

7th Annual EPRI-IEA Challenges in Energy Decarbonisation Expert Workshop

*Big or Small: Decentralised Resources in a
Decarbonised World*

October 27-29, 2020

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<https://www.epri.com/pages/sa/washington-seminar>

<https://www.iea.org/past-events>

Meeting Logistics

Audio Options:

1. Connect via computer audio
2. Have Webex call your phone

You are Muted on Entry

RED button means muted in Webex
*6 to unmute/mute on phone

Chat window

Please introduce yourself, ask questions, and offer comments and advice. Choose "Everyone" at bottom or "Wil Smith" to remain anonymous

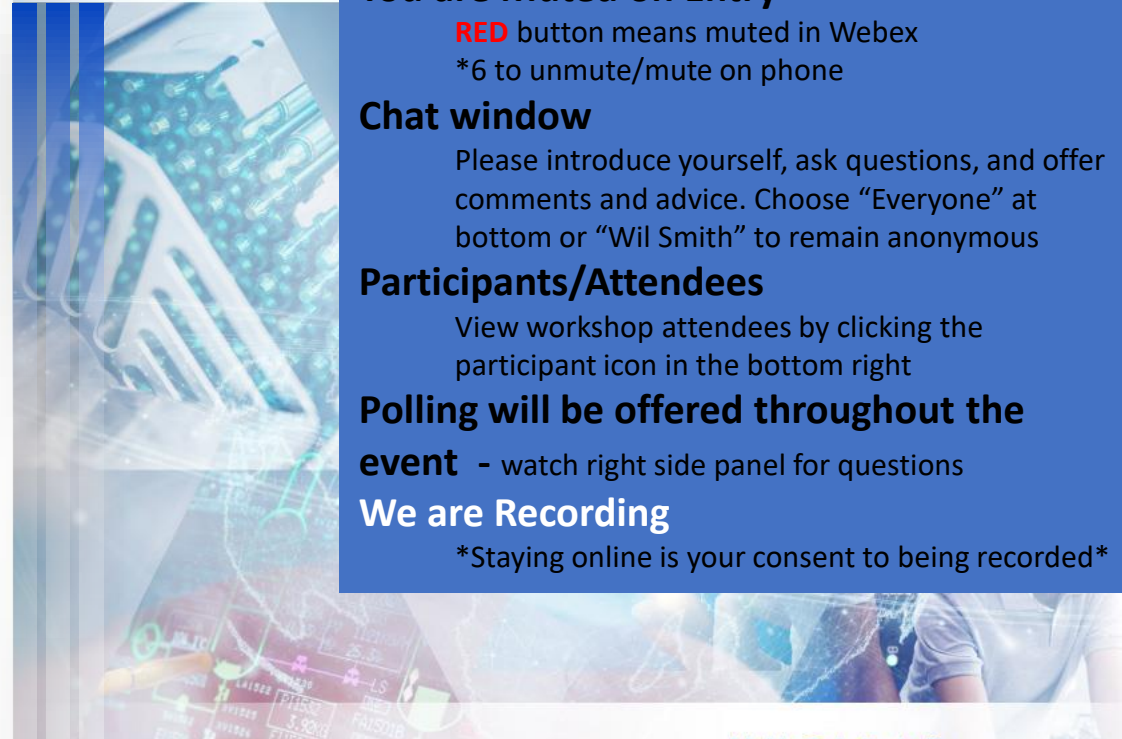
Participants/Attendees

View workshop attendees by clicking the participant icon in the bottom right

Polling will be offered throughout the event - watch right side panel for questions

We are Recording

Staying online is your consent to being recorded



Mute

Polling

Chat

Notes
Polling
Closed Captions

Mute Start video Share Record

Participants Chat



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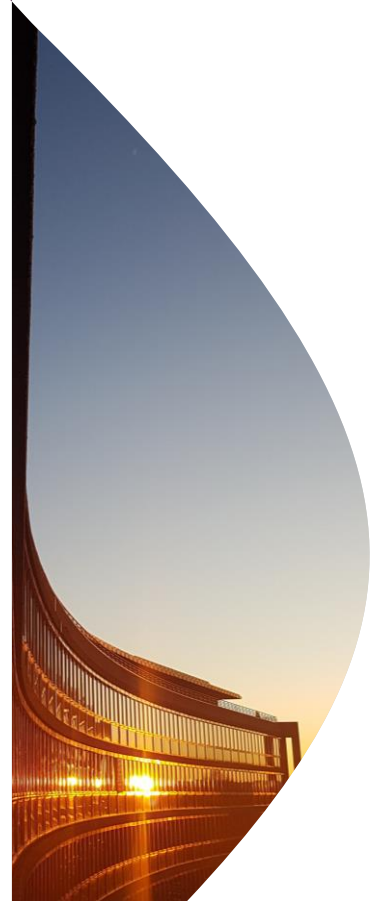
The Norwegian Energy
Regulatory Authority – RME

