



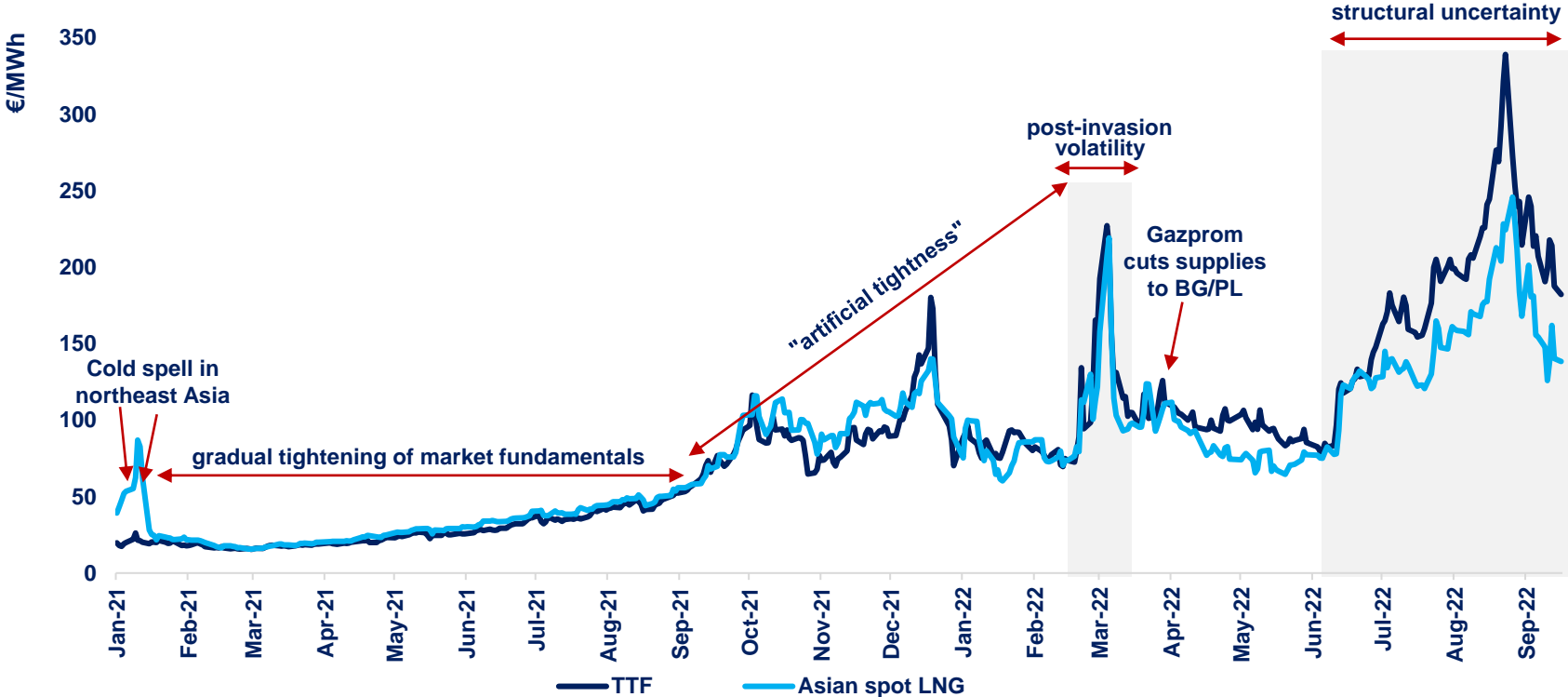
The Future of Energy

Araceli Fernandez, Head of Technology Innovation Unit

Madrid, 18 October 2022

European and Asian gas prices hit record highs in Q3 2022

TTF and Asian spot LNG prices, 2021-2022

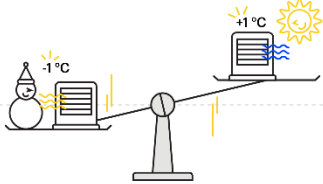


Playing my part:

