
WEBINAR
CURRENT
Enabling Network Technology throughout Europe
ITALY'S POWER NETWORK TOWARDS A ZERO EMISSIONS FUTURE
THE ROLE OF THE GRID AND INNOVATIVE TECHNOLOGIES
17 FEB | 13-14:30 CET

Agenda

Moderated by Susanne Nies currENT Europe

Keynote by Fabio Genoese Terna

Roundtable with

Riccardo Vailati ARERA

Joachim Balke DG ENER

Christoph Maurer Consentec

Jan Kostevc ACER

Ercole de Luca ARETI

Catherine Winning Smart Wires

Anders Skånlund Heimdall Power

Alberto Pototschnig Florence School of Regulation

followed by a Q&A.

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MODERATOR

CURRENT
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SUSANNE NIES

Board Chair
currENT Europe

GLOBAL, EU POLICY CONTEXT AND WHAT CURRENT HAS TO PROPOSE

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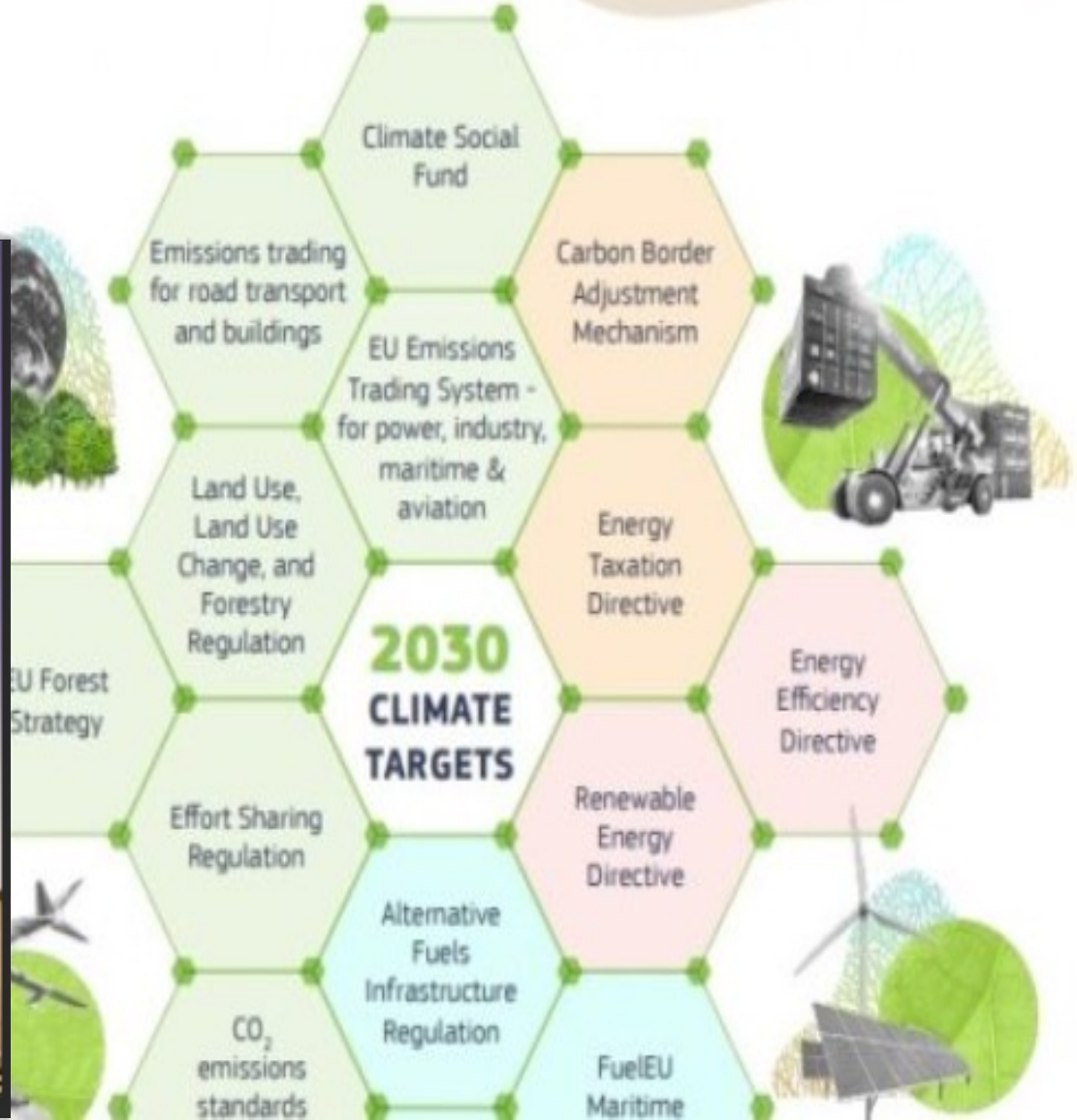
Fit for 55 ?

GREEN DEAL

THE DECISIVE DECADE

2030, compared to 1990 levels, as agreed in the EU Climate Law. On 14 July 2021, the Commission presented proposals to deliver these targets and make the European Green Deal a reality.



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"currENT's Vision is a European power network using innovative grid technologies to realise an efficient, renewable and decarbonised power system"

amsc

SUPERNODE™

GWP greenwood power

LINEVISION

VISION® ELECTRIC Super Conductors

Ampacimon Smart solutions for a dynamic grid

OTLM KNILL GRUPPE

SMART WIRES

HEIMDALL POWER

depsys

Leading reports claim use of NOVA principle

ACER THE AGENCY ELECTRICITY GAS

22.11.2021

Infrastructure efficiency: the role of regulation in incentivising smart investments and enabling the energy transition

Share on:

European Commission

Do current regulatory frameworks in the EU support innovation and security of supply in electricity and gas infrastructure?

Final Report

ECORYS RAMBØLL consentec TU WIEN

March – 2019

Making the most of Europe's grids

Grid optimisation technologies to build a greener Europe

SEPTEMBER 2020

Wind EUROPE

Bundesministerium für Wirtschaft und Energie

≡ MENÜ Suchbegriff eing

12.08.2021 **PUBLIKATION** Netze und Netzausbau

Netzbetriebsmittel und Systemdienstleistungen im Hoch- und Höchstspannungsnetz

Erster Ergebnisbericht zur „Netzbetriebsmittel-Studie“

25 June 2020

Climate proof Europe's power grid

currENT'S SEVEN RECOMMENDATIONS TO POLICY MAKERS

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Unlocking the Queue with Grid-Enhancing Technologies

CASE STUDY OF THE SOUTHWEST POWER POOL
FINAL REPORT – PUBLIC VERSION

PRESENTED BY
T. Bruce Tsuchida
Stephanie Ross
Adam Bigelow

PREPARED FOR
WATT (Working for Advanced Transmission Technologies) Coalition

FEBRUARY 1, 2021

Brattle

ENTSO-E Technopedia

Welcome to ENTSO-E's new tool, the Technopedia!

Energy transition is underway, we help you to keep up with the new technologies related to the Transmission System Operators. Below you will find factsheets of different innovative and state-of-the-art technologies covering the fields of transmission assets, system operations, digital and flexibility solutions. These up-to-date sheets will help you to understand each technology and their advantages, and also to show their readiness level.

Filter by TRL | Filter by Technology Type

Found 62 Technologies

High Temperature Superconductor (HTS)...

Superconducting cables are based on special superconducting materials that are

Artificial Intelligence (AI)

In modern life, Artificial Intelligence (AI) already plays a significant role in social

5G Digital cellular networks

5G is the 5th generation cellular network technology that provides broadband

Regulatory updates needed in..

