International Energy Agency

Net Zero Roadmap:

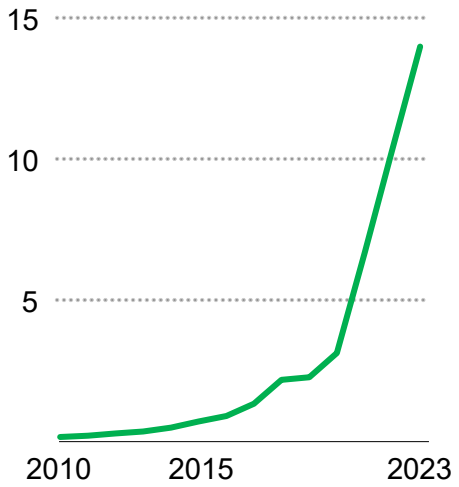
A Global Pathway to Keep the 1.5 °C Goal in Reach – 2023 Update

Launch presentation

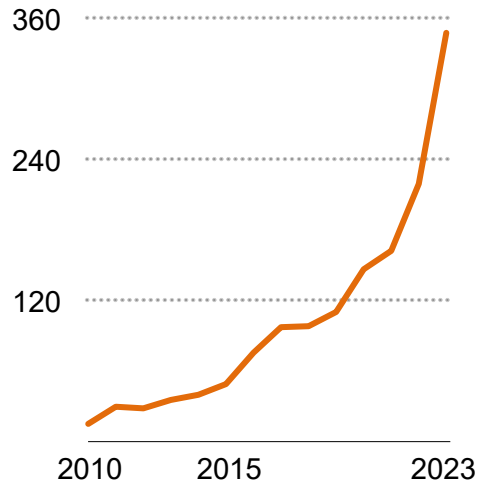
Paris, 26 September 2023

The path to 1.5℃ has narrowed, but clean energy growth is keeping it open

Electric car sales
(million)



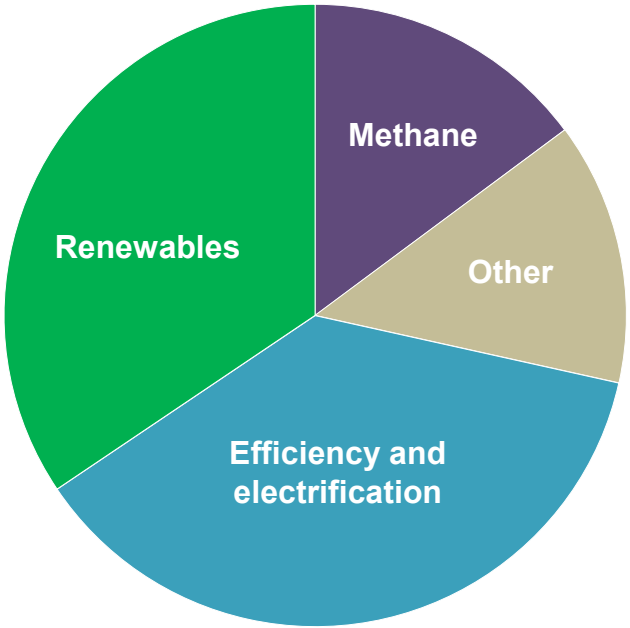
Solar PV capacity additions
(GW)



Global CO_2 emissions reached a record high in 2022, but the speed of the roll-out of key clean energy technologies means that coal, oil and natural gas will all peak this decade even without any new climate policies.

We have the tools to go much faster

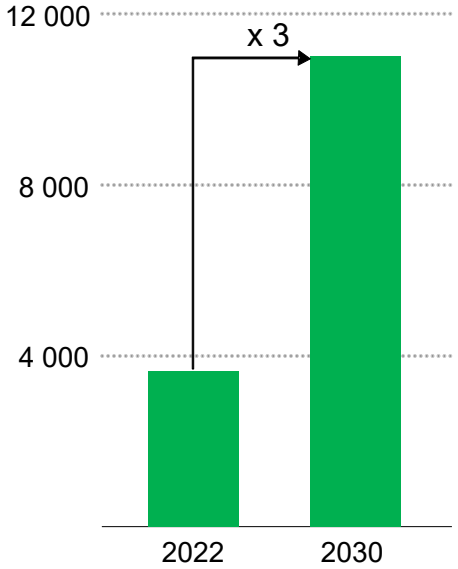
Emissions reductions by measure by 2030 in the NZE Scenario



