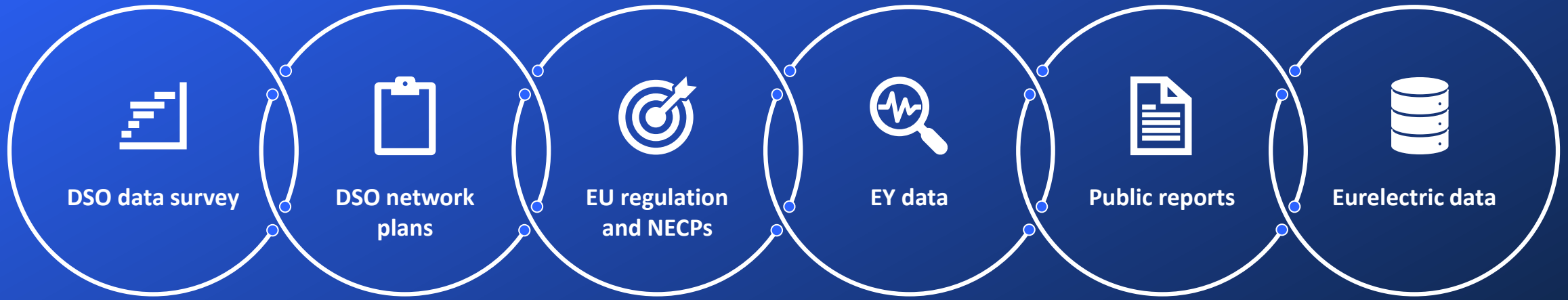
GRIDS

FOR SPEED

Zsuzsa Csekő
Senior Advisor of Eurelectric 25
November 2024

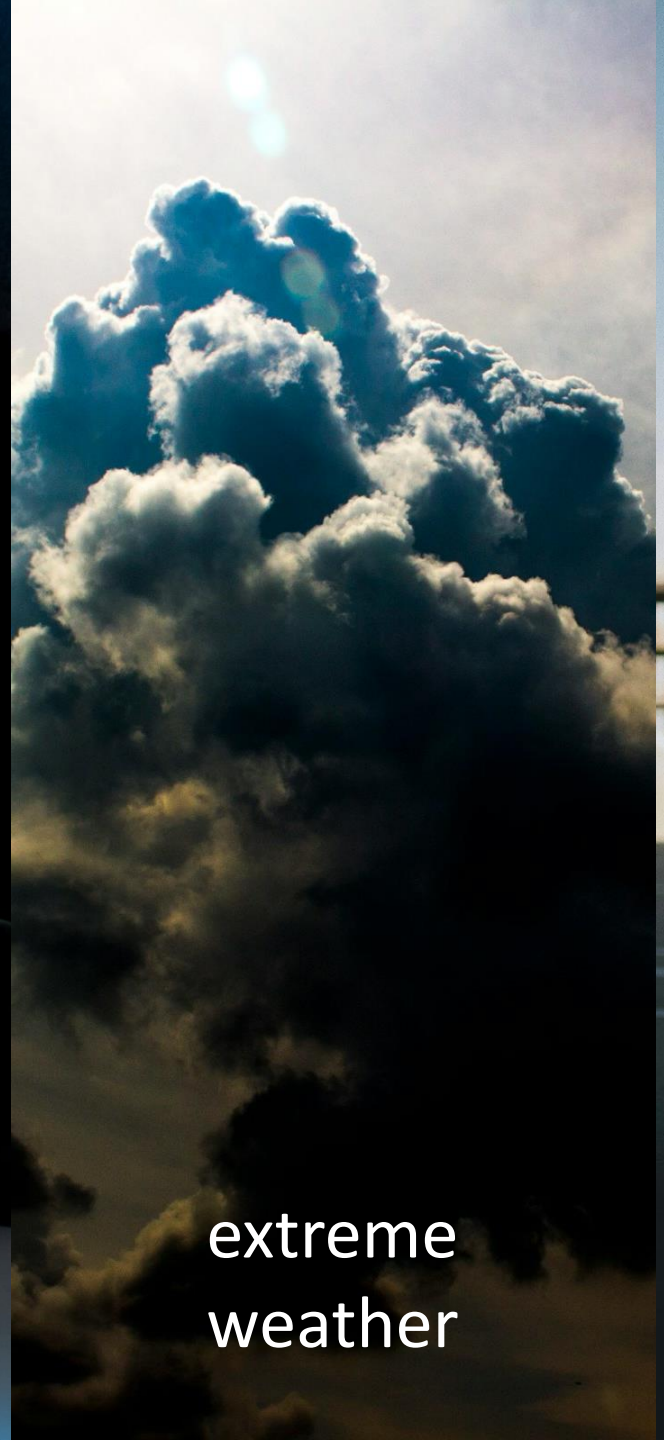
Robust and comprehensive data sources and network modelling underpin GFS



The survey data covers more than **60% of DSO connections in the EU27+Norway,** representing 21 countries out of which 10 countries cover more than 80% of network customers within Europe.