The Green Deal implementation

- ✓ *Energy Efficiency Directive (EED): Energy Efficiency First Principle!*
- ✓ *Renewable Energy Directive (RED) revision: focus on optimised grids for 100% Renewables by 2050*
- ✓ *European Offshore Renewable Energy Strategy implementation*
- ✓ *TEN-E: more out of grids and more grids form ONE solution towards electrification*

As part of Electrification and digitalisation

We want to promote efficient use of electricity networks through modern grid technologies:

- ✓ *Dynamic Line Ratings*
- ✓ *Superconducting Cable Systems*
- ✓ *Modular Power Flow Control technology*
- ✓ *Intelligent sensors*

Keeping the energy transition costs affordable, system secure, and customers active

The use of efficient innovative technologies decreases the costs of the energy transition: Consentec report

KEYNOTE SPEAKER

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FABIO GENOESE

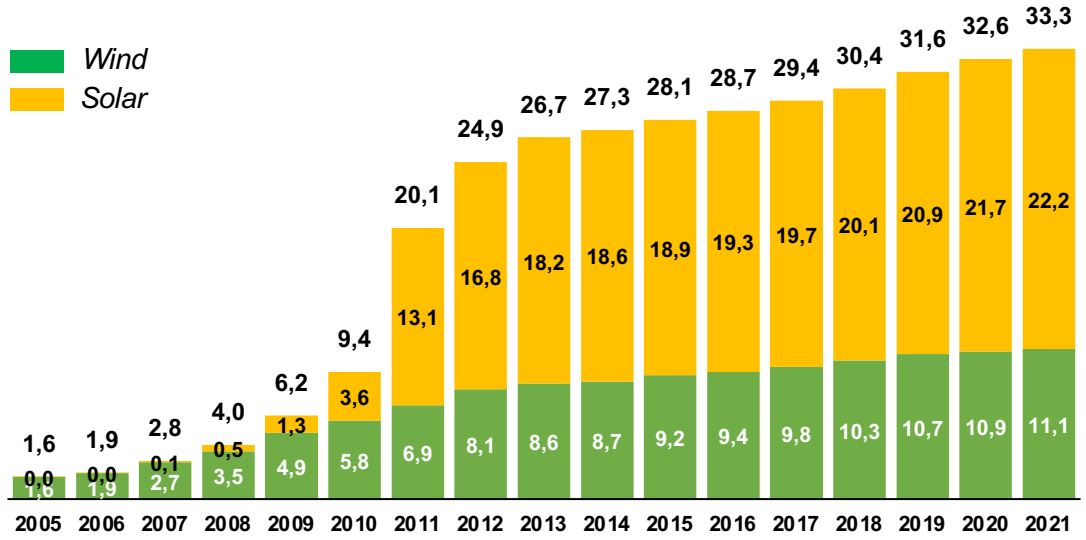
Head of Strategy
Terna

DELIVERING THE GREEN DEAL IN ITALY: RENEWABLES, NEW NETWORK NEEDS, REINFORCEMENTS AND THE POTENTIAL OF INNOVATION

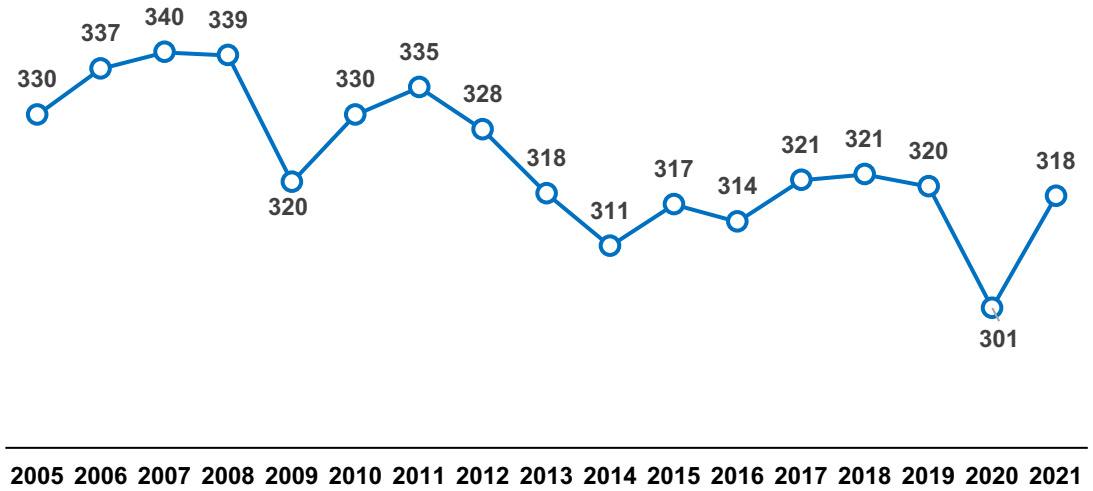
Where we are in terms of renewables

Key figures at glance

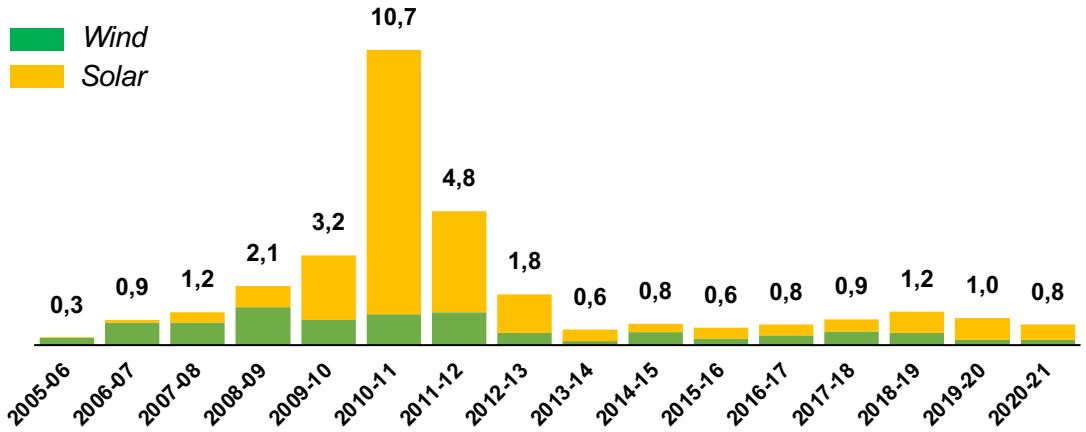
Total installed capacity of wind & solar* (GW)



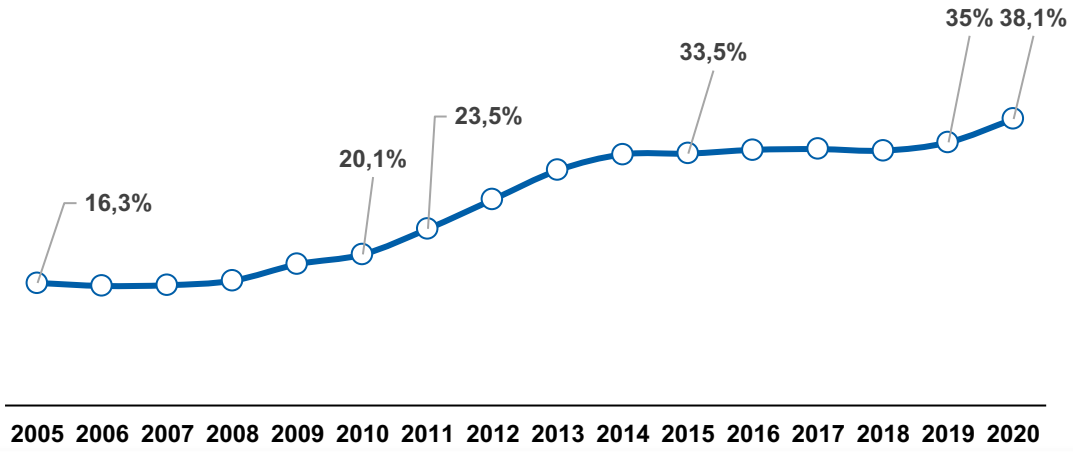
Electricity demand* (TWh)



Annual installations of wind & solar* (GW)



RES-E share** (%)



* Source: Terna. Note: 2021 data may be subject to updates.

