

Environment

The Story So Far

China's rapid economic rise has come at a heavy environmental cost, and its population is increasingly demanding an "ecological civilization" that addresses health-threatening air pollution, heavily polluted rivers and groundwater, and contaminated land. Studies estimate premature deaths from air pollution at 1 to 2 million per year, while the World Bank puts the overall cost of China's water pollution crisis at 2.3% of GDP. Policymakers are aware of these threats: the 2013 Third Plenum set environmental reform and sustainable development as some of the government's main responsibilities. Aided by structural transition away from polluting heavy industries, initial reform efforts are making a difference. Yet much more is required to put a sustainable future within reach, let alone to raise China's air and water quality to international standards.

- In 2013, officials released the first "Air Pollution Prevention" plan, requiring major Chinese regions to meet air pollution reduction targets within four years. Beijing was required to reduce air pollution by 33%, prompting it to shutter coal-fired power stations and curtail coal-burning heaters. A 2018 "Blue Sky" action plan built on the original 2013 plan by setting out further reduction targets of at least 18% for large cities and regions that lagged 2013 goals.
- Premier Li Keqiang announced a "war on pollution" in 2014, outlining plans to reduce particulate air pollution, cut production in overcapacity industries like steel and aluminum, shift away from coal power, and develop renewable energy and resources. While previous policy efforts suffered from a lack of concrete action, a revised Environmental Pollution Law reinforced the war on pollution by increasing penalties for polluters and integrating environmental performance into local officials' performance and promotion metrics.
- The winter of 2017–2018 featured an aggressive campaign against air pollution, including a strict coal-heating ban in northern cities. However, natural gas supply shortages and preemptive coal furnace removals prompted a heating crisis in some regions and forced officials to allow some flexibility at the local level. January 2018 revisions to the tax code also implemented sliding pollution tax rates; increased penalties; and initiated new rewards for firms that cut air, water, noise, and solid waste pollution. Importantly, the law put local governments at the forefront of enforcement, enticing them with 100% of pollution tax revenue.

- The State Council created a new Ministry of Ecology and Environment (MEE) in March 2018, consolidating scattered pollution enforcement and environmental powers from seven agencies. The previous Ministry of Environmental Protection had been sharply criticized even by domestic observers for feeble policy and perceived collusion with provincial interests. The MEE was meant to streamline governance and invigorate enforcement and local inspections.

Methodology

For the air pollution index, a range of factors drives seasonal concentrations of PM 2.5; one of the largest is the domestic use of coal for heating and cooking. We source monthly average PM 2.5 data from the China National Environmental Monitoring Center (CNEMC) for 74 Chinese cities. From these data, we remove some of these seasonal effects using a decomposition analysis. We then average the data across the 74 cities to produce our index. Previously, we utilized daily U.S. State Department air quality data from five environmental monitoring stations at U.S. consulates in China. Due to both the retirement of the U.S. State Department's air quality feeds and increased reliability of China's own air quality data, we implemented a switch to CNEMC data for our analysis starting in 3Q2019.

For the water quality index, we use data from the Ministry of Environment and Ecology (MEE). Specifically, we track the average water quality for the Yangtze, Yellow, Pearl, Songhua, Huai, Hai, Liao, and Zhejiang-Fujian river basins. The average water quality from these basins is aggregated into a national indicator. The MEE publishes water quality data on a monthly basis derived from several hundred monitoring stations across the country in key watersheds. Based on 21 indicators, including total nitrogen, pH, dissolved oxygen, heavy metals, chemical oxygen demand, and others (all based on Surface Water Environmental Quality Standard: GB3838-22), these surface water bodies are put into categories ranging from I (excellent, drinking quality) to V+ (high pollution, not suitable for any use). By tracking the changes in these categories over time, our water quality index can provide an idea of the overall health of Chinese surface water supplies. As seasonal effects can change water quality, we seasonally adjust this index as well. In January 2017, the Ministry of Environmental Protection (MEP, now MEE) started issuing weekly quality reports. We rely on these data for December 2016 through June 2018.

We rebase the air quality data to November 2014 as the benchmark to track quarter-on-quarter changes. Water pollution data only go back to October 2012. We also

adjusted the World Health Organization standards to provide a comparable context.

