



2nd Regional Power Exchange: “Green Agenda: Decarbonization of the Electricity Sector in the Western Balkans” *Keynote Address*

30 October 2024, Bečići, Budva, Montenegro

Charles Esser, Secretary General, E.DSO

E.DSO Members



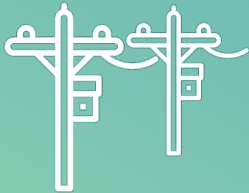
E.DSO is the only **100% DSO**, **100% electricity** industry association at EU level



36 Distribution System Operators, including 2 Associations



Over 200 million customers



Over 7 million kilometres of distribution lines

E.DSO Members in Europe



- | | | | | | |
|--|--|--|--|--|--|
| | Austria
Energienetze Steiermark
Netz Niederösterreich | | France
Enedis | | Poland
Enea Operator
Energa Operator
PGE Dystrybucja
PGE Energetyka
Kolejowa |
| | Belgium
Fluvius
ORES
Sibelga (2025) | | Greece
HEDNO | | Portugal
E-Redes |
| | Bulgaria
Electrodistribution Grid West | | Ireland
ESB Networks | | Spain
EDP REDES España
i-DE
UFD |
| | Cyprus
Electricity Authority of Cyprus | | Italy
Areti
Enel Grids
Unareti | | Latvia
Sadales tīkls |
| | Czech Republic
ČEZ Distribuce
PREdistribuce | | Lithuania
ESO | | Ukraine
DTEK GRIDS
DSO(E)
UDG |
| | Germany
E.ON
EWE Netz
Netze BW | | Netherlands
Alliander
Enexis
Netbeheer Nederland
STEDIN | | United Kingdom
NIE Networks |
| | Finland
Caruna | | | | |

WHAT WE DO



ADVOCACY

Working as a **sector** to shape an optimum **regulatory environment** for the distribution networks in Europe.

EXPERTISE

Position E.DSO as the **centre of expertise** and **"go-to-point"** for **data and insights** on the distribution networks in Europe.

COMMUNICATION

Leveraging our Association as **the trusted voice of DSOs** to educate stakeholders on the evolution of sector and effectively **communicate our policy asks.**

PARTNERSHIPS

Supporting our **advocacy efforts** by building constructive dialogue and strategic alliances **with other sectors and interest groups.**

Our Vision & Strategy



- ✓ **Advocate for smartest, trusted, grids of the future**
- ✓ Be a respected leader and representative of leading DSOs, to lead the way to a clean energy future.
- ✓ Remain the trusted source for intelligence and advice regarding the electricity DSOs, particularly for EU and national policymakers and industry stakeholders.
- ✓ Embrace opportunities, including investments that expand and enhance the DSOs' capabilities and offerings.
- ✓ Uphold a strong commitment to service excellence, engaging actively with current members and working diligently to attract new ones.
- ✓ Place high value on human capital.

Our strategy is built out of our purpose and values. Our reinvigorated role is to lead the climate change and decarbonisation agenda, which includes themes such as **energy efficiency, electrification, renewables, flexibility**. Our long-term, strategic relationships with EU officials, regulators and stakeholders have (and will) positioned E.DSO as the trusted go-to resource for electricity-related decision-making in Europe.