** Source: Eurostat (2021)

Where we need to go

European Union CO_2 emission reduction targets

2030 — 2050

Clean energy for all Europeans — *Clean Energy Package* — **- 40%**

Green Deal Fit-for-55 — **- 55%**

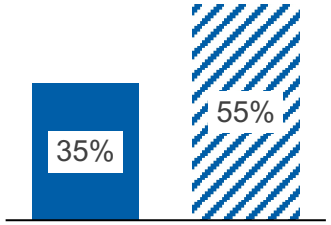
Net zero emissions

National Energy and Climate Plan (NECP)

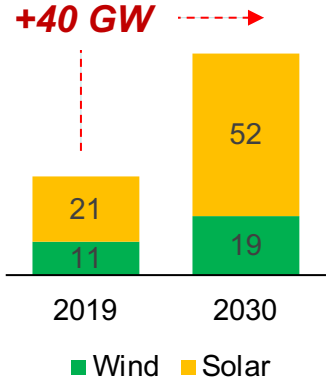
Long-Term Strategy (LTS)

NECP*

RES share in electricity consumption [%]

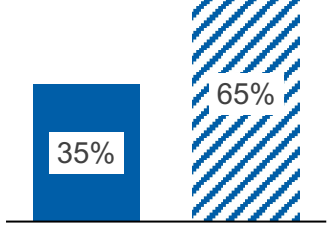


vRES installed capacity [GW]

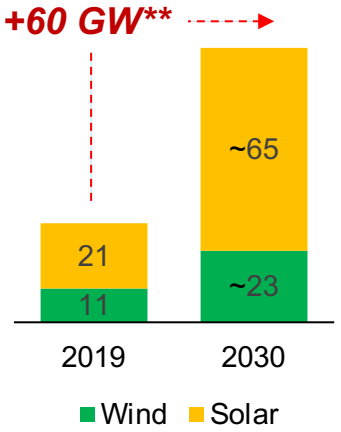


Minister Cingolani Senate Hearing*

RES share in electricity consumption [%]

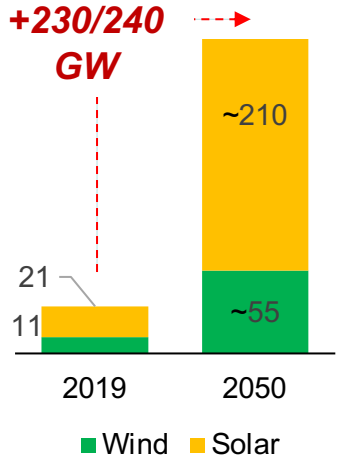


vRES installed capacity [GW]



Long-Term Strategy*

vRES installed capacity [GW]



Policy targets keep evolving: to reach the 2030 targets outlined in the Fit-for-55 package, at least +60 GW of new solar & wind capacity will be needed. The Long-Term Strategy envisages more than 260 GW of total installed capacity in 2050 to reach Net Zero.

** Sources: NECP (2019), Senate hearing of minister Cingolani (2021), Long-Term Strategy (2020)*
*** Moreover, a growth of 3 GW dispatchable RES capacity is indicated. In their absence, wind & solar will have to fill the gap.*

SPEAKER

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RICCARDO VAILATI

Team Leader Quality and Innovation of Electricity infrastructures
ARERA

ELEMENTS OF REGULATION OF TRANSMISSION NETWORK DEVELOPMENT AND OF TRANSMISSION INNOVATION FOR ITALY

ARERA
Autorità di Regolazione per Energia Reti e Ambiente

ARERA's regulation of transmission network development and transmission innovation

Riccardo Vailati
ARERA, Regulatory Authority for Energy, Networks and Environment

Italy's Power Network towards a Zero Emissions future: The Role of the Grid and Innovative Technologies
17 February 2022

Staff of the Regulatory Authority have the duty to disclaim in public that only personal opinions are presented when speaking in public at conferences, workshops and seminars

OUTLINE

1. ARERA's approach to regulate electricity transmission network development: plans and cost benefit analysis

2. ARERA's approach to transmission innovation pilot projects

3. ARERA's output-based regulation: two main incentive mechanisms and their outcomes

THE REGULATION OF TRANSMISSION NETWORK DEVELOPMENT 1

At the end of 2015, ARERA:

- Strengthened the objective of prioritising transmission investments
- Launched the transition from input-based incentives to (a wider portfolio of) output-based incentives and continued the phase-out of input-based incentives (down to 1% - 12 years for the period 2016-2019, referring to a smaller portion of total investments, with complete shutdown on 31/12/2019)
- Started a (relatively long) process to define the outputs, the metrics and their incentive schemes
- Introduced a stronger forward-looking approach including network development planning - NDP - as a pillar of investment planning and stronger consistency between transmission regulation and NDP
- Introduced the NDP - cost benefit analysis methodology

THE REGULATION OF TRANSMISSION NETWORK DEVELOPMENT 2

The cost benefit analysis evaluates over a 25-year assessment period the capital and operational expenditures vs. the monetised benefits of each new project (applicable to projects above 15 million Euro CAPEX threshold)

Example of benefits: increase of socio-economic welfare, integration of RES, reduction of greenhouse and non-GHG emissions, reduction of energy not supplied, reduction of costs for dispatching/balancing, reduction of must-run-unit costs

Reference: ARERA Decision 627/2016 on requirements for the transmission network development plan, including the Italian cost benefit analysis methodology for transmission projects
https://www.arera.it/allegati/docs/16/627-16eng.pdf

TRANSMISSION INNOVATION - PILOT PROJECTS

In 2012-2013, the Italian NRA introduced a pilot project for TSO-owned storage to reduce RES curtailment in congested 150 kV network areas, and included as a minimum requirement the application of **dynamic line rating**:

- 2% premium on top of weighted average cost of capital for 12 years
- Extra-WACC applicable only to pre-approved CAPEX
- Extra-WACC subject to output-based conditions (amount of saved RES curtailments)
- Public dissemination required https://www.terna.it/it/sistema-elettrico/innovazione-sistema/progetti-pilota-accumulo

Voce di costo di investimento	Costo (migliaia di Euro)
Trasduttori, dispositivi PMU, upgrade tecnologico	261
Studi preliminari, sviluppo e rilascio dei modelli termici ed elettrici, evolutive dei modelli e sviluppo piattaforme software	349
Installazione trasduttori e protezioni	139
Costi di project management	91
Totale	**840**

Actual DLR CAPEX (kEur)

Actual DLR benefits in the first year of full operation

Voce	Quantità
Saving di Mancata Produzione Eolica nel 2016	49,11 GWh / anno
Beneficio legato al *saving* (valorizzato @ 43 Eur/MWh)	2,11 MEur / anno

Source: ARERA, Consultation document 542/2017 on output-based regulation of electricity transmission, July 2017
https://www.arera.it/allegati/docs/17/542-17.pdf

TRANSMISSION OUTPUT-BASED REGULATION 1

Since 2015, in addition to pre-existing quality of supply regulation, the Italian NRA started introducing output-based incentive mechanisms that promote all investments (under a technology neutral approach) according to their expected benefits. The idea is to **share the (gross or net) benefit of network investments between final customers and the TSO, assigning to the TSO a small part of it**

TRANSMISSION OUTPUT-BASED REGULATION 2

In 2018, the Italian NRA introduced a new output-based incentive mechanism for cross-zonal transfer capacity increases:

