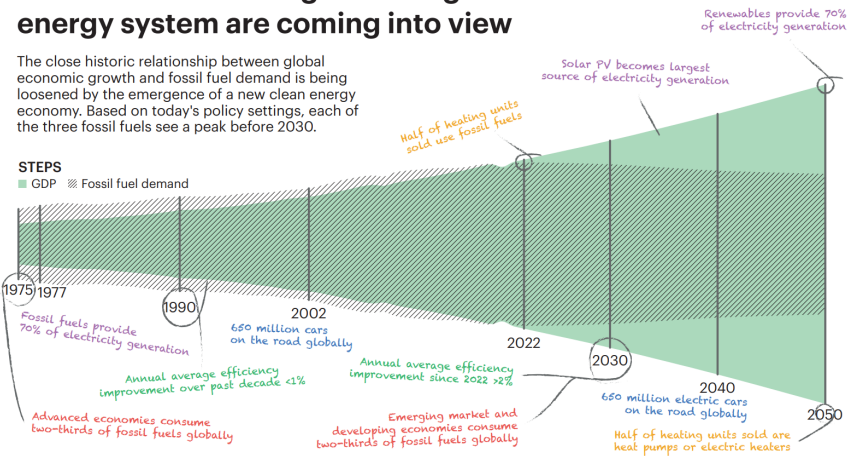

DTU

Industrial IoT for Digitization of Electronis Assets

Agenda

Transformative changes of the global energy system are coming into view

The close historic relationship between global economic growth and fossil fuel demand is being loosened by the emergence of a new clean energy economy. Based on today's policy settings, each of the three fossil fuels see a peak before 2030.



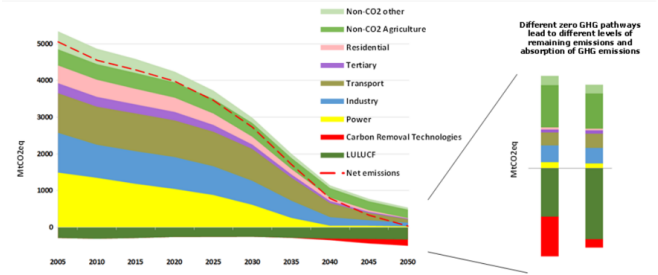
[0]World Energy Outlook 2023, iea

The Green Transition and European Targets

Europe has set the goal of reducing 40% of Greenhouse Gas emissions by 2030 and the 80-95% by 2050, to reach the target of maintaining global atmospheric warming below the 2℃. To accomplish this target, massive investment in renewables is on the way:

Key Goals:

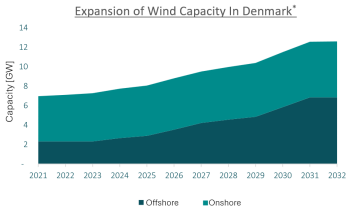
- 45% of Renewables by 2030
- **600 GW** of Solar Capacity
- **450 GW** of Wind Capacity

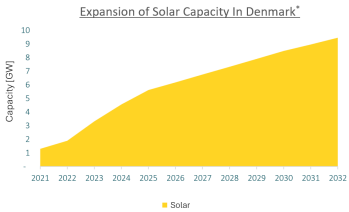


[0]European policies on climate and energy towards 2020, 2030 and 2050

Future Projections In Denmark

Word leading country in wind energy with more than 44% of the energy production from renewable sources. Carbon Neutral by 2030, with Offshore and Onshore Wind up to 13 GW and Solar up to then 10 GW.





[0]Energinet. (2022). SCENARIERAPPORT 2022 – 2032: Forventninger til fremtidens Systemydelser. Energinet

Main Challenges of energy sistem based on Renewables

Past and Future Challenges

- Higher chance of frequency events.
- Higer capacity of Ancillary Services.
- Tailored control strategies.
- Reduce the curtailment of energy production with BESS.

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- Exploit flexibility of variable loads (*fans, drives, compressors*).
- Aggregate multiple presumers.
- Data-driven modeling solutions.
- Bosting digitalization of old assests.

Digital Twins:

A core technology to boost the Digitalization

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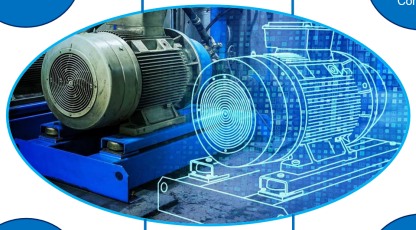
IoT sensors enable the real-time data transmission, which is used to create a digital duplicate of the real asset.

IoT

Modelling & Control

Data-driven modelling and tailored control strategies to enhance energy efficiency operation and provide grid support.



Cloud architecture allows access to the stored data from any location and enables to external computational capabilities

Cloud

AI

As Advanced analytical tool, AI analyze the data, offering real-time inference and condition monitoring.