considering the general wish for a more crosscutting and less silo based approach required for sector coupling. Regardless, careful attention should be given to ensure a governance where DSOs from small member states are sufficiently represented, but also that the tasks given to such organization do in fact merit a common EU approach. Examples could be TSO-DSO cooperation on issues such as data exchange and planning, and obviously general sharing of best practice etc. among the EU DSOs can only be supported.

As will be elaborated in detail in the following sections, we foresee that adjustments and subsequent clarification and guidelines to the legal acts in the wider Clean Energy Package will be needed to ensure regulatory alignment and break down barriers notably with regard to green gasses and sector coupling (a re-mirroring exercise).

2. Topics and opportunities/challenges for market development

2.1 Full implementation of existing legislation

In general, Energinet finds that the current gas legislation provides a sound basis for ongoing development of an integrated gas market. The implementation of the current legislation has already had a clear positive effect in many market areas, resulting in liquid and functional market places, as shown in the recent ACER Market Monitoring Report (MMR) 2018. In Northwest Europe we see that all network codes are fully implemented, which has given competitive markets and close price correlations between the different market areas. In large parts of Europe however, we still see a lack of network code implementation resulting in a very few dominant players and lack of competition and trade between hubs. In the gas package the main focus for further conventional market development should first be on full implementation of the current legislation and where issues or problems are identified, additional measures could be considered.

2.2 An EU-wide market for renewable and decarbonized gases

For Energinet, further development of the green gas market and sector coupling (as described extensively in the sections below) are the main opportunities for the continuous development of a European gas market, which will need to embrace and support such transition to be “future proof” and in line with medium and long term decarbonization targets. Consequently, the incorporation of renewable and decarbonized gases into the current market design, and the

effective coupling of the electricity and gas infrastructures should be the key priorities of a new gas market design, while also keeping the broader perspective to connected sectors such as heating and transport. The upcoming gas package must deliver the necessary framework to accelerate an EU-wide market for renewable and decarbonized gasses. This involves enabling injection, transport, storage and trade of new gases throughout Europe. A European market would allow new gases to be produced at lowest costs where resources are available and enable end use segments throughout Europe to benefit from the existing gas infrastructure. Especially three themes are central in this regard:

2.2.1 A credible common framework for cross border trade

There is a need to develop a common EU framework, which enables trading renewable and decarbonized gases across borders and sectors in a transparent and trustworthy way, avoiding double selling and double counting of the new gases. And at the same time allows the inherent value of new gases as flexible, storable and easily transportable renewable or decarbonized fuels to be obtain a market value.

A key element in such a framework is the recently decided GO (Guarantee of Origin) system for renewable gases (cf. REDII) which Member States must implement before 1. June 2021. Building on a GO system for renewable and decarbonized gases injected to the gas grid, an European market could be created. Several aspects which are not addressed in the REDII could be included in the Gas Package 2021 to enable sector coupling, unlocking the potential of the gas infrastructure and valuing new gases as storable and flexible renewable and decarbonized fuels. Energinet has worked with the European gas sector to provide recommendations to Madrid Forum on a future GO system on the following three themes:

- Need for **standardized GOs** for renewable and decarbonized gases GOs should follow a standard format to enable market scale and trade, but there should be clear information whether the gas origin is renewable or non-renewable.
- Need for **interoperable GO schemes** to support trade and sector coupling. GO systems should be established for energy carriers – electricity, gas, hydrogen – and schemes should be compatible to support sector coupling. Furthermore, GOs should be part of a methodology enabling renewable power from the grid to be converted to renewable gas to by supplied via the gas grid – thereby unlocking the potential of existing infrastructure.
- Need for **compatibility and use of GOs in other legislation** should be ensured Renewable gas is already today used by end users in several segments where it has an additional value or accessibility compared to other renewable alternatives – as fuel for transport, under the ETS scheme, for power and heating, as industrial feedstock. There is a need to ensure compatibility of GOs with other legislation to create a level playing field for different renewable based and decarbonized fuels, and usage where it has most value. Gas GOs combined with other information should be able to go beyond disclosure purposes.