- Reward-only, up to a “target” capacity increase (no rewards to extra-capacity)
- Rewards based mostly on historical congestion revenues in 2016-2017 at the boundary and partly on estimated project benefits as per Italian network planning

In 2019, the Italian NRA introduced a complementary incentive:

- Reward-only, as an adder to the capacity increase reward
- Extra-rewards based on the difference between standard CAPEX for capacity increase at the boundary minus actual CAPEX for the realised extra-capacity

Reference: ARERA, Decision 567/2019 on output-based regulation of electricity transmission for years 2020-2023, December 2019
https://www.arera.it/it/docs/19/567-19.htm

TRANSMISSION OUTPUT-BASED REGULATION 3

From 1 January 2021, Terna TSO increased cross-zonal capacities on 4 internal network boundaries by using several low-capital measures, in particular special protection schemes including RES controllability, dynamic line rating and removal of limitations or limiting components on some lines

The cumulate increase of transfer capacities was 1450 MW

The total CAPEX was slightly above 5 million euro, compared to a CAPEX estimate around 750 million euro, in case of traditional reinforcements

The net present value of estimated benefits is >> 1 billion Euro

The total reward to Terna was about 143 million Euro (103 million Euro for the capacity increases, 40 million Euro for the CAPEX savings)

Reference: ARERA, Decision 23/2022 on output-based rewards for year 2020, January 2022
https://www.arera.it/allegati/docs/22/023-22.pdf

SPEAKER

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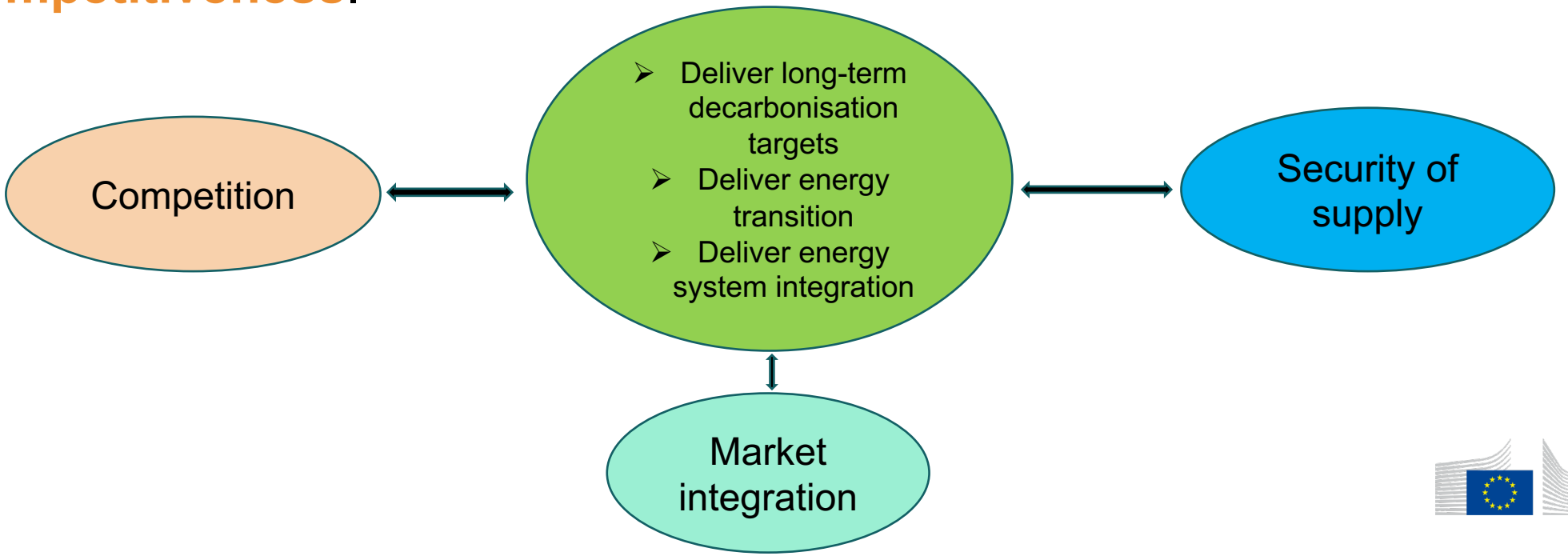
JOACHIM BALKE

Head of Infrastructure and Regional Cooperation
DG ENER

ENERGY INFRASTRUCTURE PLANNING IN THE REVISED TEN-E

TEN-E revision: cross-border infrastructure planning for the Green Deal

- Fit for the infrastructure needs of the clean energy system of the future focusing on the (upgraded) **2030/ 2050 climate and energy targets**, the **climate neutrality objective** and **technological developments** whilst ensuring contribution to market **integration, security of supply and competitiveness**.



European Commission

A. Full alignment of infrastructure with the EGD (1/4)

- Through an increased focus on **offshore grids** covered under five dedicated priority corridors reflecting Europe's sea basins and building on **regional cooperation strengths**.
- The TEN-E operationalises the ambitions in the EU Strategy for Offshore RES by including dedicated planning (**integrated offshore network development plans**), permitting (**single point of contact for offshore PCIs**) and regulatory tools (**incentives**) to facilitate scale-up of offshore grids to the target 300 GW in 2050.

A. Full alignment of infrastructure with the EGD (2/4)

- Support the scale-up of **smart electricity grids by**, esp. in support for RES and demand response (e.g. EVs, prosumers or storage)**:**

  - Streamlining and modernising the eligibility criteria to reflect technological development, **digitalisation and cybersecurity** in transmission and distribution network.

  - Clarifying eligible project promoters in smart grids: TSOs and/or DSOs from at least two Member States.

A. Full alignment of infrastructure with the EGD (3/4)

- **Exclusion of natural gas infrastructure** due to achieving an integrated and shock-resilient gas grid in Europe
- **Exclusion of oil pipelines**

Instead:

- Support for new and repurposed **dedicated hydrogen networks and electrolysers** above 50 MW
- Tapping into locally produced renewable and low-carbon gases (biogas, biomethane) through IT-focused **smart gas grids**

European Commission

A. Full alignment of infrastructure with the EGD (4/4)

- Through inclusion of **mandatory sustainability criterion** for all infrastructure categories:
  - By and large, sustainability to be assessed in terms of the integration of renewable energy sources into the grid or the reduction of greenhouse gas emissions.
  - In general, the more a candidate project contributes to sustainability – renewable energy integration or CO2 reduction –, the higher it ranks in the list.

Infrastructure gap assessment and the EE1st

- Stronger requirements for the assessment of the infrastructure gaps:
  - Based on more comprehensive joint scenarios;
  - Implementing the EE1st principle;
  - Taking into account all relevant costs;
  - Focus on those gaps that could potentially affect the climate and energy targets.

- The EE1st principle becomes more prominent:
  - Joint scenarios to be fully in line with the principle;
  - To be considered in the infrastructure gap assessment;
  - To be considered by the Regional Groups for each candidate PCI or PMI;
  - Included and explained in the CBA methodology for all the steps of the TYNDP.

