

An Energy Sector Roadmap to Carbon Neutrality in China

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Abstract

In September 2020, President Xi Jinping announced that the People's Republic of China will “aim to have CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060”. Amid the growing wave of governments around the world setting targets for reaching net zero emissions, no pledge is as significant as China's. The country is the world's largest energy consumer and carbon emitter, accounting for one-third of global CO₂ emissions. The pace of China's emissions reductions will be an important factor in global efforts to limit global warming to 1.5 °C.

This report, *An Energy Sector Roadmap to Carbon Neutrality in China*, responds to the Chinese government's invitation to the International Energy Agency to cooperate on long-term strategies by setting out pathways for reaching carbon neutrality in China's energy sector. It shows that achieving carbon neutrality fits with China's broader development goals, such as increasing prosperity and shifting towards innovation-driven growth. The first pathway in this *Roadmap* – the Announced Pledges Scenario – reflects the enhanced targets China announced in 2020. The report also explores the implications of a faster transition – the Accelerated Transition Scenario – and the socio-economic benefits it would bring beyond those associated with reducing the impact of climate change.

This *Roadmap* examines the technology challenges and opportunities that this new phase of the clean energy transition will bring for China's development, with a focus on long-term needs. The technology innovations required in the Chinese context are a key in-depth focus area. The report concludes with a series of policy considerations to inform China's energy debate.

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Executive summary

There is no plausible path to limiting the global temperature rise to 1.5 °C without China¹. In September 2020, President Xi Jinping announced that China will “aim to have CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060”. Announced 40 years after the country began its remarkable journey towards economic modernisation, this new vision for China’s future comes amid growing convergence among the world’s major economies on the need to reach net zero emissions globally by mid-century. But no pledge is as significant as China’s: the country is the world’s largest energy consumer and carbon emitter, accounting for one-third of global CO₂ emissions. The pace of China’s emissions reductions over the coming decades will be important in determining whether the world succeeds in preventing global warming from exceeding 1.5 °C.

The energy sector is the source of almost 90% of China’s greenhouse gas emissions, so energy policies must drive the transition to carbon neutrality.

This Roadmap responds to the Chinese government’s invitation to the IEA to co-operate on long-term strategies by setting out pathways for reaching carbon neutrality in China’s energy sector. It also shows that achieving carbon neutrality fits with China’s broader development goals, such as increasing prosperity, strengthening technology leadership and shifting towards innovation-driven growth. The first pathway in this Roadmap – the Announced Pledges Scenario (APS) – reflects China’s enhanced targets that it declared in 2020 in which emissions of CO₂ reach a peak before 2030 and net zero by 2060. The Roadmap also explores the opportunities for an even faster transition and the socio-economic benefits it would bring to China beyond those associated with reducing the impact of climate change: the Accelerated Transition Scenario (ATS).

China can build on its current clean energy momentum

China’s energy sector reflects decades of efforts to lift hundreds of millions of people out of poverty while pursuing other energy policy goals. Energy consumption has doubled since 2005, but the energy intensity of gross domestic product (GDP) has decreased significantly in the same period. Coal accounts for over 60% of power generation – and new coal power plants continue to be built – but solar photovoltaics (PV) capacity additions have outpaced those of any other country. China is the second largest oil consumer in the world, but also home to 70% of global manufacturing capacity for electric vehicle batteries, with Jiangsu province alone accounting for one-third of the country’s capacity. China’s

¹ The People’s Republic of China (hereinafter, “China”)

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