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powering people

Consultation on the European Commission 2050 Strategy for long-term EU GHG emissions reductions

A Eurelectric consultation response paper

October 2018

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

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WG Climate Change & Decarbonisation

Contact:
Krzysztof LASKOWSKI; Advisor Climate Change,
klaskowski@eurelectric.org

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KEY MESSAGES

- The European power sector fully subscribes to the Paris Agreement and accelerates its efforts to be carbon neutral well before 2050. Going forward electricity will be a key carbon neutral energy carrier which will help decarbonize other sectors, through direct and indirect electrification. A highly decarbonised European economy between 90% and 95% needs electrification rates between 48% and 60%, as compared to 22% today.

- Cost-effective decarbonisation is crucial if Europe is to remain competitive in the global market place, and Eurelectric is committed to leading this transition. While respecting the concept of technological neutrality the Commission 2050 Strategy for long-term EU GHG emissions reductions must therefore give guidance on long term pathways for economy wide decarbonisation, taking into account environmental but also social sustainability.

- Electrification is a critical enabler to decarbonise energy using sectors, in particular heating and cooling, transport and industry. On the way to 2050, it should be further enabled through regulatory frameworks and a future proof investment environment for carbon neutral technologies that stimulate the development of clean generation, relevant charging infrastructure, digitalised networks and storage facilities.

- The decarbonisation of the power sector is on track but challenges remain in terms of investments and technology availability. The 2050 Strategy should give clear guidance for current and future policy makers to build on the 2030 Energy & Climate Framework and achieve a cost-efficient transition, enabling the necessary investments.

- The Commission's Strategy must take into consideration the different starting points of European countries and commercial availability of key transitional technologies. All EU carbon-intensive regions and Member States, in particular with low GDP/capita levels, need a comprehensive support from the EU budget, EU ETS auctioning revenues and compensation mechanisms to finance required investments and enable a just energy transition.

- Eurelectric appreciates the opportunity to feed into the process of devising the 2050 Strategy. Going forward, we call on the Commission to maintain a transparent approach and enable an open dialogue on all key transition technologies and coherent policies needed to meet the Paris climate goals.

Eurelectric welcomes the opportunity to respond to the consultation on the European Commission's 2050 Strategy for long-term EU GHG emissions reductions. As a strong supporter of the Paris Climate Agreement we believe this long term strategy is crucial to enable Europe to lay out the pathway for a smart, energy efficient and truly sustainable society for all citizens of Europe.

Commitment of the power sector – Carbon neutral well before 2050

The power sector is at the heart of the European fight against climate change. Europe's ability to meet the ambitions of the Paris Agreement depends heavily on our industry's ability to decarbonise the power sector. Eurelectric and its members accept this responsibility, acknowledging the urgency to address climate change, air pollution and the depletion of natural resources. Our engagement also comes with the conviction that energy using sectors also need to make major efforts in order to reach Europe's goals for the Paris Agreement.

Our sector is currently in the midst of a deep transformation driven by technology, digitalisation and more active European customers. Taking on the challenge to decarbonise therefore also comes with a clear recognition of the importance of cost-efficiency and the need to deliver secure and affordable energy while modernising our infrastructure, taking into account data protection and public acceptance challenges.

With this in mind, Eurelectric launched its new industry vision in December 2017[1], fully committing Eurelectric members to invest in clean electricity generation and transition-enabling technologies such as storage and demand response in order to deliver carbon neutral electricity well before 2050. This commitment followed a statement made earlier that year where the industry declared that it does not intend to invest in new coal plants after 2020.

Progress to meet this ambition is well underway. Data from the European Environment Agency (EEA), Eurostat and Eurelectric show how the European power sector is making significant strides towards decarbonisation. As a key indicator the CO_2 emission intensity for EU electricity & heat generation declined by more than 40% between 1990 and 2016, from a level of 431 gCO_2/kWh in 1990 to 257 gCO_2/kWh in 2016. Further, between 2010 and 2017 the amount of power generated across the EU coming from carbon-free sources rose from 46.5% to 57.5%, with the RES share reaching 30% in 2017. Further reduction of CO2 emission intensity of the power sector creates economic and technological challenges and opportunities that require additional efforts and commitment from the EU and all its Member States.