Quarterly Assessment and Outlook

- Our environmental reform score remains neutral, as pollution rebounded but renewable resource utilization increased.
- China’s environmental pollution returned to pre-COVID levels in 2Q2020 as economic activity resumed following 1Q2020 lockdowns. Seasonally adjusted air and water pollution levels were flat or only slightly improved year-on-year.
- To help China get past the pandemic, local officials are relaxing environmental restrictions and expanding infrastructure and coal stimulus. By contrast, central authorities have announced ambitious policies to combat climate change. President Xi Jinping’s pledge to make China carbon neutral before 2060 is encouraging but difficult to square with center-local tensions over environmental enforcement, China’s continued heavy reliance on coal power, and its financing of new coal-fired power plants around the world

This Quarter’s Numbers

After improving in 1Q2020 as economic activity in China ground to a halt due to COVID-related lockdowns, all of our environmental indicators deteriorated in 2Q2020, returning to pre-COVID levels. Air and water pollution increased (quarter-on-quarter), though they remain slightly lower than in 2Q2019. Air pollution conditions were exacerbated by the larger-than-usual share of coal power in electricity generation in April and May, as well as carbon-intensive infrastructure stimulus from local governments (see **Policy Analysis** below). A relaxation of curfews leading to higher automobile traffic also contributed to resurgent emissions.

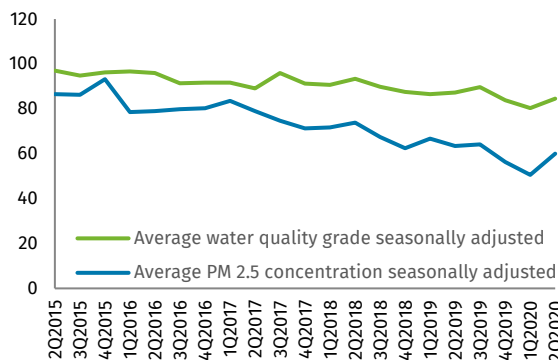
Though pollution worsened, renewable energy sources and technologies were put into expanded use. Wind curtailment—the wind energy wasted because it could not be absorbed or transmitted to the grid—decreased back to its pre-crisis levels (around 3%). In addition, **Sales of New Energy Vehicles (NEVs)** as a share of total auto sales rebounded after a historic collapse in 1Q2020, part of a broader recovery in the automotive sector as showrooms opened and production (especially of commercial vehicles and trucks) rebounded. Second-quarter NEV sales were lower than 2Q2019, but the 12% drop was much smaller than the 62% plunge recorded in 1Q2020. Stronger than

expected results from Tesla and Nio, as well as Volkswagen’s announcement in May that it would invest in EV production, all bode well for NEV adoption.

Policy Analysis

Primary Indicator: Water and Air Quality Trends

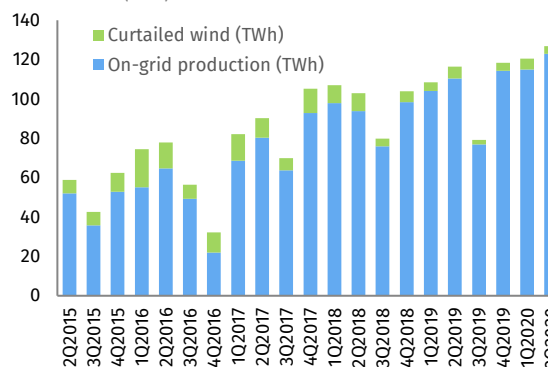
Index, Nov 2014 = 100



Source: Ministry of Ecology and Environment, US Department of State, Rhodium Group.

Supplemental 1: Wind Energy Curtailment

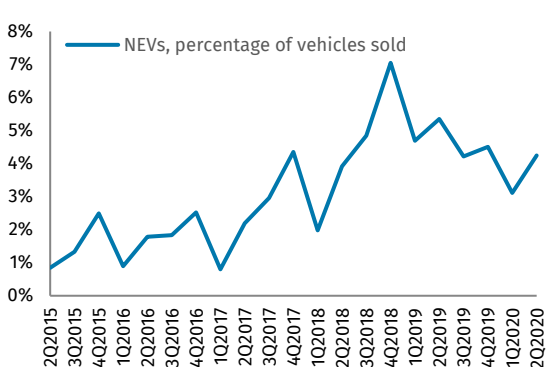
Terawatt hours (TWh)



Source: China Electricity Council, Rhodium Group.