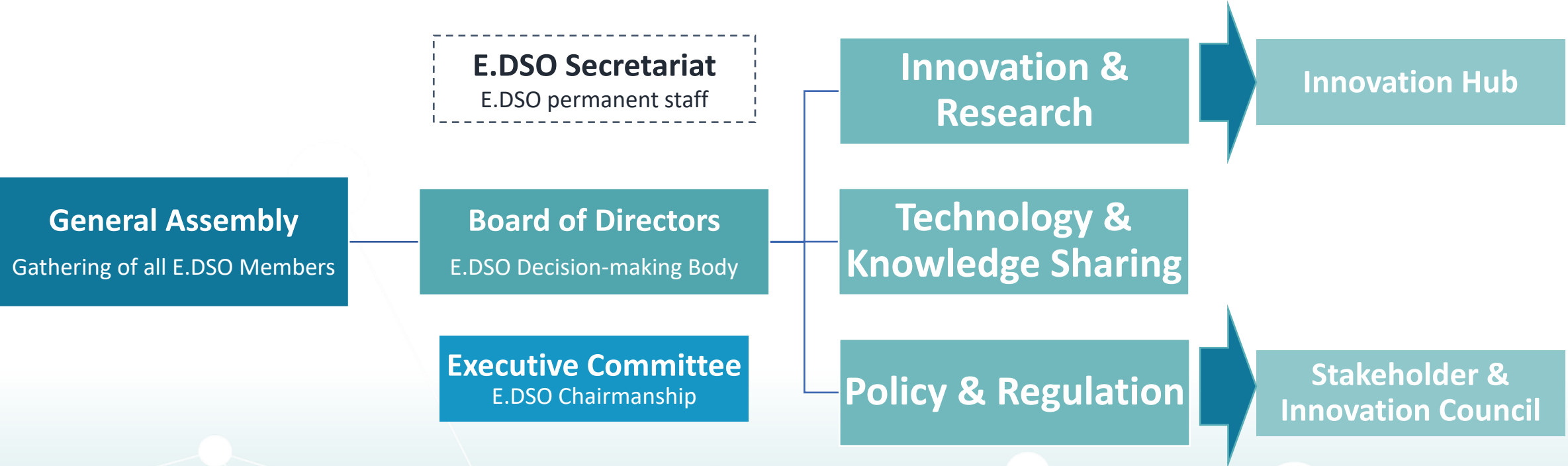
Our Benefits



E.DSO provides value-added insights and services to advance the strategic interests of the leading Distribution System Operators (DSOs).

- ✓ Maintain a direct influence on relevant European policy debates related to energy files and distribution grids.
- ✓ Discuss the latest policy proposals, reports, and documents from the European Institutions and other relevant stakeholders.
- ✓ Contribute to public consultations by the European Commission and other stakeholders.
- ✓ Be part of a unique network and knowledge-sharing platform on technical and regulatory questions relevant for DSOs and energy experts.
- ✓ Join consortia of EU-funded projects and share in knowledge from cutting-edge projects.
- ✓ Be part of our Assembly and Board meetings and of our policy, technology and/or projects Committees and respective Task Forces.
- ✓ Be involved in European events on grids, cybersecurity and innovation.
- ✓ Get international exposure through events and media.
- ✓ Have the opportunity to interact with related business associations.
- ✓ Receive a monthly newsletter with updates on E.DSO activities.

E.DSO Structure



E.DSO Committees

- E.DSO's Committees are the normal channel and **thematic relays** with E.DSO Members.
- Each Committee meets **every 3 month**, either on 1 day in Brussels (P&R Committee) or hosted by an E.DSO Member company on 2 days with field visit (Technology and Projects Committees).
- Each E.DSO Member can freely appoint 1 or more experts in each Committee.



P&R Committee

- Green Deal Expert Network (GDEN)
- E-Mobility WG
- Customers Empowerment WG
- DSO Skills Gap WG
- Climate risks and adaptation WG



Technology

- Task Forces:
 - **Active network management**
 - **Electric Vehicle**
 - **Data management**
 - **Cybersecurity**
 - **Network Codes**
 - **Technology radar**
 - **Smart metering**
- Technical cooperation (ESA, ENCS, CEN/CENELEC)



Projects

- Knowledge sharing from **projects' experience**
- E.DSO **direct participation** in H2020 projects (5 ongoing)
- Contribution to EU **Research & Innovation** in Smart Grids
- Support to E.DSO **Members' projects** and project proposals

E.DSO key achievements: Policy



- **Advocacy:** We aim to enhance the understanding of the distribution grids, explain the critical role the industry plays in the energy transitions to a low-carbon energy future, and to provide an essential conduit for advocacy and debate between our industry and policymakers.
- **Consultancy:** E.DSO acts as a catalyst and an enabler to help the DSOs drive ongoing and future low carbon projects and supports:
- **Common approach:** Providing a forum for leading DSO business to exchange views and establish a single approach to shared challenges
- **Strength & expertise:** E.DSO is leveraging its key strengths and experience to help tackle climate change through decarbonisation & electrification.



Main achievements

- **Creation through savvy expertise of the EU DSO Entity** by the Clean Energy Package
- **Defending DSOs' interests in the Clean Energy Package, the Green Deal, Fit for 55 Package and RepowerEU Plan**, particularly on flexibility, energy efficiency, renewables integration, electric vehicles, data management, TSO/DSO cooperation.
- **Successfully contributing amendments of pieces of legislation of FF55 Package:** Renewable Energy Directive (RED), Energy Efficiency Directive (EED), Alternative Fuels Infrastructure Regulation (AFIR), Energy Performance of Buildings Directive (EPBD).
- Publication of Position Papers on **Customer Empowerment, Grid Edge and Data Protection, Wholesale Electricity Market Design, Digital Transformation for DSOs.**
- Publication of E.DSO and Deloitte study **“Connecting the Dots” on investment needs in the DSO grids**
- Creation of **new E.DSO Manifesto “It Is Time to Get to YES”**