Beyond our drive for environmental sustainability, it becomes increasingly clear that value for companies is generated not only through business operations but also in the way they are carried out. Eurelectric is deepening its engagement in social sustainability, expanding partnerships with social and local actors across Europe. Delivering on this commitment truly enables our sector to support the economy-wide shift to an efficient climate-friendly society and achieve a competitive European economy.

Enabling the transition – key policy aspects for a 2050 strategy

The electricity sector is ready to lead the ambitious journey toward decarbonisation. Enabling the transition and truly unlocking the opportunities it brings is therefore the primary concern of Eurelectric and its members. We believe that the 2050 strategy should be built on the following pillars:

[1] https://cdn.eurelectric.org/media/2189/vision-of-the-european-electricity-industry-02-08-2018-h-864A4394.pdf

- **Ensuring cost-efficiency**. As they move towards decarbonisation, each European country is facing different challenges and opportunities. European policy must therefore provide policy instruments which enable the development and deployment of all transition enabling technologies. This includes a strong carbon market for the ETS sectors that delivers a meaningful price whilst ensuring a global competitiveness of the European industries and complimentary CO2 pricing in the non-ETS sectors. It necessitates channelling of sustainable climate and energy financing toward the relevant technologies. It also includes framework conditions that allow innovation, research and commercialisation of new and more efficient solutions throughout the entire value chain of the electricity sector. Later this year, Eurelectric will publish the second part of its 'decarbonisation pathways' study, which will provide detailed insights into cost-effective paths enabling the power sector to deliver on its commitment to become carbon neutral well before 2050.

- **Delivering efficient electrification.** Decision makers and investors have begun to recognise the key role clean electricity has to play in allowing other, fossil fuel dependent sectors to decarbonise and become more efficient. Smarter and better regulation is needed to promote the take-up of energy efficient electric and power to gas technologies, including clean & sustainable heating and cooling in residential and industrial buildings, clean electric mobility and more efficient industrial processes. The first part of Eurelectric's '*decarbonisation pathways*' study, published in June 2018 shows that a 95% decarbonisation of the European economy by 2050 would require a direct electrification rate of 60% across all energy using sectors.[2]

- **Unlocking the benefits of digitalisation**. Over the past decade utilities and energy businesses have introduced digital innovation to optimise processes while new technologies and services continue to disrupt and transform the traditional power sector value chain. The digital future of the electricity system will require Europe to make smart grids a reality so as to integrate centralised and decentralised technologies, promote customer participation in a secure, flexible and cost-effective manner. It is therefore key to address existing challenges to unlock new business models and align the EU's strategies on triggering investments in clean technologies across sectors. Overcoming the slow development of regulatory frameworks and asynchronous investment strategies will only be possible with a cross-sectoral approach to innovation and digitalisation.

- **Ensure a well-functioning, fully integrated power market**. The power sector transition will require very significant investments over the next decades, in generation, storage, demand response and networks. Giving the right signals to investors must therefore be a priority for policy makers and the private sector. While the Clean Energy Package is shaping up to be a big step in the right direction, major challenges remain: insufficient price incentives for investments in new plants coincide with technology discriminating regulation, as well as distorted tax and tariffs incentives. These shortcomings lead consumers and producers to take inefficient decisions. Further to that, significant barriers to the free flow of electricity remain across the continent. If Europe is to unlock the investments needed, the 2050 Strategy must foresee the implementation of a sustainable market design that values energy, flexibility and assets' contribution to system adequacy.

2 https://cdn.eurelectric.org/media/3172/decarbonisation-pathways-electrificatino-part-study-results-h-AD171CCC.pdf

- **Enabling a fair transition**. The commitment and ambition expressed in our vision are challenging, especially for Member States with low GDP/capita and regions which depend on high carbon value chains. When looking toward 2050, the European Commission needs to carefully take into account potential negative impacts on business, employment and living conditions. This social sustainability dimension requires close cooperation between regional and local governments, Social Partners, as well as the industry. The power sector is engaged in discussions on transforming carbon-intensive regions by enabling the future EU budget to leverage financing of their energy transition. Eurelectric is convinced that in addition to regional and cohesion funds for Member States with low GDP/capita and affected regions, the creation of a new "Just Energy Transition Fund" is needed for successful restructuring of all EU carbon intensive regions. The investment support should go hand in hand with site repurposing activities, the adaptation of education systems and the creation of new jobs in social dialogue with communities. If Europe fails to provide new, prosperous perspectives for those affected by the transition it cannot succeed.