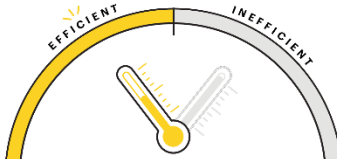
How to **save money**, **reduce reliance on Russian energy**, **support Ukraine** and **help the planet**

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1 Turn down heating and use less air-conditioning



2 Adjust your boiler's settings



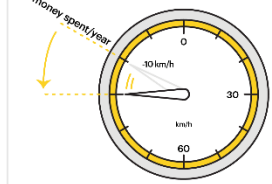
3 Work from home



4 Use your car more economically



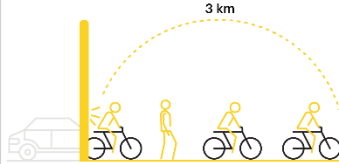
5 Reduce your speed on highways



6 Leave your car at home on Sundays in large cities



7 Walk or bike short journeys instead of driving



8 Use public transport

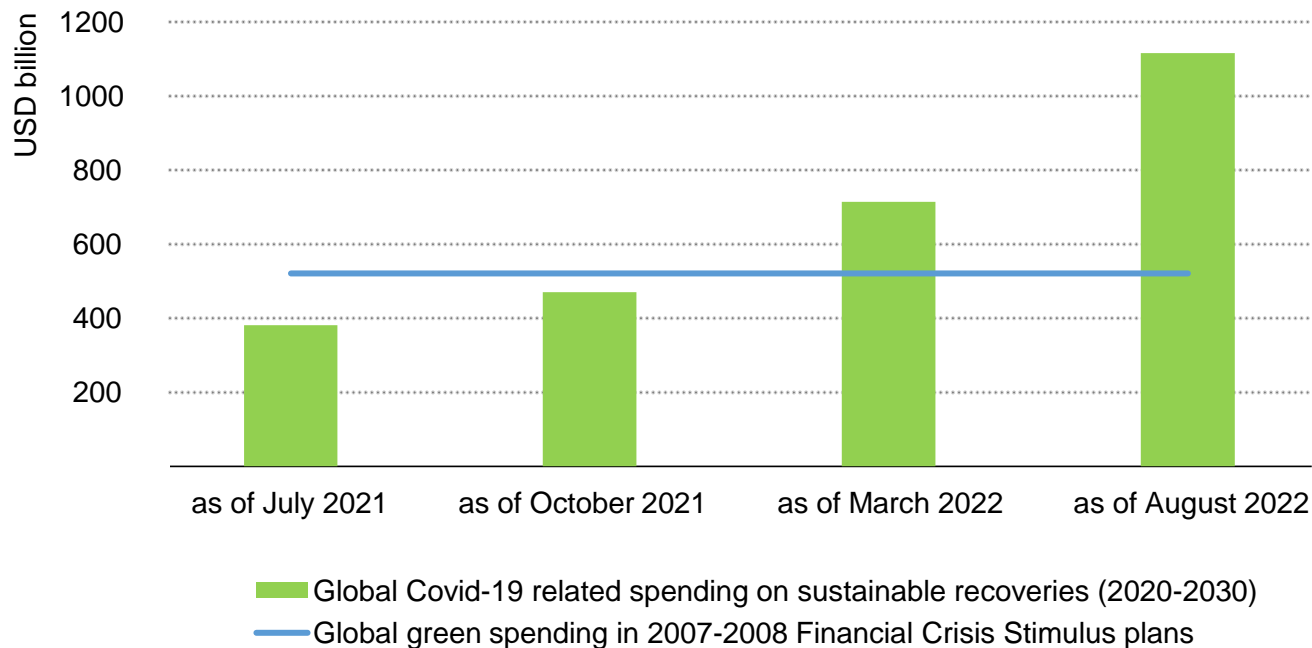


9 Skip the plane, take the train



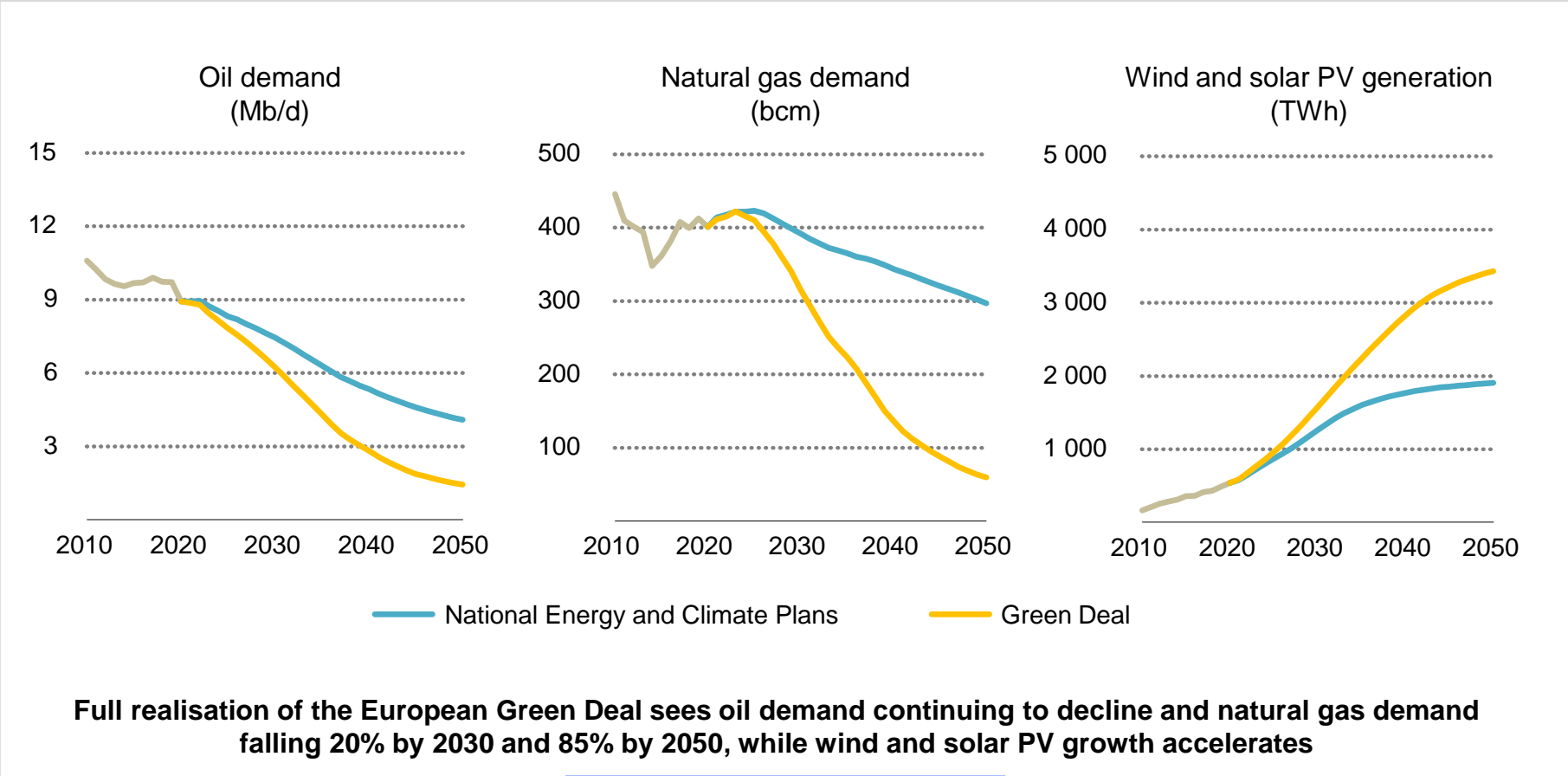
Government recovery spending for clean energy reaches new high

