

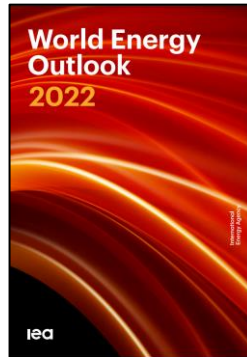
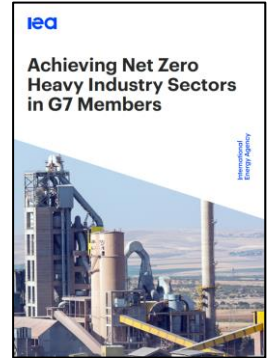
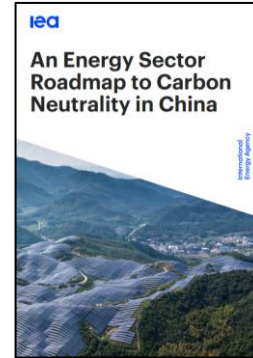
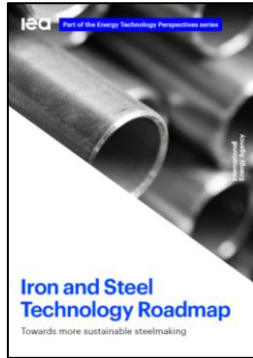
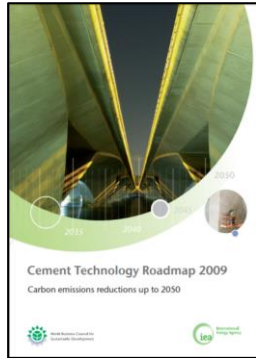


# The Industry Sector in a Net Zero Energy System

Dr Peter Levi, Energy Technology Policy Division, International Energy Agency

Energy Future in Industry, IETS International Conference, May 2023

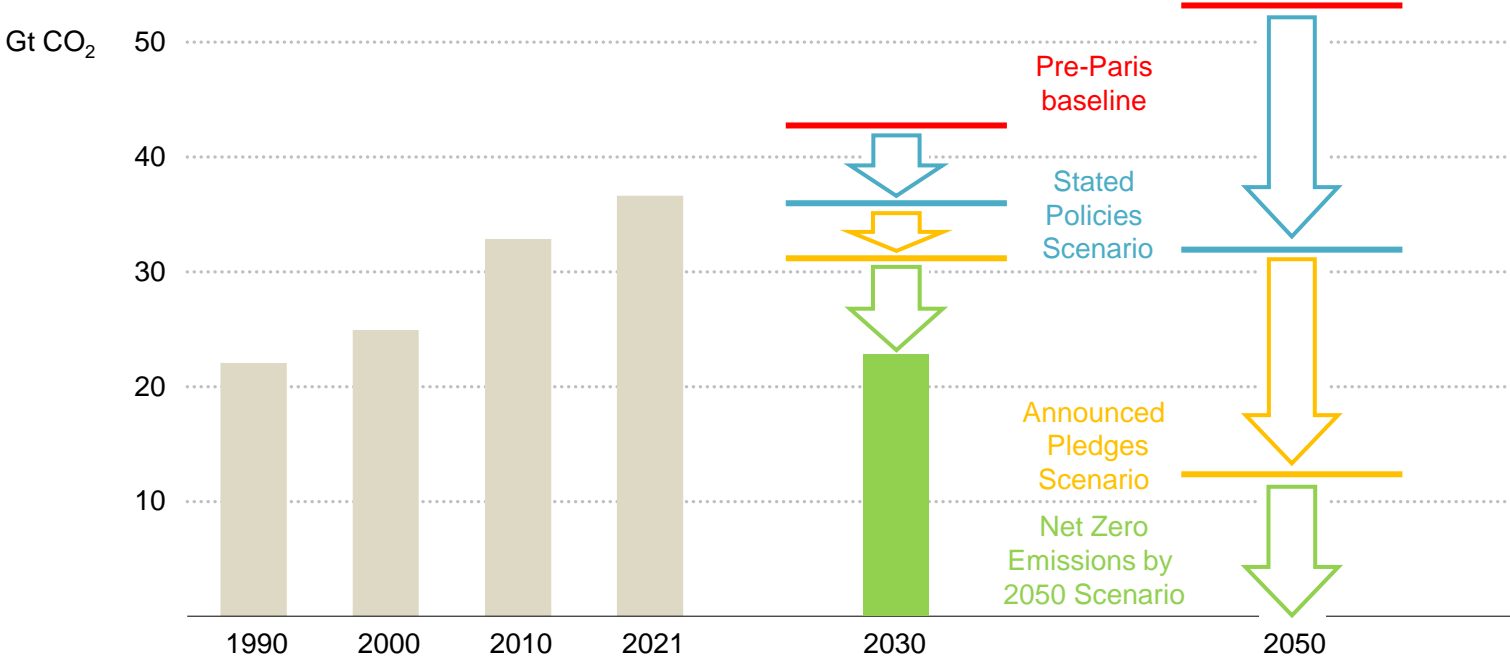
# IEA industry sector analysis



IEA analysis of the industry sector features across the portfolio of technology roadmaps, country roadmaps, energy system scenario analysis, and most recently in the Agency's work on clean energy technology supply chains

