



WHEN TRUST MATTERS

Boosting flexibility in distribution grids

Webinar Agora Energiewende

Agora Energiewende

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Introduction DNV Energy Markets and Strategy



Hans de Heer

Principal Consultant

- Business Development Manager in Markets and Regulations.
- **Expertise:** Various areas including demand side management, electric mobility, smart meter infrastructure, wholesale processes, energy portfolio management, and ancillary services.
- **Background:** Pivotal roles in industry initiatives such as leading the design team of the USEF foundation and contributing to the European Commission's Smart Grid Task Force and ACER's expert group on demand-side flexibility.



Rogier Roobeek

Senior Consultant

- Project Manager and subject matter expert on hydrogen, demand side flexibility and system integration.
- **Expertise:** Market analyses, corporate strategy, scenario development, and techno-economic feasibility studies. Engineering background with a deep understanding of business, including finance, strategy, and innovation management.
- **Background:** TU Delft, MSc Industrial Ecology and MSc Sustainable Energy Technologies.



Elisa Anderson Vázquez

Consultant

- Team member and subject matter expert on demand side flexibility and regulations.
- **Expertise:** Specializing in European energy markets, systems projects, and optimization of network capacity and electricity market design.
- **Background:** Work at E.DSO, DG ENER, expertise in DSO-TSO coordination, regulatory drafting, policy assessment, and renewable energy engineering, with an MSc in Sustainable Energy Technology Engineering from Imperial College London, UK.

DNV is an advisory and risk management company with one focus on energy systems.

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15,000
employees

100,000
customers

100+
countries

5% R&D
of annual revenue

**Ship and offshore
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**Energy advisory,
certification,
verification and
monitoring**



**Software and
digital solutions**



**Management system
certification,
supply chain and
product assurance**



DNV supports customers creating value from flexibility



Market design & regulatory support

Structuring



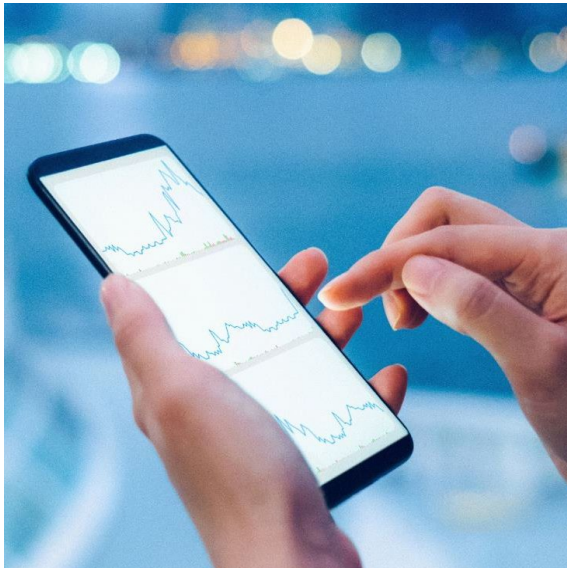
Flexibility decision mechanisms

Guiding



Implementation of flexibility options

Dealing



Product design and verification

Performing

Context – Situation of capacity network scarcity



Severity of the issue:

6/7 DSOs interviewed have parts of their HV and MV grid with insufficient grid capacity. 4/7 in LV.

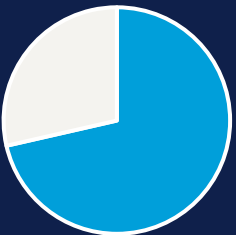
There is an insufficient grid capacity issue if there is a gap between the grid available capacity and grid utilization needs (primarily driven by the connection of RES and electrified loads) that continues to widen.



Extent of the issue:

6/7 DSOs interviewed report facing both feed-in and offtake grid limitations.

- **Offtake** with new businesses and electrified loads being **unable to connect to the grid.**
- **Feed-in limiting the integration of renewable energy sources**, as there is limited grid capacity to absorb the sustainable generation.



Urgency of the issue:

5/7 DSOs interviewed experience insufficient grid capacity today at MV or LV

DSOs that are not experiencing limitations at MV or LV at the moment, expect these in **2024-2027**



Challenge – Four key drivers of grid scarcity

Grid reinforcements alone are insufficient

Massive grid reinforcements are needed, but this mechanism alone cannot solve grid scarcity. The main causes for this were ranked by DSOs:

1. Permitting /Timing

The process requires many interactions and takes too long. E.g., a DSO in Germany as of October 2023, has had none of their permitting requests approved since 2017.

2. Financing

In some Member States there is not enough financing to invest in the reinforcements needed.

