Achieving net zero electricity sectors in G7 members

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The G7 can drive action towards net zero emissions

The G7 has an opportunity to be a driving force to accelerate clean energy transitions, making domestic gains and catalysing global action by advancing technologies and accelerating cost reductions.
G7 members start from different places

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G7 electricity emissions have been falling, mainly due to the switch from coal to natural gas and rising renewables, though the pace of reductions needs to accelerate to reach net zero by 2035.
Electricity demand returns to growth on a path to net zero, raising the share in final consumption to 56% by 2050, driven by electrification of transport & industry and hydrogen production, moderated by energy efficiency.
The electricity mix is re-imagined for net zero electricity

Unabated fossil fuels fall from half of electricity supply while wind and solar PV rise from 14% in 2020 to 66% in 2050, re-shaping the nature of electricity supply and system operations.
New challenges emerge for electricity security

G7 phases of integration in the Net Zero Emissions by 2050 Scenario

Phase 6  Wind & solar PV lead to excess or deficit over months and seasons
Phase 5  Frequent periods of wind & solar PV exceeding demand
Phase 4  Require advanced technologies
Phase 3  Flexibility investment in all measures
Phase 2  Draw on existing flexibility
Phase 1  System integration not a relevant issue

2020 wind and solar PV share:
- Germany 29%
- United Kingdom 29%
- European Union 20%
- Italy 15%
- United States 11%
- Japan 9%
- France 8%
- Canada 6%

G7 members have pushed forward on wind and solar PV, moving through the early phases of renewables integration, soon they move into new territory, tripling flexibility needs by 2050 & calling for new approaches to meet challenges.
Innovation is essential to reaching a global net zero electricity

Innovation delivers about 30% of G7 electricity sector emissions reductions in the NZE to 2050 by bringing additional technologies to market. The G7 taking the lead on international cooperation is a key to accelerating innovation.

G7 CO$_2$ reductions by technology maturity in 2050

- Market uptake: 58%
- Demonstration and prototype: 28%
- Mature: 14%

2.7 Gt CO$_2$
Investing in a clean transition boosts employment and affordability

- Tripling of electricity sector investment by 2030 adds 2.1 million jobs in the electricity sector, and clean electrification paired with energy efficiency makes energy more affordable for consumers.
The G7 can achieve net zero electricity by 2035

Key milestones include no new unabated coal plants approved post 2021, wind and solar PV capacity additions reaching 230 GW by 2030, and average efficiency of key product sales doubling by 2030.