Electricity as the key - a 95% reduction target requires a 60% electrification of EU energy consumption in 2050

As the energy needs of modern society evolve and the focus shifts from access to sustainability, security and affordability, electricity is ready to reveal its true potential. It is set to become the leading energy vector to decarbonise other sectors of the economy as well, even beyond the EU ETS – such as transport, heating and cooling.

To substantiate the power sector commitment to be carbon neutral well before 2050, Eurelectric conducted a new study[3] showing the close connection between electrification and deep decarbonisation. The analysis shows that for the EU to reach 80% - 95% GHG emissions reduction by 2050, electricity needs to cover between 38% and 60% of final energy consumption. This is achievable with a 1% to 1.5% year-on-year growth of EU direct electricity consumption whilst at the same time reducing the EU's energy consumption by 0.6 % - 1.3% per year through energy efficiency improvements.

Electrification does more than remove CO_2 emissions. It reduces the import dependency of fossil fuels by replacing these energy carriers with locally produced electricity. It also enhances energy efficiency by incentivising the roll-out of more efficient technologies. And it improves air quality – especially in our cities. Electrification also creates significant opportunities for EU's technology leadership, exports and job creation that can be harnessed through a well-managed energy transition.

There is no single silver bullet in decarbonising the EU economy – Europe is diverse and the challenges differ considerably from country to country. It is however clear that for many energy-based applications, energy efficient electrification is the most direct, effective and efficient way of reaching the decarbonisation objectives. Electricity is flexible and versatile; it can be used in almost all energy using sectors either directly or indirectly. Our study finds that in a deeply decarbonised Europe in 2050:

- Electricity will play a leading role in **transport,** where up to 63% of total final energy consumption will be electric in our most ambitious scenario. With major car manufacturers increasingly moving towards electric fleets (see BMW, Volvo, VW etc.) the shift toward electrification of road transport is already initiated for passenger cars, but also for buses and trucks. In the future, successful decarbonisation of all segments of the transport sector, in

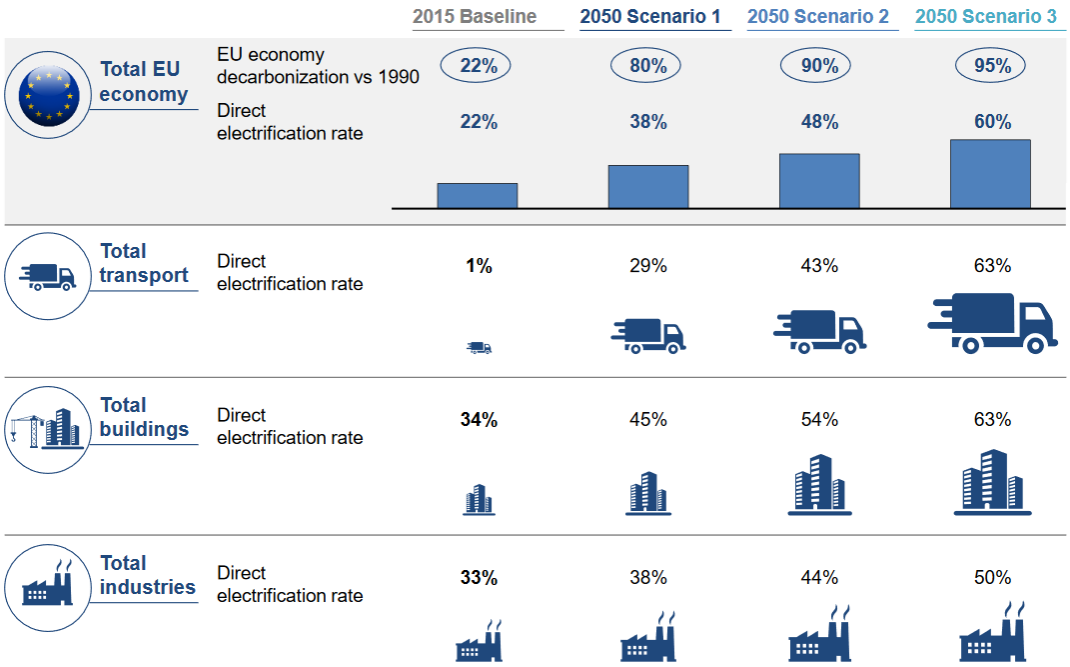
[3] 'Decarbonisation Pathways', June 2018 – available at www.eurelectric.org

