

A wide-angle aerial photograph of a large-scale renewable energy facility. In the foreground and middle ground, numerous blue solar panels are arranged in long, narrow rows. In the background, several white wind turbines stand tall against a clear blue sky. The facility is situated in a flat, open landscape with some green vegetation and a few small buildings or structures. The overall scene represents a significant investment in clean, sustainable energy.

OUTLOOK

OF SYSTEM NEEDS AND FUTURE TRANSFORMATION

Ditlev Engel
CEO, DNV GL - Energy

Grids meet Renewables
Conference and Best Practice Fair
20 February
The Egg, Bara Street 175, 1070 Brussels

Wind*
EUROPE
Renewables Grid Initiative

Our vision: global impact for a safe and sustainable future

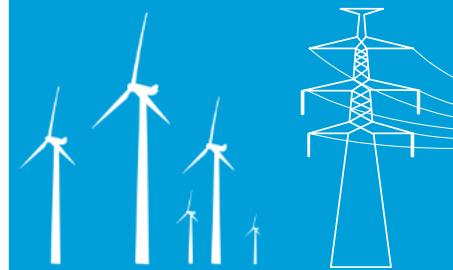
MARITIME



OIL & GAS



ENERGY



BUSINESS
ASSURANCE



DIGITAL
SOLUTIONS



TECHNOLOGY & RESEARCH



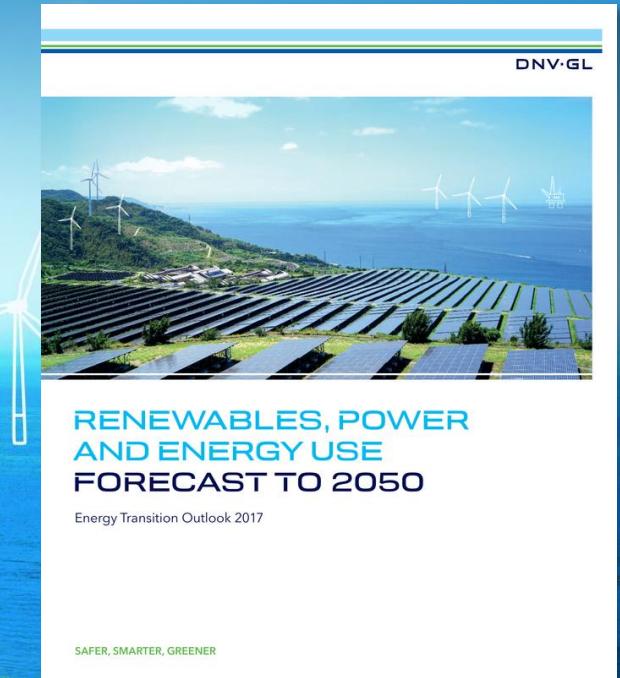
Taking a broader view – enabling safer, smarter and greener performance



- We **classify, certify, verify and test** against regulatory requirements, standards and recommended practices
- We develop new **rules, standards and recommended practices**
- We **qualify new technologies** and operational concepts
- We give **expert advice** on safety, technology, data management, efficiency, performance, risk management