# Keeping the door to 1.5 °C open

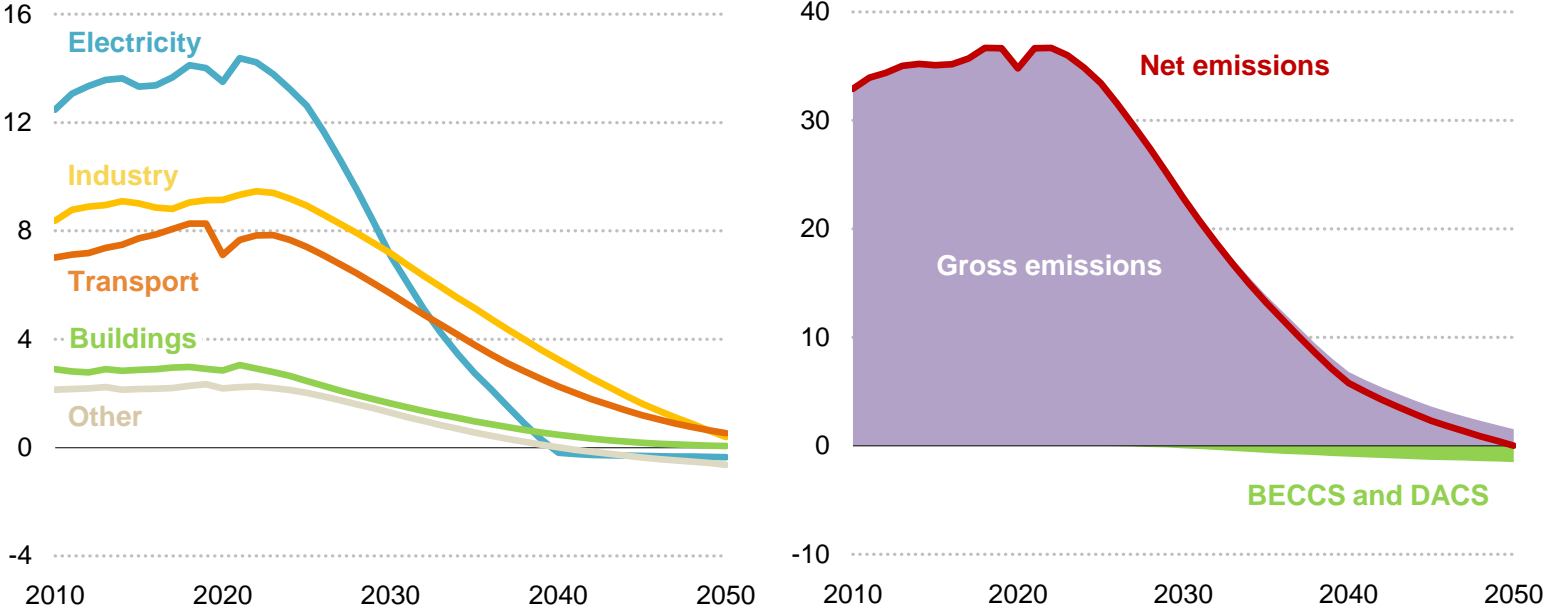
Global energy system CO<sub>2</sub> emissions



**Policy and technology progress since 2015 has shaved 1 °C off projected warming, a step in the right direction; but much more needs to be done in order to avoid severe climate disruptions**