3. Lack of manpower

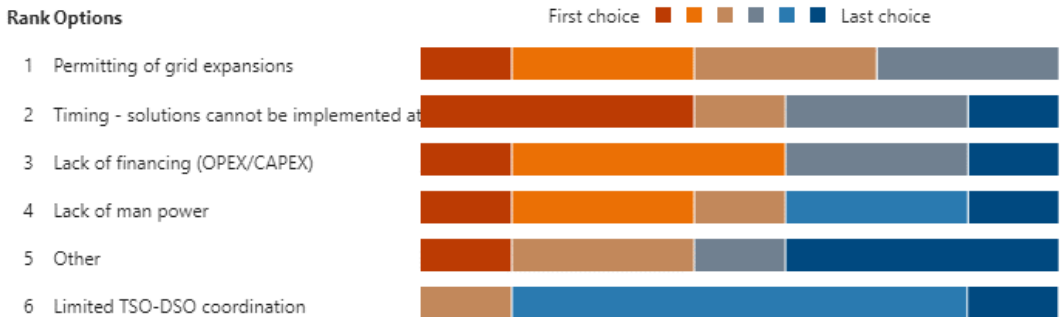
There is not sufficient skilled workforce to implement the grid reinforcements necessary.

4. Limited TSO-DSO coordination

Not considered one of the main causes. There is satisfactory coordination within SOs, some DSOs looking to expand it during real time operation.

Permitting of grid expansions is listed as the top cause

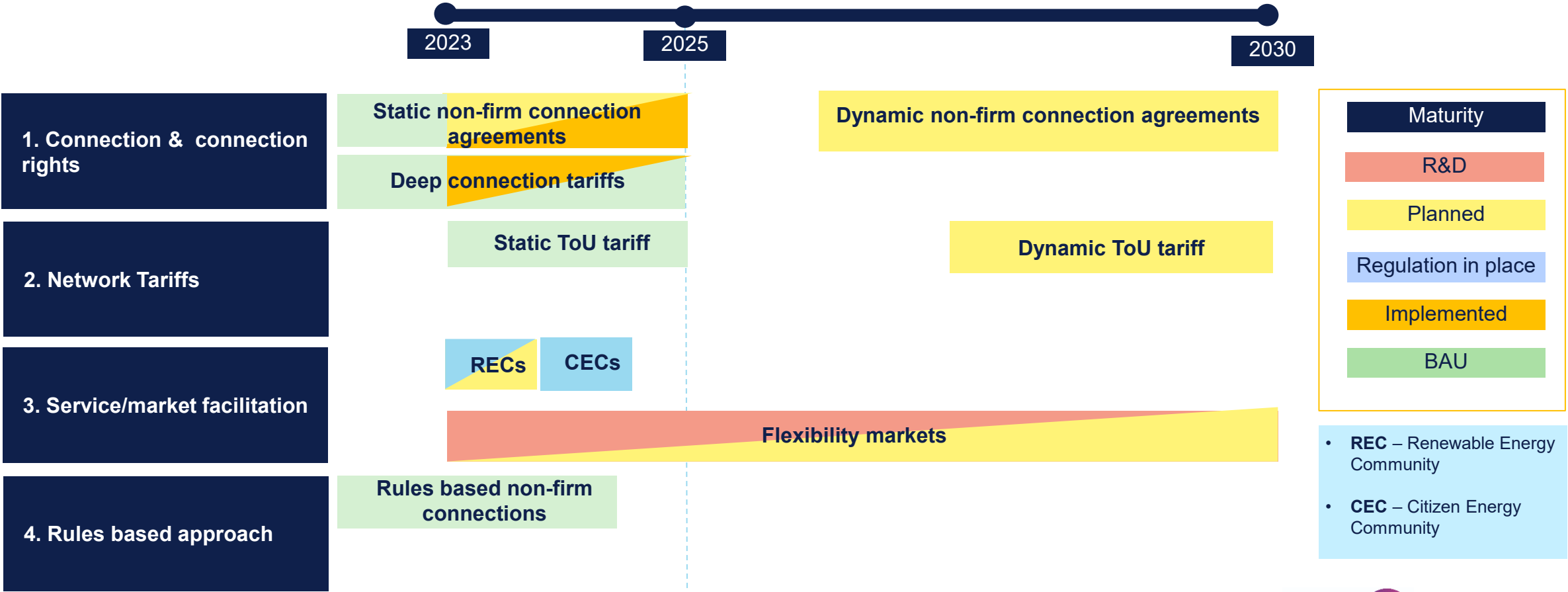
Rank Options



- + **Other – Regulatory incentives and readiness:** Several DSOs pointed at a lack of regulatory incentives to encourage investment in networks as the main cause for network scarcity. As a regulated business, the regulated level of investment and return depends on regulation.
- + **Other – Supply chain:** High demand, especially for transformers, that e.g., in Norway might take two years to supply, this timing having to be anticipated or lack of equipment availability.
- + **Other – R&D and digitalisation:** with not enough investment in smart grid solutions and digitalisation.