E.DSO key achievements: Projects



Objectives

- **Knowledge-sharing from projects' experience**
- **E.DSO direct participation in EU funded projects (7 ongoing and 14 completed)**
- **Contribution to EU Research & Innovation in Smart Grids**
- **Support to E.DSO Members' projects and project proposals**



Main achievements

- 7 ongoing projects (5 Horizon Europe, 1 Digital Europe, 1 Interreg North Sea).
- High success rate in EU funded project proposals; successfully engaging E.DSO members in project consortia
- Successful campaign on smart grid Projects of Common Interest (PCIs) and endorsement by EU Parliament and Council of E.DSO's position on review of TEN-E Regulation
- Elaboration of internal Projects Insight Papers on storage; flexibility; micro-grids; active network management; e-mobility
- Multiple project site visits since December 2016, re-established with the end of Covid pandemic restrictions in 2022

E.DSO key achievements: Technology



Objectives

- Be the **reference point for discussion on technological topics** that impact smart distribution grid development.
- Fostering **knowledge exchange** among DSOs on strategic topics.
- Work closely with the Policy and Projects Committees to steer the debate on **technological trends and innovation**.
- Promote **cooperation** with key players in the industry.

Main achievements



- Four active **Task Forces** of experts from the member DSOs:
 - TF2 – E-mobility**, investigating DSO-based solutions for smart charging and Vehicle-to-Grid (V2G), innovative charging technologies and future e-mobility trends.
 - TF3 – Data management**, promoting knowledge exchange on data governance practices, data security and culture and analyses the impact of EU data laws on the distribution system.
 - TF4 – Network Code on Cybersecurity**, investigating the transversal role of cybersecurity on strategic DSO activities in line with the developments in the EU legislative panorama.
 - TF6 – Technology Radar**, focusing on the early identification of innovative technologies and disruptive trends, increasing awareness of the associated risks and opportunities, and stimulating the uptake of innovative solutions.
 - TF7 – Smart Metering**, new for 2024, it supports E.DSO members in designing their approach for the evolution of smart metering and management of LV grids.
- Publication of the E.DSO [Technology Radar](#) and the [Technology Paper](#) “Experiences for Optimising RES Integration in the Distribution Grid”.
- Publication of [Success Cases](#)
- Organisation of ten Knowledge Sharing sessions on key topics (e.g. Generative AI, Demand Response, Data Spaces).

Target



European
Commission

REPowerEU: Joint European action for more affordable, secure and sustainable energy



23%

share of renewables in
EU energy consumption
2022

32%

2030 target set in 2018

**at least
42.5%**

new binding target for
2030, but aiming for
45%

E.DSO survey on DER connection

Main **bottlenecks** faced by DSOs in connecting DERs:

- **Poor qualification** of technical project designers and errors in projects.
- **Limited number of contractors** for grid reinforcement work.
- Pre-occupied **grid capacity**.
- **Permitting**.
- Delivery times of **equipment**.

Measures in place to decrease connection lead times :

- **Attract, train and retain** more **field engineers**.
- Set up campaigns for material sourcing and **increase equipment availability**.
- Set up agreements with governments to **speed up permission processes**.
- **Digitalize** plant connection acceptance process and **automate** capacity solutions.
- Optimise grid operation and/or set up flexibility markets.
- Upgrade the grid in advance.
- Optimize connection requirements and hosting capacity calculations.