SPEAKER

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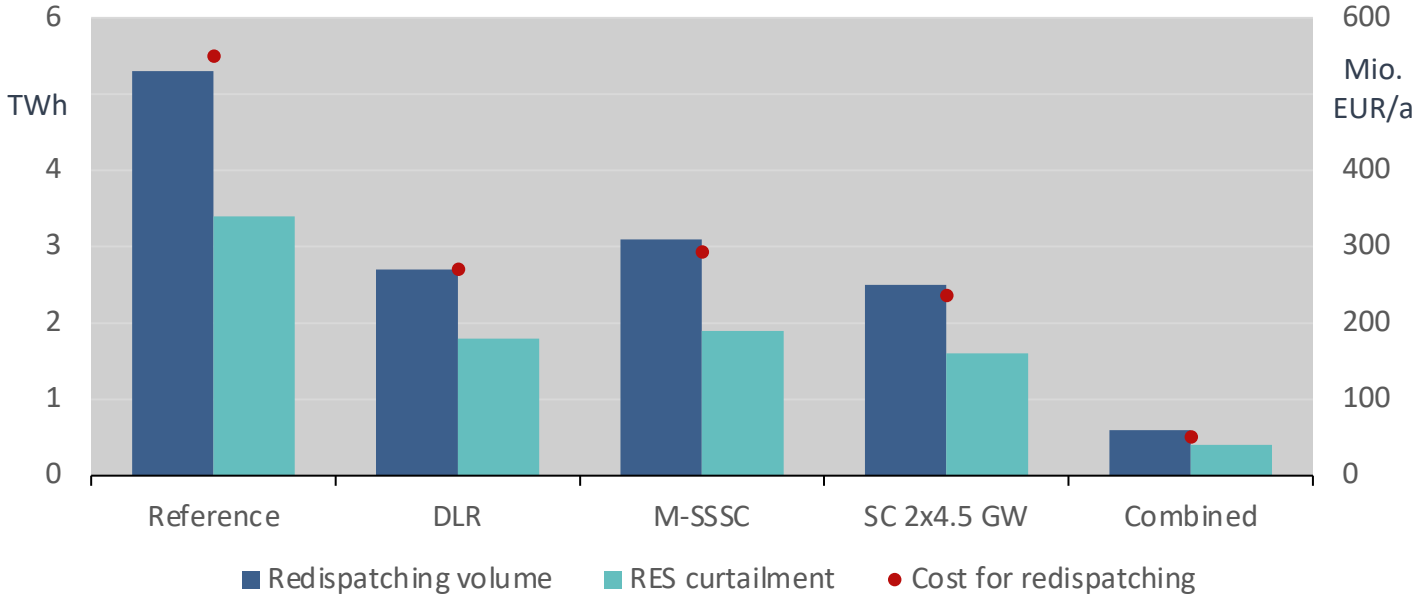
CHRISTOPH MAURER

Managing Director
Consentec

LESSONS LEARNT FROM CURRENT'S RECENT STUDY ON INNOVATIVE GRID TECHNOLOGIES

Study shows significant mitigation of congestion cost in 2030 by large-scale deployment of innovative grid technologies



Significant impact and complimentarity

- considered technologies can each significantly reduce congestion in highly loaded transmission systems
- study shows the complementary benefit of those technologies

Innovative technologies can support energy transition

- better RES integration, increased economic efficiency
- no substitute for, but rather complement to grid expansion

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JAN KOSTEVC

Team Leader Energy Infrastructure
ACER

INFRASTRUCTURE EFFICIENCY

ACER
European Union Agency for the Cooperation of Energy Regulators

Why infrastructure efficiency?

- Huge effort needed for the energy transition
  - Not only **expanding** the grid
  - …but **improving** the **efficiency** of the existing grid

- Current regulatory frameworks seem inefficient when addressing efficiency improvements
  - Remuneration **not competitive** - higher cost brings higher (absolute) return
  - More efficient operation **increases risks and operational stress**

ACER
European Union Agency for the Cooperation of Energy Regulators

Key to incentivise infrastructure efficiency

- In 2021, EU NRAs under the umbrella of ACER agreed that bridging the gap between the “appeal” of high-cost and low-cost investments is crucial.

- The **Infrastructure Efficiency Position Paper** identifies 2 main activities:
  - Recognition of the **VALUE** of investments and sharing their **BENEFITS**;
  - Identification of **K**ey **P**erformance **I**ndicators to introduce systemic incentives;

SPEAKER

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ERCOLE DE LUCA

Head of Electrical System Development Department
ARETI

SMART GRID KEY PERFORMANCE INDICATORS: A DSO PERSPECTIVE - A COMPREHENSIVE WAY TO MEASURE "SMARTNESS" TRIGGERED BY ARTICLE 59.1 (L) OF THE ELECTRICITY DIRECTIVE

Report Structure

Table of Contents

Chapter 4: Commonly agreed requirements for KPIs selection and implementation

Difference between KPI and (K)I in the frame of smart grids

A (Key)Indicator, expressed in % or as a fraction, **is the performance of a specific component of the Smart Functionality.**

A Key Performance indicator, expressed in % or as a fraction, **is the performance of the Smart Functionality**; can be based on one or a number of (Key)Indicators

A smart grid KPI could be further defined as a measurement of the intelligence of the grid, or for the progress of implementing an obligation in the frame of an intelligent ecosystem, or of certain outputs or outcomes that have been deemed necessary for customer benefits.

Chapter 4: The Adopted Philosophy To Solve the Complexities

COMPLEXITY: USE A KPI TO MEASURE A SKILL

A SKILL IS THE CAPABILITY TO EFFECTIVELY EXECUTE A FUNCTION

SOLUTION: build up the KPI's structure in such a way to describe the "Value Chain" of the most valuable "Smart Grid Functionalities".
KPIs structure is a weighted summation of the parts that make up the process of the Smart Functionality, i.e. the (K)Is

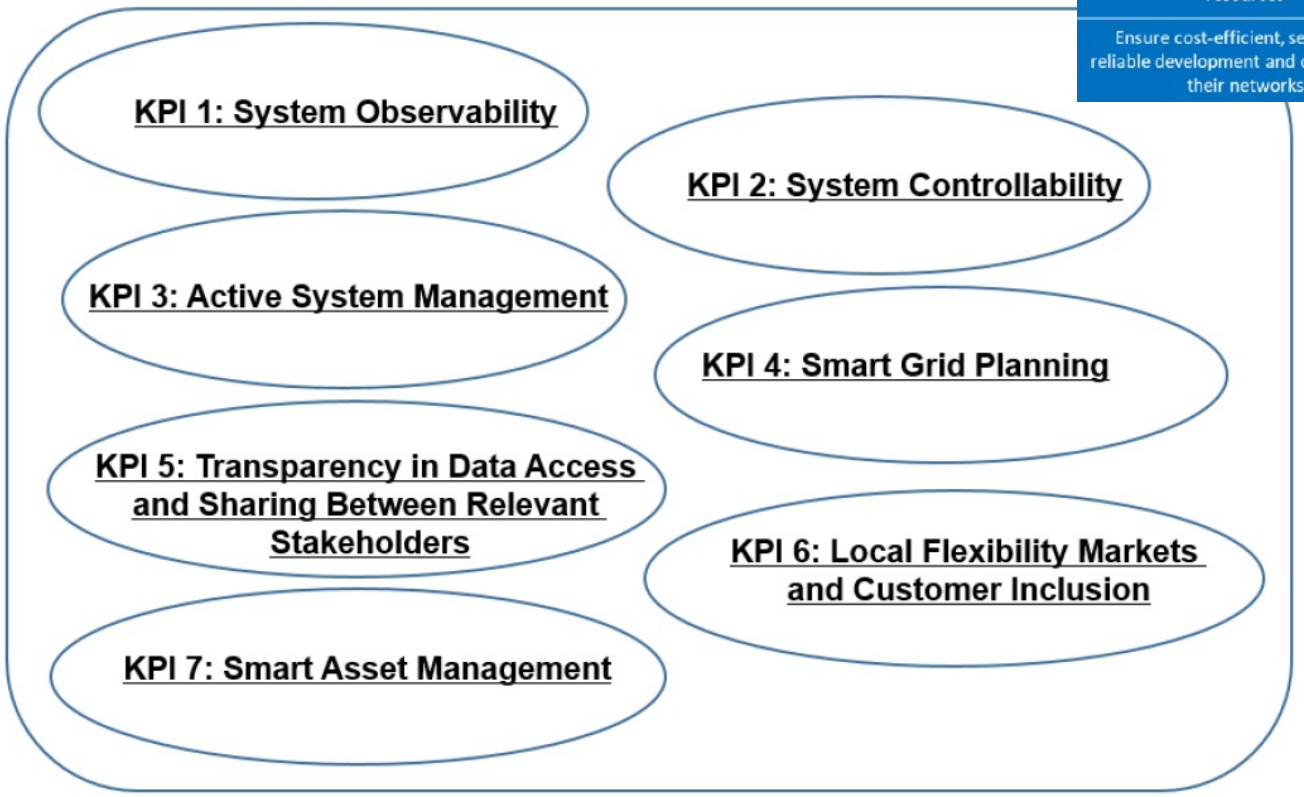
COMPLEXITY: LINK A SKILL TO A PERFORMACE

