



EUROPEAN TECHNOLOGY & INNOVATION  
PLATFORM ON WIND ENERGY

# Electricity grids for a climate-neutral Europe

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## 1 Context

### 1.1 Background

The objective of the ETIPWind interactive webinar “Electricity grids for a climate-neutral Europe” was to a) disseminate the factsheet with the same name (deliverable 4.5) as prepared by the ETIPWind executive committee and b) discuss how to overcome the barriers to the transformation of electricity networks.

The specific objectives of the webinar were to:

- Inform participants of the publication of the factsheet and provide them with its digital version;
- Involve experts in system integration and grid management to further the discussion between system operators, technology providers and generation asset owners; and
- Dig deeper into the latest technology developments on grid management and system integration.

This webinar report (deliverable D3.6) relates to the ETIPWind activities described in Work Package 3, task 3.2.

### 1.2 Scope

On 9 December the European Technology and Innovation Platform on Wind Energy (ETIPWind) organised a webinar entitled: “[Electricity grids for a climate-neutral Europe](#)”.

The aim of the webinar was to present the ETIPWind Factsheet “[Electricity grids for a climate-neutral Europe](#)” to a broad base of EU and national stakeholders. The presentation of the factsheet served to steer a discussion between experts on how Europe’s power grids can be the backbone for delivering climate neutrality. This comprised the needs for research & innovation, grid optimisation, and grid expansion that allow for the ambitious electrification of industry, buildings and transport set out by the European Green Deal.

The target audience therefore included technical experts from the wind energy industry, national and EU transmission and distribution operators, regulatory agencies, and policymakers.

## 2 Agenda

Time	Item
15:00 – 15:05	<b>Introduction</b> Adrian Timbus, ETIPWind Executive Committee Chair/Vice President Portfolio and Strategic Marketing, Hitachi Energy
15:05 – 15:15	<b>Presentation of the ETIPWind Factsheet “Electricity grids for a climate-neutral Europe”</b> Daniel Fraile, Director of Market Intelligence, WindEurope
15:15 – 15:45	<b>Panel discussion and Q&amp;A</b> <ul style="list-style-type: none"> <li>• <b>Vera Silva</b>, CTO, GE Grid Solutions, and Vice President at T&amp;D Europe</li> <li>• <b>Kristian Holm</b>, Technical Director, Renewable Solutions, Equinor</li> <li>• <b>Rena Kuwahata</b>, Business Development Manager, Ampacimon, and Vice Chair at CurreENT</li> <li>• <b>Jean-Baptiste Paquel</b>, System Planning Manager, ENTSO-E</li> </ul>
15:45 – 15:50	<b>Conclusions</b>

### 3 Minutes of the webinar

#### 3.1 Introduction

**Adrian Timbus**, Chair of the ETIPWind Executive Committee, opened the workshop. He welcomed all the participants and explained the house rules of the workshop. As the workshop was held virtually participants could send their questions and feedback via the chat function. All questions were answered by the panellist during the webinar.

Mr Timbus stressed that ETIPWind plays a vital role in supporting the delivery of a decarbonised energy system in Europe by 2050. The platform has identified five pillars of wind energy R&I. And published [a detailed roadmap](#) that includes several research priorities on grid & system integration.

In this sense the ETIPWind Factsheet “[Electricity grids for a climate-neutral Europe](#)” and its dedicated launch webinar build and expand upon previous ETIPWind and WindEurope reports. Notably also the June 2021 publication “[Getting fit for 55 and set for 2050: Electrifying Europe with wind energy](#)”.

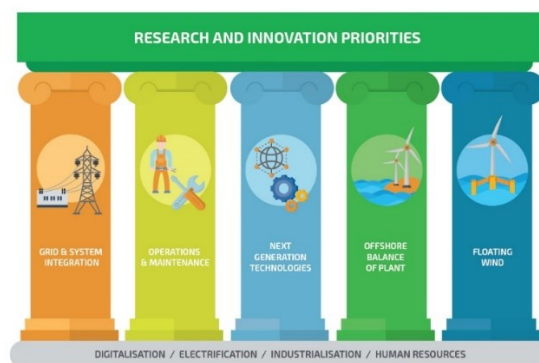


Figure 1: The five pillars of wind energy Research & Innovation.

#### 3.2 Presentation of ETIPWind Factsheet “Electricity grids for a climate-neutral Europe”

**Daniel Fraile**, Director for Market Intelligence at WindEurope, set the scene for the discussion by recapping the main findings of the “[Getting fit for 55 and set for 2050: Electrifying Europe with wind energy](#)” report published by ETIPWind and WindEurope earlier in the year.

The report highlighted that deep decarbonisation of the EU economy will cost no more as a share of GDP than our energy system costs today. And it showed that three quarters of the EU final energy demand will be electrified by 2050 up from 25% today. This would require a doubling in the electricity system to 6,800 TWh and a doubling in grid investment from the current €40bn a year by 2025 at the latest.

In this context, Mr Fraile presented the ETIPWind Factsheet “[Electricity grids for a climate-neutral Europe](#)” which spells out the technology and policy areas Europe needs to work on to deliver the grid system necessary for a decarbonised energy system by 2050. There are four pillars:

- Grid development:** Europe needs to build more interconnections between and within countries, while integrating new technologies such as superconductors and underground high voltage cables, and reinforcing the distribution grids. Offshore infrastructure including energy islands and offshore hybrid projects deserve special attention as Europe builds a dedicated offshore grid from scratch to accommodate the 300 GW offshore wind target by 2050 set out in the EU Offshore Renewable Energy Strategy;

- **Grid efficiency:** Europe needs to accelerate the uptake of technologies that can allow it to both expand the existing grid and optimise its operation (e.g. synchronous condensers). This will also help increase the resilience of Europe's electricity network when facing extreme weather conditions or cybersecurity challenges;
- **System flexibility:** Europe needs to assess and accommodate the flexibility needs required by an energy system predominantly powered on variable renewable energy sources like wind energy in 2050. This includes incentivising the use of storage technologies and electric vehicles to grid services; and
- **Renewables-based electrification:** Europe also needs to look into managing more closely the use of renewables-based power across multiple, different, and increasingly interconnected sectors, countries and timescales.