Supplemental 2: Sale of New Energy Vehicles

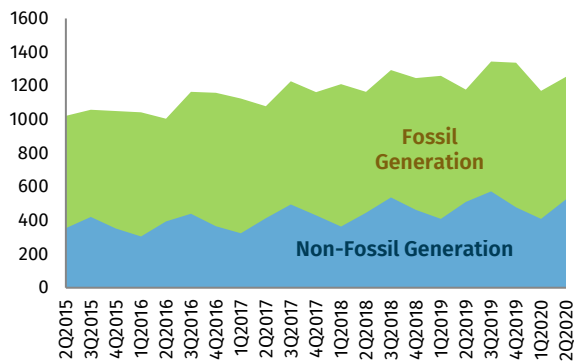
Percent



Source: China Association of Automobile Manufacturers, Rhodium Group.

Supplemental 3: Overall Electricity Generation

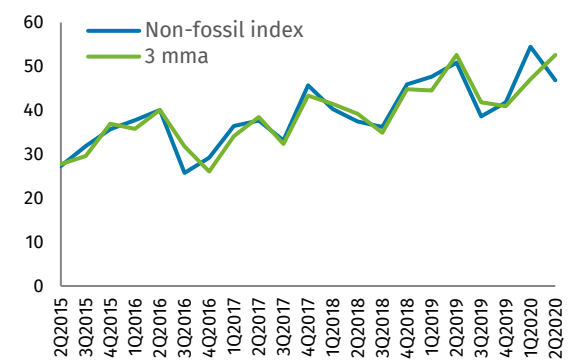
Billion Kilowatt-Hours



Source: National Bureau of Statistics, China Electricity Council, Rhodium Group.

Supplemental 4: Non-Fossil Electricity Generation

Index



Source: National Bureau of Statistics, China Electricity Council, Rhodium Group.

Policy Analysis

Beijing has not resolved the central tension in its environmental policy: balancing pollution-intensive short-term support for the economy with the long-term goal of being green. The contradictions were evident in June as provinces approved the most new coal power capacity in five years, while central agencies ordered a focus on clean energy and improved renewable grid capacity.

As we predicted in the **Summer 2020 Edition**, the pressure to support economic recovery led China to fudge a key environmental target. In May, Premier Li Keqiang announced that China would continue to reduce energy consumption per unit of GDP—emissions *intensity*—but declined to offer a specific target as China had done since 2014. Economic growth is taking precedence over meeting environmental targets at this time.

While China is dropping short-term targets, it is making ambitious long-term commitments. In September, President Xi Jinping pledged that the country would become carbon neutral before 2060 and reach peak carbon dioxide emissions by 2030. No ministry has yet provided

specifics on how these goals will be achieved. China’s pledge is potentially game changing, but attaining the 2060 goal will require significant changes to the country’s energy mix.

Final Dashboard Assessment

Looking back, China’s 2013 environmental reform plans were ambitious. They included stepping up enforcement; initiating new pollution control, waste treatment, and environmental cleanup rules; taxing greenhouse gas emissions; and shrinking carbon-intensive industries such as coal. The implementation of these plans has been mixed. China reined in chemical and toxic material pollution following several large-scale industrial accidents (see **Summer 2019/Spring 2019 Editions**). Administrative rule changes have made officials more accountable for pollution. China has also integrated environmental scores into government performance evaluations.

Although air and water pollution levels do not yet meet international standards, average quarterly particulate matter (PM 2.5) pollution has fallen by nearly 40% since 2014, and water pollution has been reduced by 15%. Renewable energy and green automotive technology have expanded, and NEVs and wind power have become less expensive, more widespread, and more efficient in a short period of time. The availability and quality of China’s environmental data have generally improved, although the whole framework of China’s macroeconomic data has increasingly come under greater scrutiny due to multiple statistical inconsistencies.

To truly achieve the goal of environmental sustainability, China will need to make absolute (not just relative) reductions in coal power capacity, further restrict gasoline-powered cars, and break its reliance on pollution-intensive activity for growth. China has met its Third Plenum goals on the share of renewables and coal in the energy mix; however, absolute coal consumption continues to grow, and air and water pollution remain heavy in specific regions. The challenge is not only to meet China’s global commitments on air pollution but also to ensure that no region is left behind at home.

The next five years of China’s environmental policy will be crucial. Some laws have yet to be fully implemented, like the carbon tax and cap-and-trade system. But the contents of the Communist Party’s 14th Five Year Plan, covering 2021 to 2025 and coming out in March 2021, will be most important. The danger is that it will be more of the same, with no absolute emissions targets and limited (if any) commitments to reduce coal capacity.