On the note of point 2. regarding interoperability, Energinet will likewise like to point to our latest analysis "PtX before 2030", which is presenting a number of possible PtX setup in terms of grid connection etc., thereby showcasing how the current rules affects the green value of the end-products and associated risks for of suboptimal solutions and potential PtX plants going "off grid".

It should be emphasized that a common EU-terminology and definition for renewable and low-carbon gasses should be put in place in order to facilitate a green gas market in the EU. Energinet finds that there must be a clear distinction between renewable based and decarbonized gasses, and that the actual GHG-mitigation effect of the latter should be rigorously assed.

2.2.2 Gas quality issues must not be a barrier for transition to new green gasses and cross border trade

Greening of gas with biomethane injections into the natural gas grid is already a vital element for the transition of Danish gas system and the production of biomethane has lately – although from a very low basis – rapidly increased in a number of EU countries such as Italy, France, Germany and the Netherlands. Due to the high share of biomethane in the Danish grid (+10 %), Denmark is the first country to encounter issues with cross border trade of gas due to existing O2 limitations in the German gas quality standard. However, as the share of injected biomethane will increase in other parts of. Thus, going forward, the issue is not specific to Denmark.

Similar issues are expected to arise in scenarios where hydrogen and other new gasses eventually will enter the grid. Recently hydrogen has gained a lot of momentum – not at least among our southern neighbors. This has spurred discussions about potential use of current gas infrastructure to transport and store hydrogen. It is important to foresee even in the shorter to midterm perspective a situation, where a certain percentage of hydrogen could possibly be injected into the natural gas network and be blended with natural gas/biomethane.

National regulatory standards on gas quality for the injection of biomethane and potentially hydrogen could prove to be a potential show stopper for the transitioning of the gas system and a future proof internal gas market. Thus, we need a new approach towards handling varying gas qualities in the gas system. Some countries especially in North West Europe are moving fast, while the rest of Europe see a slower progression on green gasses. Hence both status quo and a static and harmonized approach without regional and local flexibility for varying gas qualities could potentially slow the transition. Consequently, Energinet sees a need for the issue of gas quality to be addressed in the legal base for the gas package with a mandate to ensure that issue will not constitute a barrier an internal market with growing share of new gasses. This could potentially be in the form of a clear political signal to ensure cross border flows of renewable and decarbonized gasses and more specifically a demand for a highly flexible EU standard – perhaps with minimum thresholds for oxygen and a requirement to accept a certain minimum blend of hydrogen. Given the regional specificities and relative technical complexity, a way forward could be to enshrine the task in the gas package with a governance structure that put obligations upon NRAs, gas infrastructure operators and industry to ensure

close regional cooperation and solutions on this issue. It might in such case also be appropriate to enshrine a certain timeframe for such work and some level of oversight by ACER and/or the Commission to ensure sufficient progress.

2.2.3 Different technological and regulatory maturity of green gasses

It is important to be aware of different development stages for green gas technologies and the related regulation. As DUR is aware of, we already have 10% of the Danish gas consumption covered by biomethane and we have standardized connection and grid injection rules in place, as well as the producers generally must comply with the general market rules – facts that seems surprising for stakeholders in other EU countries and the EU-institutions. Biomethane has very similar properties to natural gas and can easily replace natural gas in the existing gas system within the current timeframe without consequences for the end consumer, and beside the issue of gas quality the need for regulatory adaptations has proven to be limited.

On the other hand, the role of hydrogen in relation to market structure, infrastructure needs and the regulatory framework is far more complex and the timeframe more uncertain. Hydrogen transport is currently not included in EU gas legislation nor are there yet national examples of regulated gas networks being used to distribute hydrogen. It is obvious that with the current scale of the hydrogen market and production the lack of a comprehensive regulatory EU-framework is not problematic now. However, when looking to the speed of technological development and political pressure to increase decarbonization ambition, Energinet finds it plausible, that this could change within the time frame of the new gas legislation. Hence it will likely be necessary already in the context of the upcoming package to foresee scenarios, where PtG and so-called blue hydrogen would reach a notable maturity state and scale. As such, a possible starting point could be to consider to which degree the general principles in the existing gas directive such as TPA, cross border handling of (dedicated) infrastructure etc would apply for hydrogen as well going forward.

