International Energy Agency

Net Zero by 2050: the role of electrification

24th August, 2021

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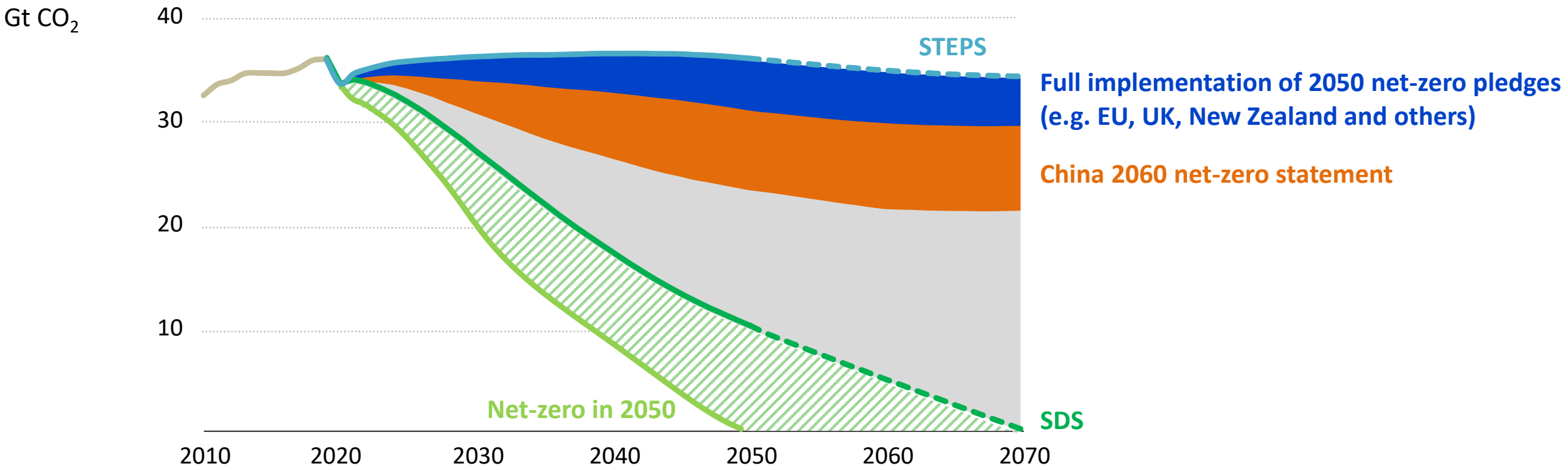
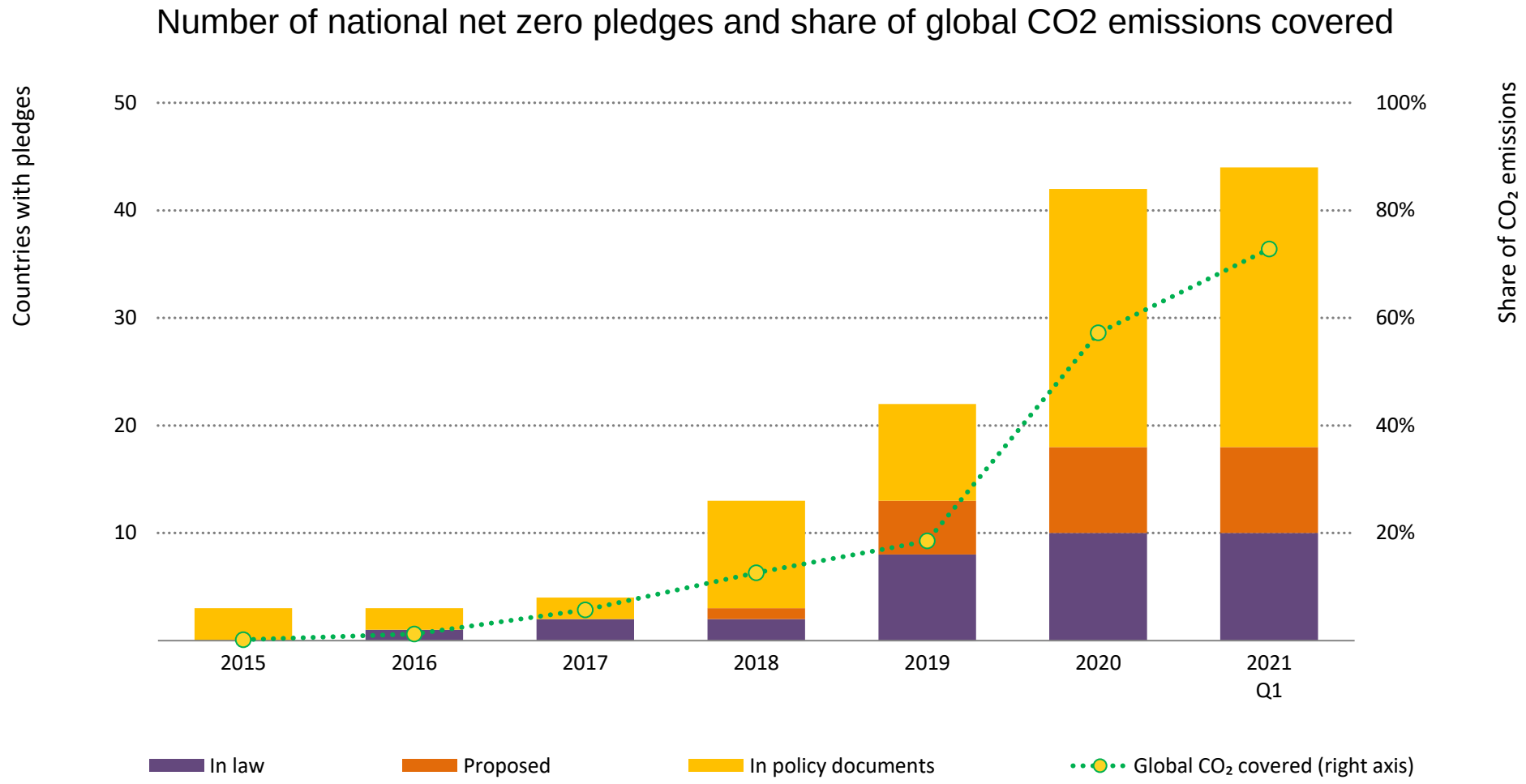
The world is still far from putting emissions into decisive decline



