

Document officer: HJV
Secretary:
Case no.: s2019-1276
Document no.: d2020-9130-8.0
29. maj 2020

Road Map for EU Strategy on Energy Sector Integration

The Danish Energy Association welcomes this opportunity to elaborate further on the comments to the EU questionnaire which we submitted on 14 May 2020, focusing on the elements of a Roadmap for the Strategy of EU Energy Sector Integration. We refer to the submission from the Danish Energy Association of 14 May¹ and wish to highlight the following elements:

1. Only by making sure that all sectors are electrified in a cost-effective way - using electricity directly in heat pumps for heating or for industrial processes and in batteries for EVs and storage in the grid etc. or converting electricity into storable E-fuels and green gasses through Power-to-X (PtX)-processes - will enable the EU to achieve its climate target and become carbon neutral by 2050.
2. In order to balance future power generation and consumption the electrification of all sectors needs to be implemented in a way that secures maximum demand response.
3. Digitalisation from generation to end-use and across all sectors is crucial to enable sector integration and ensure that demand response can be activated through price signals in the energy market.
4. Facing a significant increase in the share of intermittent renewables (wind and solar power), the **main features** of a truly integrated energy system are based on maximum degree of sector integration between:
 - *Power and Heating* (District heating as well as individual heat pumps may provide flexibility by using the heat pumps flexibility (heat storage in water or buildings) or through power-gas-hybrid solutions for heating and industrial processes)
 - *Power and Water and wastewater utilities* (The water utilities are large power consumers with the ability to use power flexibly when pumping water / wastewater. Furthermore, wastewater sludge generates biogas which may be used for power gen-

¹ 14 May submission: https://www.ienergi.dk/sites/ienergi.dk/files/media/dokumenter/2020-05/H%C3%B8ringssvar%20til%20EU_Sector%20Integration%20-%20Comments%20from%20Danish%20Energy.pdf

- eration or upgraded to biomethane and inserted into the natural gas system. Finally, processes in the water sector generates heating.
- *Power and Transportation* (charging batteries for EVs when power is abundant and cheap and off-peak hours, and using green gasses (biogas or hydrogen) for purposes where direct electricity is not possible (see below) and
 - *Power and process industries* (Fuel switch from fossil fuels to power and applying – even high temperature - heat pumps enables industries to provide demand response flexibility. Furthermore, industrial processes develop heat which may be boosted with heat pumps and deliver surplus heating for the district heating system. Finally, the industrial processes in itself may provide storage and flexibility “services” e.g. when producing cement)
5. Energy efficiency is provided specifically by switching from fossil fuels to electric heat pumps in industry as well as in heating and cooling of buildings. Therefore, direct electrification is a primary source of energy efficiency. Attention is drawn to two elements of further regulatory and research funding areas:
- a. *Renovating buildings making them intelligent*: It is possible to reduce direct consumption of energy in buildings through insulation etc. but combining the renovation with installation of intelligent building monitoring, such as CTS, or intelligent, web-based monitoring of the heat pump and cooling system will increase energy efficiency in buildings and enable the building and the heat pump to deliver flexibility services to the grid as well as to the energy market (A recent Danish study from the University of AalborgBUILD² demonstrates that renovating Danish buildings will reduce energy consumption related to heating in the house by 12-18%. This will increase to 14-20% if additional measures such as intelligent monitoring of the building is established). **Recommendation**: The current Building Performance Directive should require that all larger buildings (1000 SqM) should install CTS and similarly when renovated or new build. And the Eco Design regulation should require all heating and cooling pumps to have equipment integrated that makes remote monitoring and controlling of temperature and response to price signals possible.
 - b. *Speeding up development of high-temperature heat pumps*: To a large extent, the direct use of power in all sectors and hence direct energy system and sector integration, builds on existing, known technologies, which are already or very close to being commercially viable compared to fossil fueled technologies. But in the case of high-temperature heat pumps an extra effort is required immediately to avoid sunk costs. It is assumed to take another 3-5 years of rapid development and demonstration to reach 160degreesC+. Reaching this temperature will enable direct electrification of multiple industrial processes. Hence it is important to speed-up development efforts. **Recommendation**: EU and national funding must flow into this area stepping up on development and demonstration efforts.

² https://www.ienergi.dk/sites/ienergi.dk/files/media/dokumenter/2020-05/beboernes_betydning_for_den_realiserede_varmebesparelse_ved_renovering_af_boliger_sbi_2019.pdf

6. A common EU strategy for biogas, PtX and Carbon capture, usage and storage is required to enhance a cost-effective development of technologies and market-based tools must be put into place.
- a. *Biogas and combined CCU/S-strategy*: The availability (volume) and cost of biogas needs to be assessed and market-based instruments need to ensure that production of biogas reveals the true market price. Biogas is a scarce resource especially at EU level. Unexploited resources of biogas must be developed, e.g. from wastewater plants. Internal EU barriers for biogas/biomethane trade must be removed. Hence combining heat pumps and biogas in hybrid solutions within heat and industrial processing must be an element of the power-heat/industry sector integration and optimal utilization of biogas. For industry CCS may be a better option, providing that costs are brought down on this technology too. Hence a CCS strategy – while not being a sector integration strategy will be an important contribution to the overall decisions on Biogas as well as Power-to-X strategies.
 - b. *Green hydrogen / Power-to-X*: As an important element in the sector integration strategy is a common EU-strategy for Power-to-X should be developed. The technology development costs are significant, and incoherent national Power-to-X strategies are likely to make costs even higher. A common EU strategy must ensure that benefits from the synergies across member states are harvested, and that national strategies don't compete against each other but work to enhance each other.
 - c. Scaling up on demonstration sites for Power-to-X enabling additional value stream, e.g. from selling surplus heating and flexibility to the energy market, are essential and hence location of facilities need to take this into account. Furthermore, driving demand for green hydrogen needs to be supported on EU level through market driven mechanisms.