For modelling, ICL created representative grids for rural, semi-rural, semi-urban and urban grid types calibrated with statistical data, and then modelled the different investment scenarios.


cyber
attacks


extreme
weather

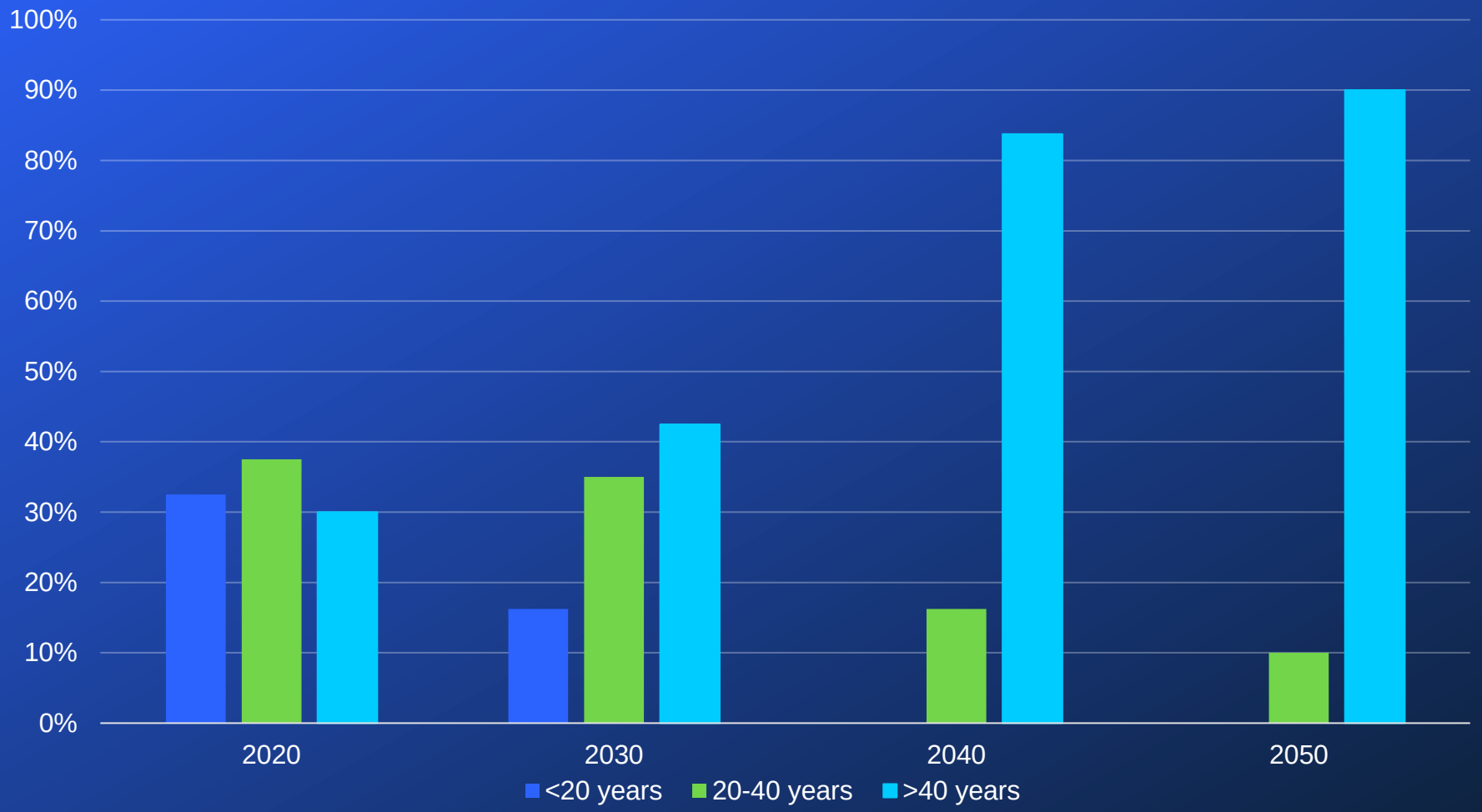

customer
expectations


ageing