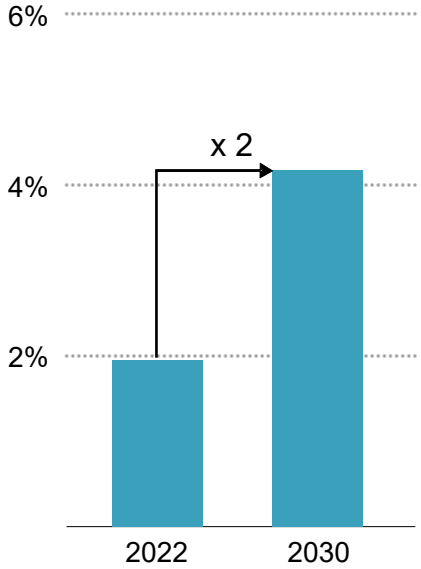
Energy-related greenhouse gas emissions peak by 2025 and decline by nearly 40% from today to 2030. Proven solutions available today deliver over 80% of what is needed this decade.

We have the tools to go much faster

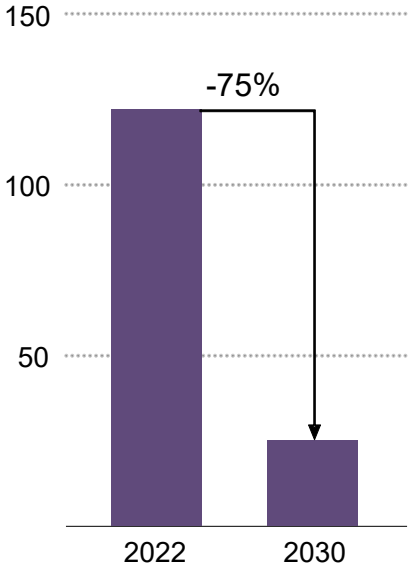
Renewables installed capacity (GW)



Annual energy intensity improvement



Methane emissions from fossil fuel operations (Mt)



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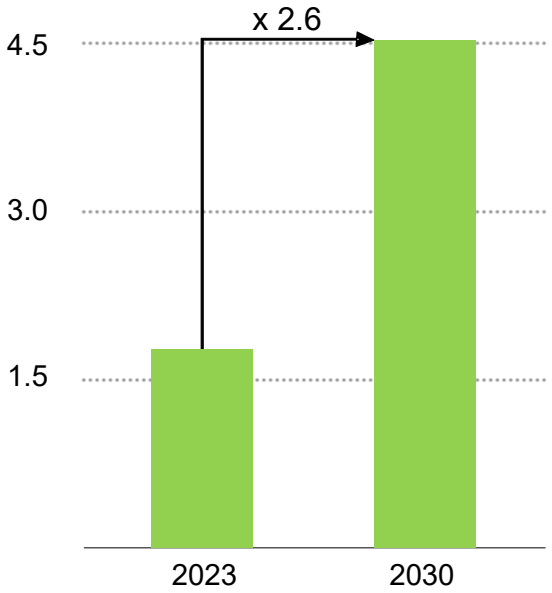
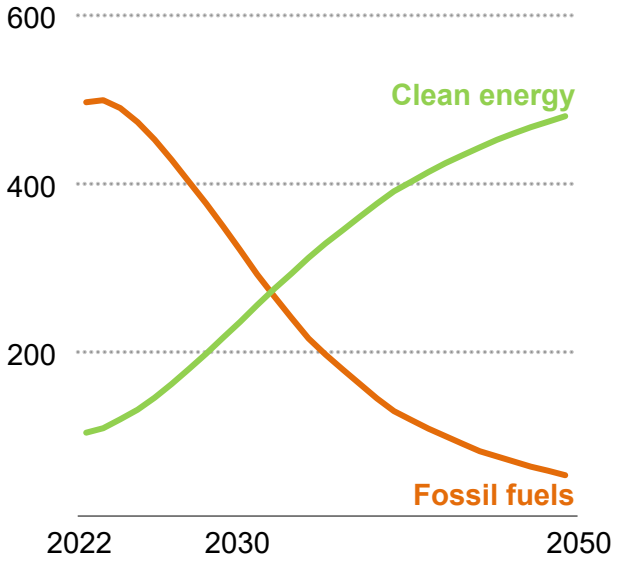
Strong growth in clean energy drives a decline in fossil fuel demand

Clean energy investment
(trillion USD)