# Different sectors move at different speeds on the road to net zero

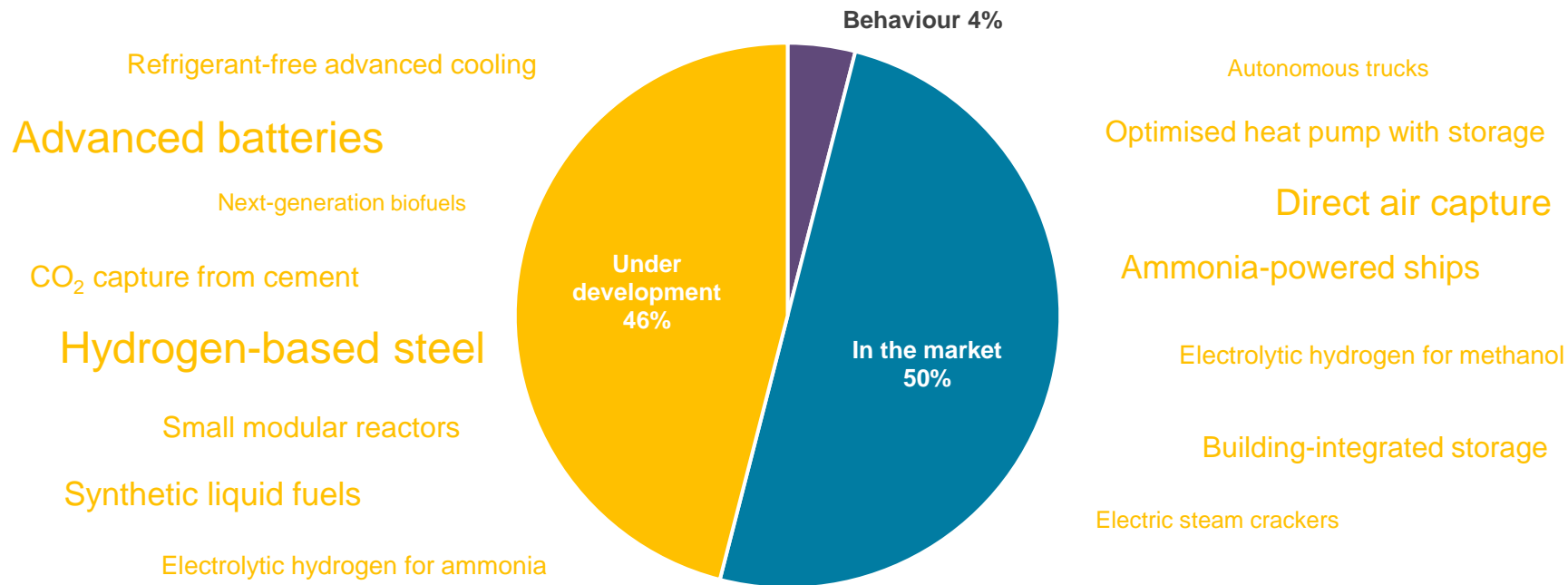
Energy system CO<sub>2</sub> emissions by sector (left) and gross and net emissions (right) in the NZE Scenario



**The power sector leads emissions reductions to 2030, but all sectors contribute to the net zero emissions goal, with residual emissions in 2050 balanced by atmospheric removals**

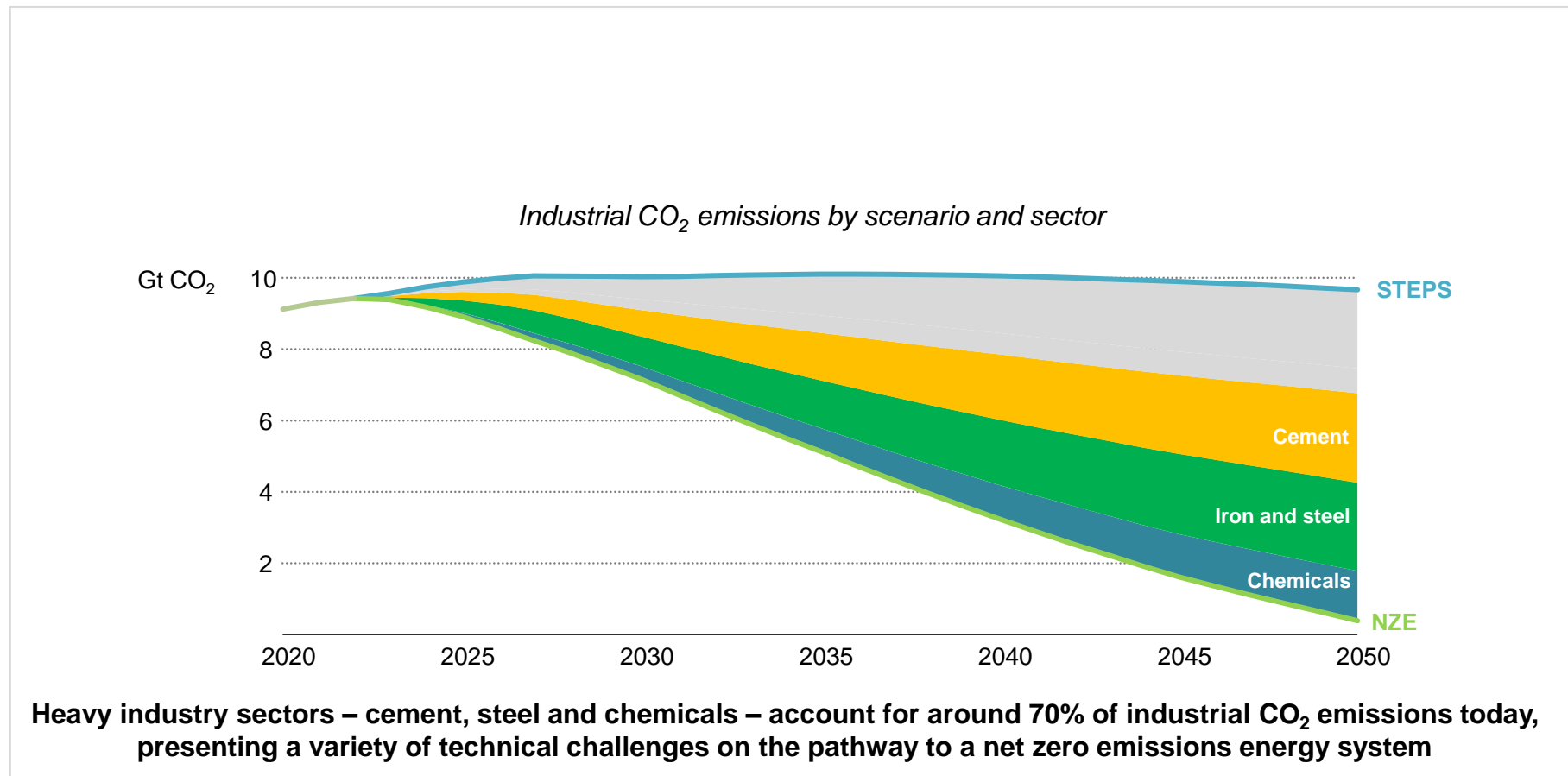
# Prepare for the next phase of the transition by boosting innovation