NEW TARIFFSTRUCTURE IN NORWAY



Kjell Rune Verlo

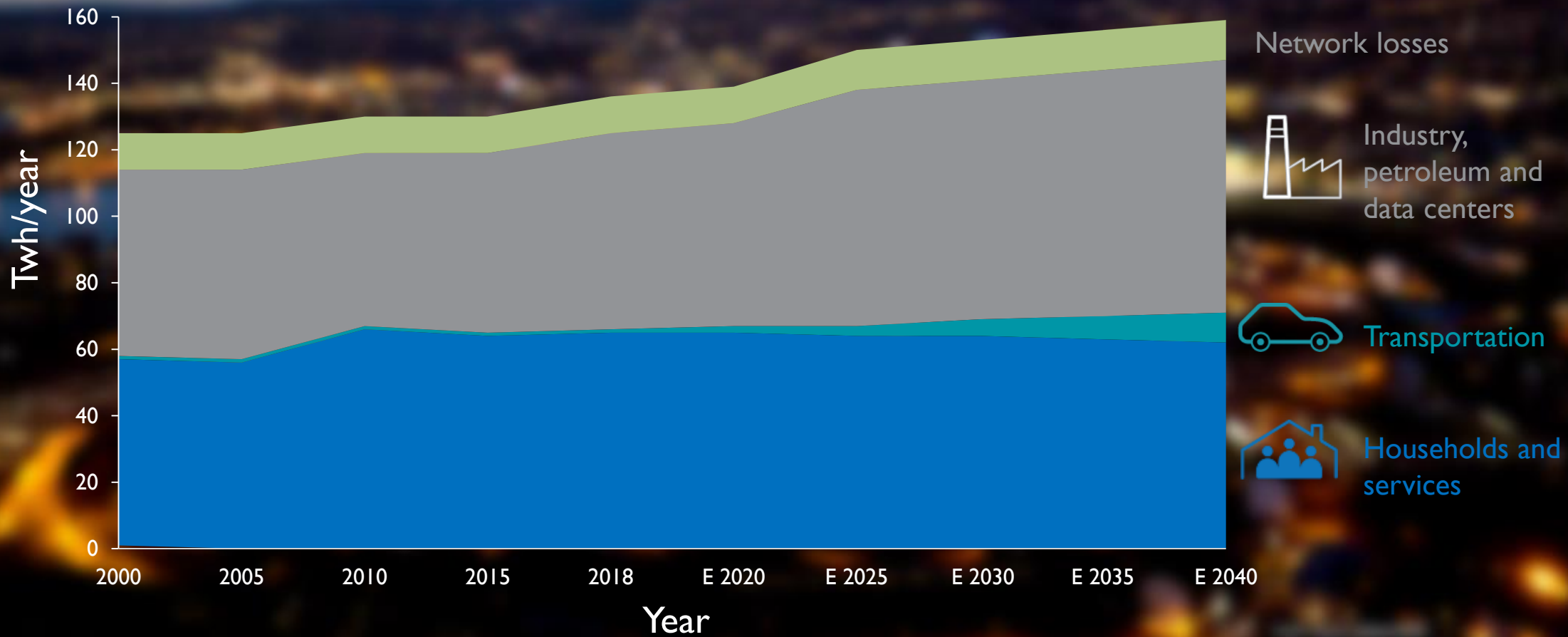
krv@nve.no



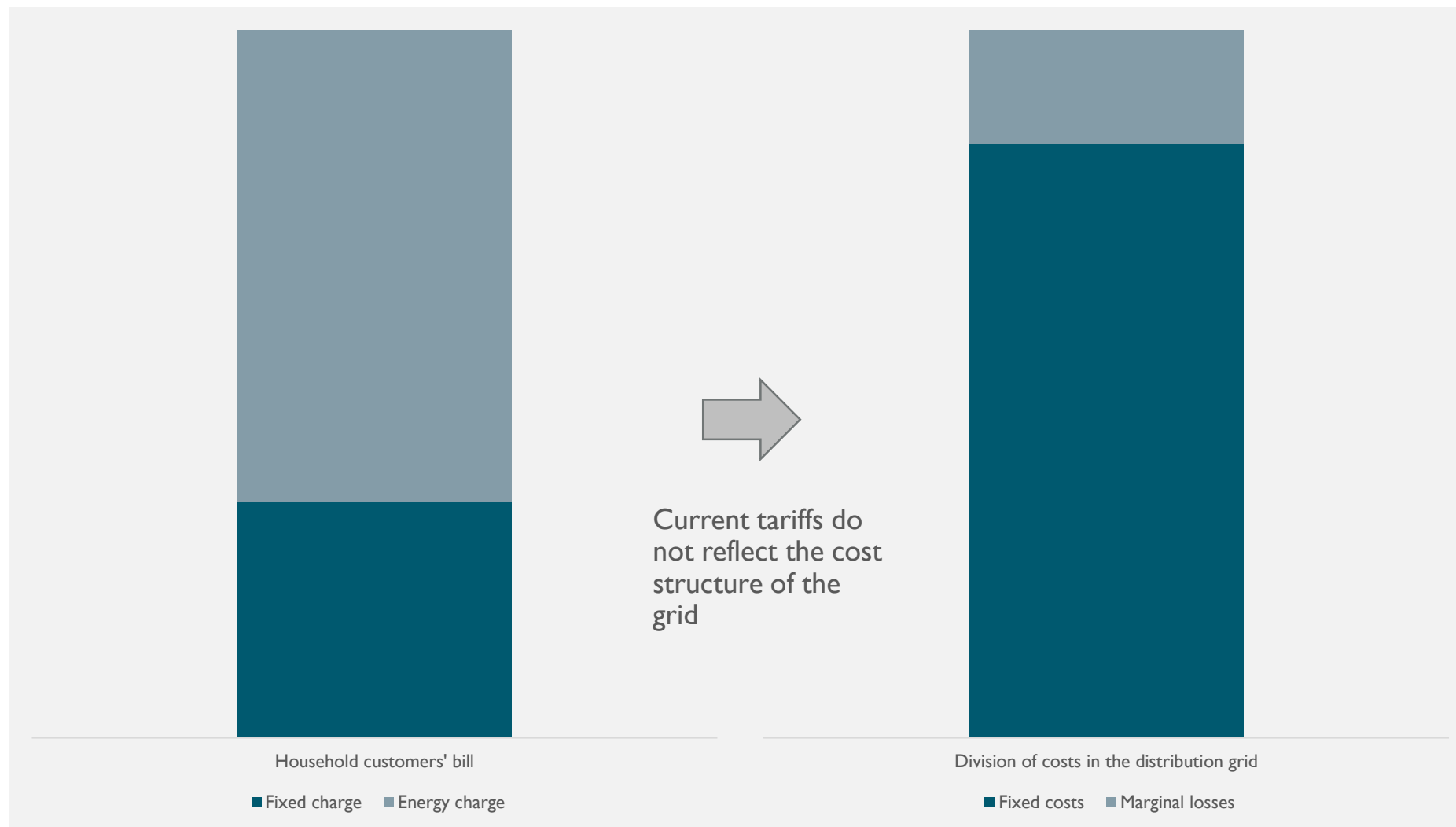
Electrification is increasing energy consumption

2040

159 TWh



For smaller consumers, the network tariff has traditionally been **volumetric**. This does not reflect the cost structure of the grid





New type of customers in the future



Challenges in Energy Decarbonization

Government & Regulatory Perspectives on Decentralization

David Sandbank, Vice President Distributed Energy Resources
NYSERDA

October 28, 2020

Climate Leadership and Community Protection Act (CLCPA) – Overview

- > Most aggressive greenhouse gas reduction goals of any major economy: 40% by 2030, 85% by 2050
- > 70% renewable energy by 2030, 100% zero-carbon electricity by 2040
- > Path to carbon neutrality
- > Codifies clean energy targets
- > Commitments to environmental justice, disadvantaged communities, and just transition
- > First statutory Climate Action Council

The Value of Distributed Energy Resources (VDER)