A SKILL IS THE CAPABILITY TO EFFICIENTLY EXECUTE A FUNCTION

SOLUTION: build up the (K)I's formulation in such a way to represent a performance using an "OUTPUT BASED" criterion (meaning with this both effectiveness and efficiency of the operated functionality).
(K)Is are not just availability of tools or equipment, but weighted performances in executing specific parts of the Smart Functionality

Chapter 5:
DSO's Identified KPIs

THE SIX COMMON CHALLENGES	KPI 1: System Observability	KPI 2: System Controllability	KPI 3: Active System Management	KPI 4: Smart Grid Planning	KPI 5: Transparency in Data Access and Sharing Between Relevant Stakeholders	KPI 6: Local Flexibility Markets and Customer Inclusion	KPI 7: Smart Asset Management
Cooperation in network operation	X	X	X		X	X	
Cooperation in planning the networks				X			X
Exchange all necessary information regarding the long-term planning of network investments			X	X			X
Exchange all necessary information regarding the generation assets and demand side response for the daily operation of their networks	X		X		X	X	
Cooperate with each other in order to achieve coordinated access to resources	X		X		X	X	
Ensure cost-efficient, secure and reliable development and operation of their networks	X			X	X	X	X



SPEAKER

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CATHERINE WINNING

Customer Solutions Manager
SmartWires

POWER NETWORK OPTIMIZATION: GLOBAL LEARNING

Smart Wires develops and implements power optimisation technologies

Research & Development

- Continue to further develop the product capability
- Address network needs as they change

Modular

- Solutions that can be changed in size
- Recognising that network needs change

Adaptable

- Flexible, scalable, redeployable
- Rapidly installed
- Voltage agnostic up to 500 kV

Power Flow Control

- Modular SSSC injects controllable voltage
- Increase/decrease power flows and perform dynamic services

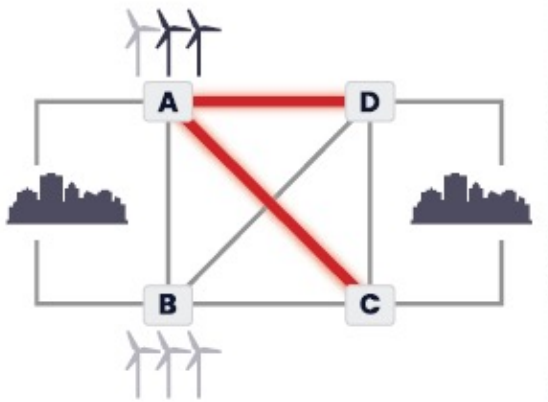
Maximizing the grid's transfer capacity to accelerate affordable, clean energy

Maximize economic dispatch in real time

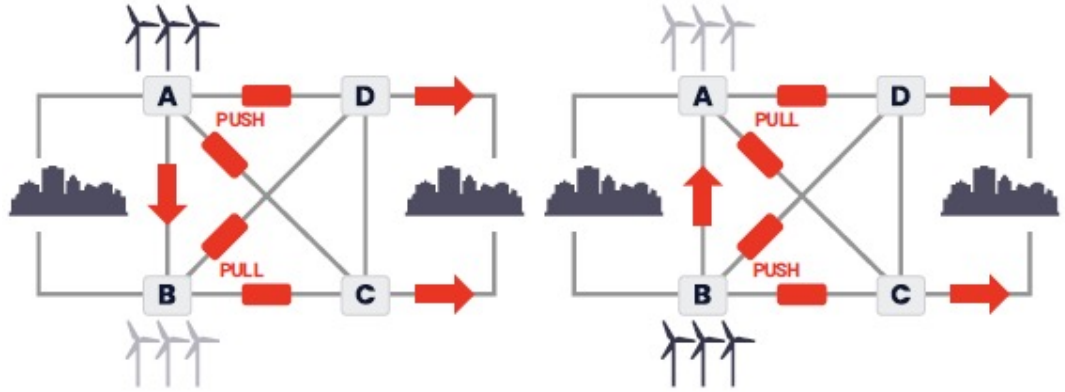
Wind farms cannot access market due to line overloads
Wind resources are active at different times

Multiple SmartValve deployments adjust reactance in real time and optimize power flows
Algorithm calculates ideal reactance on each line based on the post-contingency line loading

Before Smart Wires



After Smart Wires



40 MW

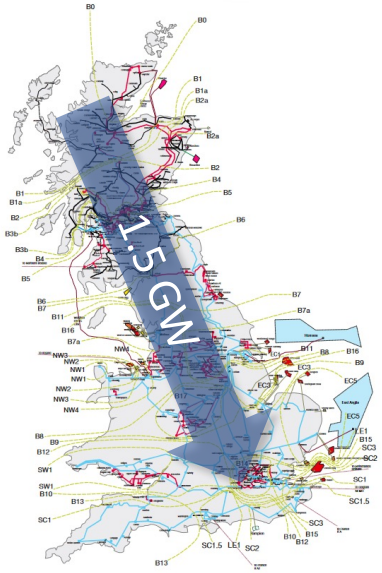
of additional transfer capacity from one deployment

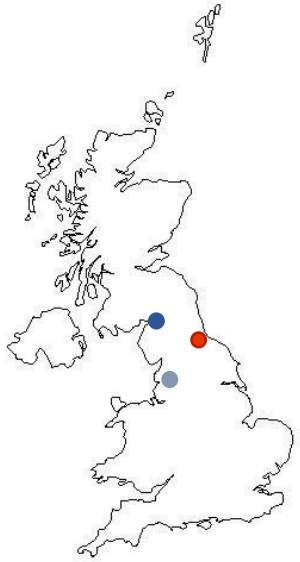
200 MW

of additional transfer capacity from four deployments

Project details

nationalgrid





Across 3 boundaries

48	SmartValves	< 18 months	Manufacturing to commissioning
5	Circuits	< 12 months	For delivery of expansion
3	Sites	£387+ M	Savings for UK consumers

