International Energy Agency

Net Zero by 2050: a Roadmap for the Global Energy Sector
The role of industry

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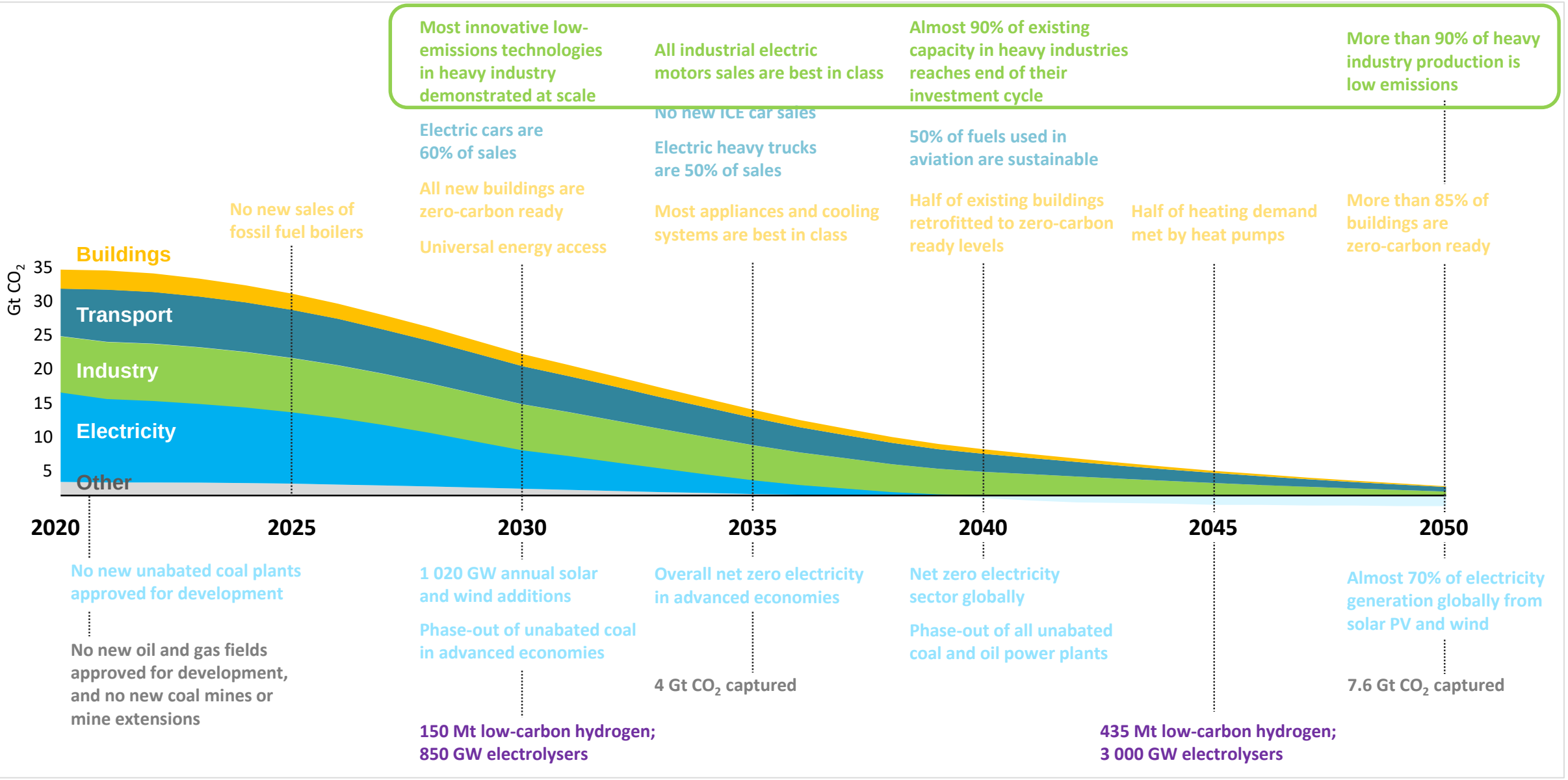
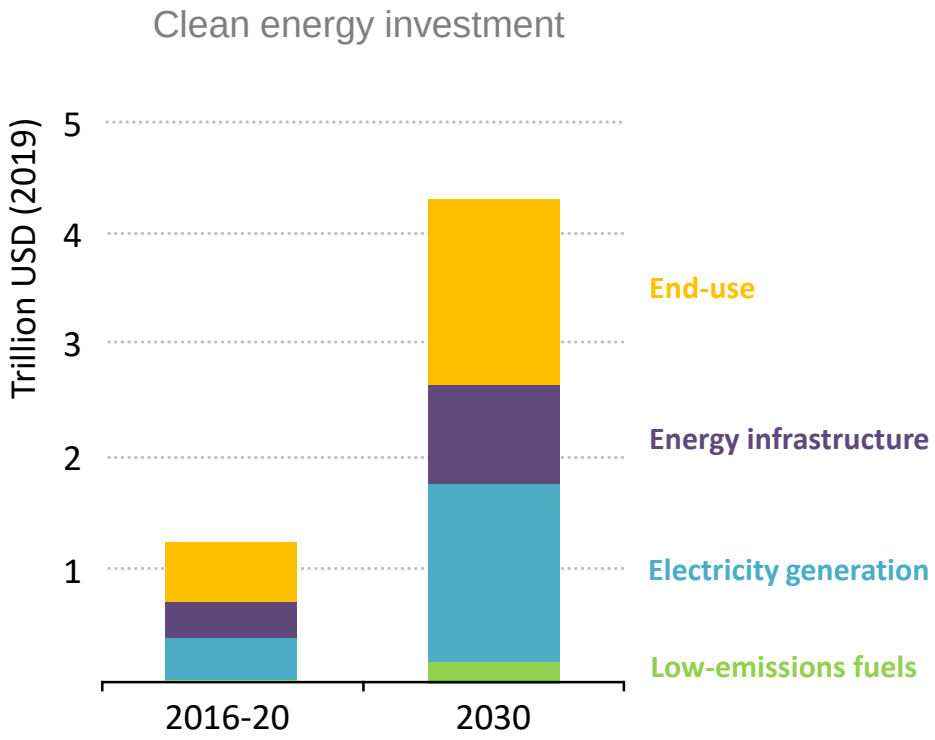
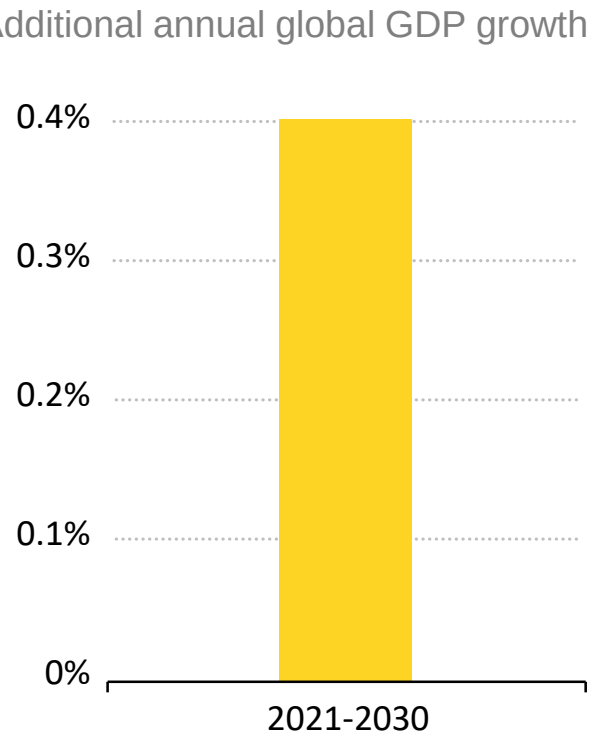
Net Zero by 2050: a Roadmap for the Global Energy Sector