Global sustainable recovery spending by governments

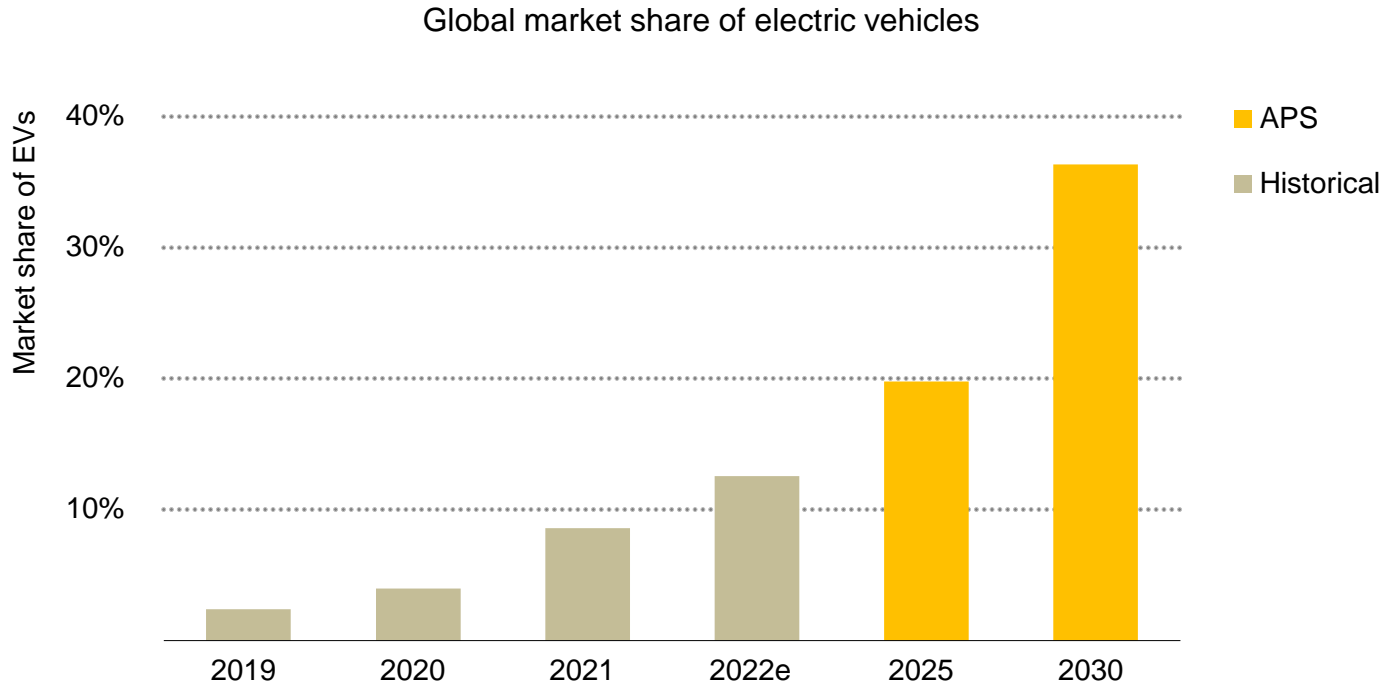


Government sustainable recovery spending has grown to USD 1.1 trillion, more than twice the amount dedicated to green recovery measures after the Global Financial Crisis.