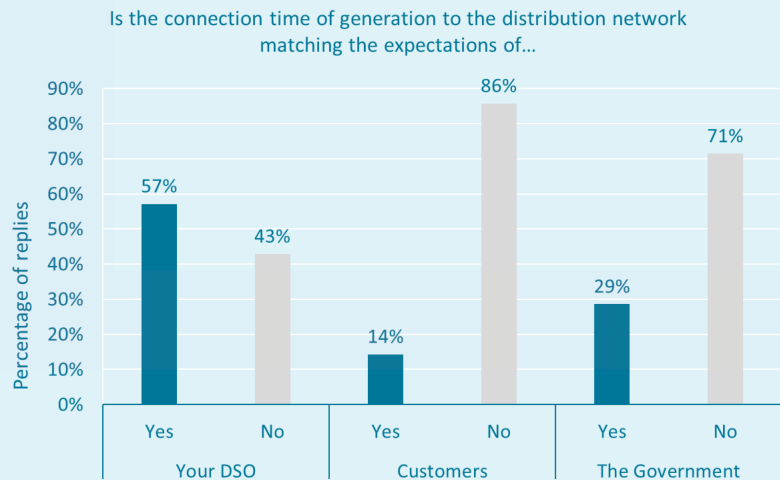
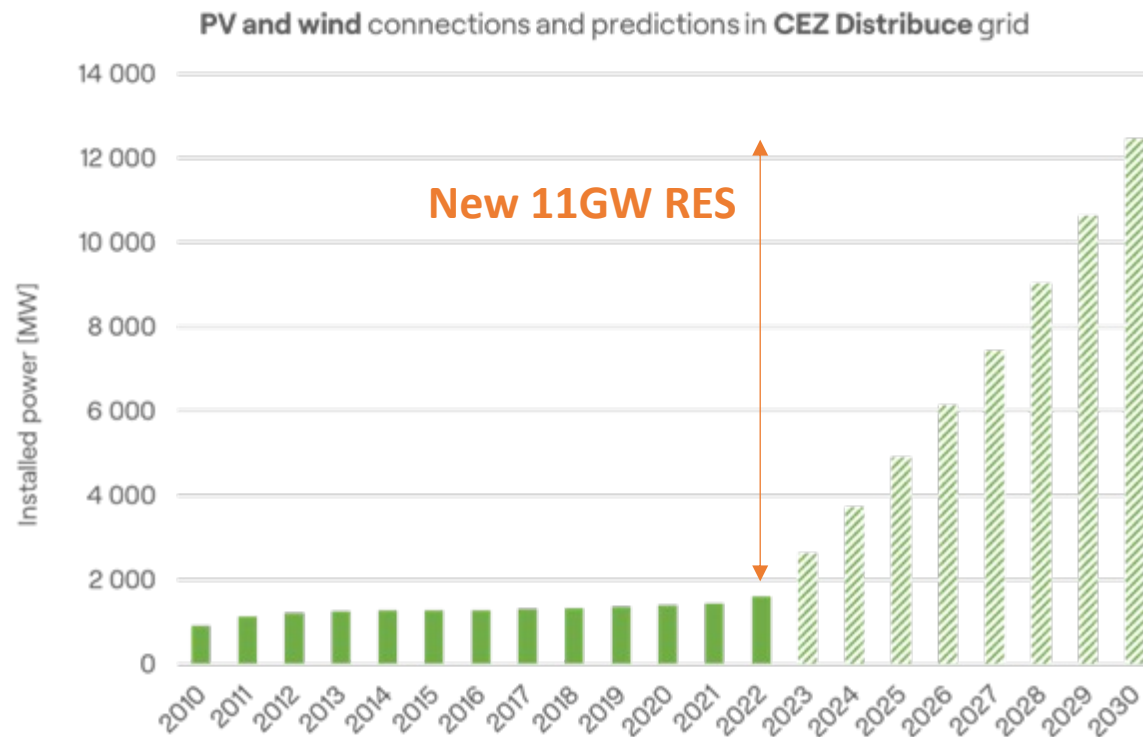


Figure 2: Connection times expectations of stakeholders.

E.DSO members' experiences from PT, CZ, NL, LT

Four practical case studies from E.DSO members' experience are presented in the paper:

- DSO/TSO coordination for non-firm DER connection in Portugal (E-Redes)
- Managing network capacity in the NL: expanding grids, optimising and co-creating solutions (Stedin)
- Addressing connection lead times and hosting capacity challenges in LT amidst prosumer growth (ESO)
- **Technical solutions for increasing hosting capacity in the Czech Republic (ČEZ Distribuce)**



Ramp-up of renewables resulting in >100,000 requests in 2023 and 11,000 MW installed by 2030 in CZ.

Number of solutions implemented to enable a hosting capacity increase of up to 90%.

Investigation of innovative solutions: flexible contracts, BESS coupling, digital twins for grid capacity calculations, web-based hosting capacity maps, ...

E.DSO recommendations

Recommendations were clustered into four categories:

Permitting and Regulation



- **Reduce permitting times** through automation and digitalization.
- Define **transparent and common rules (EU)** for **congestion management** and for handling connection queues.
- Set up **transparent network planning frameworks**.

Grid Management and Planning



- Assess the use of **non-firm connection contracts**.
- Introduce **reactive power management**.
- Improve **transparency of end-to-end grid upgrade processes** (from planning to execution).

Technical skills



- Set up technical in-person **technical training** and promote **specialized education programs**.

Advanced DER functionalities and digitalisation

- Implement **droop control** and **advanced functionalities** to support network management.
- **Digitalise DER connection processes**.
- Set up and update public **hosting capacity maps**.
- Leverage **smart network control and ADMS** for improved network observability and control.
- Implement **market-based flexibility mechanisms** and **automated grid simulations** to minimize curtailment.