CO<sub>2</sub> savings by technology maturity in 2050, NZE Scenario

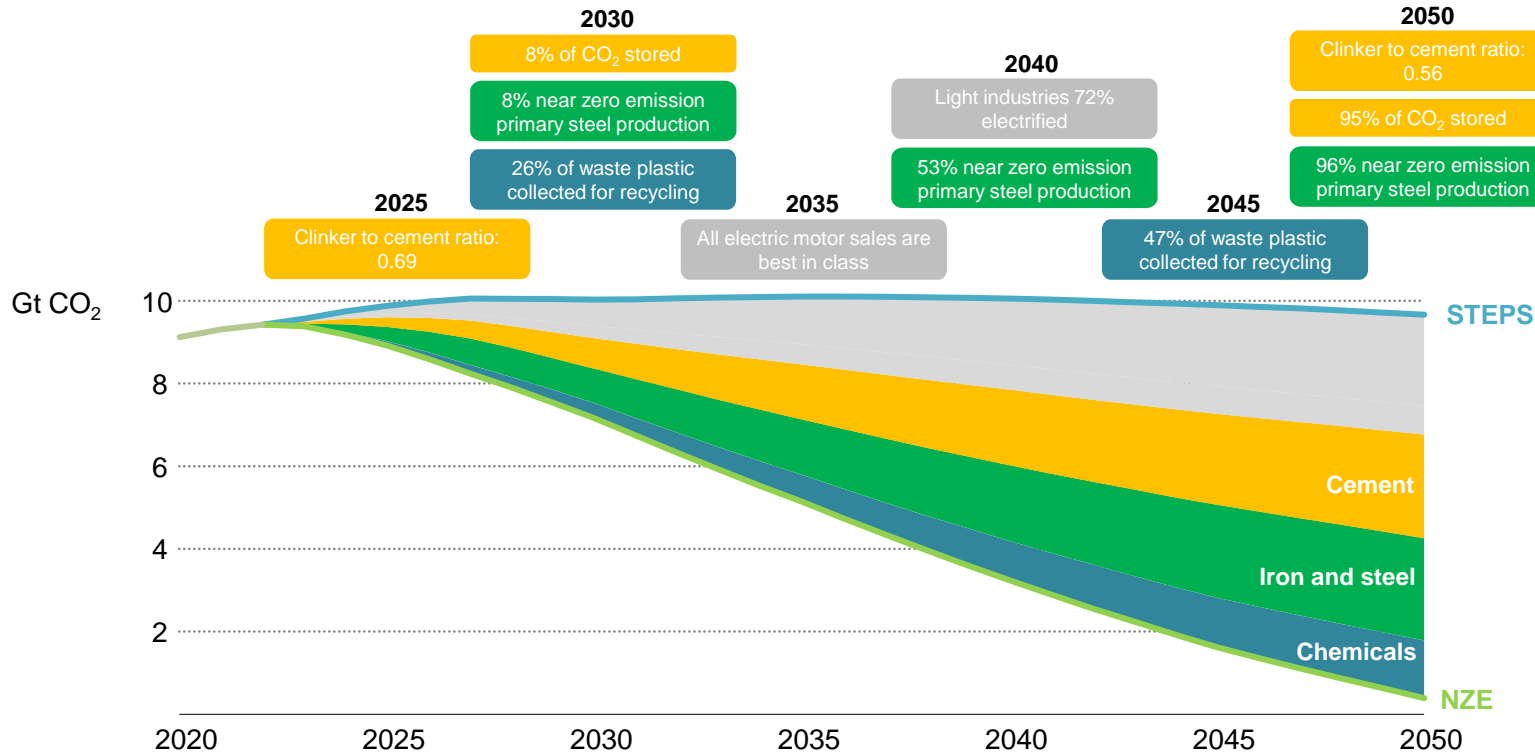


**Unlocking the next generation of low-carbon technologies requires more clean energy R&D and \$90 billion in demonstrations by 2030; without greater international co-operation, global emissions will not fall to net zero by 2050**

# Net zero means tackling 