Energy transitions re-shape the EU's energy needs

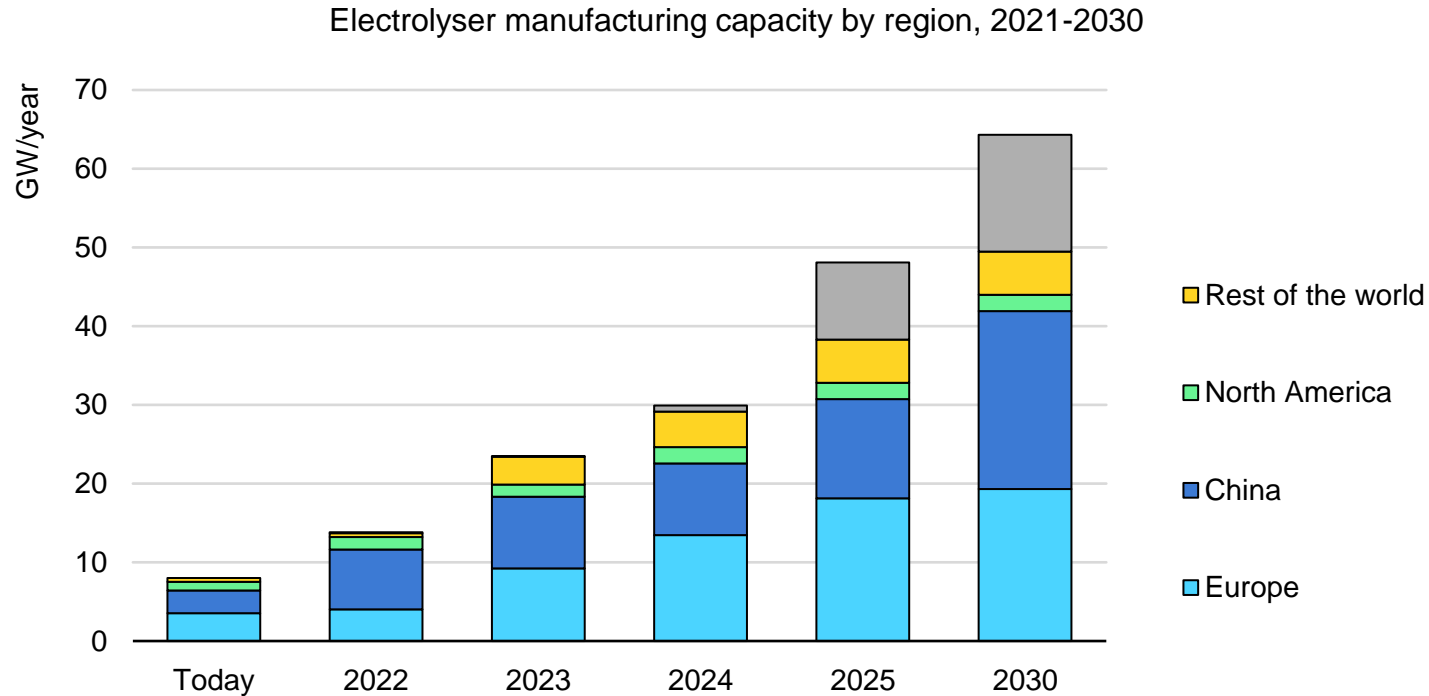


Spectacular growth in EVs signals a new energy economy taking root



By 2030, more than one out of every two cars sold in the US, the EU and China could be electric. EVs are vital for making energy supplies more secure rather than continuing to rely on fossil fuels.