Other considerations

- Grid expansion needs to take into account issues other than RES, concurrently
- This includes electric vehicles*, including V2G; heat pumps; low rate of smart meter rollout in some MS; smart homes/appliances; aggregators; electrification in general, etc.
- Interoperability and Data Spaces
- See the new E.DSO paper on EVs...



Grid-Optimised Deployment of Charging Infrastructure for Light and Heavy-Duty Vehicles

Overcoming Capacity Constraints

Brussels, September 2024





Flexibility challenge

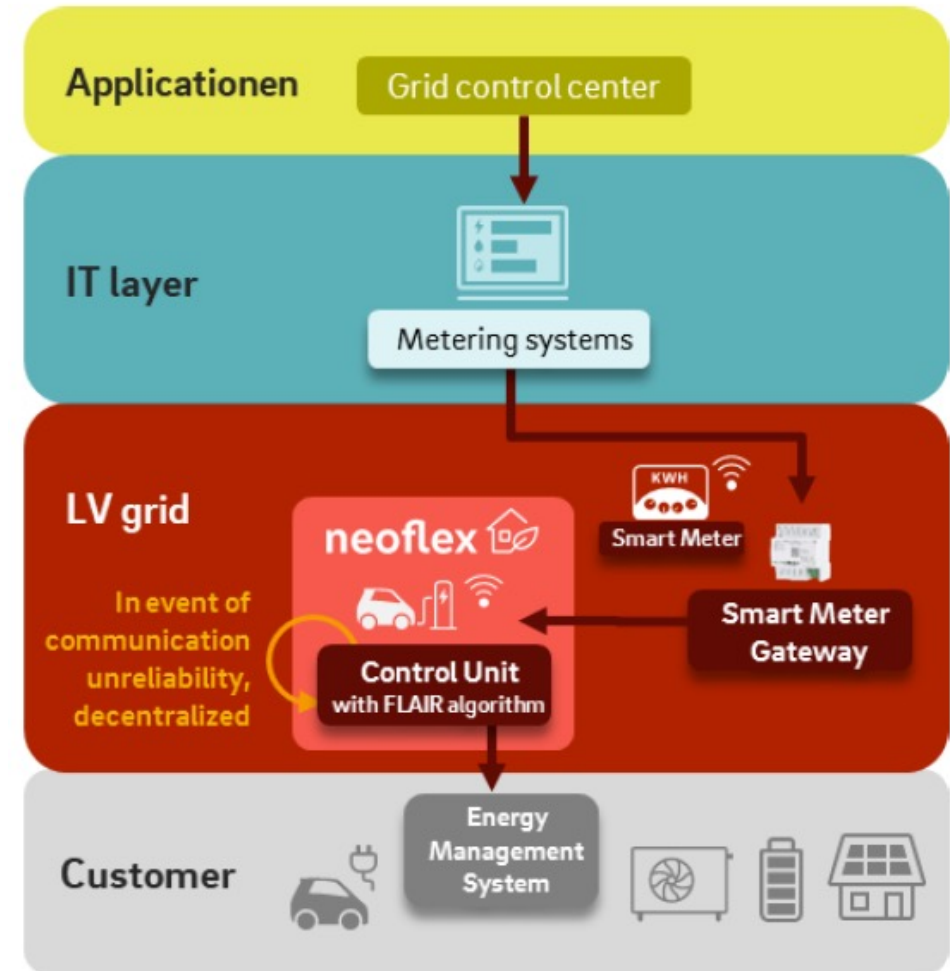
- The increasing number of decentralised energy resources and the growth of controllable loads, especially electric vehicles (EVs) and heating pumps, cause new challenges for the stable operation of energy grids. One issue concerns the difficulty in predicting the feed-in of decentralised energy resources and the consumption of partly flexible loads.
- For DSOs, flexibility management to reduce power peaks is one possible alternative to grid reinforcement that offers additional flexibility and more resilience for the low voltage (LV) grid. A centralised and grid-oriented flexibility management system is being developed by E.ON, but its successful implementation requires wide-range observability at the LV level.
- The current challenges are:
 - The required wide-range observability is not yet implemented.
 - The communication connection between the DSO and the flexible assets is still partly unreliable.