- > The “Value Stack” provides time- and location-specific compensation, based on
 - LBMP: Wholesale energy price set by day-ahead NYISO hourly action
 - ICAP: Wholesale capacity price
 - Demand Reduction Value (DRV): Deferred cost of distribution grid upgrades
 - Environmental value: Currently set as the Social Cost of Carbon as set by NY Department of Public Service
 - LSRV: Locational adder if connected to congested substations
 - Community Credit: A subsidy for community solar. Available for a limited number of MW, and fully subscribed in most utility territories

How to Build a Reliable & Resilient Decentralized energy system

DER's need to be invited to the party: Energy storage, solar and flexible loads on the distribution network are the same physical assets used in planning centralized networks, just different location and scale

1. Build a DER marketplace: NY-Sun: 6GW x 2025 Energy Storage: & 3GW x 2030
2. Turn DERs from Passive assets to Active assets
 1. Need the DERs to be in the system models to begin with
 2. Include DER's in energy/reliability planning
 3. Require integrated T&D planning and broader operational protocols
 4. Ideally, the whole system, distribution through bulk, needs to be planned and operated together

New York Moving Forwards

1. VDER
2. NY-Sun & Energy Storage
3. Distribution System implementation Plans (DSIP)
4. Market Design & Integration Working group

Distributed Flexibility and the TSO-DSO Interface

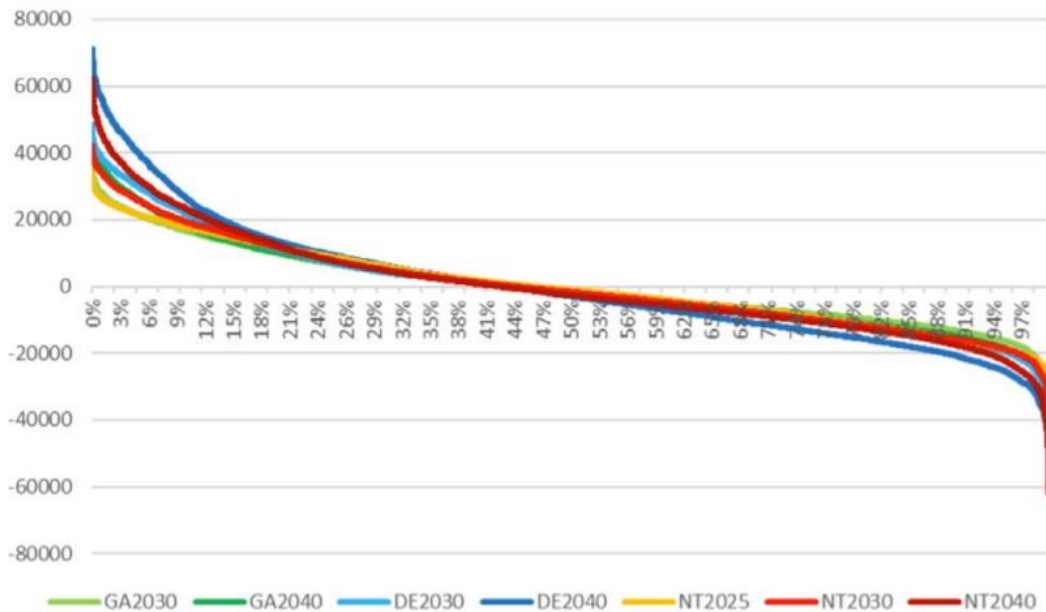
EPRI-IEA 7th Annual Expert Workshop: Challenges in Energy Decarbonisation, 28 October 2020

Victor Charbonnier, ENTSO-E (victor.charbonnier@entsoe.eu)