grids

30% of today’s grid is more than 40 years old

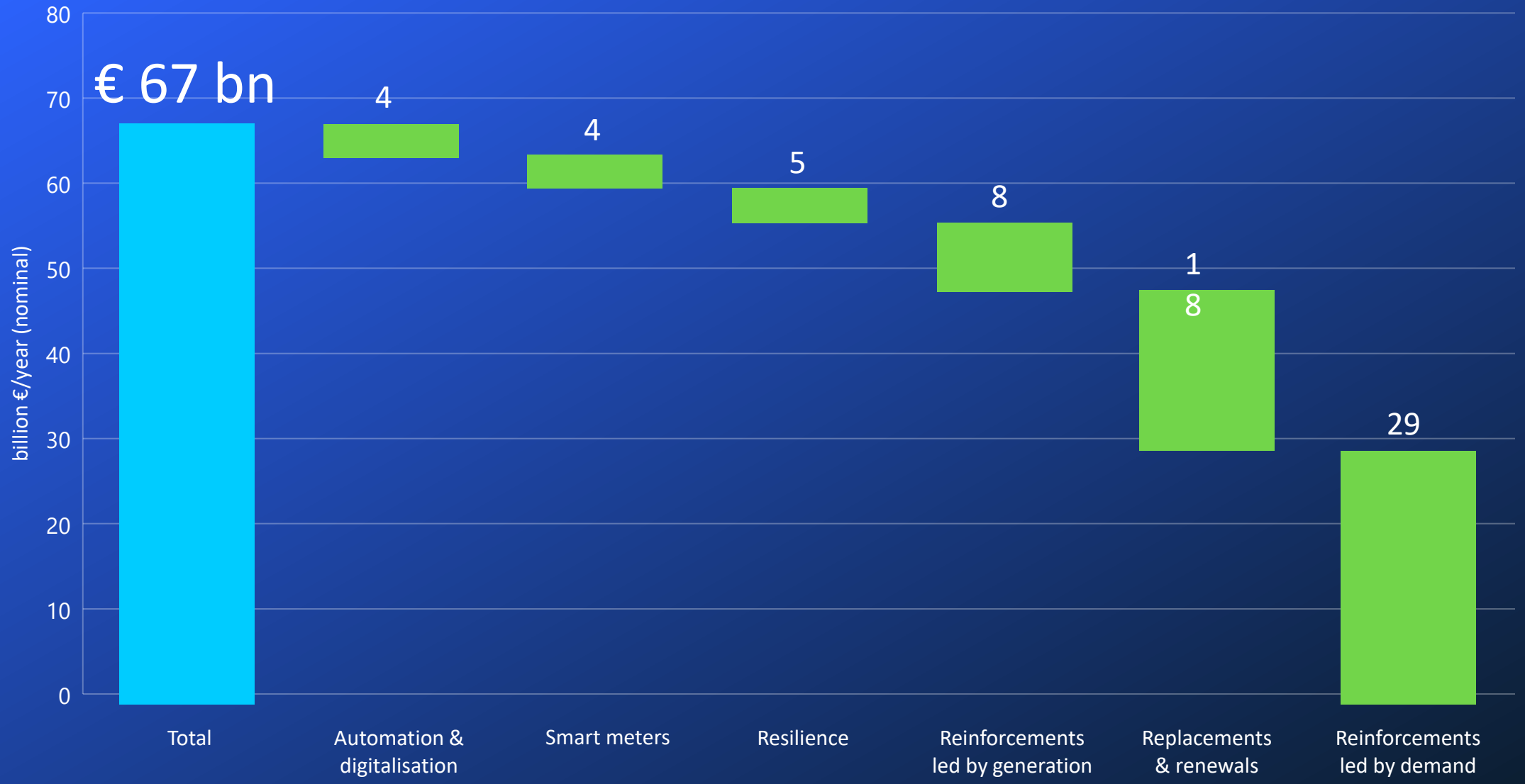
Age of grid infrastructure (LV power lines)

Progressive asset ageing if none of the infrastructure is replaced after 2020 in the EU27+Norway



How much DSO investment is needed to deliver RePower EU?