Drive a historic surge in clean energy investment

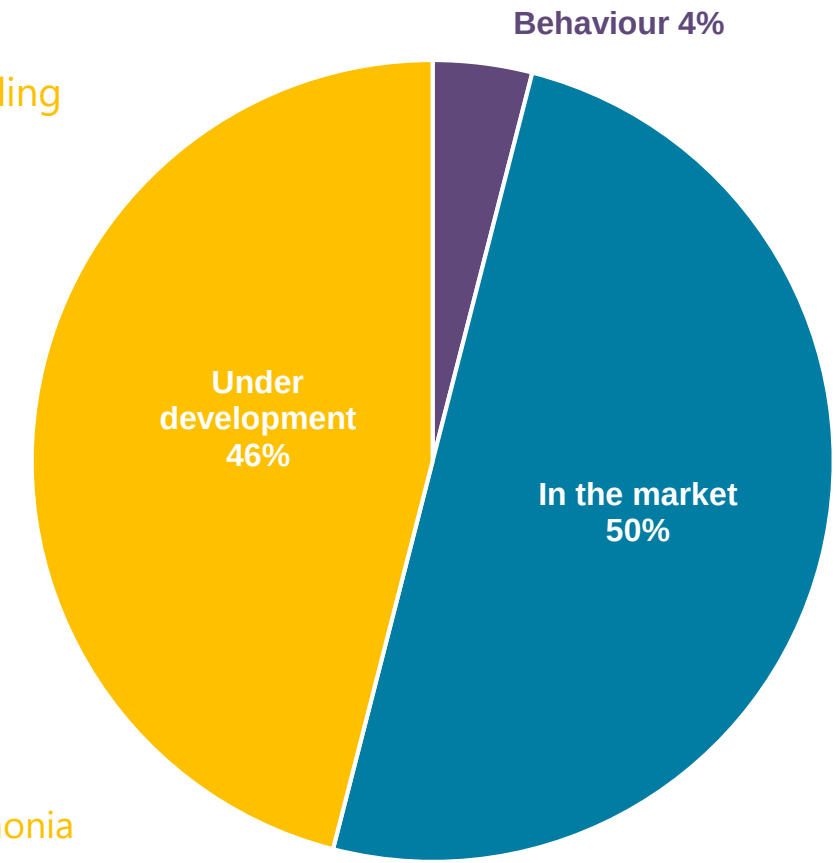




Annual clean energy investment more than triples by 2030 in the NZE scenario, driving an average 0.4% per year increase in global GDP to 2030 & speeding the recovery from the COVID-19 shock

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

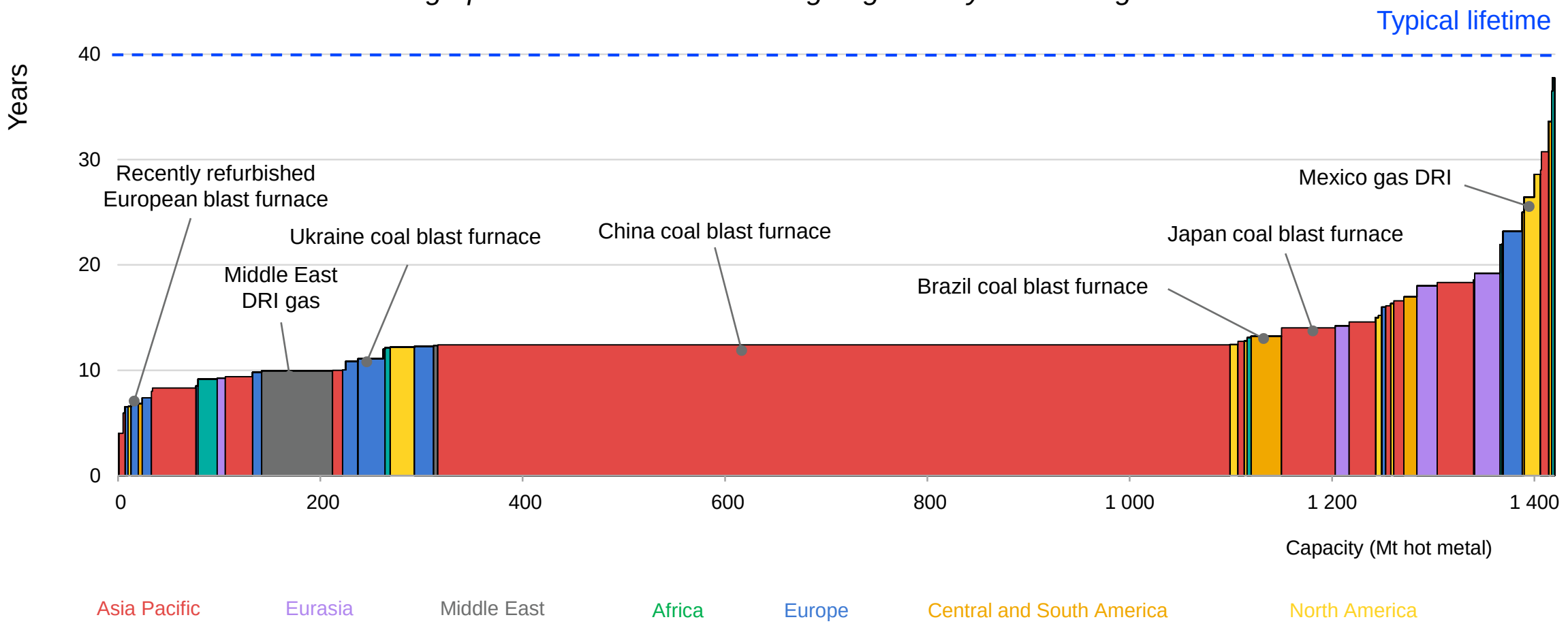
Building-integrated storage

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.