ENERGY TRANSITION OUTLOOK 2017

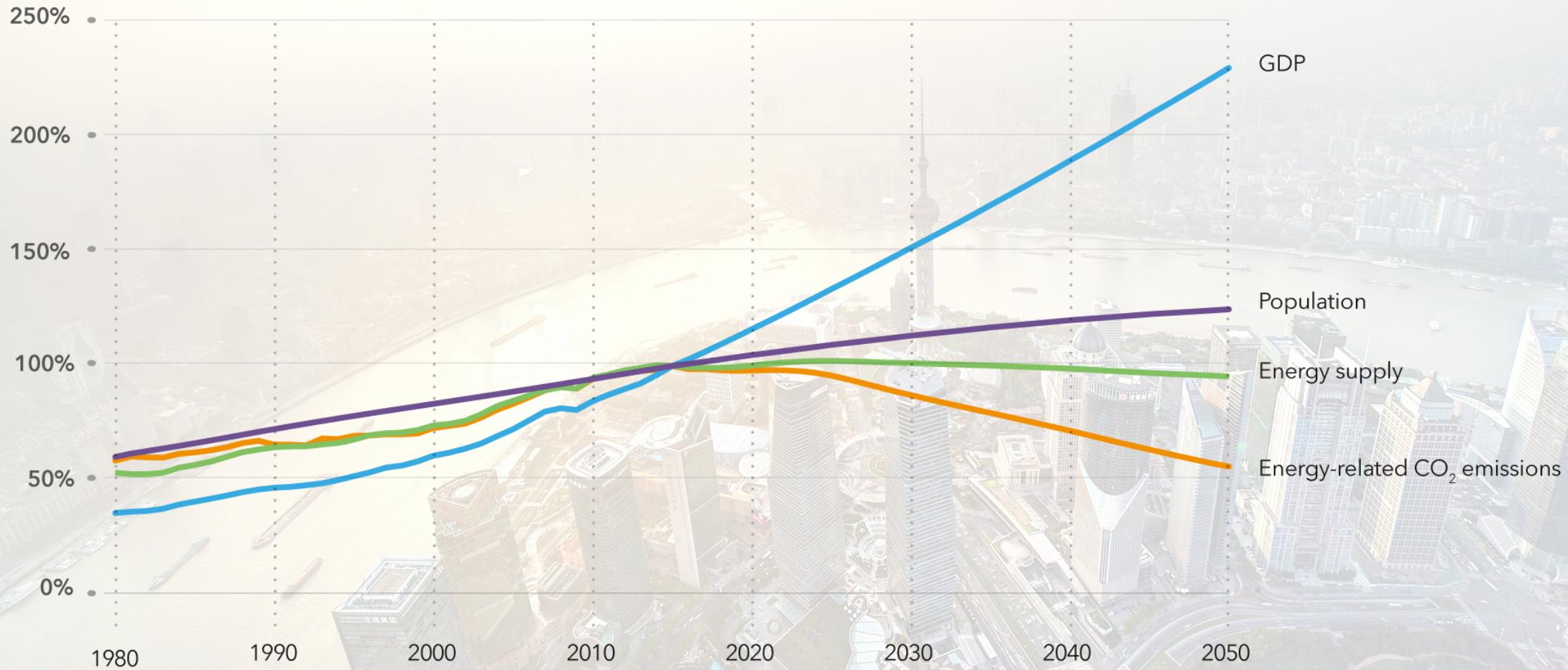
**INSIGHTS AND IMPACT
FOR THE EUROPEAN ENERGY SECTOR**



E > GDP

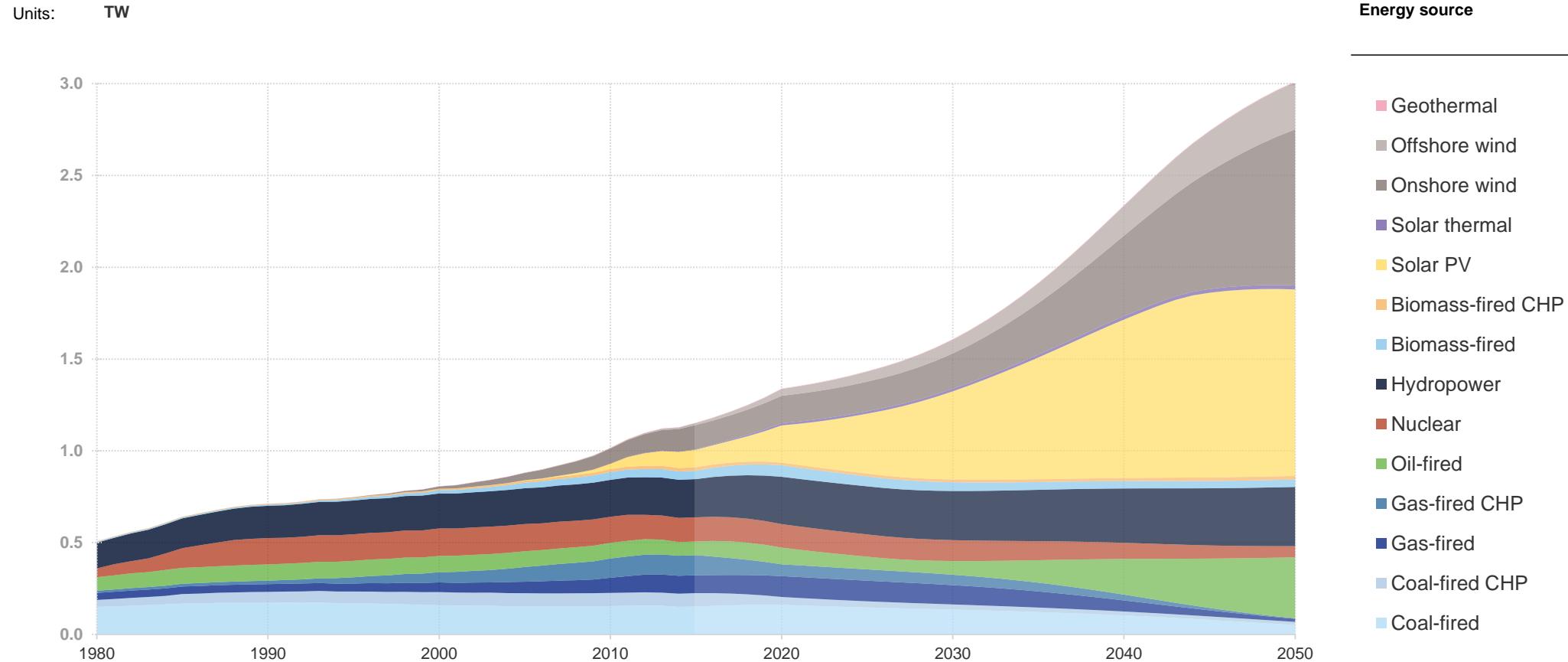
Economic growth vs. energy efficiency growth