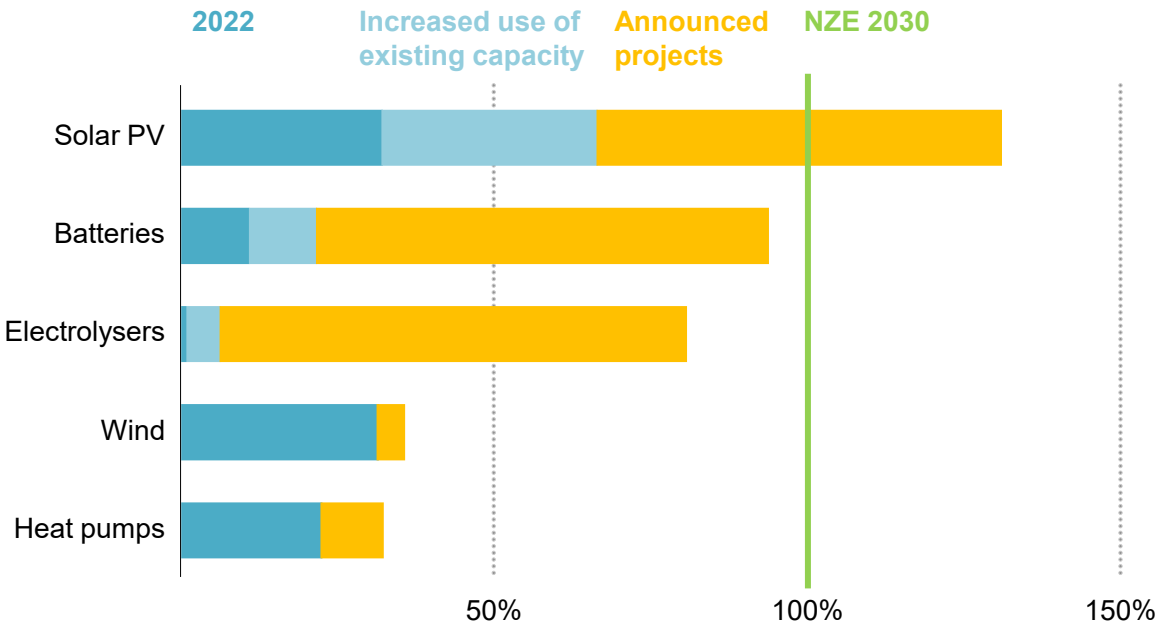
Primary energy demand
(EJ)



Clean energy investment needs to grow from USD 1.8 trillion today to USD 4.5 trillion in 2030. As clean energy grows and fossil fuel demand declines, there is no need for investment in new coal, oil and natural gas.

Clean technology supply chains present an industrial opportunity

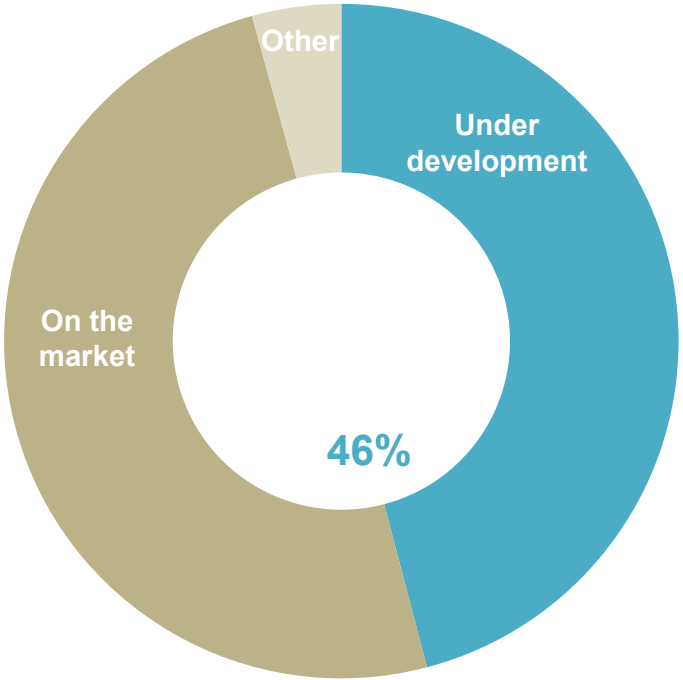
Announced manufacturing project throughput and deployment of key technologies in the NZE Scenario



If all announced projects proceed, solar PV manufacturing will exceed the 2030 level needed in the NZE Scenario, and batteries manufacturing will get very close; other technologies see larger gaps.