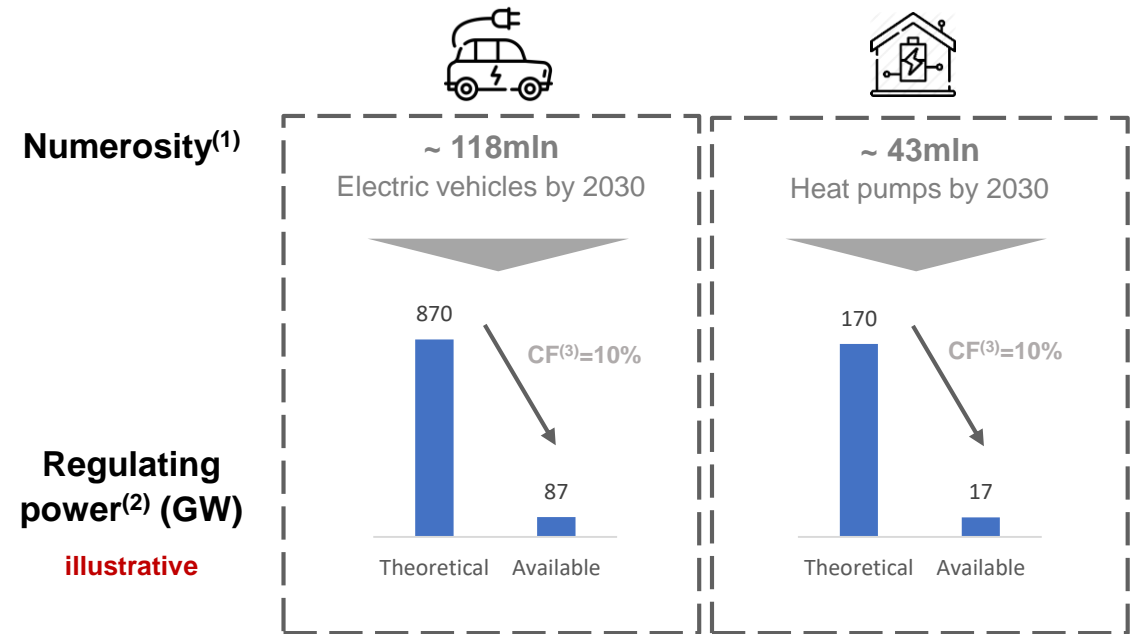


2030: Distributed Energy Resources could represent a significant source of flexibility for TSOs

Hourly ramps of residual load (MW/h) in Continental Europe



Distributed Flexibility Resources



(1) Distributed Energy scenario

(2) Own elaboration assuming: (a) heat pump: 4kW, (b) electric vehicle charge point: 7,4 kW

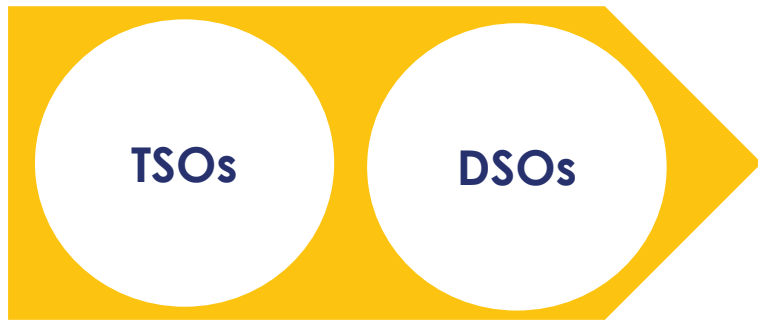
(3) CF = Contemporary Factor: Average share of resources available to be turned off

Sources:

- ENTSO-E TYNDP 2020 scenarios report - https://eepublicdownloads.azureedge.net/tyndp-documents/TYNDP_2020_Joint_Scenario_Report_ENTSOG_ENTSOE_200629_Final.pdf
- ENTSO-E Power System Needs Analysis - https://eepublicdownloads.azureedge.net/tyndp-documents/loSN2020/200810_loSN2020mainreport_beforeconsultation.pdf

Unlocking the potential of 'distributed flexibilities' requires coordination between voltage levels and markets

"One integrated system approach"