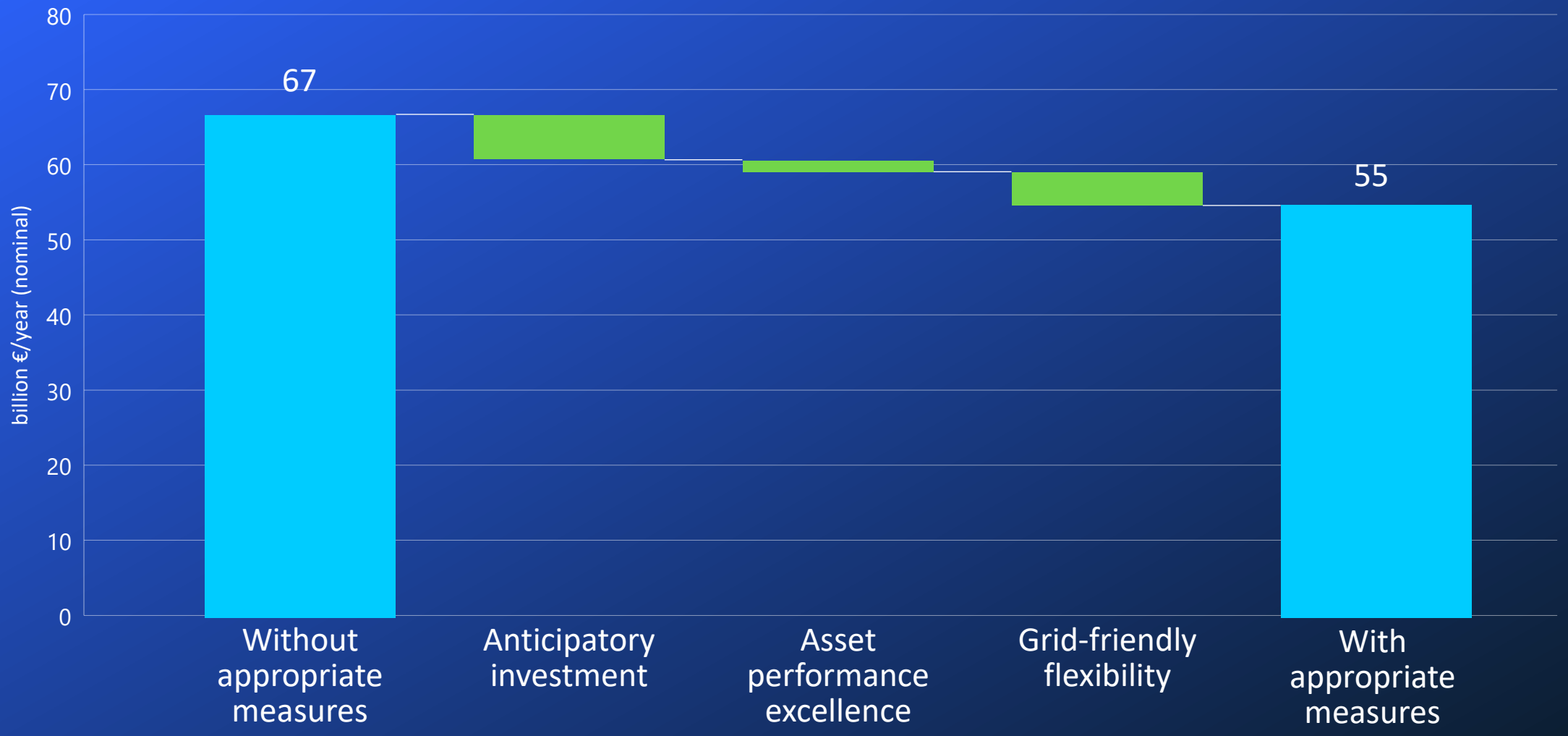
Annual investments need to double