Source: WEO 2020

Global emissions are set to bounce back more slowly than after the financial crisis of 2008-2009, but the world is still a long way from a sustainable recovery

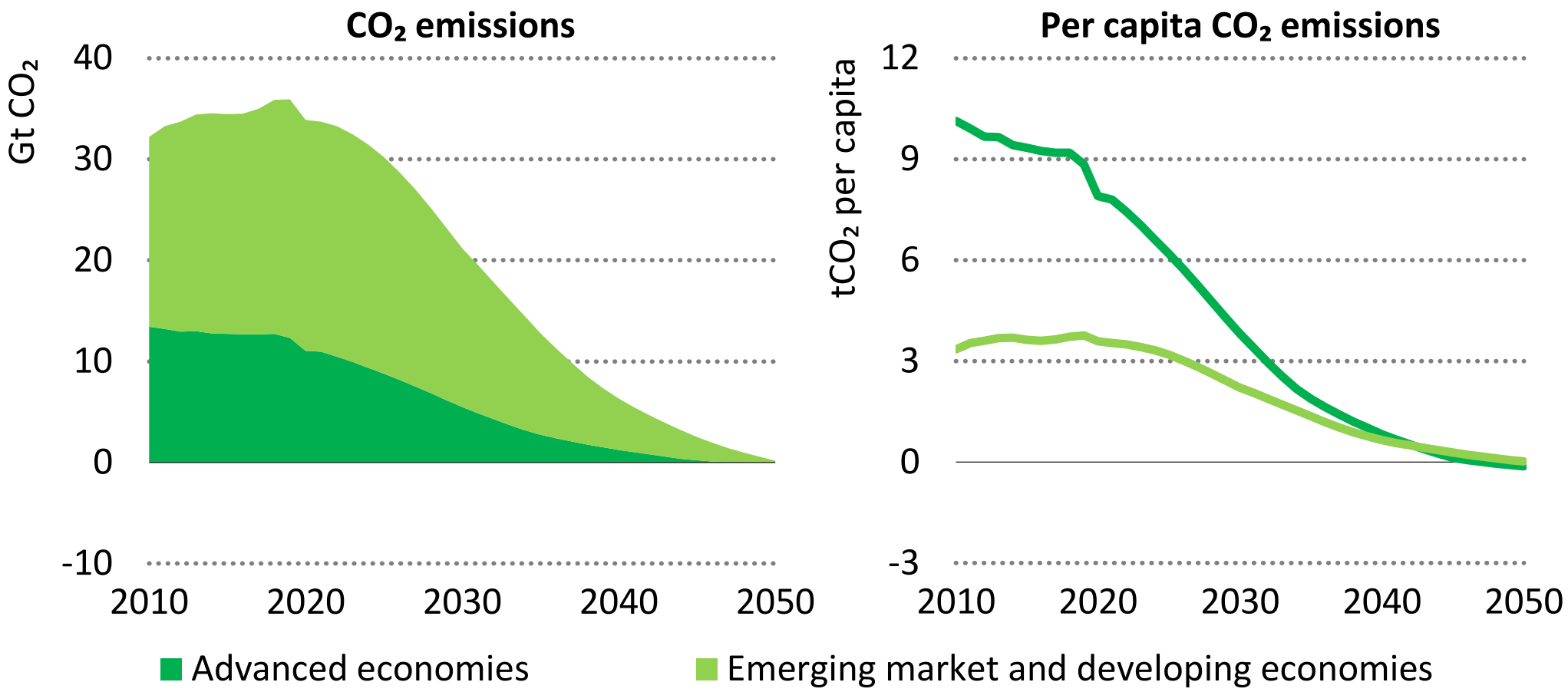
Setting the right targets