Balancing

Congestion management

Voltage control

Stability

Inertia

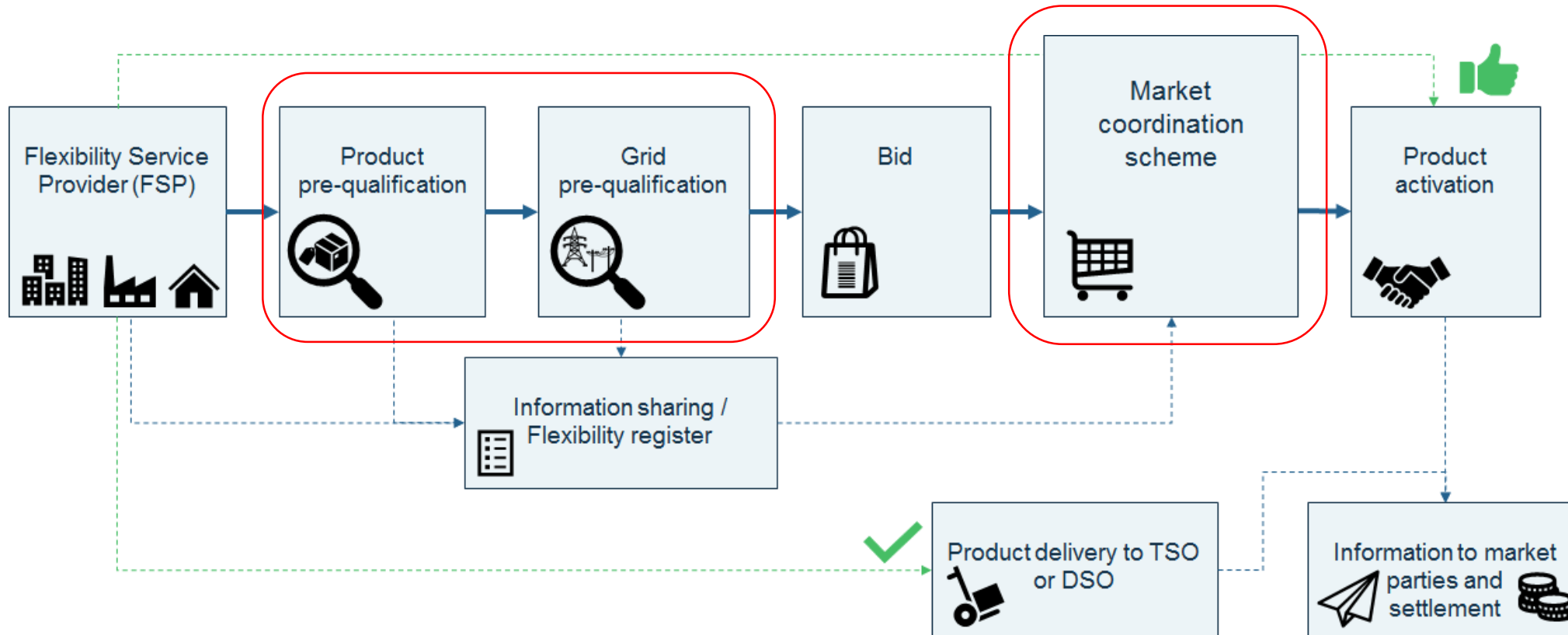


- ✓ Assets mainly connected to the DSO grid
- ✓ Aggregation of assets as new services

TSO-DSO report on 'Active System Management': A conceptual framework for market-based congestion management



