

NET ZERO BY 2050

The IEA outlines a path to decarbonize the energy sector in three decades

FOLLOWING A RAFT of net zero target announcements in 2020 and 2021, scrutiny is mounting about the plans to get there. Some countries have detailed outlines of how they will reduce their emissions to net zero, but many still do not. Thanks to countries with detailed plans we have an idea of the task at hand to decarbonize at the country level, but it is hard to imagine what it will take on a global basis. This is especially true given that the current global pledges won't get us to net zero in time to limit the temperature rise to 1.5°C.

To address this problem, the International Energy Agency (IEA) released its "Net Zero by 2050" report. The study's detailed road map outlines the policies, technologies, and behavioral changes needed to achieve a net zero energy system in just three decades. The energy sector holds the key to decarbonizing the global economy: energy-related emissions account for about three-quarters of total CO₂ emissions.

A daunting picture emerges from the report: the energy sector needs a complete overhaul. To succeed, governments must act immediately and decisively to end fossil fuel consumption and craft a resilient

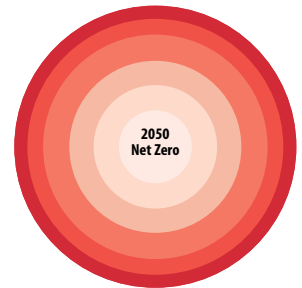
energy economy dominated by renewables such as solar and wind power. The pathway to success is narrow, but the IEA report makes it clear that it is achievable. Decisive climate action now will put the global economy on a stronger and more sustainable footing over the long run. **FD**

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Emissions Target

As the major source of global emissions, the energy sector holds the key to the world's climate challenge.

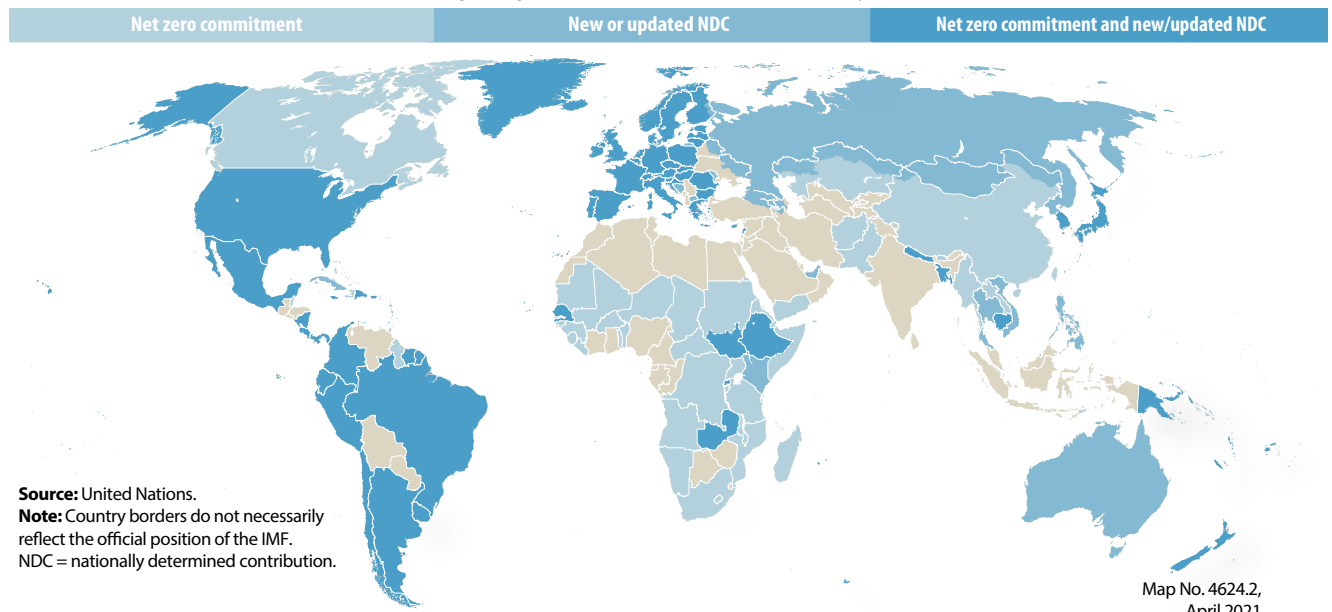
GtCO ₂	Year
33.9	2020
30.2	2025
21.1	2030
12.8	2035
6.3	2040
2.5	2045
0.0	2050



Source: International Energy Agency, "Net Zero by 2050."
Note: GtCO₂ = gigatons of carbon dioxide.

Growing Commitments

The number of countries with net zero commitments is growing but still falls short and must be backed by credible action.



Source: United Nations.
Note: Country borders do not necessarily reflect the official position of the IMF.
 NDC = nationally determined contribution.

Map No. 4624.2, April 2021

Buildings

No new sales of fossil fuel boilers by 2025; all new buildings zero carbon ready by 2030; 50% of existing buildings retrofitted to zero-carbon-ready levels by 2040; 50% of heating demand met by heat pumps by 2045; more than 85% of buildings zero carbon ready by 2050.



Transportation

60% of global car sales electric by 2030; 50% of heavy truck sales electric and no new internal combustion engine car sales by 2035; 50% of aviation fuel low emission by 2040.



Industry

Most new clean technologies in heavy industry demonstrated at scale by 2030; all industrial electric motor sales best in class by 2035; 90% of existing capacity in heavy industries at the end of their investment cycle by 2040; more than 90% of heavy industrial production low emission by 2050.



Electricity and heat

No new unabated coal plants by the end of 2021; 1,020 gigawatts of annual solar and wind added by 2030; unabated coal plants phased out in advanced economies by 2030; net zero emission electricity in advanced economies by 2035; net zero emission globally, including global phaseout of all unabated coal and oil power plants by 2040; almost 70% of electricity generation globally from solar photovoltaic technology and wind by 2050.



Other



Source: International Energy Agency (IEA). 2021. "Net Zero by 2050." Paris.

Note: Hollow circles represent negative emissions. GtCO₂ = gigatons of carbon dioxide; Mt = metric tons.