In 2022, National Grid is scaling up SmartValve deployments at two sites

1

2

3

4

5

SPEAKER

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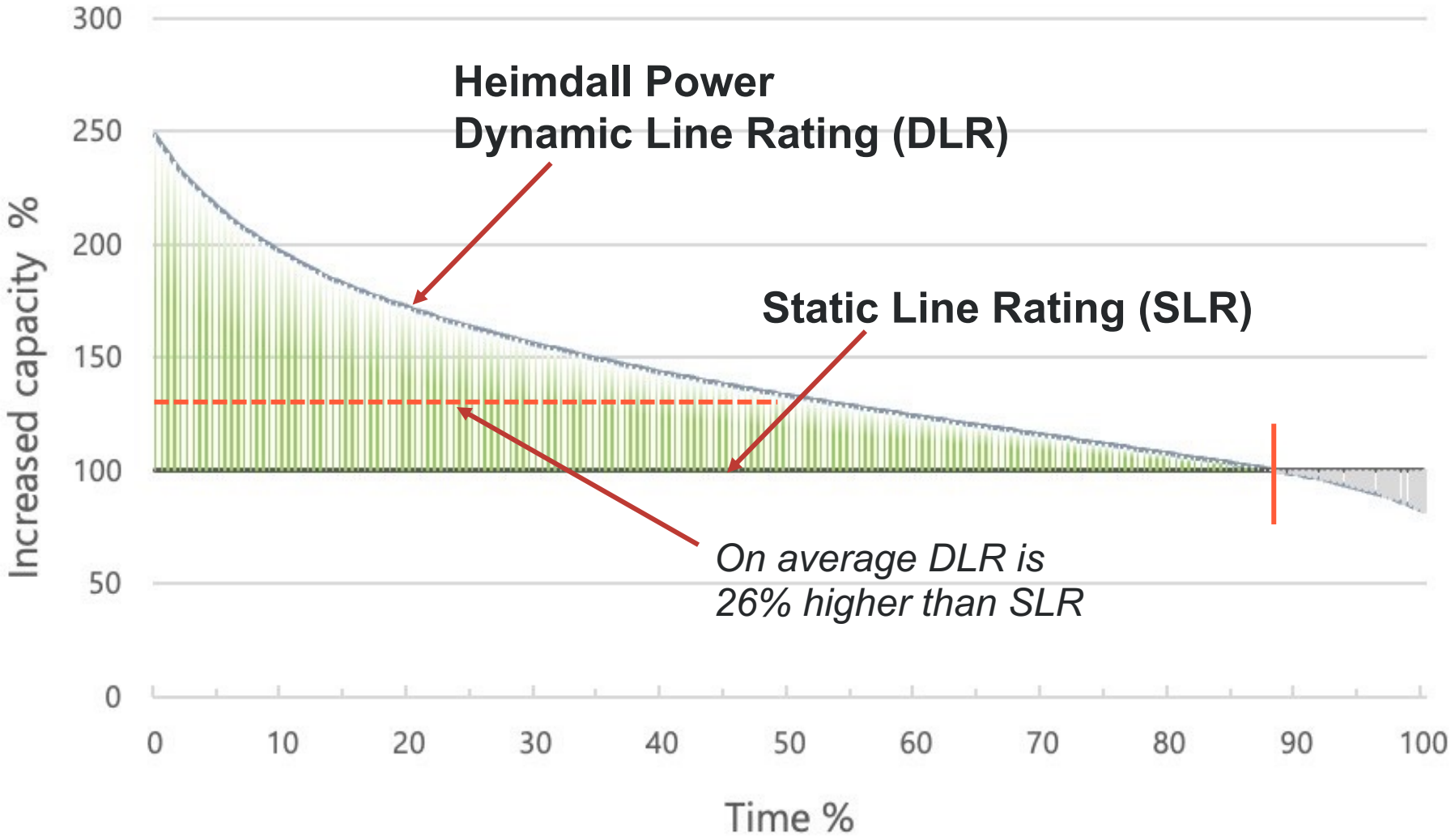
ANDERS SKÅNLUND

Chief Commercial Officer
Heimdall Power

DYNAMIC LINE RATING – HELPING GRIDS TOWARDS ZERO EMISSION

The capacity limits of powerlines vary

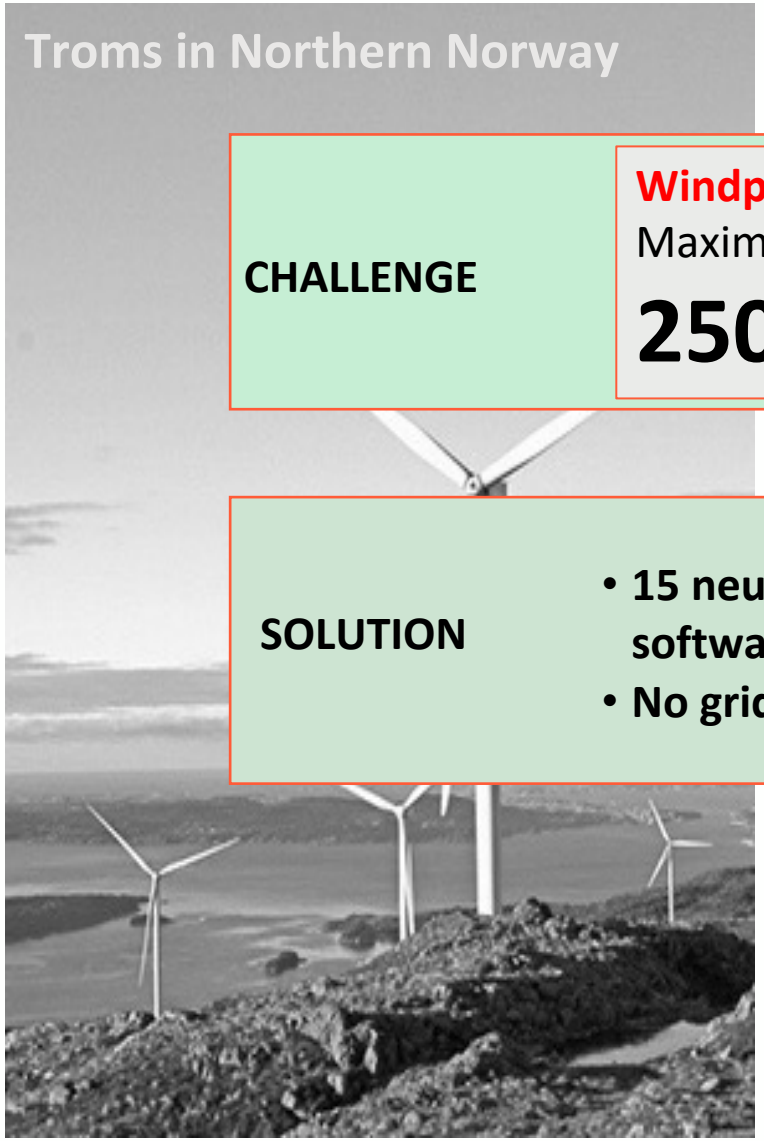
Knowing the true capacity is a game-changer