Governments and industry can collaborate to ensure the effective implementation of net-zero strategies along with compatibility between different actors' targets

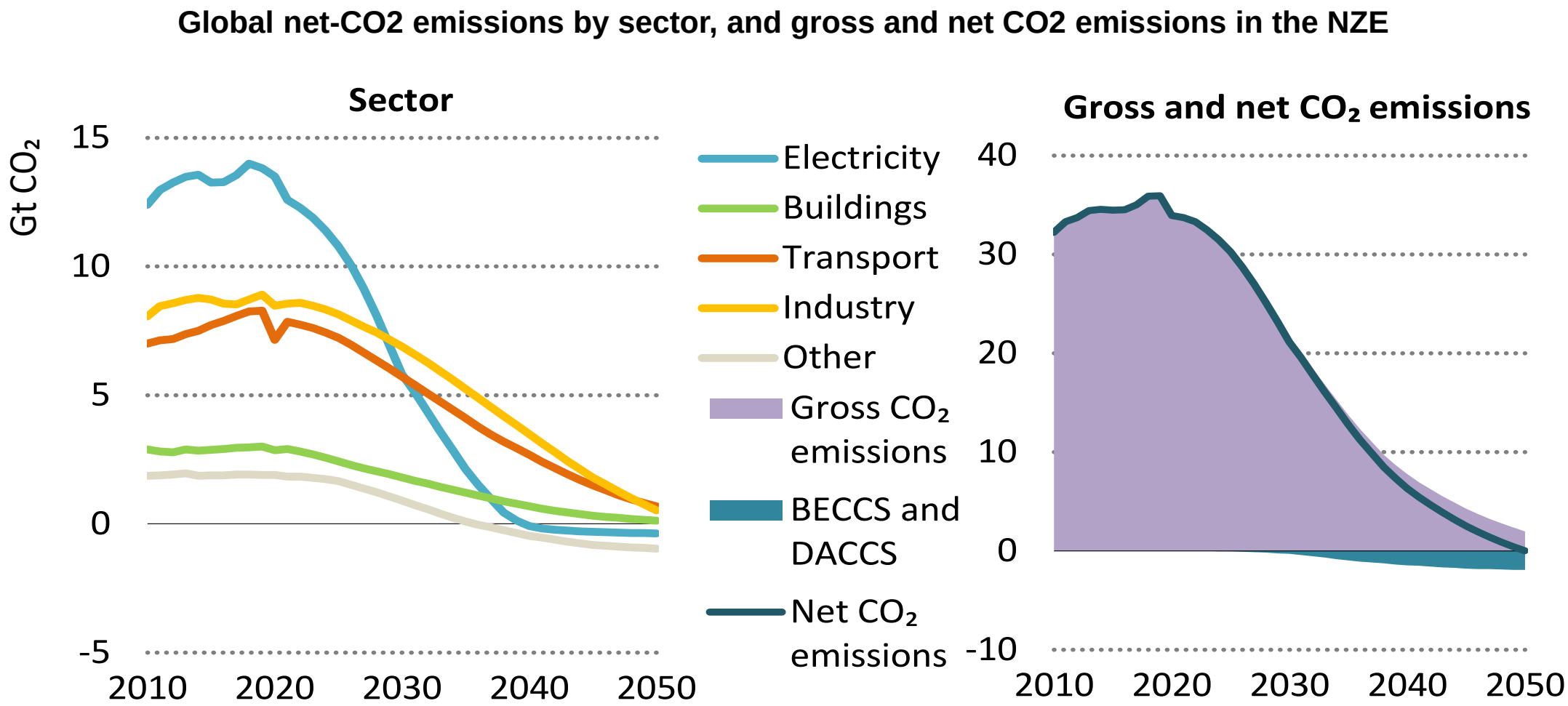
The pace of the transition varies across regions