3 main options for TSO-DSO interaction



The role of DSOs in a decentralised future Randolph Brazier, Head of Innovation

October 2020

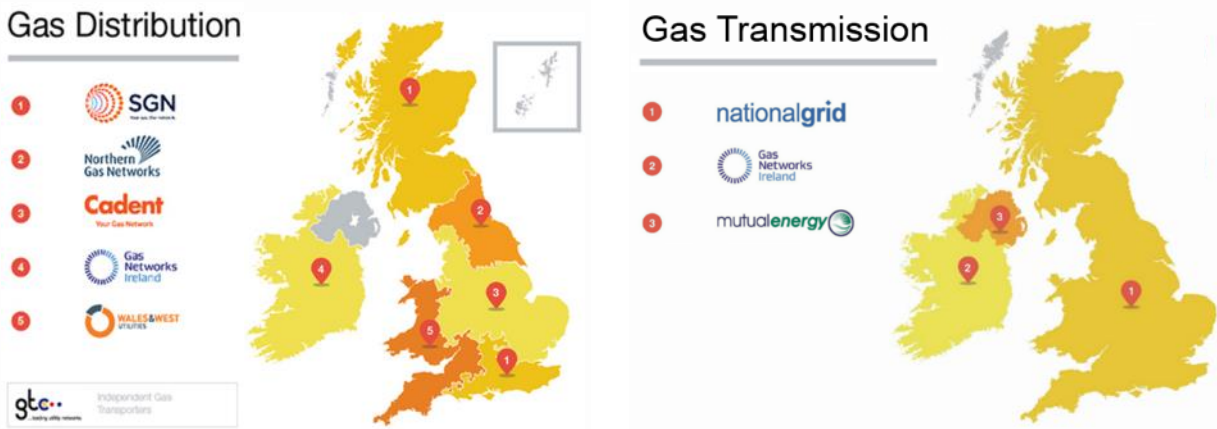
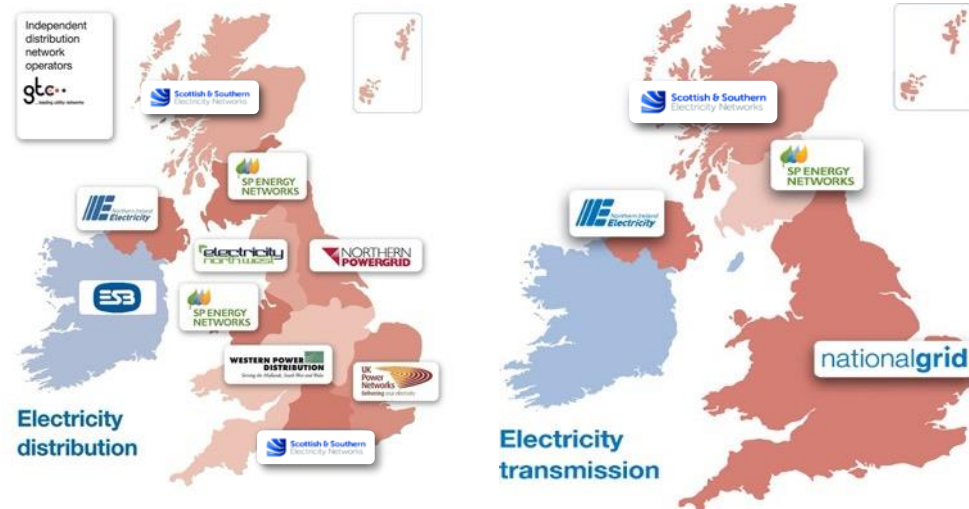
Introduction to ENA

The voice of the networks

- 29 million electricity customers
- 21.5 million gas customers
- 180,000 miles of gas network
- 519,304 miles of electricity network

Distributed Energy Resources (DER)

- Over 30GW of distributed generation is currently connected
- DER uptake (especially EVs!) is increasing rapidly



UK Policy & Regulation

- The UK has signed and ratified the COP21 Paris Agreement
- In 2019, the UK became one of the first major economies to legislate for net zero greenhouse gas emissions by 2050
- Government has a dedicated smart grids policy: Smart Systems and Flexibility Plan
- However, regulatory support is critical throughout the entire journey
- Gas and Electricity Networks are governed by the ‘RIIO’ model: Revenue = Incentives + Innovation + Outputs
- Performance-based framework that includes a ‘TOTEX’ model
- Establishing an agile regulatory framework that encourages smart grid development and flexibility markets is essential



Department for
Business, Energy
& Industrial Strategy

Open Networks – Delivering a Smart Grid



ENA's Open Networks Project is a major energy industry initiative that will transform the way that both local Distribution Networks and national Transmission Networks will operate and work for customers. This is being driven by the 3Ds; digitisation, decentralisation and decarbonisation



The Open Networks Project will help customers connect and realise value; as well as reducing cost for consumers through more cost effective planning

ofgem

Making a positive difference
for energy consumers



HM Government

The Open Networks Project is a key initiative to deliver Government policy set out in the Ofgem and BEIS Smart Systems and Flexibility Plan, the Government's Industrial Strategy and the Clean Growth Plan



We are taking a stakeholder led, 'learn-by-doing' approach; we trial and test all aspects of the various future electricity system options

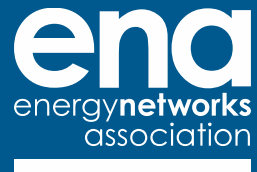
Local Flexibility Markets

- More DER is becoming flexible, which is critical to achieving net zero
- Being flexible means the ability to control or schedule demand and/or generation, and this can help address local and national needs
- Britain's Networks have made a "Flexibility Commitment"; using cost-efficient flexibility to relieve network congestion
- Last year, almost 1GW of flexibility was tendered out for DSO (local network) services
- This year, over 1.9GW of flexibility is being tendered
- Open Networks is increasing liquidity in these new and exciting local flexibility markets by focussing on standardisation, transparency and dissemination across the customer journey



Thank you!

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Polling Questions

Q1: What is the biggest barrier in scaling up (efficient) DER deployment?