'hard to abate' industrial emissions



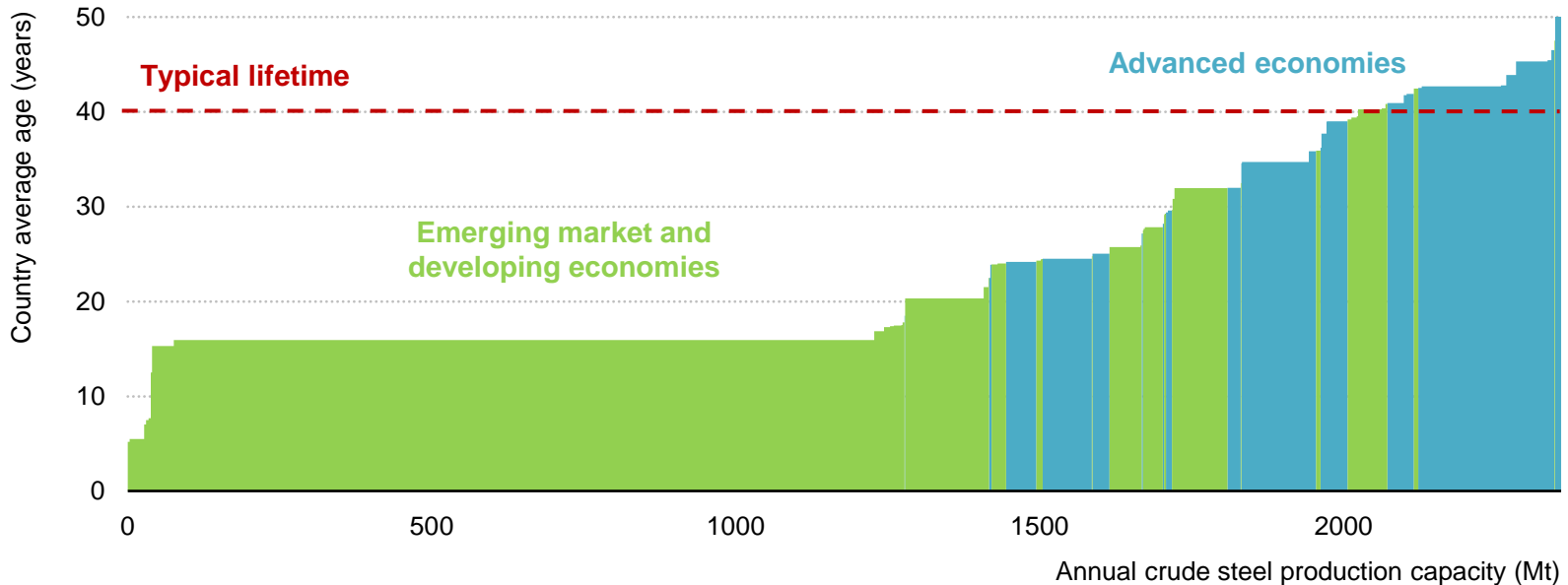
# Net zero means tackling ‘hard to abate’ industrial emissions



**Heavy industry sectors – cement, steel and chemicals – account for around 70% of industrial CO<sub>2</sub> emissions today, presenting a variety of technical challenges on the pathway to a net zero emissions energy system**