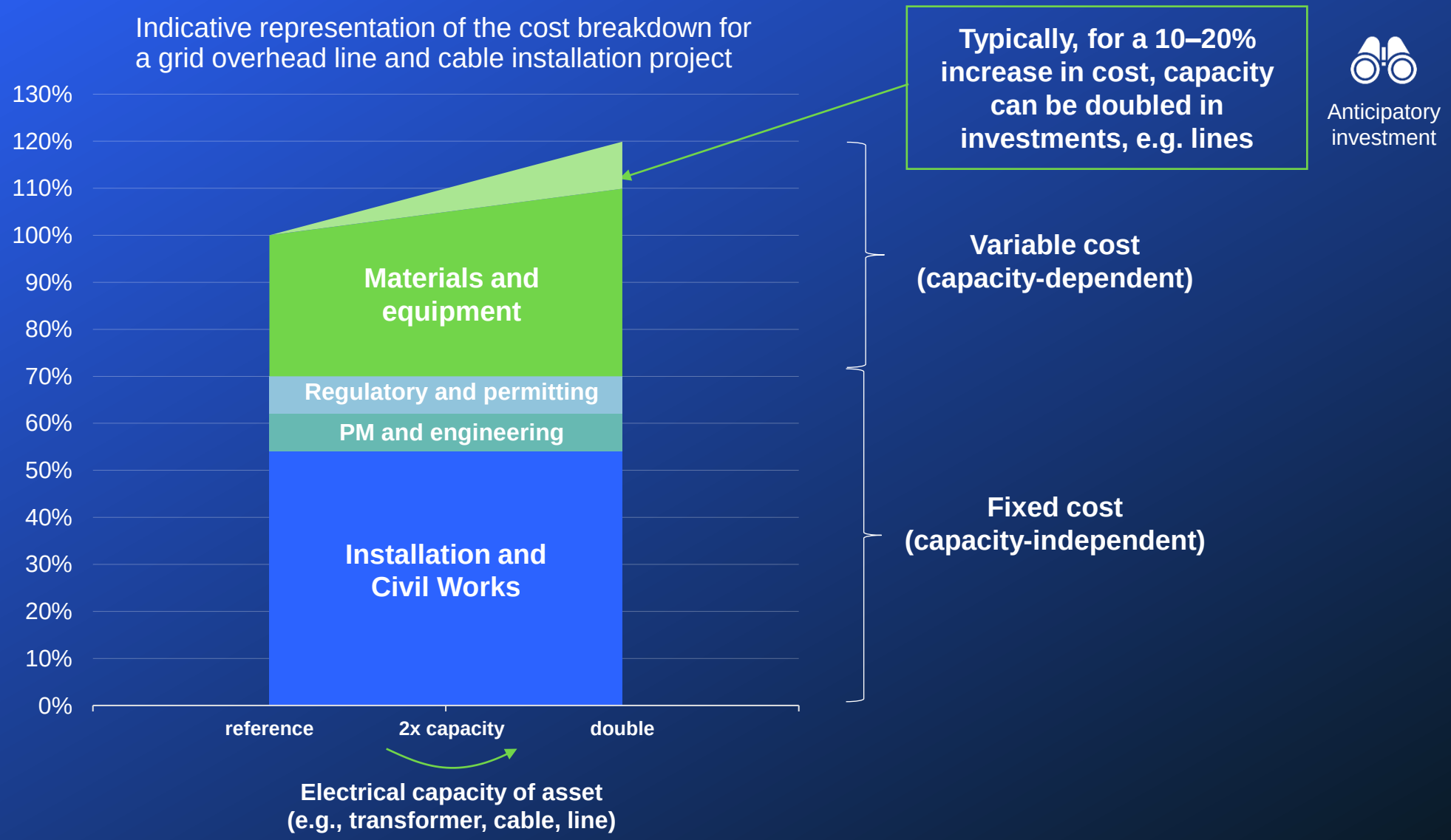
How can we lower this cost?