2.3 Storage

Storage is generally expected to play an important role going forward to an energy system, which to an increasing degree will be supplied be fluctuating renewables.

SSOs (Storage System Operators) provide three basic services based on insurance value, system value and hub value. Insurance service allows the storage of gas locally, close to centers of consumption, and provide resilience to the energy system especially in times of gas shortage or outage. System service enables the energy system to benefit from economies of scale in such a way that the network can be expanded at the lowest cost. Both services are not remunerated directly by the market. The hub service which is based on seasonal modulation is remunerated by the market via the differences in the forward price for summer gas and winter gas.

However, this summer/winter price spread has fallen to a very low level which does not support the long run marginal costs of the storage business. In some countries, the SSOs are additionally remunerated for the insurance value and system value via a stream of regulated income.

Different variations of the latter approach are now adopted in Italy and France and likewise Belgium and Hungary operate with regulated access to storage.

The combination of low hub prices and that some countries have introduced regulated income streams have undesirable effects.

From a basic EU internal market perspective this creates an unfortunate situation, where some market participants participate in the market with a buffer of guaranteed income, whereas other compete solely on market terms. The expected dynamic of this development might very well be, that some storage facilities in the EU will have to close. However, the diverging regulatory conditions create a situation with high risk, that the surviving storages will be those with a national solution for regulated income without looking at their socioeconomic values and their role in the green transition.

Given the national specificities a detailed "one-size-fits-all EU-regulation will not be appropriate, but Energinet sees a need for a common structured and transparent EU-framework to ensure sufficient remuneration of gas storage services in a given national context, while minimizing competitive distortion in the EU market for gas storage. Such EU regulatory framework should be based on market-based pricing to achieve efficient gas storage use in a level playing field. On top of that, additional services for the energy system should be assessed and adequately captured in the regulatory framework. It is important that any specific measures leading to a regulated income stream for SSOs are consistent and proportional to the assessed socioeconomic value of the storage services Additionally, the future role and relevance of storage to store renewable and low-carbon gasses - and innovation in this regard - should be addressed and considered in a new regulatory framework.

3. Role of gas in the future energy system

It is a key focus for Energinet to support the comprehensive transition of the energy system towards the political objective of a fossil free society in 2050, notably be ensuring that the energy system can integrate rapidly growing amount of fluctuating renewable electricity production from wind and solar. This while in parallel with ensuring a high level of security of supply and ensuring a cost-effective approach from a societal perspective. In our point of view, it entails ensuring a complete system focus to ensure a secure and efficient energy transition.

On a European scale it is assessed that electrification of 50-60 % of energy demand is necessary to reach EU climate targets. That means that 40-50 % of energy consumption must be covered by other renewable (or at least totally decarbonized) energy carriers. The sectors within the energy system supplement each other and their further integration will be increas-

ingly important going forward. Gas storage can support the balance between supply-and-demand in the electricity system, as it becomes much more volatile due to the integration of renewable sources. Storage by electrons alone (batteries, etc.) will not be sufficient nor cost-effective. Storage by molecules (H2, etc.) can store large volumes over a long period of time (seasonal) and likewise the gas system allows for efficient transport of large quantities of energy over long distances. An important role for gaseous and subsequently refined fuels going forward, is as energy carrier in the sectors, where it is impossible or overall costlier to apply direct electrification, such as parts of the transport and industry sector. This gas sector will however need to be fossil free to be a part of the future energy system given the demand for societal carbon neutrality in 2050 and the implicit demand for the energy sector to achieve that before.

4. Sector coupling – opportunities and barriers

As a starting point, it should be noted that It is important that the regulation and the discussions regarding sector coupling have a system perspective that covers all sectors (e.g. electricity, transport, industry, etc.), instead of suboptimal sector by sector decarbonization. A general sound principle to apply across various regulation of sectorial origin is likewise to ensure technological neutrality, when it comes to regulatory design of various services within the energy system – going forward in the green transition such services could be delivered by new energy carriers such as hydrogen or other even connected sectors.