particular aviation and maritime, will also rely on hydrogen and synthetic methane produced from carbon neutral electricity, as well as availability of other clean fuels. The infrastructure requirements of this transition will need to be carefully managed in an integrated manner with a rapid increase in the number of charge points required to meet an increase in Electric Vehicles. These charging points should be deployed 'smart ready' so that vehicle-to-grid services can be utilised providing benefits to both network companies, and the consumer.

- In **buildings**, energy efficiency is a key driver of emission reductions; district heating and cooling are expected to keep on playing critical roles in some geographies and especially in densely populated urban areas with the use of large industrial heat pumps, while 45% to 63% of buildings energy consumption could be electric in 2050 mainly driven by adoption of electric heat pumps. A smart management of these heat pumps will be required as peak demand from heating can be many times higher than current peak electricity demand in some regions. Flexible, digital and automated solutions, demand response and storage technologies will be critical to enable this transition at the least cost.

- A series of **industrial processes** can technically be electrified with up to 50% direct electrification in 2050. The relative competitiveness of electricity against other carbon-neutral fuels will be the critical driver for this shift. Hydrogen and other carbon-neutral alternatives will also play a role and drive indirect electrification. In some industrial sectors an increased use of electricity will facilitate the achievement of circular economy. In other sectors electrification will enable sector coupling and trigger joint cooperation opportunities in CCS/CCU infrastructure development. Public and non-public preferential financing of installations allowing re-use of captured CO2 in another technological process will be key to succeeding in this.

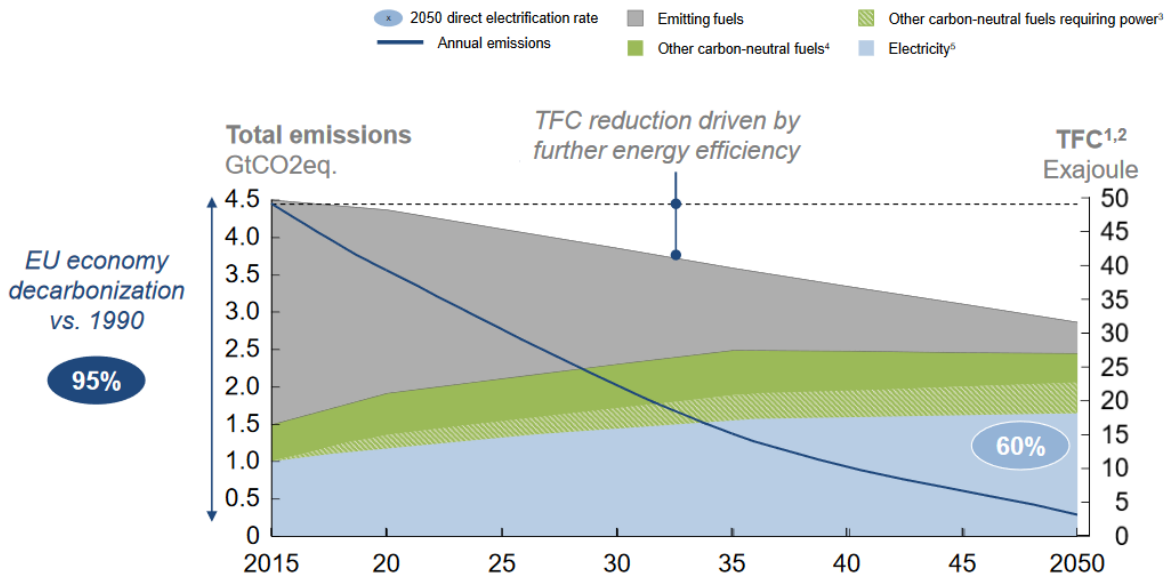
Figure 1: Electricity share in final energy consumption across sectors to achieve deep decarbonisation



Deep decarbonisation requires the removal of critical barriers on electrification, energy efficiency and other non-emitting fuels

Eurelectric is convinced that 95% decarbonisation of the EU economy would only be possible through strong electrification, energy efficiency, and support from other non-emitting fuels (see graph below). A number of challenges also need to be addressed.