Units: Percentage of 2015 level

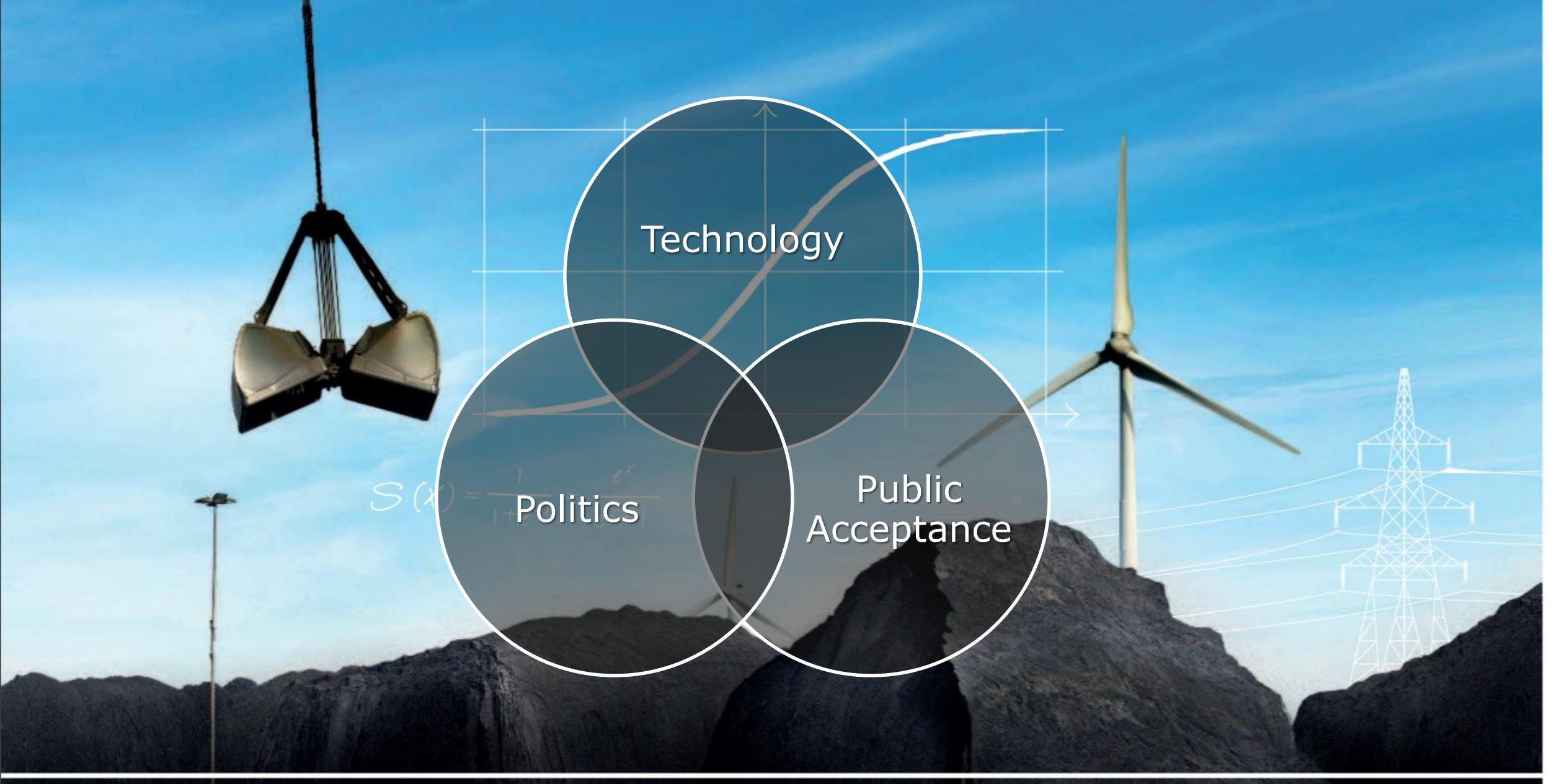