4.1 Opportunities in sector coupling

4.1.1 Flexibility

Energinet sees a huge potential in the sector coupling of electricity, heat and gas sectors in Denmark. An energy system based on an increasing share of renewable energy will have an increased need for flexibility and storage options. Existing tools in the electricity system such as grid re-enforcement and interconnectors will remain important, but will not be sufficient as Denmark takes the next steps in the green transition. Here Energinet sees an opportunity for gaseous energy carriers and associated infrastructure to deliver large scale storage solutions (seasonal) and daily flexibility to the power and heat sectors. Furthermore, the ability of PtX facilities to operate flexibly will position them well to participate in the various sections for auxiliary services in the electricity market, thereby - on an equal footing - expanding the number of market participants that support a balanced and flexible power grid.

Green gasses used for flexibility at the end-consumer level (i.e. hybrid heating pumps) could potentially provide flexibility in electricity demand at DSO-level during high peaks or periods with low electricity supply from wind and solar. From a societal point of view dynamics and tradeoffs between utilization and continuous operation of existing gas infrastructure at DSO level of and electricity DSO-grid expansion for peak handling should be considered.

4.1.2 Full decarbonization

Sector coupling, however, should not be seen just with a narrow focus on providing flexibility and cost-efficiency in the transition of the electricity and heating systems. A significant potential in its own, is the conversion of renewable electricity into other gaseous or liquid energy

carriers as a fundamental necessity to achieve full decarbonization across all sectors. Where massive direct electrification of transport, heating and industry is crucial, it will most likely not be a technical and/or economically viable solution for the so-called hard-to-abate sectors such as aviation, shipping and high temperature industrial processes. Instead electro fuels (PtX-products) along with bioenergy will be needed in these sectors.

New value chains for "green CO2" from bioenergy (i.e. biogas) to produce these fuels is likely to be developed as well. This underline the importance of extending the sector coupling discussion and regulatory assessment to go beyond the energy system and include perspective on agriculture and waste handling as well.

4.1.3 Future infrastructure needs and alternative approaches to RES-integration

As the share of wind and solar accelerate, an increased need for electricity infrastructure follows. However, public resistance against new infrastructure spurs political demands for alternative solutions. Also, socioeconomic considerations in relation to the location of large scale power-to-gas facilities within the energy system will require a more integrated approach to infrastructure planning across sectors. Likewise, the role of storages for renewable and decarbonized gasses as major flexibility provider across sectors should be considered – an issue which might not be sufficiently managed under existing regulation (as described in the market section above).

The potential for offshore wind power in the Danish part of the North Sea is by far expected to exceed even future Danish demand. This resource potential can only be fully utilized if ample source of renewable energy can be integrated into the energy system and transported to the points of consumption – that being geographically down in Europe or into other end use sectors. Thus, it will be necessary to turn shares of the electricity into another energy carriers such as hydrogen, synthetic methane and liquid fuels that can be transported and stored cost efficiently. Furthermore, the waste heat from such processes could potentially be utilized for district heating.

A point of attention is however, that location, capacity and operation patterns of PtG and PtX has a large impact if we are to harvest the socioeconomic benefits – notably with regard to the potential of dampening the need for increased high-voltage power line capacity. If those issues are not carefully considered the development of PtX might trigger the opposite effect i.e. require further expansion of electricity transmission capacity.

4.2 Challenges/Barriers for sector coupling

4.2.1 Regulatory lock-in in existing silos

As a general remark we see a fundamental challenge in the fact that sector coupling – by nature – require interaction and regulatory alignment between sectors, which traditionally largely have been approaches in silos, when it comes to political objectives, regulation, market development etc. Although it might not be the path of least resistance, we strongly recommend a more holistic approach going forward. Looking to the examples of issues and challenges identi-

fied in this paper it is clear, that a re-cast of the existing gas market regulation alone will not be sufficient. Alignment and correlation between existing regulation on transport, electricity, renewable energy and climate is deemed necessary.