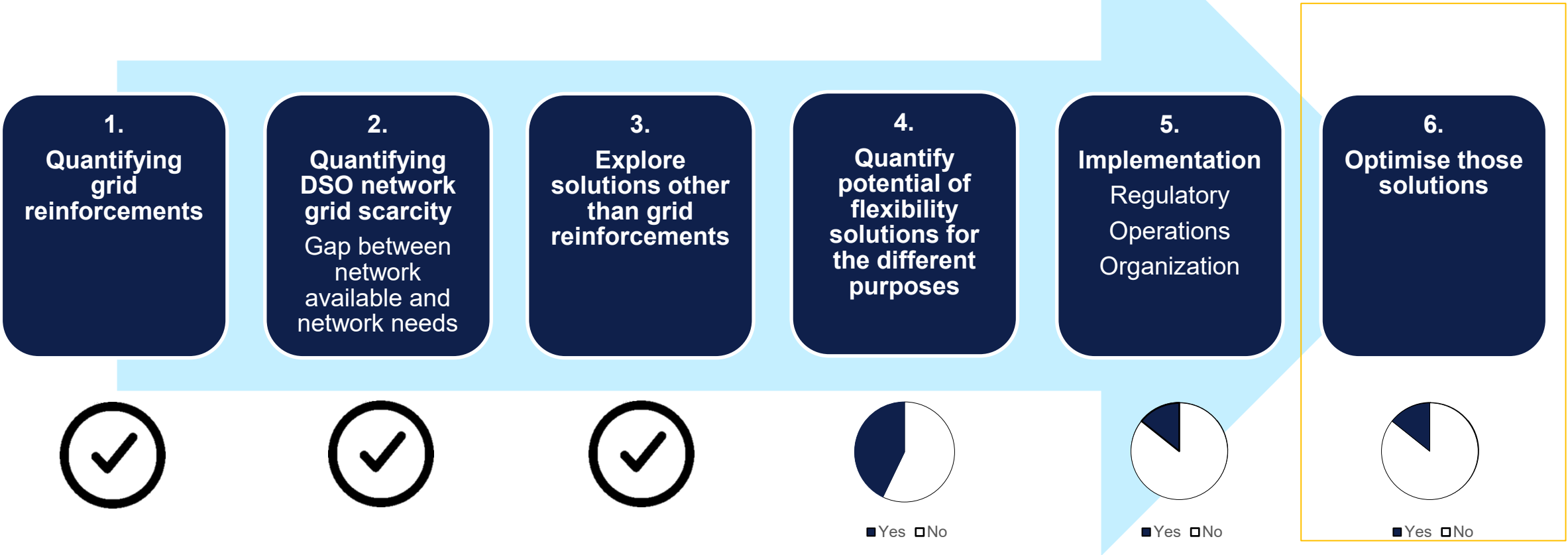
Solutions – Deployment timeline

DNV discussed with the DSOs the flexibility solutions being assessed and their level of maturity. The four demand side flexibility categories **were ranked by interviewed DSOs in their ability to make the system more flexible**. This integrated overview of solutions, their implementation timeline and their maturity is depicted below and is based on the consolidated response from interviewees (DSOs).



Solutions – DSO maturity steps

Some DSOs quantify their flexibility potential. Only one DSO has implemented and optimised flexibility solutions: Enedis



Findings and key messages – Ecosystem

Flexibility solutions are at the centre of a complex ecosystem, where every party seems to be waiting for the other to take the lead.

Four key parties are identified in this ecosystem:

1. **Market parties** experience uncertainty as a barrier to participate in DSF;
2. The **DSOs** seem to await guidance and incentives to further develop DSF solutions;
3. Also suffering from non-participating **customers**.
4. Meanwhile, **NRA** expect the DSF initiatives to come from DSOs, developing the regulatory framework as demanded, being potentially overdue.



Findings and key messages – DNV recommends

NRAs

Incentivise DSOs to significantly accelerate the implementation and deployment of flexibility solutions

Encourage and fairly compensate DSOs

Develop the regulatory frameworks, not only to assess DSOs on reliability and affordability, but also on sustainability, allowing an appropriate return

Ensure the speedy transposition of the European regulations such as the EU Electricity Market Regulation and Directive

Stimulate customers to unlock their flexibility

DSOs

Quantify the capacity scarcity

Quantify the potential of each flexibility solution for the different purposes for which it can be implemented

Formulate a strategy to implement the relevant solutions within a certain timeline. This will enable optimal and strategic long-term planning, operation and investment.

Build a catalogue of solutions that are effective and share these best practices

Conduct a self-assessment to better understand to what degree their organizations are ready/prepared for the energy transition

Thank you.

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