We can lower this cost by invesment strategies and technologies

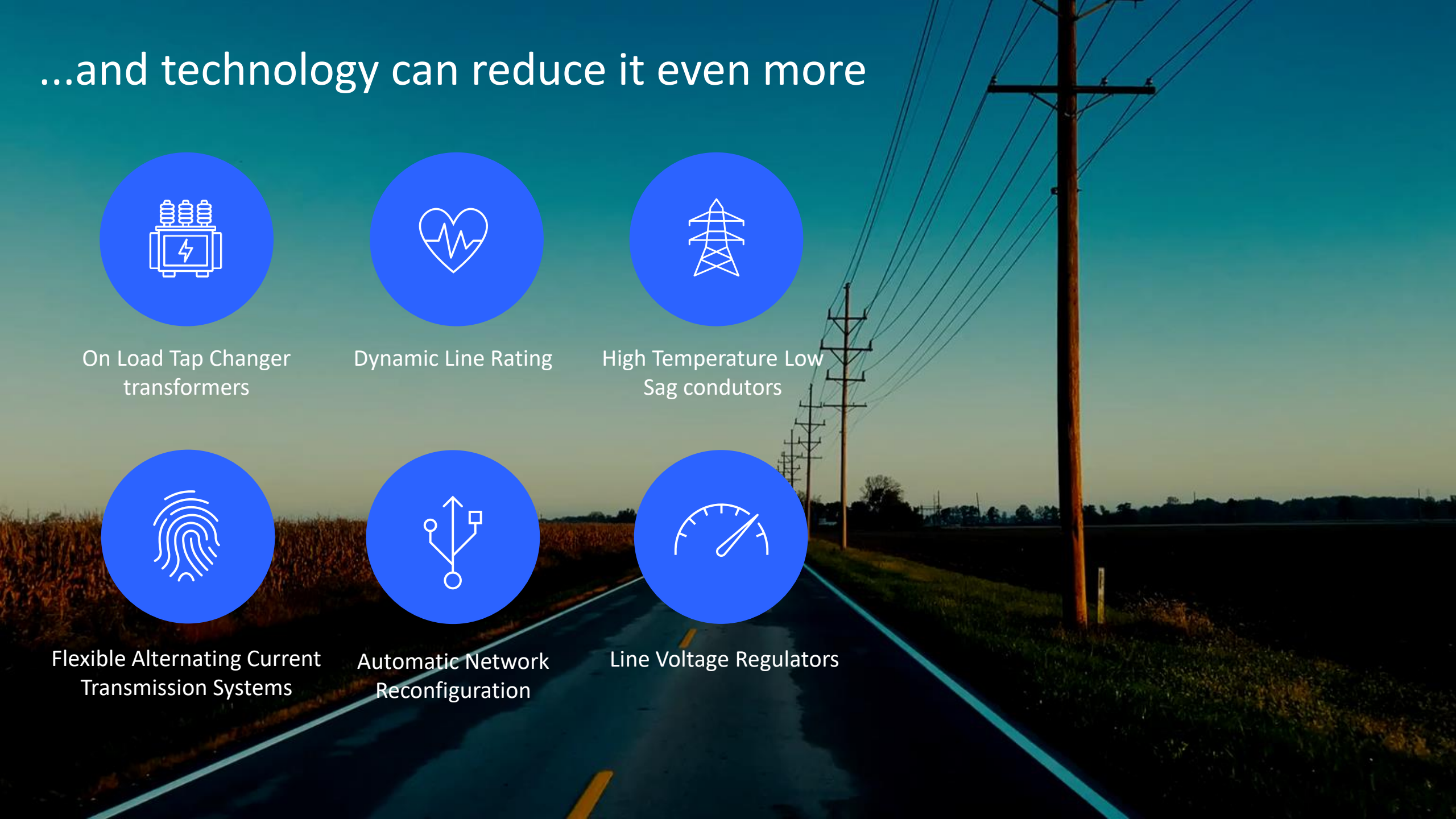
Grids for Speed investment strategy



Economics supports anticipatory investment in distribution grids



...and technology can reduce it even more



On Load Tap Changer transformers

Dynamic Line Rating

High Temperature Low Sag condutors

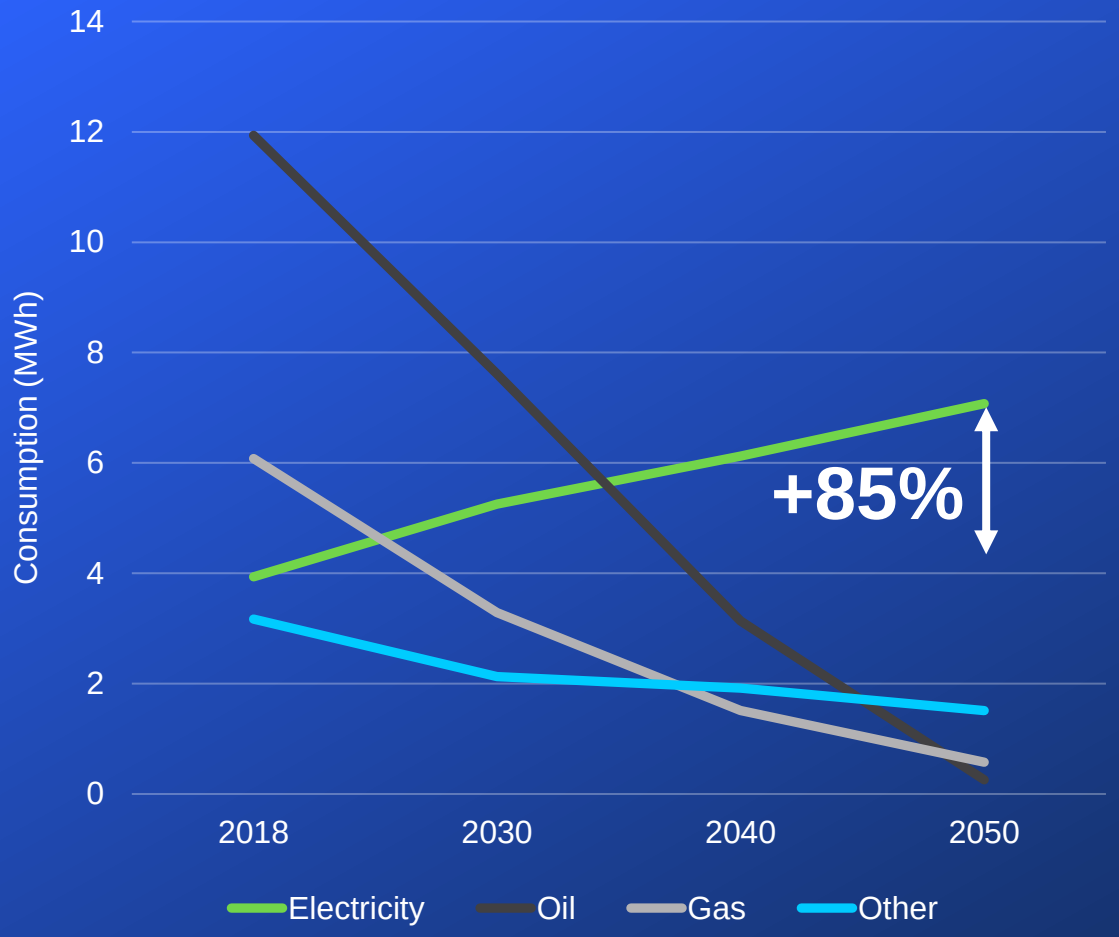
Flexible Alternating Current Transmission Systems