4.2.2 Transferability of green value across sectors and energy carriers

It is important that the EU regulation provides the possibility to transform renewable electricity into another renewable energy carrier, as also highlighted in the market section. Currently, the revised renewable energy directive (REDII) does not allow the producer to preserve the energy as 100% renewable unless the PtG facility is placed on site of the wind/solar farm and not connected to the grid. In order to ensure only renewable electricity is used, guarantees of origin or *power purchase agreements* between a renewable electricity generation facility and an electrolyzer should be sufficient to allow the electrolyzer to count its electricity use as renewable. Allowing the electrolyzer to connect directly to the grid is necessary to achieve the system benefits such as ancillary services and the optimization of the electrolyzer's location to avoid the need for additional grid enhancement.

4.2.3 Role of fees and taxes

The key cost drivers in operating PtG plants are the electricity price (electricity tax, renewable levies & electricity grid fees) + CAPEX of plant and utilization hours. From pilot projects operators we learned that there is significant and immediately visible potential for decease CAPEX resulting from an increase in production quantity (economies of scale). Electricity prices, however, is the largest cost component for PtG production. Electricity grid fees thus have a substantial impact on the overall cost and profitability of PtG. Today all electricity grid users at TSO-level in DK pay the same price for using the grid – and get the same guaranteed access. Large electricity consumers such as PtG facilities are highly flexible consumers since these users' supply can be fully interrupted if needed. Grid charges should reflect this service letting highly flexible consumers utilize temporary excess of grid capacity against a lower charge. This could lead to faster deployment of P2G and better overall utilization of the grid. Energinet is currently working to prepare a more differentiated approach within the existing regulatory framework. Looking towards other EU countries it can be noted, that the use of electricity for electrolyzers is taxed like end-use consumption, which hence challenges the viability considerably.

4.2.4 Need for closer integration on institutional level

Increased cooperation between all infrastructure operators is essential for development of the future energy system. But like for regulation, infrastructure planning cannot be achieved by working in sub-siloes. Energinet sees the need for cooperation in the planning of systems/infrastructure and alignment between frameworks as important steps towards unlocking the synergies of sector coupling. An important first step has been the joint scenario work between ENTSOG & ENTSO-E. In the future the ENTSOs should integrate further and work towards a joint TYNDP with joint infrastructure planning - including new elements such as PtG - and seek out the potential of having a joint network code(s) for sector coupling between elec-

tricity and gas. Furthermore, the CEF/PCI should be implemented to include sector coupling projects.

4.2.5 Flexibility and room for national discretion on best approach on new technologies

Flexibility is key when it comes to an appropriate regulatory framework for sector coupling, on EU as well as national level to enable the market participants and the TSOs to deliver on the increased ambitions set out at national and EU level. Such a flexible approach implies, in our assessment, further analysis and discussion on the role that the TSOs may play in the implementation of new technologies. We note that it is preliminarily concluded from the Commission's sector coupling analysis, that market failures, including risk associated with the investment in new technologies, poses a threat to the implementation of new technologies at the speed required to achieve the EU decarbonization targets. Hence the gas package provides a timely opportunity to carefully consider the possible development paths and opportunities for development, ownership and operation of various infrastructure components beyond the one used for transport of natural gas. The electricity directive from the Clean Energy Package introduces the concept of TSO involvement in securing use of new technology to overcome market failure. This seems to be a sensible point of departure, although it will be important to take into account the already existing differences between the regulatory set-up of the electricity and gas TSOs. Hence, assuming that articles are the beforementioned directive is mirrored in the new Gas Package, we would like to encourage the concept being explored further. We find that the concept as such is generally appropriate, but suggest that its scope of applications should not be limited to energy storage facilities, but rather apply in general to projects aiming at implementing new technologies in the existing systems (regulatory sandbox approach). In respect of the concept as such, we recommend that options are kept open to the widest possible extent at EU level, thereby leaving discretion with the national authorities, to assess on a case-by-case basis, how the ambitions from the EU-regulation and national policies are appropriately met and weather the conditions are fulfilled for TSO- involvement (and eventual conditions for such involvement).