### 3.3 Panel discussion and Q&A

The panel discussion kicked off with a question to panellists on how Europe can adapt its Ten-Year Network Development Plan (TYNDP) to the higher Climate & Energy targets set by the EU "Fit for 55" package.

**Jean-Baptiste Paquel**, System Planning Manager at ENTSO-E, underlined that EU and national grid planning tools are already evolving alongside the new European regulatory framework and targets. For instance the revised Trans-European Networks for Energy Regulation (TEN-E Regulation) governing cross-border energy infrastructure already weaved in a new element on offshore grid planning and looks into new power generation and transmission models like offshore hybrid power plants and energy islands. **Mr Paquel** highlighted that different EU and national entities will have to increase cooperation as sectors are becoming more and more interlinked in their decarbonisation pathways (e.g., electricity, heating & cooling, transport). ENTSO-E for instance is now working more closely with ENTSO-G and Europe's DSOs. He also insisted that the next TYNDP will have to show not only where Europe puts its wires, but also what innovative technologies that help strengthen the coupling of sectors and interoperability of the EU power system will be deployed.

**Rena Kuwahata**, Business Development Manager, Ampacimon, and Vice Chair at CurreENT picked up on this last point underlying that the TYNDP currently still misses out to factor in technologies that are already at high technological readiness level, proved and tested, and endorsed by a number of stakeholders. This includes for example superconductors and power flow control devices. She stressed these technologies are key to deliver the transition to a climate neutral economy at the lowest cost possible for society.

The discussion then went into the challenges of building up a European offshore grid. **Kristian Holm**, Technical Director Renewable Solutions, Equinor underlined that managing and operating the current system is straightforward compared to the future one we need to design. In addition, the sheer scale of the offshore infrastructure we need to build (wind farms and grids) increases the risk profile for wind energy developers. It is therefore critical, Kristian stressed, that all stakeholders involved in the build-out and operations of this future offshore grid are aligned on how it is going to be managed and on who is responsible for which activity.

**Vera Silva**, CTO, GE Grid Solutions, and Vice President T&D Europe added on this point that the huge EU ambition of installing and connecting 300 GW of offshore wind by 2050 means the industry and policymakers need to move the needle on HVDC technologies. An especially on Multi-Vendor, Multi Terminal HVDC equipment. This is uncharted territory for all stakeholders and managing the first prototypes well is of critical importance. EU support for large-scale demonstrations will be extremely useful to de-risk these projects. She underlined, similar to Kristian, that all stakeholders need to align on the functional specifications of such projects in order to avoid unnecessary delays linked to standardisation.

Participants then discussed how the grid would underpin the functioning of a climate-neutral energy system. **Mr Holm** underlined that we have the technologies available today to power 75% of our energy system with electricity in 2050. But Europe needs to adapt the regulatory framework to create a solid business case for them.

**Mrs Silva** continued on this point to stress that a sound regulatory framework that incentivises investments in the technologies and projects for climate neutrality starts with a clear distribution of roles and responsibilities between stakeholders involved in a 2050 meshed grid. This includes grid operation and remuneration mechanisms. For example, the regulatory uncertainty on the application of the 70% rule in Article 16 of the EU Electricity Regulation is what is holding back the business case for offshore hybrid plants today.

**Ms Kuwahata** then commented on the need to put digitalisation at the heart of our electricity grids. This will help operate EU networks at maximum efficiency without compromising safety and reliability. There is still a lot of room for grid efficiency improvements. For example by accelerating the uptake of optical sensors on wires, combining them with weather forecasts, and processing all data by Artificial Intelligence algorithms. Applying all these digitalisation technologies could cut down the congestion management costs stemming from redispatch and curtailment by 90%. **Mr Paquel** agreed digitalisation is a key enabler and said Europe needs more studies to show its potential in improving grid operation.

Participants then discussed the flexibility needs in a future renewables-based energy system. **Mr Holm** highlighted that developers have a lot of opportunities to add flexibility technologies to their wind farms. But that the required market mechanisms and incentives are not always available. This is the low-hanging fruit policymakers should address as a first priority. **Mrs Silva** added that Europe has not tapped into the full potential of flexibility options from two areas: first from using resources connected to the distribution grid via digitalisation, second from applying better operating principles of grid technology itself. **MS Kuwahata** also highlighted that there are more and more studies quantifying the benefits that increased system flexibility brings for the operation of European power grids.

The last part of the panel focused on the role of hydrogen in a climate neutral power system. **Mr Paquel** said that hydrogen makes good sense for the hard-to-abate sectors, but that all stakeholders need to look carefully at the future demand. Demand will drive the business case of hydrogen and will ultimately determine whether there is a need for building dedicated hydrogen infrastructure in the long run.

**Mr Timbus**, Chair of the ETIPWind Executive Committee then closed the webinar. He stressed in his concluding remarks that the stakeholders present are all aligned as to how our power system needs to change. He also noted a common underlying sense of urgency shared by the panel for increasing collaboration among stakeholders and implementing new technologies for a power grid able to uphold climate neutrality in 2050.

#### 4 Statistics

- 341 people registered to the webinar
- 164 people attended the webinar (48%):
  - 65% of the attendees identified as “Industry”;
  - 17% of the attendees identified as “Academia”.
  - 15% of attendees identified as “Organisations”.