Figure 2: Share of electricity and other non-emitting fuels in total final consumption in a 95% EU decarbonisation scenario



1 Includes 32 countries in scope: EU28 + EEA; ENTSOE report additionally includes Turkey and other Eastern European countries adding up to a total of ~3,300 TWh
2 Electricity consumption from transformation sectors not included; 3 Includes non-emitting fuels that trigger indirect electrification through power-to-X (H2, synth fuels) as well as non-emitting fuels that trigger increased electricity demand to be produced such as biofuels; 4 Includes all other non-emitting fuels/sources such as geothermal, solar thermal, and others; 5 Direct electricity consumption 22

The implementation of this 95% decarbonisation scenario will require the EU to overcome some challenges. As 1/3 of the increase in energy efficiency is driven by electrification, capturing the other 2/3 of these expected energy efficiency gains would require to remove the current observed barriers to adoption and implementation of energy efficiency measures.

Ambitious decarbonisation of industry (around 80% versus 1990), might come at an extra cost versus existing emitting technologies and will require a certain level of global coordination and ambition to avoid carbon leakage. Significant technology progress and breakthroughs will have to materialize in the timeframe considered, such as the production of cost-competitive and clean H2 and synthetic fuels at scale to complement electrification. Acceptability challenges, for instance for CCS, would need to be addressed.

Finally, different starting points between Member States in the energy transition will also require careful attention.

The results of the study show that this all can be achieved with a strong commitment from policymakers to implement the Paris Agreement in an ambitious way.

Expectations from the Commission Roadmap & transparent cooperation

The Commission 2050 Strategy will be an essential guide for current and future policy makers to get Europe on the track to meeting its Paris ambitions. Eurelectric welcomes the Commission's scope of its 2050 Strategy to include all relevant dimensions of the energy sector – and much

beyond. Political focus on shaping a fair transition and leaving room for regional nuances will be key to its successful delivery.

Effectiveness of the Commission 2050 Strategy will critically depend upon being fact-based, with nuanced technology assumptions as an input to modelling of decarbonisation pathways. In this regard Eurelectric strongly appreciates having been able to feed into the stakeholder consultation on technology cost modelling assumptions ahead of their finalisation earlier this year. Upon reviewing the final documents however, we regret that many critical points raised by Eurelectrichave not been considered. We call on the Commission to reflect upon Eurelectric's input on these assumptions, noting that:

- A proper regional differentiation for investment costs, domestic energy sources potential, technology learning curves, lifetime calculations or estimated capacity factors should be taken into account.
- Assumptions about cost reductions & innovations in electricity transmission and distribution technologies are missing.
- Some technologies were inaccurately reflected in the assumptions like electricity storage such as batteries or pumped hydro. Investments into storage and demand side response should be appropriately accounted for.
- A recognition of the fact that regulatory frameworks, political decisions and societal benefits will also play a prominent role in the development and adoption of some technologies.
- A recognition that Member States with low GDP/capita levels and all EU coal and carbon-intensive regions necessitate comprehensive EU financial support to ensure a just energy transition enabling their successful social and economic restructuring and development
- Reflection on the contribution of well interconnected countries to reaching European decarbonisation goals should also be taken into consideration.
- Transitional issues such as additional costs of closing coal mines and decommissioning of ageing fossil fuel fleet shall be taken into account, as well as the potential constraints, interactions or synergies with gas infrastructures
- Additional balancing costs of intermittent generation shall be considered too.

While all sectors clearly need to deliver to achieve the Paris Agreement, the power sector is a critical enabler and a front runner. We remain committed to decarbonising power generation well before 2050 and express our confidence in electricity as an energy carrier, which will play a major role in decarbonising other energy using sectors. The Commission 2050 Strategy represents an important and timely exercise, and will mark the next iteration of a debate on policy pathways beyond 2030 – in the energy sector and beyond. Eurelectric will remain engaged closely in this debate and looks forward to continued cooperation with all relevant stakeholders.

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

Union of the Electricity Industry - Eurelectric aisbl
Boulevard de l'Impératrice, 66 – bte 2 - 1000 Brussels, Belgium
Tel: + 32 2 515 10 00 - VAT: BE 0462 679 112 • www.eurelectric.org
EU Transparency Register number: 4271427696-87