

Achieving Net-Zero Emission Targets: Technologies and Economics

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Abstract: Since the Paris Climate Agreement set the global warming target well below 2°C, preferably 1.5°C relative to pre-industrial levels, many nations, sub-nations, and corporate entities have announced net-zero targets for carbon dioxide or greenhouse gas emissions. This study aims to understand the economic implications of net-zero targets by reviewing the existing body of literature. However, not many studies are found on the macroeconomic and distributional impacts of net-zero targets. Existing studies are rather focused on net-zero targets at the sectoral levels even though sectoral net-zero targets are sub-optimal. Most net-zero roadmaps rely on technologies that are not yet economically viable and commercially available, implying that the achievement of the net-zero targets is contingent on technological breakthroughs and cost reductions of the emerging technologies for zero emissions, energy storage, and carbon removal. The study stresses that government and corporate policies that played a critical role in reducing the costs of solar and wind power and their scaling-up, should be expanded to support the emerging technologies included in net-zero roadmaps. The study also highlights the need for further research on the economic and distributional consequences of net-zero targets and the policy design for achieving the targets.

Keywords: Climate change, Paris Climate Agreement, Net-zero emissions, clean technologies.

Main highlights: add four to six short sentences that capture the main takeaways of the paper. Each sentence should not exceed 100 characters.

- The Paris Climate Agreement aims to limit GHG concentration below 2°C to mitigate climate change
- Many nations have set up long-term net-zero emission targets for carbon neutral economy in this century
- Sub-national economies and corporate entities are setting net-zero targets independently
- Net-zero targets entail a massive transformation of the current energy supply and consumption patterns

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- Net-zero targets envision commercialization of emerging technologies including hydrogen and CO2 capture
- Economic impacts of meeting net-zero targets yet to be assessed

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