Innovation is already delivering new tools and lowering their costs

CO_2 emission reductions by technology maturity in 2050 in the NZE Scenario of **2021**



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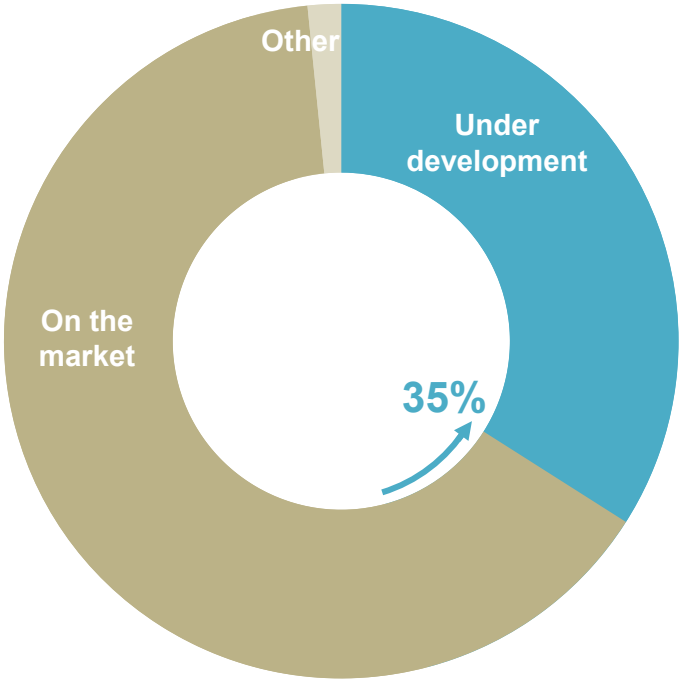
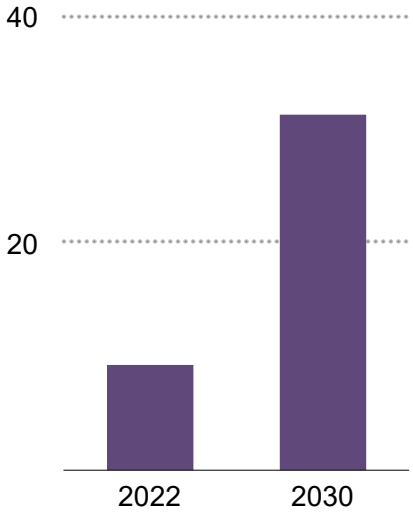
CO_2 emission reductions by technology maturity in 2050 in the NZE Scenario of **2023**



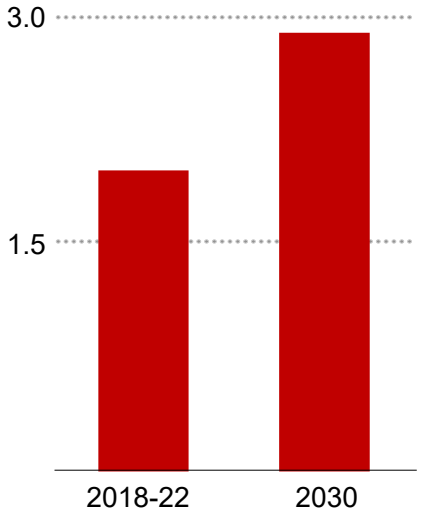
Clean energy innovation has been accelerating in the last few years, yet more RD&D is needed to unlock the next generation of low-emissions technologies.

Managing the risks and opportunities that arise in energy transitions

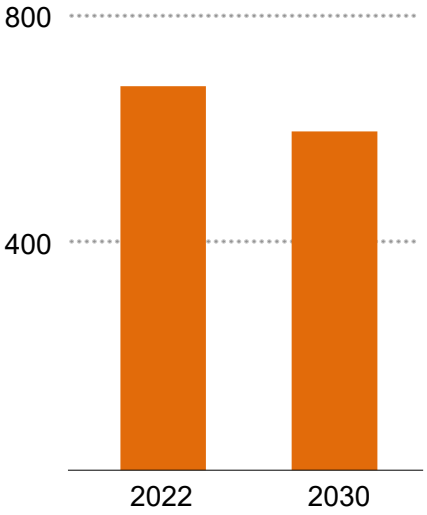
Critical minerals global demand (Mt)



Electricity grid net annual additions (million km)



Total household energy cost in emerging & developing economies (USD per household)



The pace of change required in the NZE Scenario represents an enormous undertaking in terms of ensuring energy security, ramping up infrastructure, and safeguarding energy affordability.

A roadmap to net zero by 2050