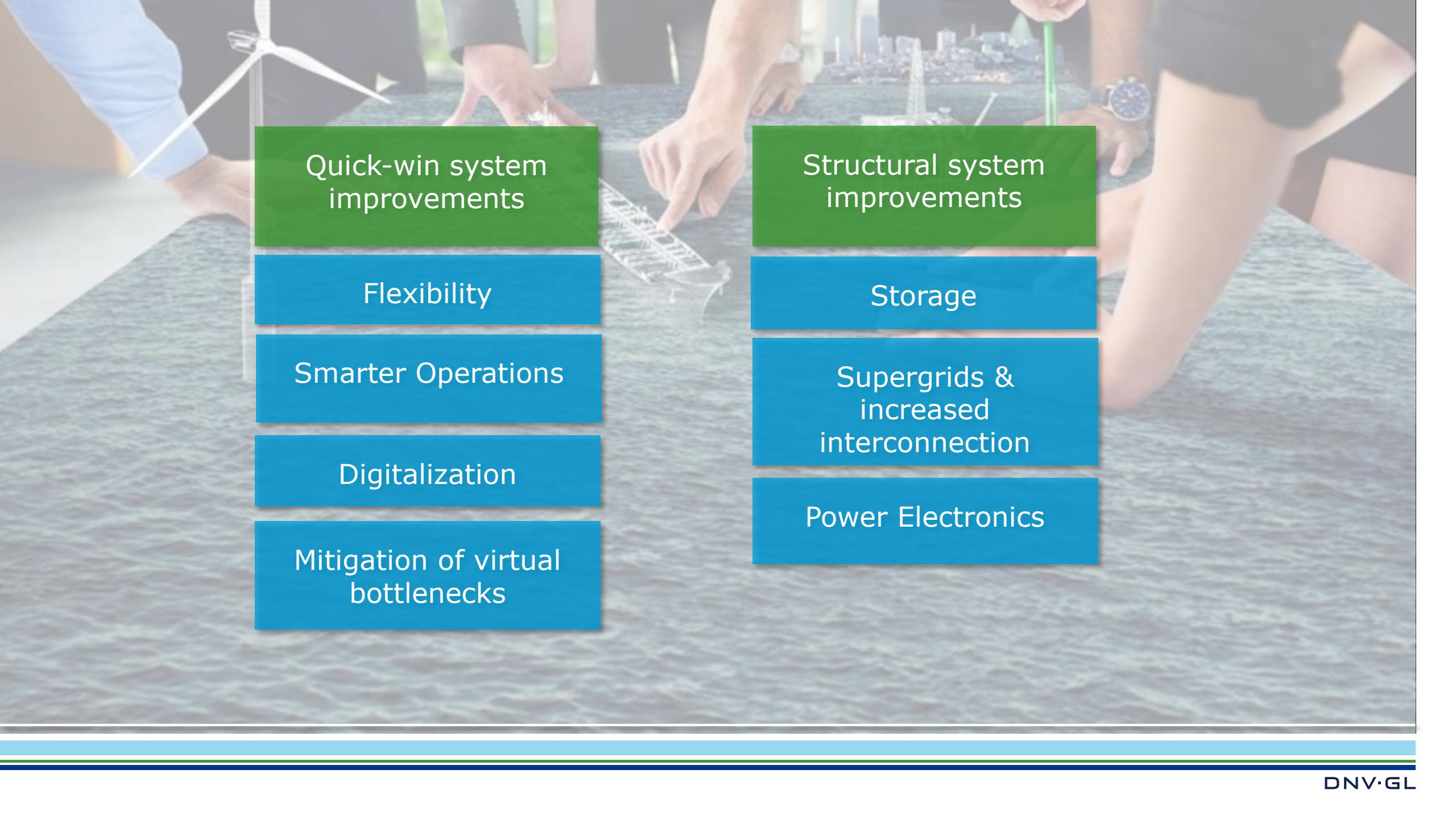
ETO shows accelerating growth rate in RES for EUR