# Where do we start in industry? Examining existing assets

*Regional distribution and average age of global crude steel production assets*

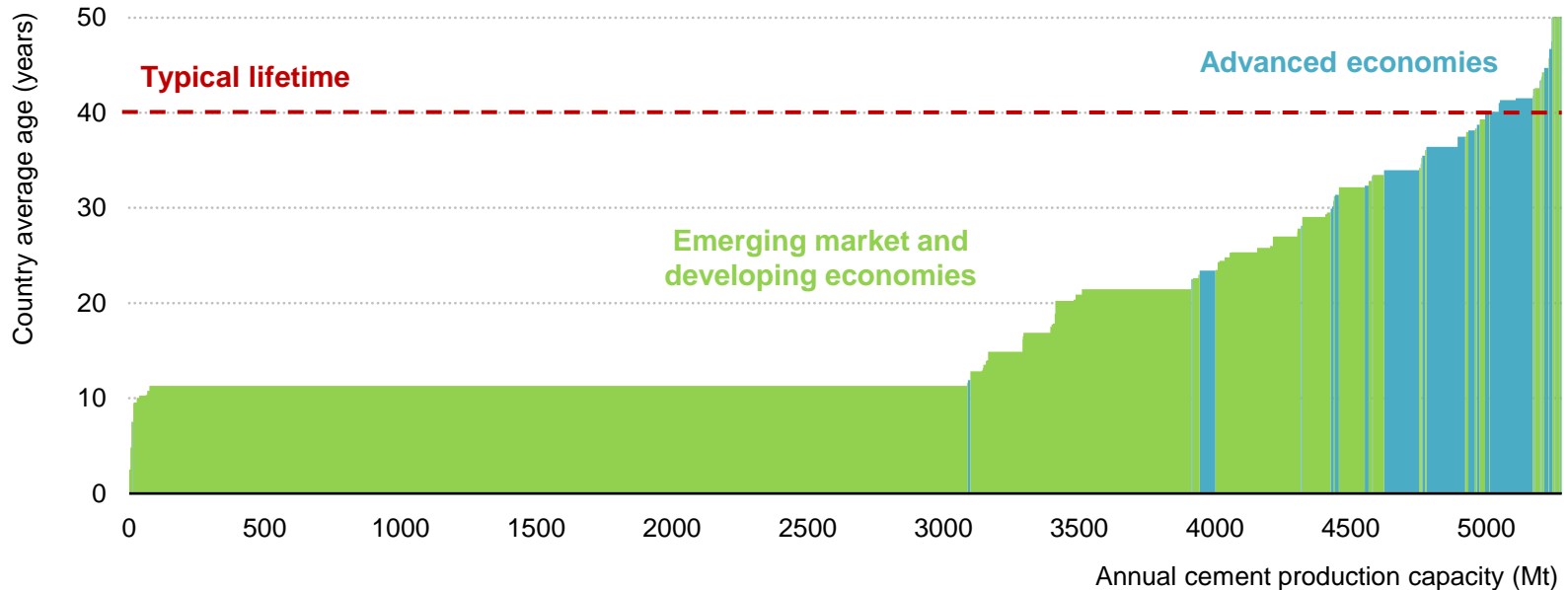


**Given the longevity and cost of key industry assets, 2050 is just one investment cycle away. In the advanced economies, many industrial plants are quite old and will face a major investment decision this decade**