Where do we start in industry? Look into existing assets

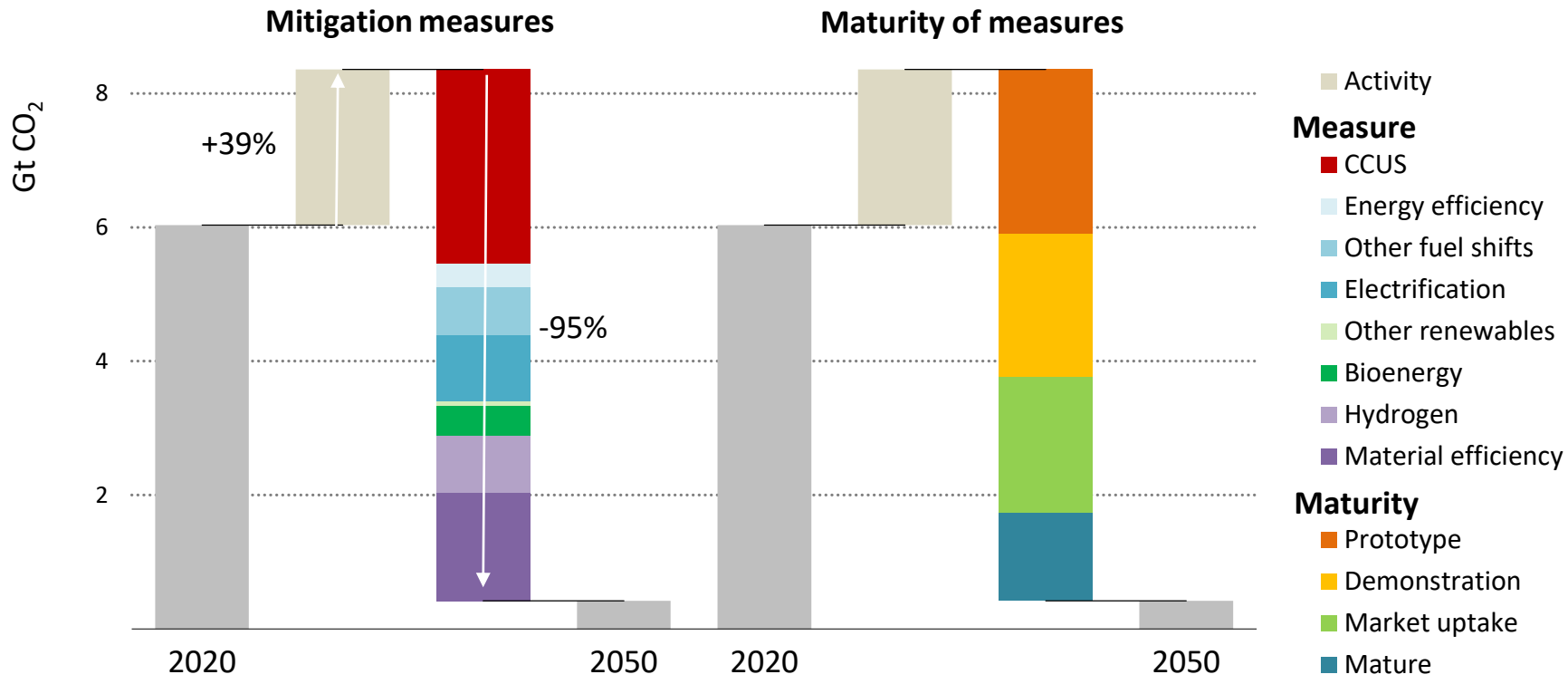
Geographic distribution and average age of key ironmaking assets



Around 60% of the existing stock of ironmaking equipment is based in China.
The current stock is quite young, with a global average age of 13 to 14 years for blast furnaces and DRI furnaces.

Addressing CO_2 emissions from heavy industry

Global CO_2 emissions in heavy industry and reductions by mitigation measure and technology maturity category in the NZE



An array of measures reduces emissions in heavy industry, with innovative technologies like CCUS and hydrogen playing a critical role