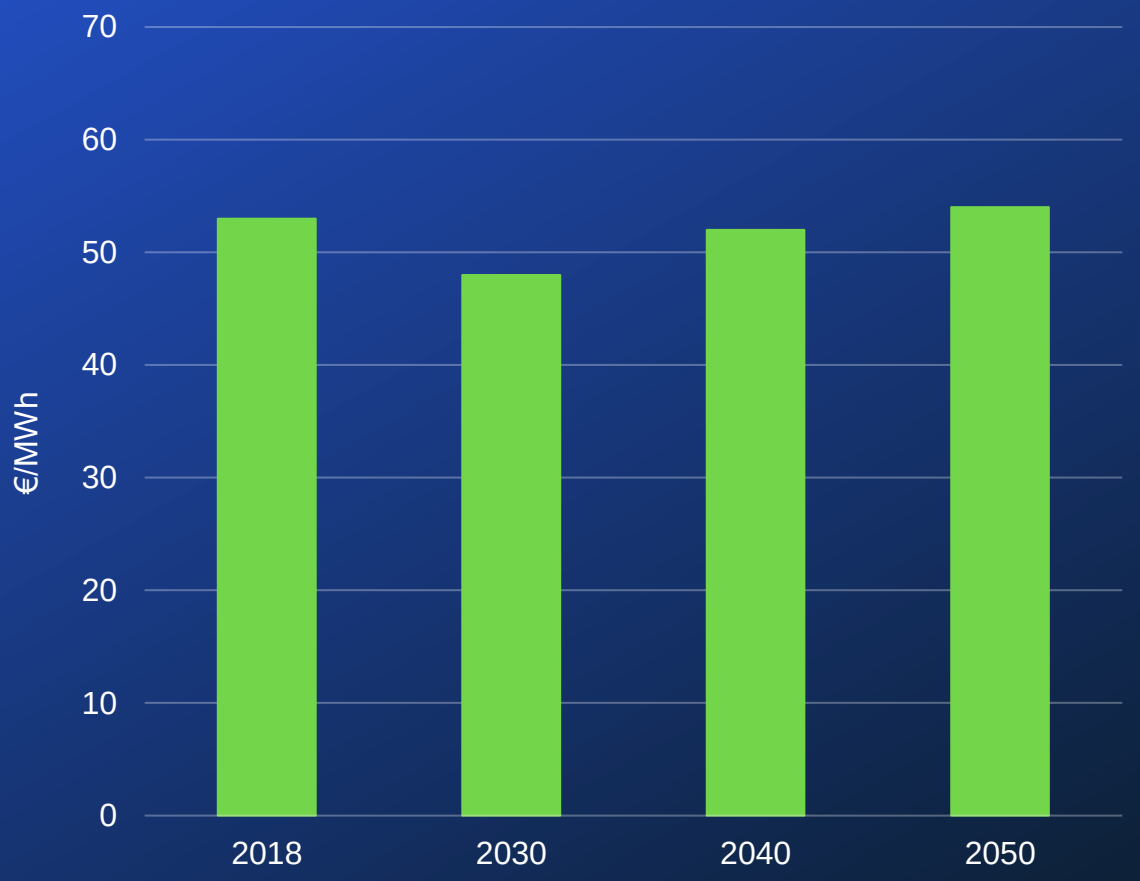
Automatic Network Reconfiguration

Line Voltage Regulators

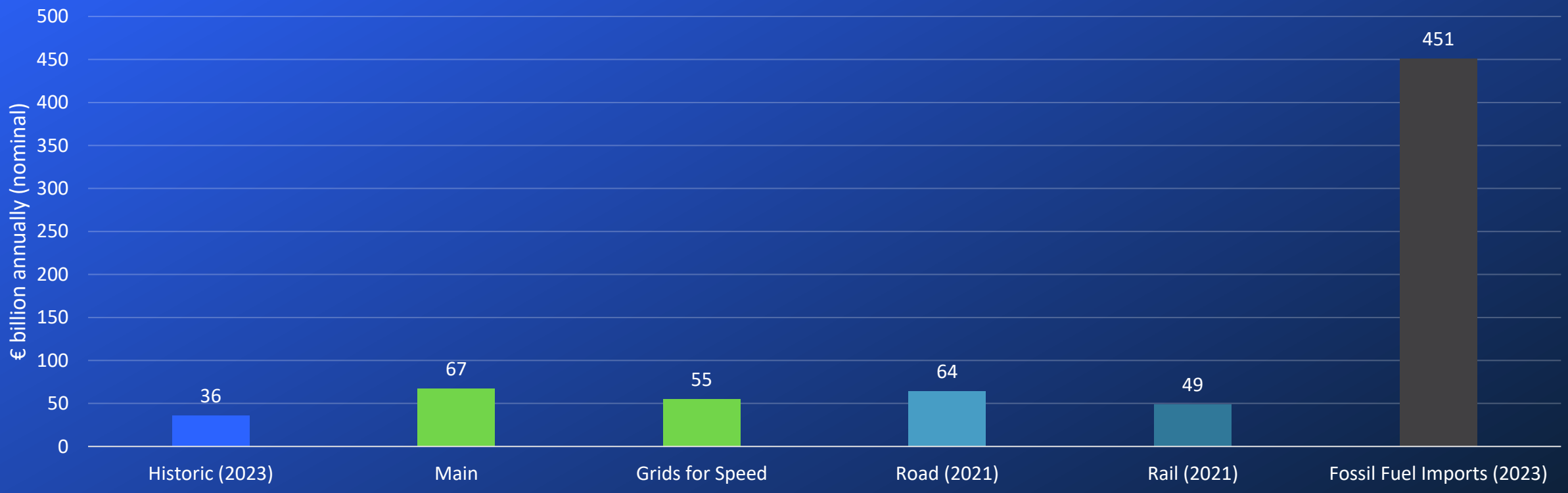
A net-zero distribution grid hinges on the supply chain's capability to scale