# Where do we start in industry? Examining existing assets

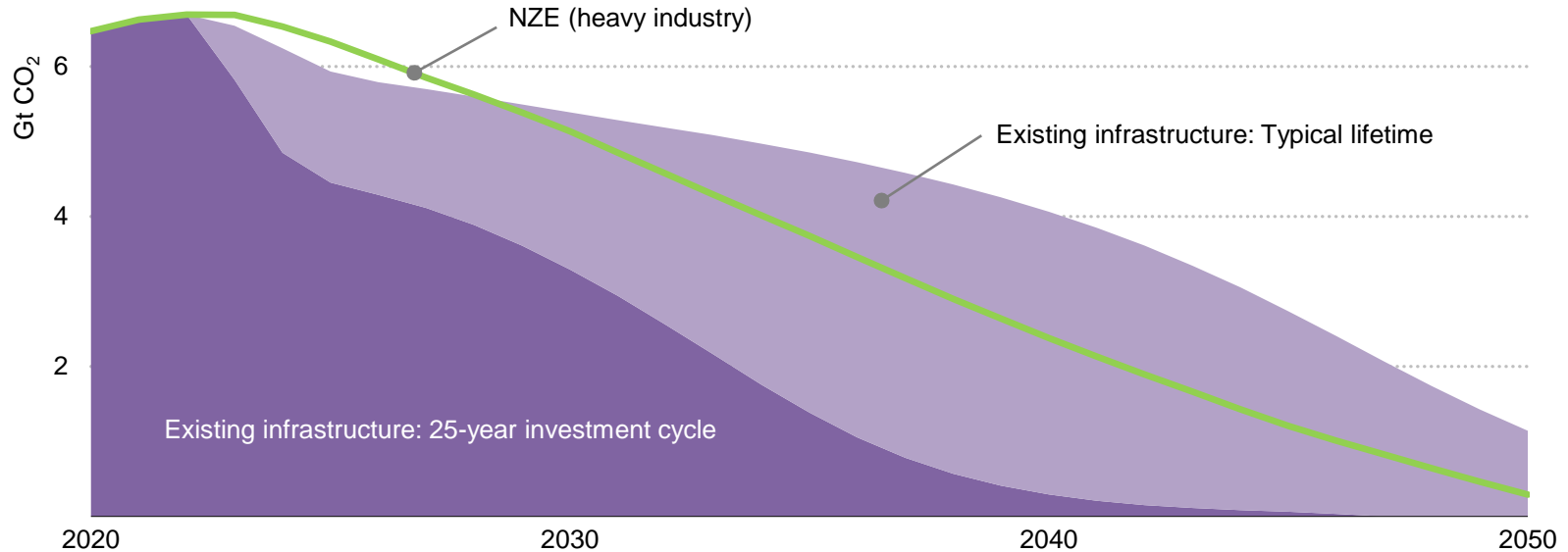
*Regional distribution and average age of global cement production assets*



**Given the longevity and cost of key industry assets, 2050 is just one investment cycle away. In the advanced economies, many industrial plants are quite old and will face a major investment decision this decade**

# Unlocking CO<sub>2</sub> emissions from existing assets

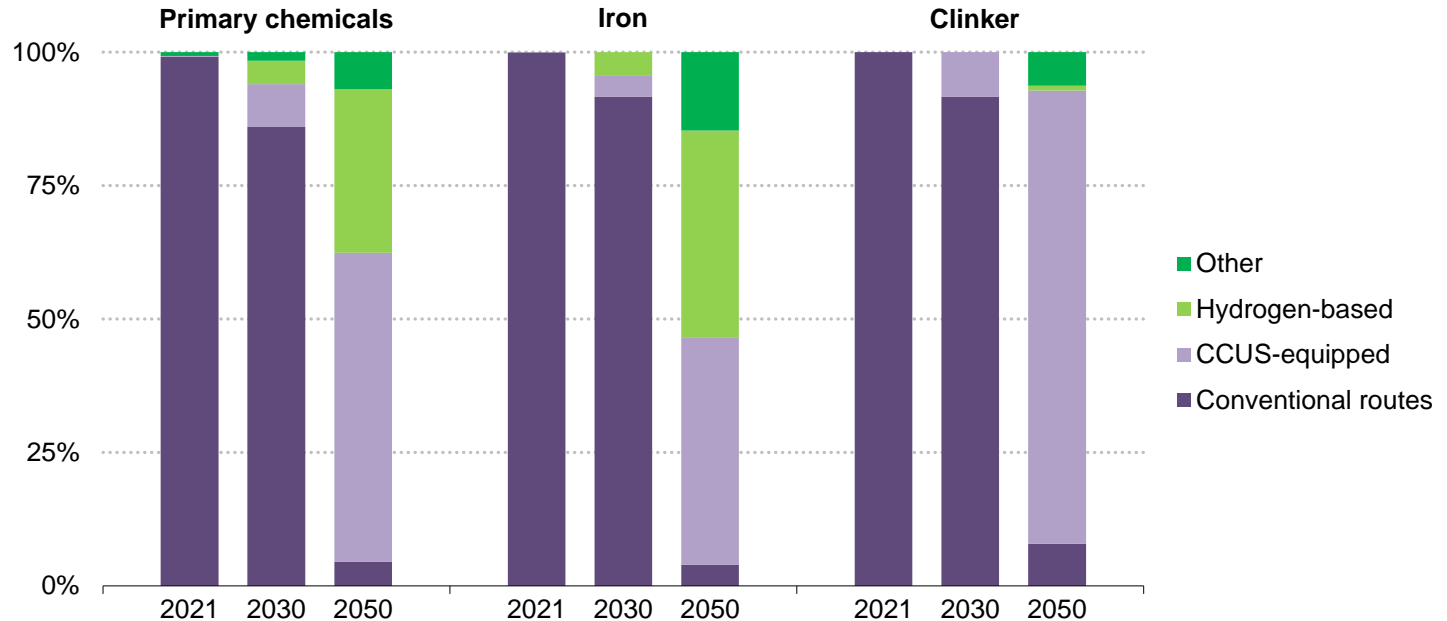
CO<sub>2</sub> emissions from existing heavy industrial assets in the NZE