Solution example: Neoflex of *e.ON*

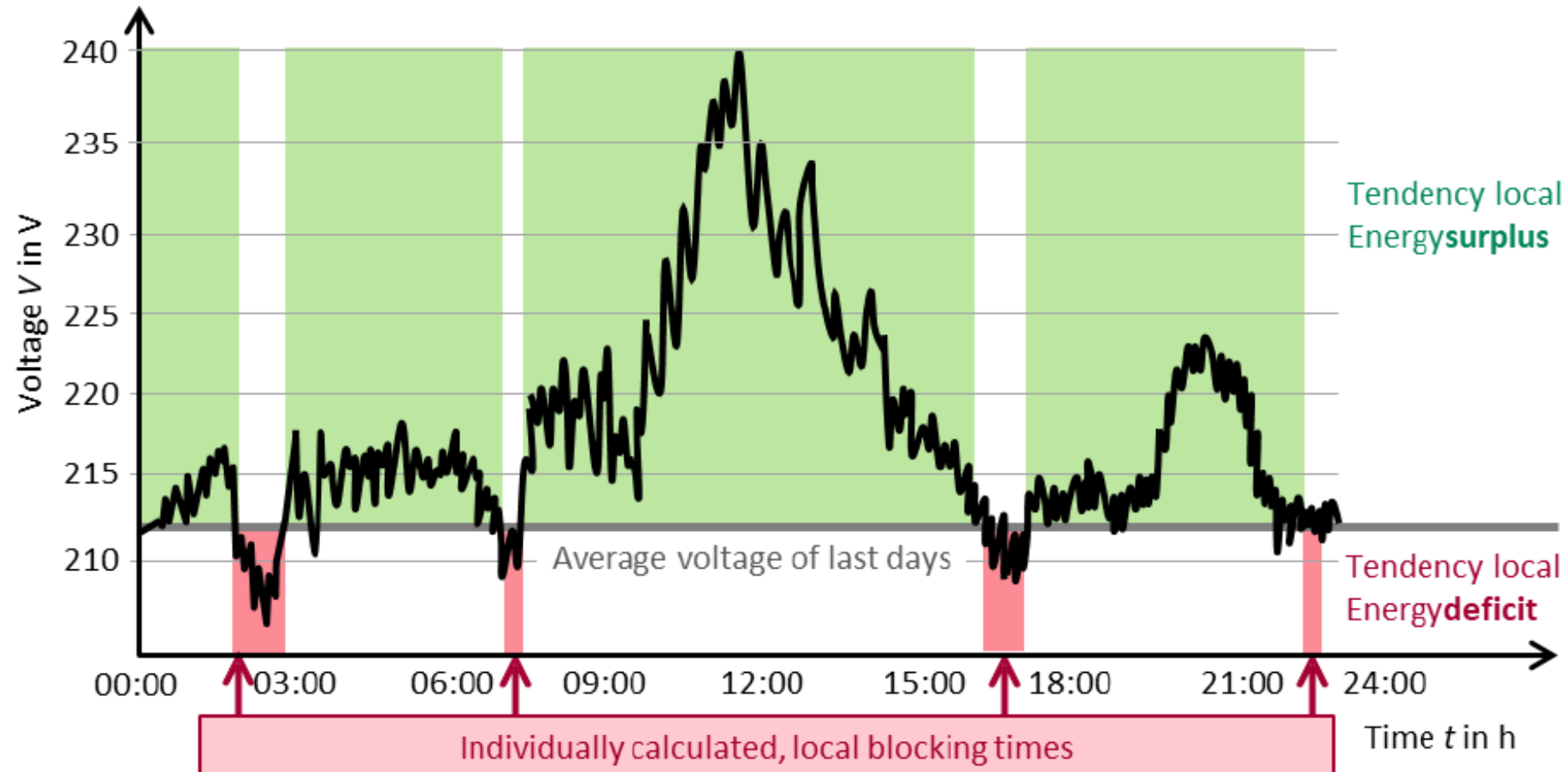
To overcome these challenges, E.ON has developed the neoflex (grid-oriented flexibilities) solution consisting of:

- A decentralised function to control flexibilities in a grid-friendly way.
- An algorithm based on real-time and historical voltage measurement data.

The neoflex algorithm is designed to run in a control unit or, in the future, in smart meter gateways. While the system's functioning is independent of communication reliability, its integration with the smart meter gateway remains possible. In Germany, this represents an additional fallback solution for centralised control of flexible loads. At the same time, neoflex could be implemented internationally as a new stand-alone solution.



The neoflex algorithm calculates the local and individual blocking times per household based on voltage measurement data.



The Grids Action Plan...