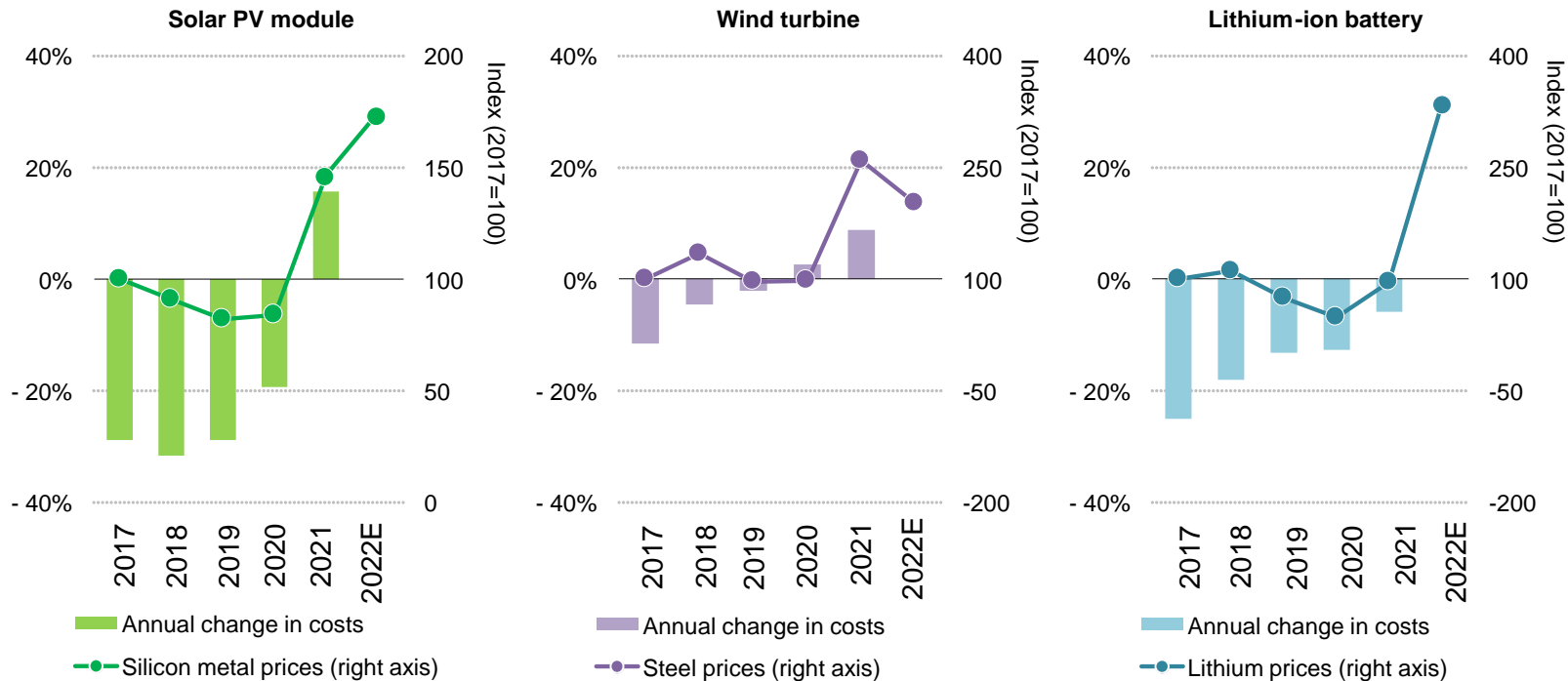
A new energy economy: the case of electrolyser manufacturing



Electrolyser manufacturing capacity could exceed 60 GW per year by 2030. This would be more than enough to support planned electrolyser projects and government targets.