Used data from 100 sensors (Heimdall Power Neurons) in 6 countries 2019-2022

Using true capacity …

… to connect wind power



CHALLENGE

Windpark
Maximum generation
250 MW

NEED FOR GRID INVESTMENTS

Powerline
Static line rating
190 MW

SOLUTION

- **15 neurons with cloudbased software services**
- **No grid investments**

Powerline
True capacity limit
240 MW

Cost savings
20 MEUR

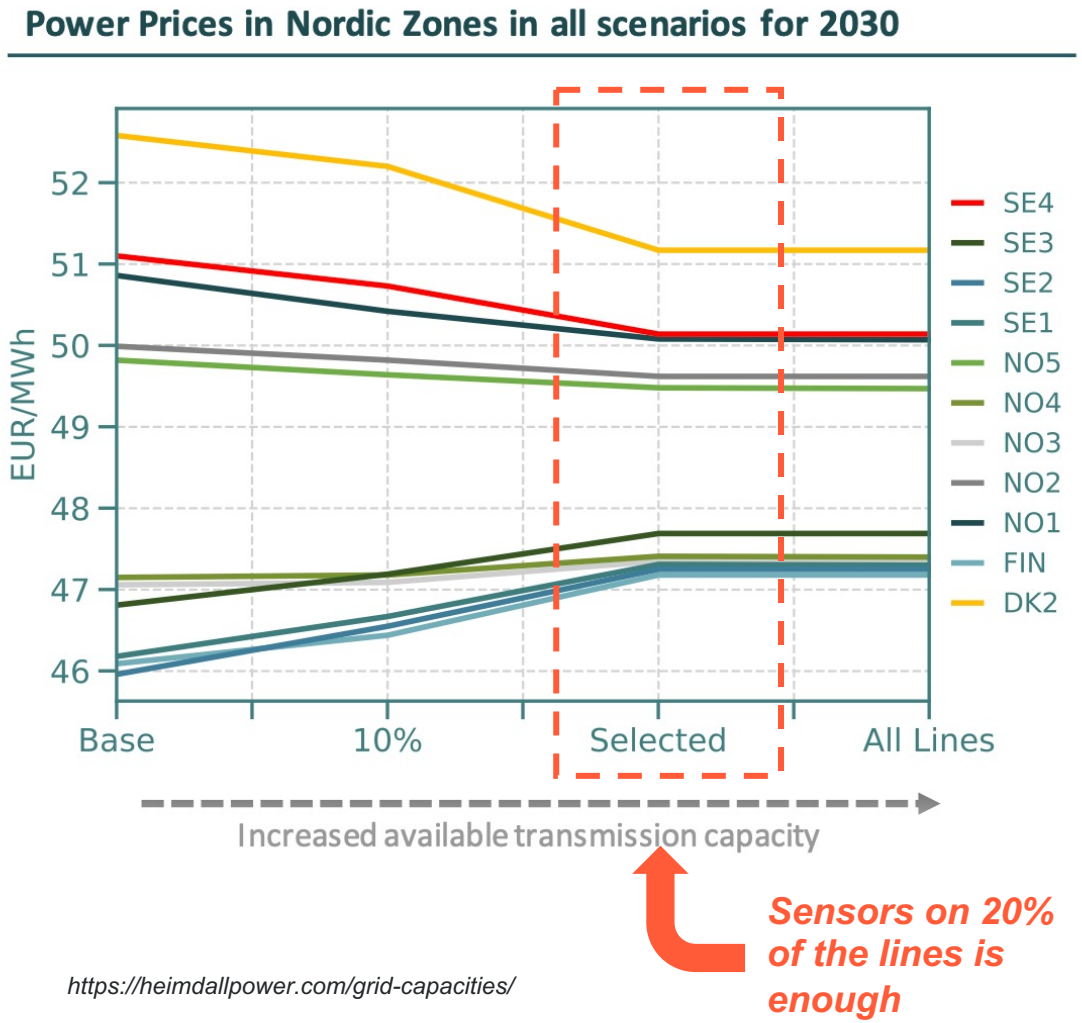
Implemented in
2 DAYS

Using true capacity …

… to connect congested areas

Nordic study:

Effects of sensors identifying 25% more grid capacity



https://heimdallpower.com/grid-capacities/

- ✓ More market integration and less price differences
- ✓ More competition and lower prices
- ✓ More renewable energy production
- ✓ More revenues to renewables
- ✓ Less carbon emissions
- ✓ Increased security of supply
- ✓ Increased social welfare
- ✓ Fast and non-controversial to implement

Other reports pointing in the same direction
- Consentec´s European report
- Brattle Group´s US report

Using true capacity …

… to take Italy to zero emissions

First sensors mounted on Italian gridlines February 10th 2022:

Enel with clear ambitions to monitor and know their gridlines

The Power of Knowing

- More efficient markets and system operations
- More knowledge-based asset management
- More knowledge-based grid investments
- More room for renewables and electrification
- To zero emissions faster


Heimdall Power
The power
of knowing
www.heimdallpower.com
7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
15 LIFE ON LAND

SPEAKER

CURRENT
Enabling Network Technology throughout Europe

ALBERTO POTOTSCHNIG

Professor and Deputy Director for the World of Practice
Florence School of Regulation

CAPACITY BUILDING FOR THE IMPLEMENTATION OF THE GREEN DEAL

Capacity Building is *more* than training courses

01 Innovative Training
We offer Online, Residential, Blended and Tailor-made training courses in all levels of knowledge: Highlights, Fundamentals and Specialised.

02 Policy Dialogue
In Florence, across Europe and beyond, and always online! The FSR promotes a wide range of opportunities for open discussion and knowledge exchange.

03 Applied Research
The school carries out robust research with the purpose of developing economically, legally, and socially-sound energy regulation and policy.

Co-funded by the Erasmus+ Programme of the European Union

EU Green Deal

FSR Community course

In **2021**, the FSR launched

a new **online course** on the **EU Green Deal**

8-week long ● *Specialised level* ● Workload: 4-8 hours/week

126 participants
from **39** countries

2nd edition in 2022 from 3 May to 23 June

The EU Green Deal | online course on EU energy and climate policy (eui.eu)

Co-funded by the Erasmus+ Programme of the European Union

Sharing knowledge around the world

Countries of origin of participants in FSR Training Courses in 2021

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Training courses at the FSR in 2021

Community Training Courses
(approx. 80-120 participants)

Course title	Dates
EU Gas Network Codes	25 February – 22 April
Regulation of the Power Sector	8 April – 17 July
Regulatory Delivery *(Special edition in Portuguese)*	12 April – 24 May
The EU Green Deal	3 May – 24 June
Regulation for Sustainable Development Goal 7	17 May – 31 October
Evolution of Electricity Markets in Europe	21 September – 18 November
Regulatory Delivery	18 October – 30 November

Class Training Courses
(approx. 25-30 participants)

Course title	Dates
Executive Course to Master Electricity Markets	1 March – 6 June
Fundamentals of Energy Regulation	20 – 29 April
Clean Molecules for the Energy Transition	14 – 25 June
Summer School on Regulation of Energy Utilities	28 June – 12 July
Summer School on Energy Systems for Young Researchers	28 September – 1 October
Annual Training on the Regulation of Energy Utilities	4 October 21 - 26 June 22

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Policy Debates

Regulatory Policy Workshops Series in 2021

The longest-running FSR event series

Date	Title
26 February	Methane Emissions from the Energy Sector and the EU Emission Trading System
12 March	The Revision of the TEN-E Regulation
26 March	Brexit and Electricity Trading: Preserving the Benefits of Efficient Electricity Trading after Brexit
18 June	A Market Framework for Hydrogen
5 November	Incentive Regulation in Network Industries
12 November	Planning and regulating energy infrastructure: a fit-for-purpose framework for the transition to 2050

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The #FSR Series

(Since September 2020)

	N .of events	Total partic.	Aver. partic.
FSR Debates	19	2116	111
FSR Insights	9	758	84
FSR Talks	8	535	67
All #FSR Series events	36	3409	95

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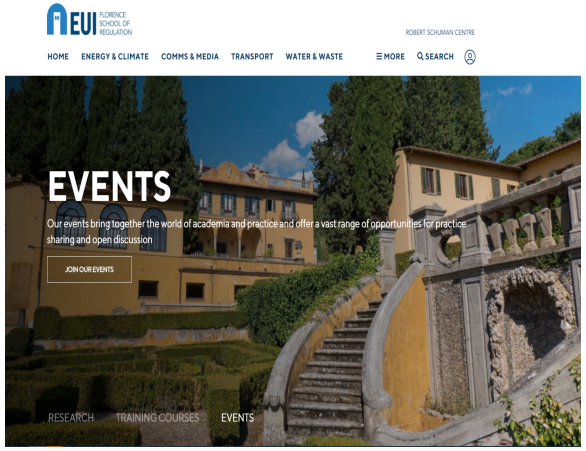
How to stay tuned with the FSR?



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Cybersecurity, Digitalisation, and the Electricity Grid in Europe

How Dynamic Line Ratings Optimise the Grid

The Role that Direct Current (DC) Grids Can Play

Optimised Power Grids for a Clean and Green Future

Massive Renewables Uptake through enhanced grids: A transatlantic perspective

Working Group for Optimising Power Grids: Aligning Incentive Regulation with Public Interest

Accelerating the Energy Transition: Moving towards a Coordinated Approach – TEN-E and European Grid Infrastructure

Spain’s Power Network towards a Zero Emissions future: The Role of the Grid and Innovative Technologies

The Benefits of Innovative Grid Technologies: Make Europe Fit for 55