A grids action plan to address the missing links of the clean energy transition



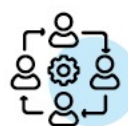
Accelerating the implementation of **Projects of Common Interest** through political steering, reinforced monitoring and more project proposals



Improving **access to finance** by increasing visibility on EU funding programmes for smart grids and modernisation of distribution grids



Improving the **long-term planning of grids** to accommodate **more renewables** and **electrified demand** in the energy system



Stimulating **faster permitting** for grids deployment by providing technical support for authorities and guidance on **better engaging stakeholders and communities**



Introducing **regulatory incentives** through anticipatory investments and offshore cross-border cost sharing



Improving **grid supply chains** by harmonising industry manufacturing requirements



Incentivising a **better usage of the grids** with enhanced transparency and improved network tariffs for more smart grids network efficiency and innovative technologies





DSO Funding

- ***Recognising*** the funding challenge:
- Additional funds for the energy transition
- Physical investment and flexibility
- Optimally incorporating non-grid-tariff funding

Additional investment for the energy transition

- 40% of Europe's distribution grids are over 40 years old and need to be modernised.
- Over EUR 400 billion of investment in distribution grids is necessary by 2030.
- Why?
 - **42.5% RES target by 2030** – 70% connected to DSO grid; 80% by 2040.
 - **130m EVs by 2035** – 85% charging at home, i.e. DSOs.
 - **10m more heat pumps by 2027** (from 17m today), i.e. primarily DSO grid.
 - At least 1 **RES energy community** in every municipality with more than 10,000 people by 2025 – DSOs as facilitators with IT-/Data infrastructure.
 - **3-4-fold increase of connection requests for solar PV for DSOs from 2021-22:** (+ 1400% Latvia; 750% Romania, 200% Poland, 160% Italy and Sweden).
 - Changing targets several % points can cause big changes in investment needs: a change in target from a 49% to a 55% reduction in CO₂ doubled investment needs for a Dutch DSO
 - Investments in a skilled workforce to enable this transition



Physical investment and flexibility

- Not an “either-or” but both
- Estimates by one study of European consumer savings of as much as EUR 71 billion a year with fully optimized and implemented flexibility
- But, flexibility will not be done without investments in digitalization, marketplaces, skills, interoperability, etc. This may be opex rather than capex

Non-grid-tariff funding

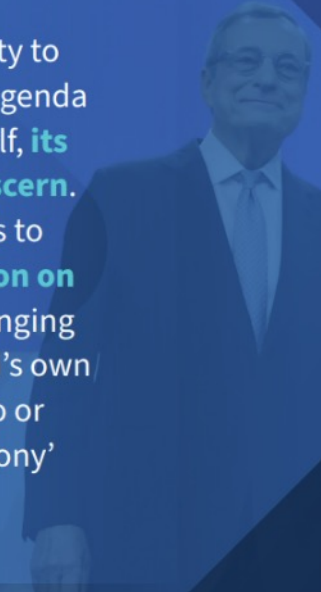
- Given the very large need for DSO (and TSO) funding for the energy transition, political, distributional and generational issues with funding it entirely out of grid tariffs
- European funding programmes have focused mostly on TSOs, given their cross-border connections
- Such funding has a somewhat different distributional profile, can reflect different priorities and be different from a political standpoint
- DSOs ask that if European funding is available, *which regulatory regime they are subject to should not affect their ability to take advantage of such funding.*

The Draghi Report

The Draghi Report in numbers

- **400 pages**
- **3 focus areas:** closing the innovation gap; increasing security; reducing dependencies
- **10 sectors** analysed in-depth
- **150+ proposals** with indicative timelines
- **750-800 billion euros** of additional investment per year required

The performance of Draghi's report will play out over different timeframes. The immediate impact of the report is high as it may influence the structure of the next European Commission and the future Commissioners' roles and responsibilities.



However, in terms of its ability to shape the competitiveness agenda beyond the Commission itself, **its impact will take time to discern.** The report deliberately seeks to **raise the stakes for EU action on competitiveness** in a challenging international context. Draghi's own comments that it was not 'do or die' but 'do or suffer slow agony' illustrate this."

It is like a 'Marshall Plan on steroids' – it is rather a 'take it or leave it' proposal.

Considerations from the report for system operators

Accelerating the transition away from fossils to lower energy prices for businesses and reduce exposure to shocks.