No major impact on distribution prices if we electrify



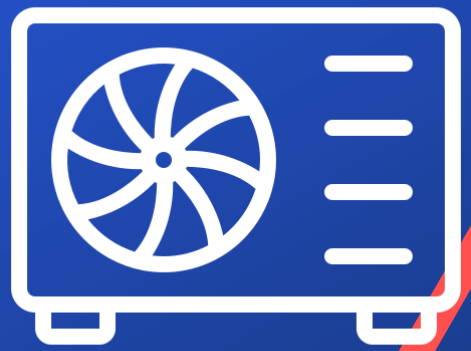


A net-zero can be delivered with a spend similar to that of road and rail infrastructure, the fossil import bill is 9x higher



Inaction puts the electric future in jeopardy

Heat pumps



63 M

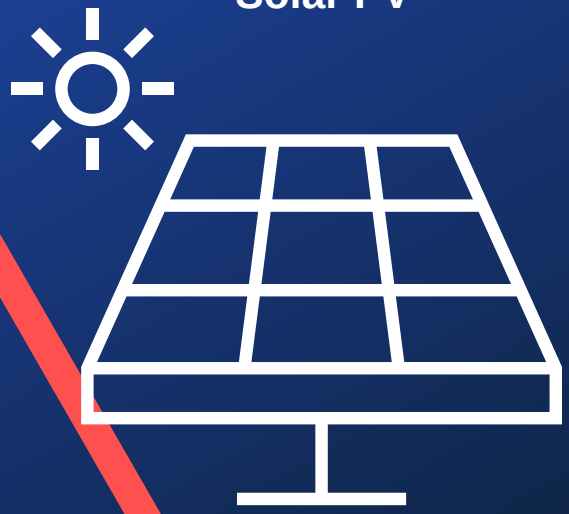
Not connected by 2050

EV

73 M

Not connected by 2050

Solar PV



371 GW

Not connected by 2050

Increased planning uncertainty and grid stability services for island electricity grids

The insularity and weak interconnectivity of island electricity grids present unique challenges that necessitate distinct regulatory and financial approaches to their energy transition.

Higher planning uncertainty

- In island grids, electricity demand fluctuates more significantly across seasons as islands are often popular leisure and tourism destinations with heightened activity in a limited period (e.g., during the high season).
- Additionally, the actual number of grid users is generally much higher than the number of customers due to factors such as day visitors or large customer loads with a high number of users (e.g., hotel complexes).
- Consequently, planning uncertainty and risk are elevated, which is reflected in financial performance and should therefore be taken into account in regulatory considerations.

Need for grid stability services

- Island grids required enhanced grid management to ensure secure and stable electricity supply compared to highly interconnected regions.
- Grid inertia and rapid fault current (also called, short circuit level) are necessary to maintain power system stability. However, synchronous generators, which traditionally provide these services, are replaced by an increasing numbers of asynchronous renewable generation sources.
- Thus, additional investments in grid stability management and technology (e.g., batteries, flywheels, synchronous condensers) will be essential for island grids. Our Eurelectric Action Plan on Grids could help address this challenge.

Wired for a competitive Europe

Competitive regulatory returns and anticipatory investments

- Remove investment caps and upsize grids via anticipatory investments
- Ensure competitive returns for grids. Recognise investments in tariffs regularly
- Apply regulatory incentives for the uptake of optimising technologies.
- Regulation to cover demand seasonality in islands and grid stability investments

Easy access funds for DSOs

- Unlock additional capital targeted for DSO network buildout to deliver RePower EU
- Support resiliency and grid stability besides smart grids

Increased planning uncertainty and grid stability

- Tackle increased planning uncertainty in regulation
- Additional investments in grid stability management and technology in islands
- Need for grid stability tools to support clean energy transition, espacially in islands

Streamline processes, smooth supply chains

- TEN-E regulation permitting work well for TSOs, to be tailor-made for DSOs.
- Ease permitting (e.g. right-of-way) in existing and future DSO corridors.
- Streamline and cap maximum time of public procurements.
- Secure access to critical materials and network assets, reduce delivery times.

Ensure skilled workforce

- Ensure skilled workforce
- Promote the electricity industry in secondary and higher education
- Establish EU wide vocational certificates among Member States to ensure the acknowledgement of certificates of skilled workforce.

Thank you for your attention!

#Grids4Speed

Eurelectric

The Union of the Electricity Industry