For further elaboration on these issues, reference is made to the submission of 14 May 2020³

7. Utilities within power, heat, water and gas are tightly regulated in many member states because they are monopolies. It is important that this regulation supports the green transition of utilities.
- a. Investments in non-fossil fuels in general and particularly in innovative green solutions must be enabled. As an example, massive increase in EVs will not happen if the charging infrastructure isn't ready to service EVs. Same goes for heat pumps when converting from oil stoves and natural gas-fired stoves.
 - b. Regulation needs to support the cost-effective choice between infrastructure investments and demand for flexibility. And local and regional/national markets for flexibility need to be developed to meet the need in the energy market as well as in the grid.
 - c. Improved national and trans-European energy infrastructure (electricity and gas as well as hydrogen and other carbon neutral/renewable gases) is needed to facilitate transportation of RE across the EU. EU must ensure that investments are given priority.

³ 14 May submission: https://www.ienergi.dk/sites/ienergi.dk/files/media/dokumenter/2020-05/H%C3%B8ringssvar%20til%20EU_Sector%20Integration%20-%20Comments%20from%20Danish%20Energy.pdf

- For further elaboration on this issue reference is made to the 14 May submission⁴
8. From the outset of the EU ambition concerning the energy sector integration strategy, it has been underlined that the consumer should be put at the center of this strategy. This is an important ambition, making sure that the EU citizen engage in the green transition. However, two points must be observed:
 - a. Digitalization across the value chain from energy production to end-user consumption of prosumer activities is fundamental and cannot be driven by the EU citizen.
 - b. Top-down energy system-integration needs to be driven forward by incentives for the utilities and the building, transport and industrial sectors, to be co-operating in their planning and investments decisions. This is something that national and EU regulation should enable. Utilities are large and often flexible energy consumers e.g. district heating and water utilities.
 - c. Engaging the end-user has proven to be difficult. Energy is a low-interest and low-cost area for many households, being green doesn't suffice "after a while". To engage EU citizens in the green transition, digital companies (often SMVs) together with energy companies need to develop green, cheap and convenient solutions for the end-user. Therefore, innovation and entrepreneurship e.g. with the independent aggregator and energy supplier must be supported.
 9. Market driven policy measures on an EU-level need to be improved:
 - a. Carbon emissions trading within the EU Emissions Trading System (ETS) is the most effective way to reach climate neutrality and should remain Europe's primary tool in decarbonizing the EU economy. A market-based system will guarantee the achievement of green affordable and reliable energy to all European citizens. To avoid the risk of oversupply of allowances, we strongly advocate maintaining the 24% intake rate after 2023 not reducing it to 12%.
 - b. The revision of the Energy Taxation Directive should reflect the important role of direct and indirect electrification and ensure a favorable treatment for renewable based electricity. The current directive lacks a common framework causing each Member States to apply its own minimum tax rates on energy product and its own rules for exemptions. Energy tax rates currently applied by Member States differ significantly which leads to market fragmentation and situations where renewable energy can be taxed more heavily than fossil fuel-based energy.
 - c. Carbon leakage measures need to be established to avoid undermining EU industry.
 10. Waste treatment in the circular economy requires a transition where a significant increase in re-cycling approaching 90% will mean that incineration capacity needs to be reduced. Better sorting of plastic will reduce emissions from incineration and may create new industries, e.g. developing biofuels based on plastic fractions.
 11. Energy markets need to develop to support demand response. Reference is made to the 14 May submission⁵. Furthermore, regulation on buildings and equipment for

⁴ 14 May submission: https://www.ienergi.dk/sites/ienergi.dk/files/media/dokumenter/2020-05/H%C3%B8ringssvar%20til%20EU_Sector%20Integration%20-%20Comments%20from%20Danish%20Energy.pdf

heating and cooling ability to communicate and respond to price signals from the grid operator and energy market must be ensured across the EU. Post-installation of CTS etc. is too costly. Only by making sure that household/building assets consuming or producing energy are ready to respond to the energy market's price signal as well as the DSO and TSO tariff-signals will it be possible to activate the EU citizen cost-effectively, making buildings and their components part of the sector coupling.

Yours sincerely
The Danish Energy Association

Anders Stouge,
Deputy Director General

⁵ 14 May submission: https://www.ienergi.dk/sites/ienergi.dk/files/media/dokumenter/2020-05/H%C3%B8ringssvar%20til%20EU_Sector%20Integration%20-%20Comments%20from%20Danish%20Energy.pdf