**Intervening at the end of the next 25-year investment cycle could help unlock 60 Gt CO<sub>2</sub>, or around 40% of projected emissions from existing heavy industry assets**

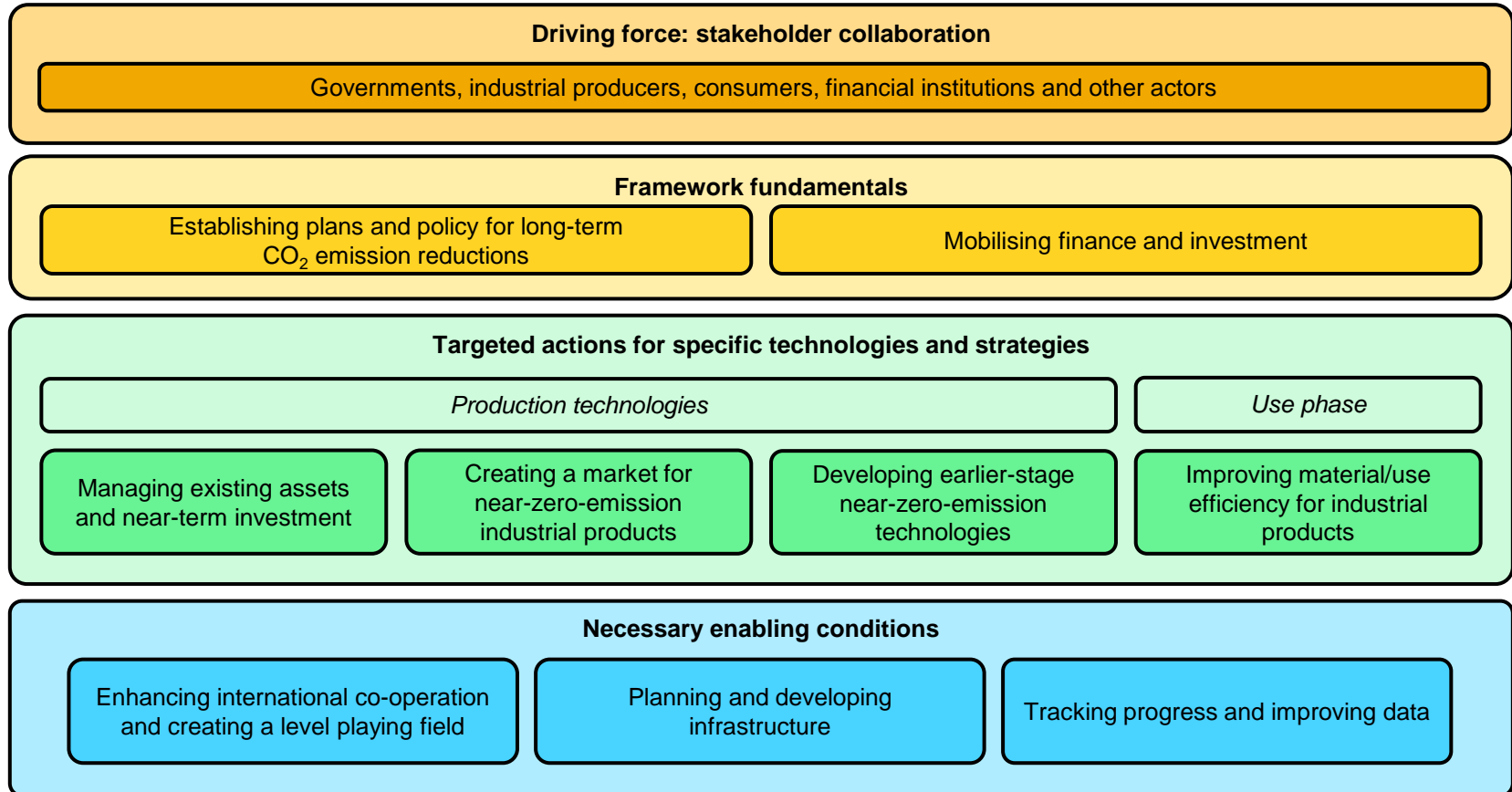
# Innovative technology deployment in heavy industry

*Share of innovative technology deployment in heavy industries in the NZE*



**Near-zero emissions routes dominate primary chemicals, iron and clinker production by 2050, with key roles for CCUS and hydrogen-based technologies**

# Governments have a critical role to play in accelerating the transition



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