

Guest Editorial

China's target for peaking CO₂ emissions

All parties are committed to reaching an agreement on post-2020 global climate arrangement at the United Nations Climate Conference in Paris at the end of this year. Countries put forward their Intended Nationally Determined Contributions (INDCs) one after another. The IPCC Fifth Assessment Report (AR5) released last year confirmed the scientific conclusion that anthropogenic greenhouse gas (GHG) emissions are the main causes of global warming, and proposed mitigation pathways to limit the temperature increase within 2 °C. However, according to current trend of emissions, the global mean temperature will increase 3.7–4.8 °C, which could bring disastrous risks to both the earth's ecology and human society. Therefore, all countries in the world should strengthen efforts to mitigate GHG emissions.

In November last year during the APEC Conference, China and the U.S. delivered the *U.S.–China Joint Announcement on Climate Change*, announcing their respective post-2020 emission mitigation targets. China intends to achieve the peaking of CO₂ emissions around 2030 and to make best efforts to peak early, and intends to increase the share of non-fossil fuels in primary energy consumption to around 20% by 2030. That is an active goal in need of efforts to achieve. The peaking of CO₂ emissions here mainly refers to the emissions from energy consumption. In order to realize that goal, China should make efforts to promote the revolutionary reform of its energy system, which consists of two points: one is to boost energy saving to improve the technical efficiency and economic output of energy using, and the other is to develop new and renewable energy to deepen the decarbonization of the energy mix. The peaking of CO₂ emissions means that sustainable social-economic development will no longer be fueled by increasing fossil energy supply and achieve decoupling with CO₂ emissions. In other words, the economy growth will be maintained while fossil fuel

consumption and CO₂ emissions keep declining, indicating a fundamental improvement in domestic resource constraints and environmental pollution situation. That will be not only a milestone for climate change mitigation, but also a landmark for pursuing green and low-carbon economic growth pattern.

Developed countries achieved the peaking of CO₂ emissions after they finished their industrialization and urbanization. In those countries the economic growth often appears to be intensive and slow, and the energy consumption increases even slowly or tends to level off. The energy elasticity of economy in those countries is relatively low while the energy supply mix is often decarbonized. As a consequence, the CO₂ emissions in those countries no longer increase. China intends to realize the peaking of CO₂ emissions around 2030, which is earlier than developed countries in terms of developing stage. China's economy will have a higher growth rate and its annual energy consumption growth rate will also be higher compared with developed countries when CO₂ emissions peaking. Therefore, China needs more efforts to promote energy conservation and substitution for high carbon energy than developed countries. China should accelerate energy decarbonization, decrease the dependence of economic growth on fuel increase, and meet the increased energy demand by new and renewable energy, thus making the fossil fuel consumption no longer increase and achieving the peaking of CO₂ emissions. It is estimated that if the peaking is realized, China's non-fossil fuel supply will need an annual growth rate of 6%–8%. To achieve such a high growth rate of non-fossil energy, China will need to add wind power, solar power and nuclear power by 20 GW, 20 GW, and 10 GW respectively each year. It means that China will need to build ten sets of 5-MW-sized wind farms each day and 8–10 units of GW-sized nuclear power generation each year. China's new and renewable energy development will far exceed developed countries in terms of speed and scale. Since energy infrastructure construction and use often takes a long time and have technology locked-in effects, forward-looking planning and deployment are necessary, and should be carried out in stages during the 13th, 14th and 15th Five-Year-Plan periods.

China's economic development has come into a New Normal which is characterized by transformation and

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upgrading for quality-and-efficiency promotion. The GDP growth tends to slow down, the quality and efficiency of economic development receive more attention, and much more importance are attached to coordinating social-economic development and resources and environment protection for sustainable development. The INDCs targets will accelerate energy production and consumption revolution. Establishing an efficient, secure, clean and low-carbon energy system should be taken as a national strategy and the overarching goal for coordinating domestic sustainable development and climate change mitigation. Reducing CO₂ emissions will also decrease conventional air pollutants, such as SO₂, NO_x, and smoke and dust. Particularly, achieving the peaking of CO₂ emissions will effectively control the total coal consumption and fundamentally cut environmental pollutants. Moreover, peaking of CO₂ emissions will boost energy technology innovation, create new economic growth points and job opportunities, and improve core competitiveness. Therefore, the INDCs target of achieving the peaking of CO₂ emissions can be treated as an overarching indicator, action focus, and the guide for domestic environment management and CO₂ emissions mitigation, accelerating the formulation of the implementation mechanisms for the green and low-carbon economy transformation. Only through changing economic growth from the extensive, high-energy-consumption and -carbon-emission pattern into an intensive, innovation-driven, low-energy-consumption and -carbon-emission one, can China effectively slow down the increasing energy demand and mitigate CO₂ emissions while maintain social and economic development. Thus, promoting revolution in energy production and consumption is not only well in line with the global change trend, but also an important engine for the domestic economic development transition, being crucial to achieving the INDCs targets.

To attain the INDCs targets, China should deepen its reform and formulate favorable systems and mechanisms for decarbonizing the economy. Each sector and region should speed up the implementation of the reform measures for energy revolution, taking it as the important content of the construction of eco-civilization. The viewpoints on achievement and evaluation criteria of government officials need to be changed, emphasizing the responsibility for achieving the target of saving energy and abating CO₂ emissions. Supports for new energy technology innovation and industrialization should be reinforced, and core technology competitiveness be improved. What's more, China should reform and improve the tax and finance policy system, pricing mechanism of energy products and tax principles of resource and environment which benefit low-carbon development, strengthen market-oriented energy system reform and establish a national carbon market. Low-carbon living styles should be encouraged, and low-carbon urbanization pathways should be pursued. Last but not the least, China should promote international cooperations on climate change mitigation especially South–South cooperation to advance the process of climate change mitigation and contribute to the earth's ecological security.

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