EUR ELECTRICITY CAPACITY BY ENERGY SOURCE



“CAN THE EUROPEAN GRID CAPACITY
KEEP UP WITH THE ACCELERATING
GROWTH RATE IN RENEWABLE ENERGY
SOURCES?”





Quick-win system improvements

Structural system improvements

Flexibility

Storage

Smarter Operations

Supergrids &
increased
interconnection

Digitalization

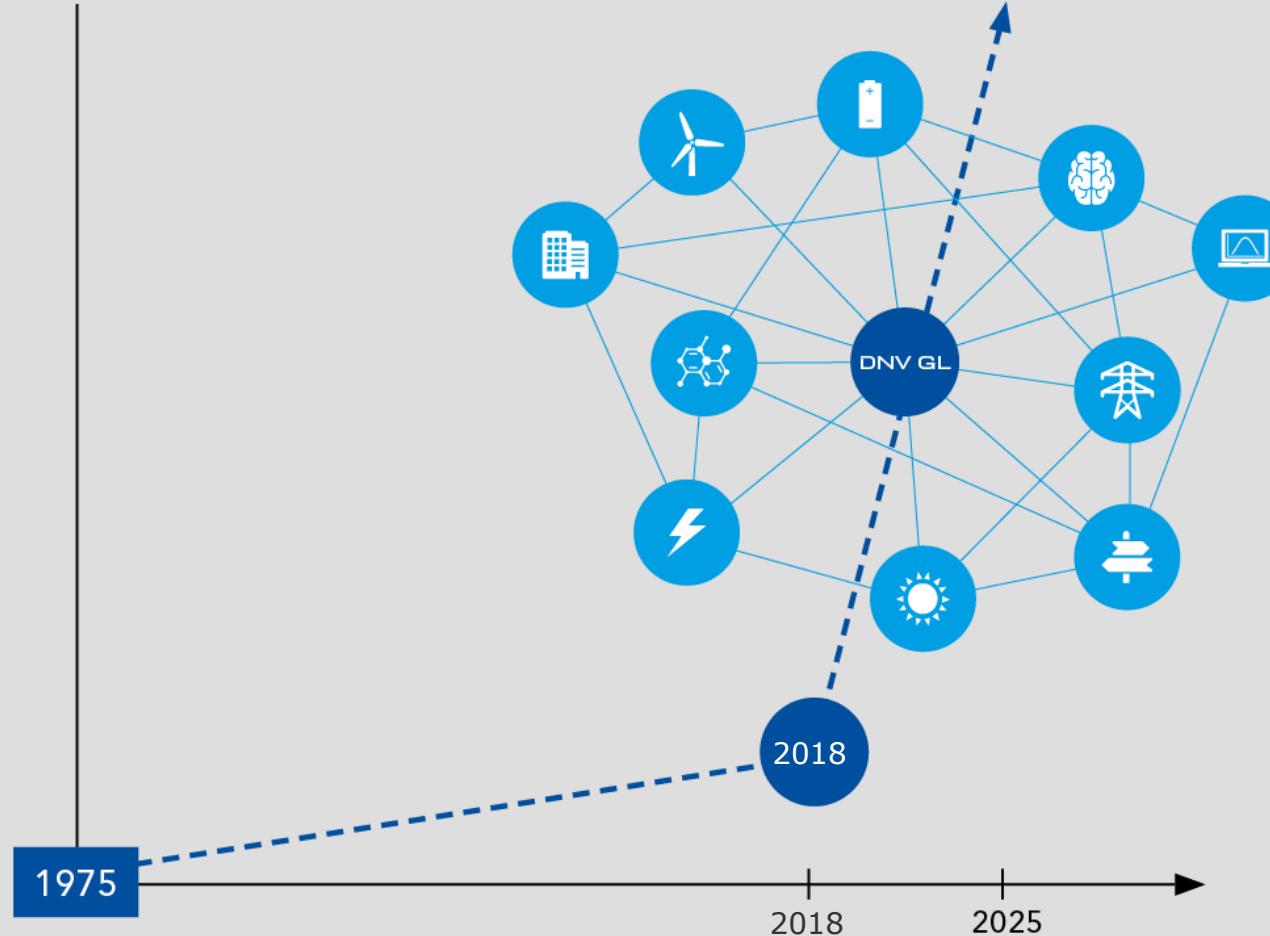
Power Electronics

Mitigation of virtual
bottlenecks

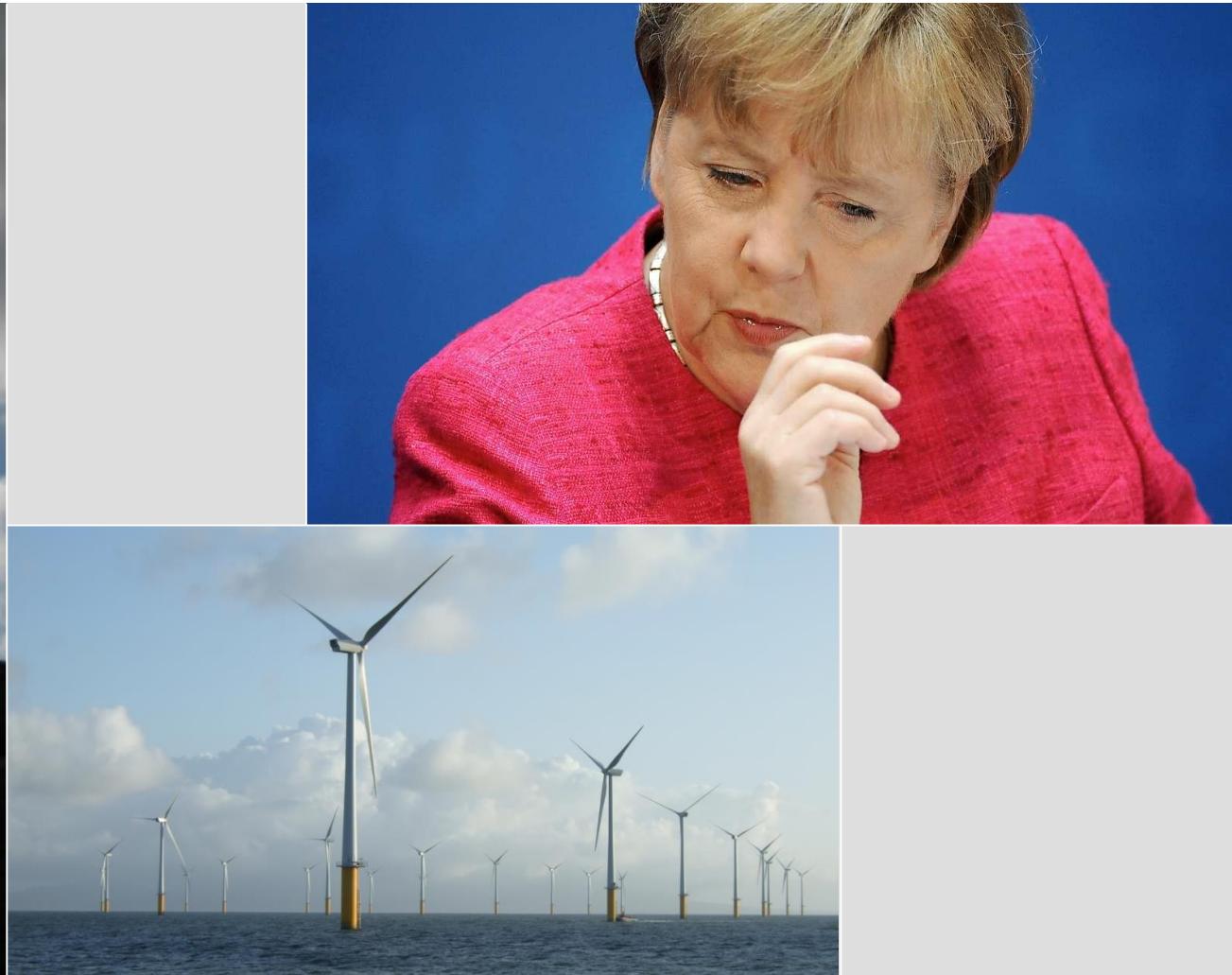