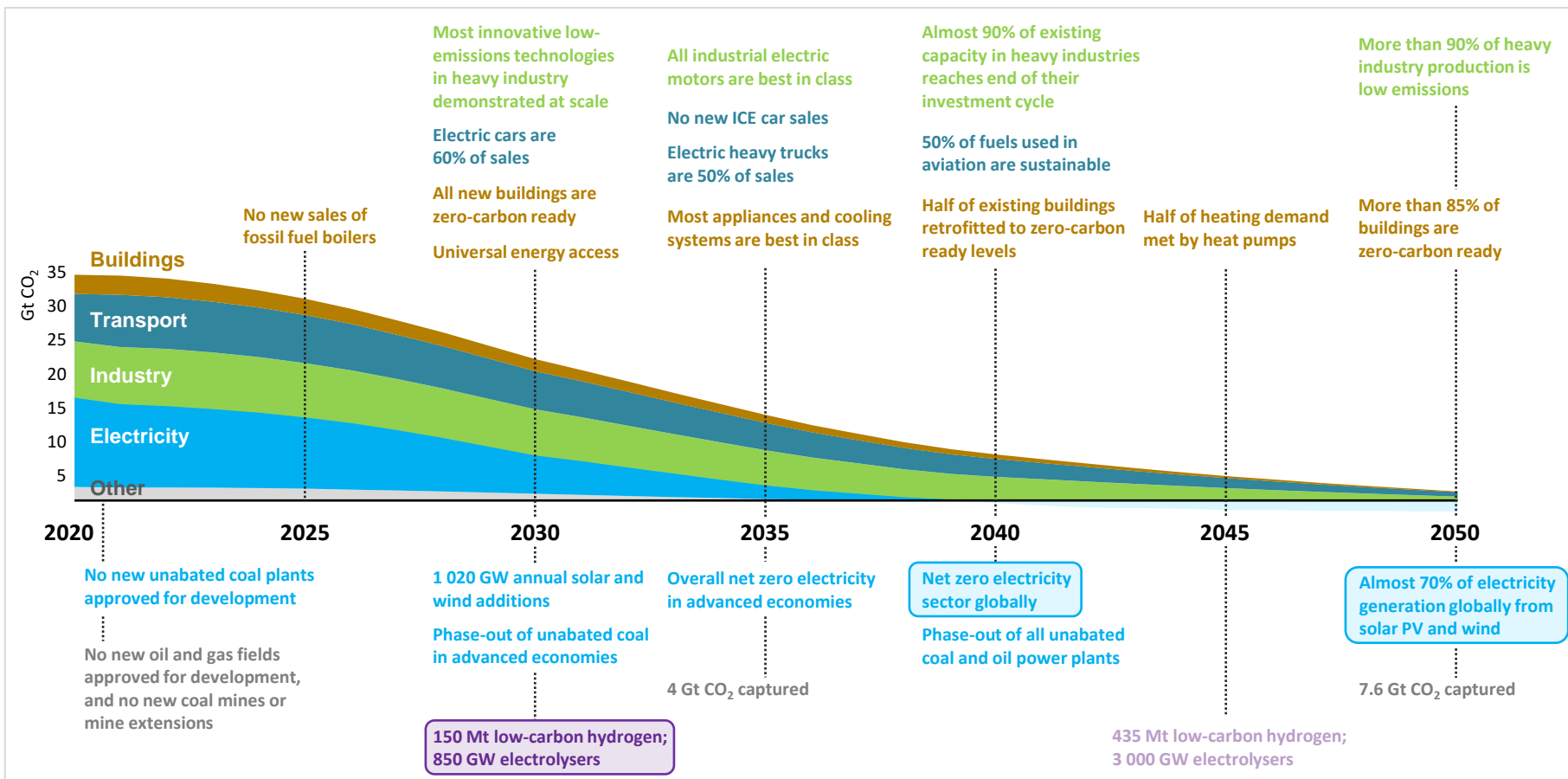
Investment in critical minerals is central to successful transitions

Technology cost trends and key material prices for solar PV module, wind turbine and lithium-ion battery



A surge in mineral prices has been a major factor in reversing the longstanding declines in the costs of clean energy, but upticks in investment offer hope for increased and more diversified supply in the years ahead

Set near-term milestones to get on track for long-term targets



Cross-cutting

Energy system overview

- Energy efficiency
- Behavioural changes
- Electrification
- Renewables
- Bioenergy
- Hydrogen
- Carbon capture & storage
- Innovation
- Digitalisation
- International collaboration

Technology deep dives

- Direct air capture
- Bioenergy with carbon capture & storage
- CO₂ capture & utilisation
- Electrolysers

Infrastructure deep dives

- CO₂ transport & storage
- Data centres & transmission networks
- District heating

Electricity

Subsectors

- Renewable electricity
- Solar PV
- Wind

Technology deep dives

- Coal-fired electricity
- Gas-fired electricity
- Solar PV
- Wind
- Hydro
- Nuclear
- Demand response

Infrastructure deep dives

- Grid-scale storage
- Smart grids

Oil & natural gas supply

Subsectors

- Methane emissions from oil and gas operations
- Flaring

Low-emission fuel supply

Subsectors

- Hydrogen supply
- Biofuels supply

Transport

Subsectors

- Cars and vans
- Trucks and buses
- Rail
- Aviation
- International shipping

Technology deep dive

- Electric vehicles

Industry

Subsectors

- Steel
- Chemicals
- Cement
- Aluminium
- Paper
- Light industry

Buildings

Subsectors

- Heating
- Space cooling
- Lighting
- Appliance & equipment

Technology deep dives

- Buildings envelope
- Heat pumps

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