Global net CO2 emissions in the NZE



CO2 emissions fall to net zero in advanced economies around 2045 and globally by 2050. Per capita emissions globally are similar by the early-2040s

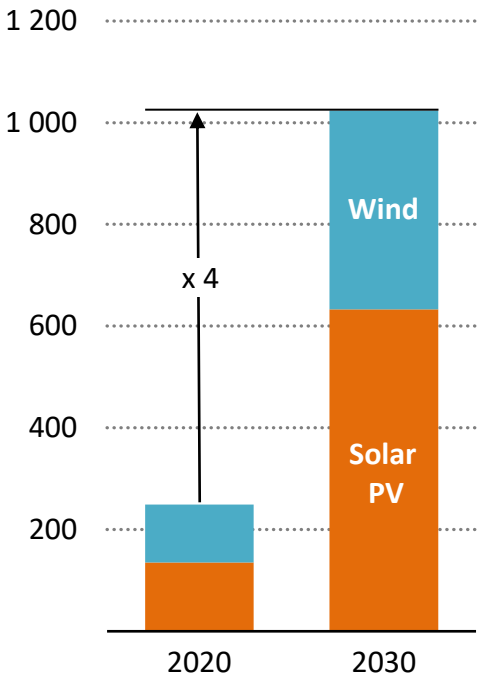
The power sector as the first mover and enabler of decarbonisation



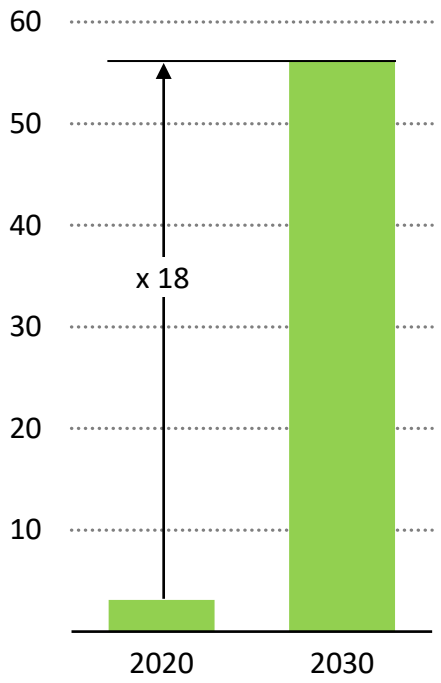
Emissions from electricity fall fastest, with declines in industry and transport accelerating in the 2030s. Around 1.9 Gt CO2 are removed by 2050 via BECCS and DACCS