Technology

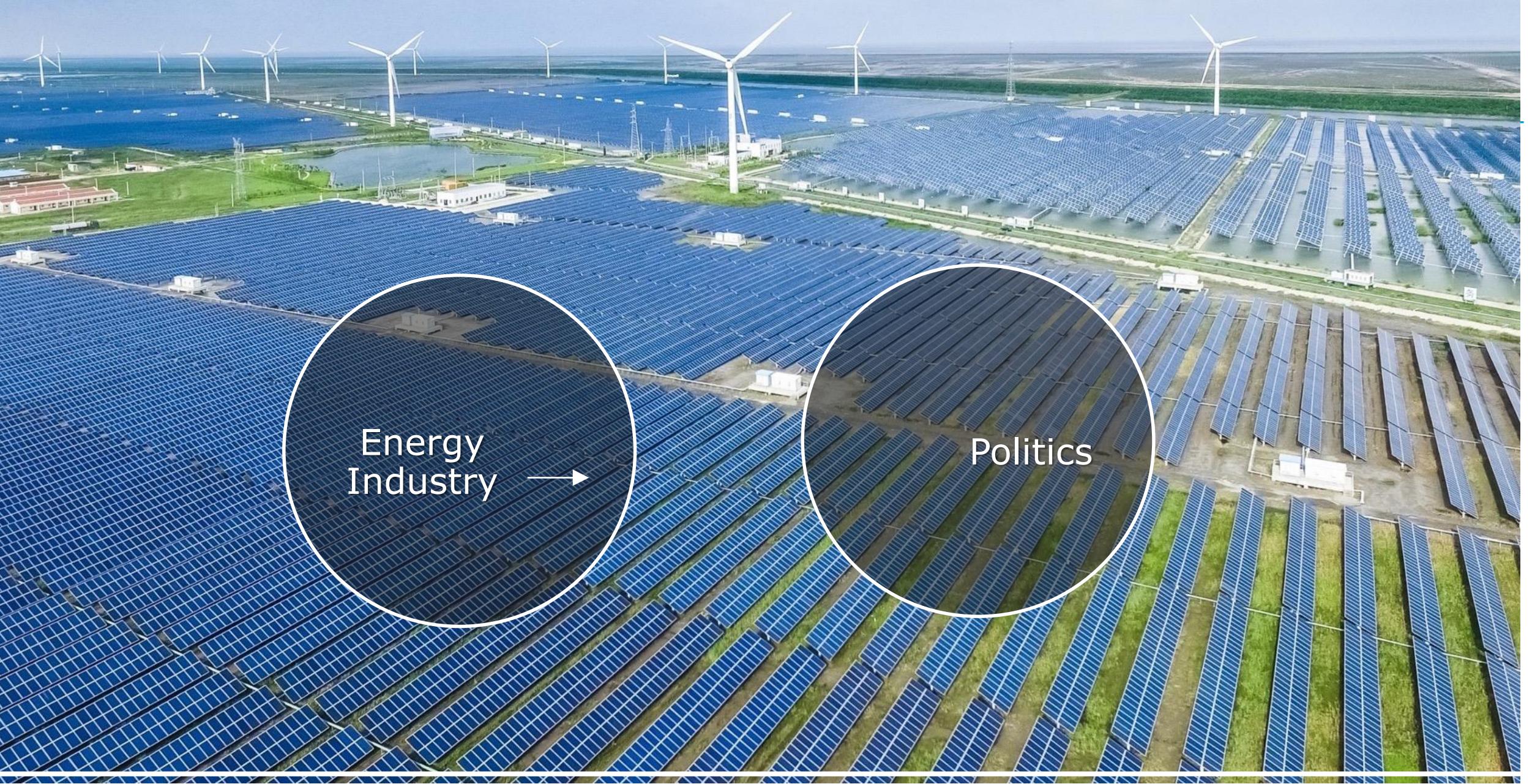
Adoption of new technologies

New power reality



Public acceptance





Energy
Industry

Politics

Wrap up

**SYSTEM
IMPROVEMENTS**



ACT



COLLABORATION