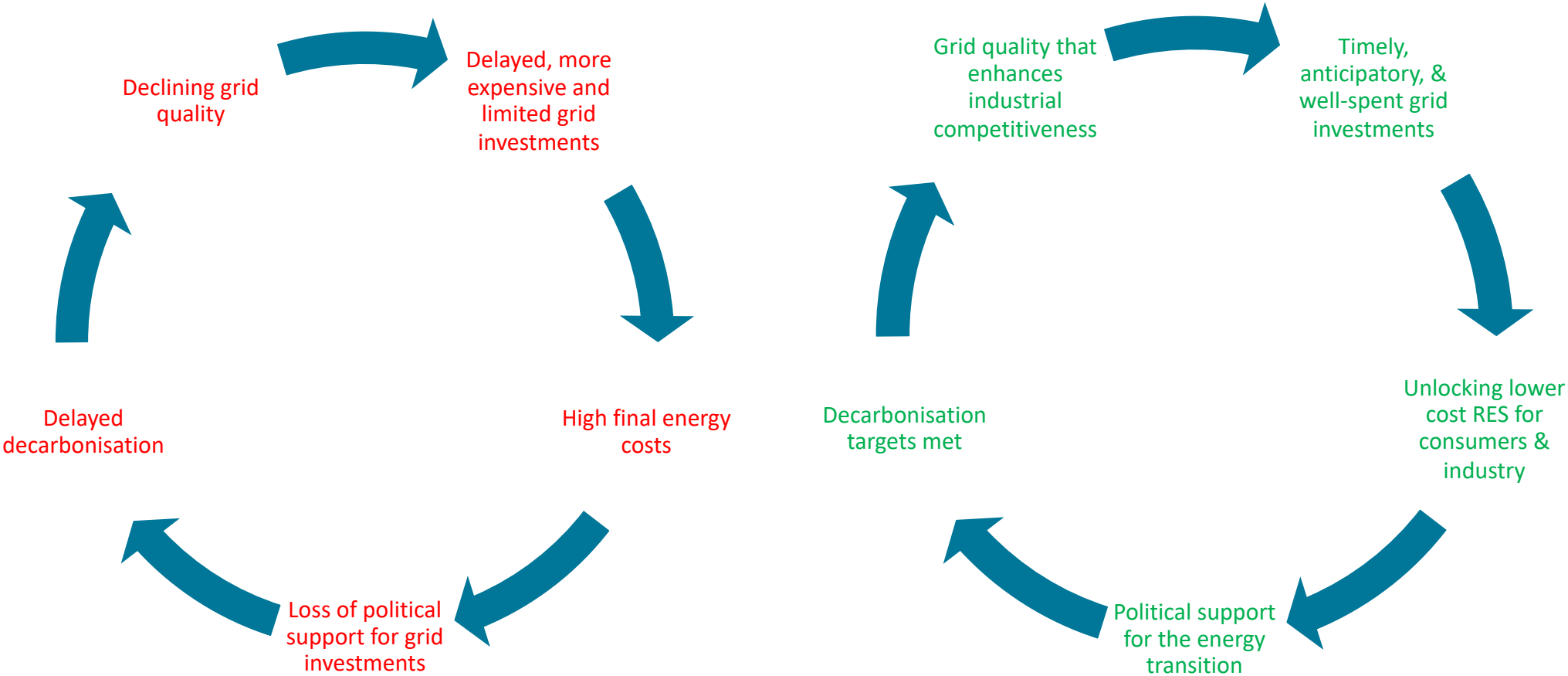
Grids are highlighted as a key component for a green transition with a focus needed on improving the permitting and financing of projects to facilitate the required buildout.

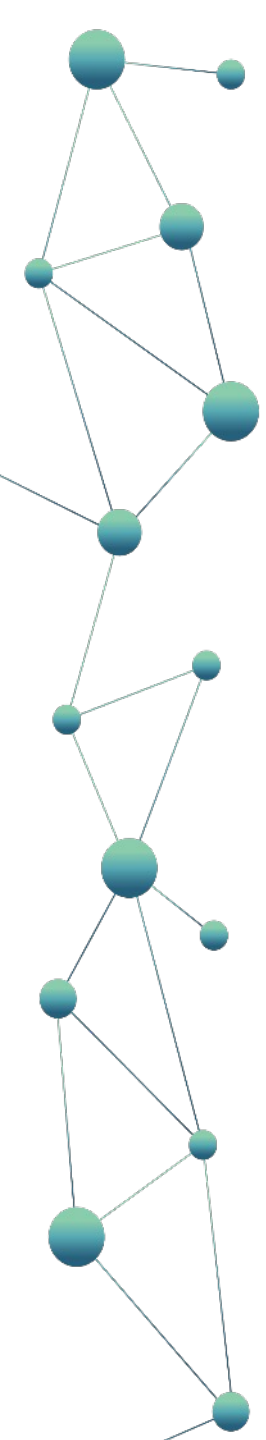
"Grids need to adapt to a more (...) decentralised, digitalised and flexible electricity system"

The need for improvement in the permitting processes for grids: As it stands "permitting represents a significant bottleneck for the development of the required infrastructures."

The need to properly finance grids: "Grids, flexibility and storage solutions must advance in parallel to enable decarbonisation. For every euro spent on clean power in Europe during the 2022-2040 period, EUR 0.9 of grid investment will be required to achieve the EU's climate ambition."

Bottom line: achieving a virtuous cycle





Thank you!