Make the 2020s the decade of massive clean energy expansion

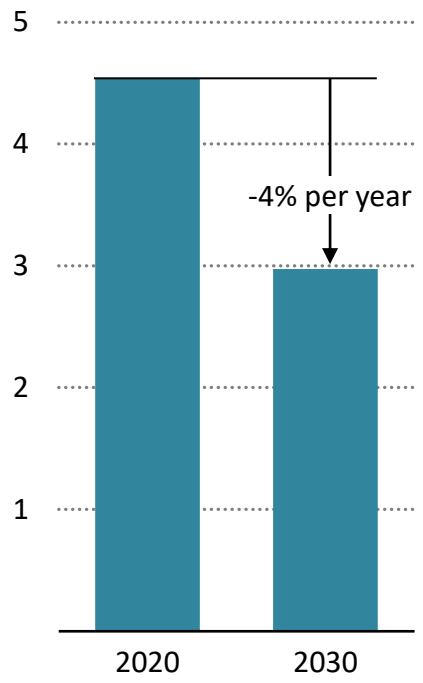
Solar PV and wind capacity additions (GW)



Electric car sales (millions)

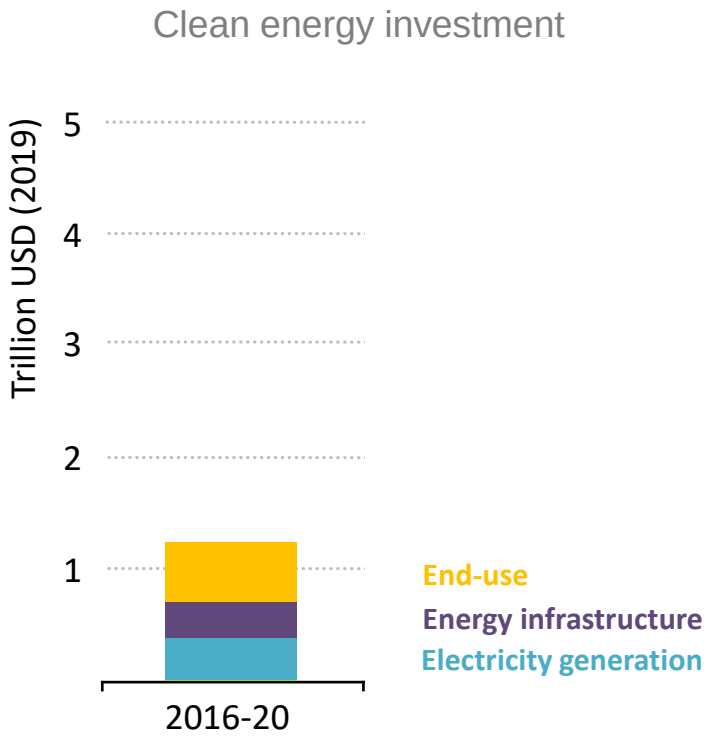


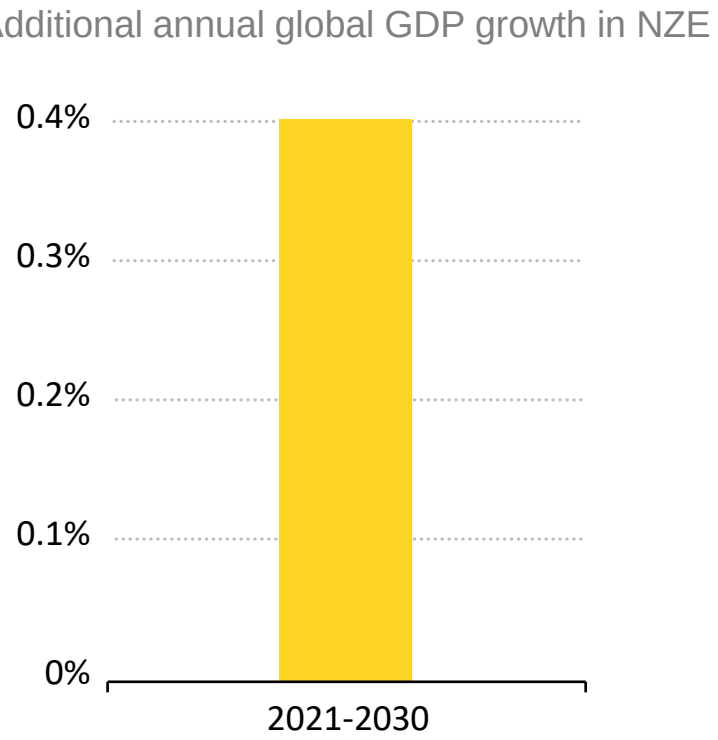
Energy intensity of GDP (MJ per USD PPP)



Technologies for achieving the necessary deep cuts in global emissions by 2030 exist, but staying on the narrow path to net-zero requires their immediate and massive deployment.

Drive a historic surge in clean energy investment

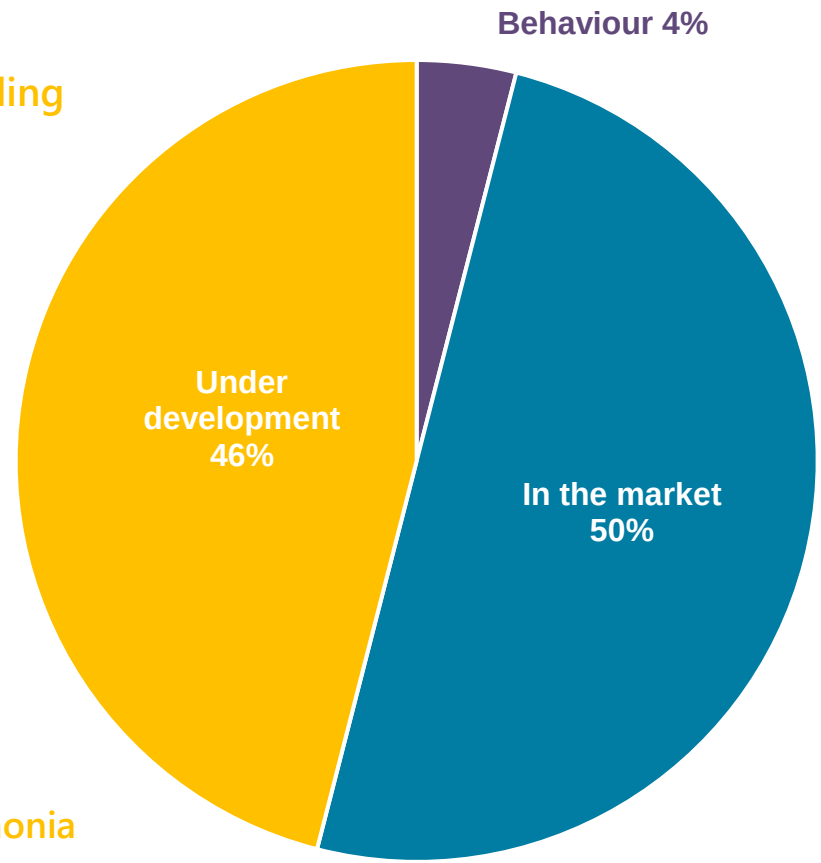




Annual clean energy investment more than triples by 2030 in the NZE scenario, driving an average 0.4% per year increase in global GDP to 2030 & speeding the recovery from the COVID-19 shock

Prepare for the next phase of the transition by boosting innovation

CO_2 savings by technology maturity in 2050, NZE scenario



Refrigerant-free advanced cooling

Advanced batteries

Next-generation biofuels

CO_2 capture from cement

Hydrogen-based steel

Small modular reactors

Synthetic liquid fuels

Electrolytic hydrogen for ammonia

Autonomous trucks

Optimised heat pump with storage

Direct air capture

Ammonia-powered ships

Electrolytic hydrogen for methanol

Building-integrated storage

Electric steam crackers

Unlocking the next generation of low-carbon technologies requires more clean energy R&D and $90 billion in demonstrations by 2030; without greater international co-operation, global CO_2 will not fall to net-zero by 2050.

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