

## 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

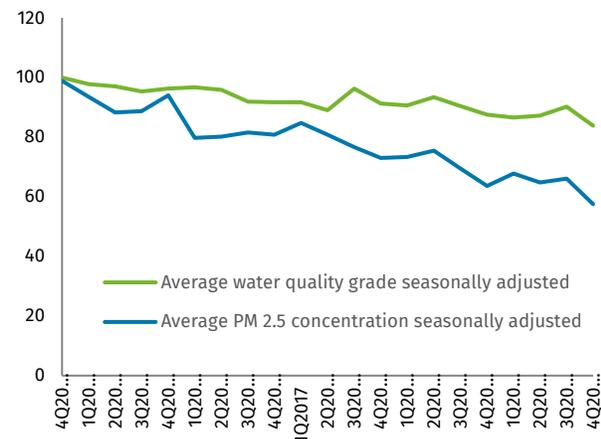
- We upgrade our environment reform assessment in 4Q2019 because air quality improved in northern cities and water quality improved in China's big river systems. The COVID-19 crisis, not reform efforts, will extend these trends with the economy stalled.
- The COVID-19 outbreak and economic shutdown have improved environmental conditions temporarily, but recession is not a policy choice—the hard work of reform still lies ahead. Past slowdowns suggest that pollution reduction will be short lived as officials focus on economic preservation for the rest of 2020.
- Renewable energy usage and efficiency increased in 2019. Yet, a broader automotive sector slowdown prevents greater adoption of new energy vehicles.

### This Quarter's Numbers

China's environmental conditions improved in 4Q2019, even before COVID-19 shut industry. Cities in air pollution control zones saw the most improvement (see **Environmental Impacts**). Air quality in the 11 cities we track in northeastern Hebei province (part of the Beijing-Tianjin-Hebei region where pollution reduction is prioritized) improved with average PM 2.5 levels falling by nearly 25% quarter-on-quarter. Outside of priority zones, however, conditions deteriorated: air quality in southern activity hubs Fujian and Guangzhou declined. Production data in the second half of 2019 showed heavy industrial output of iron ore, steel products, and cement surging in central, southern, and western provinces, suggesting some relocation of industrial activities outside targeted northeastern cities in response to pollution controls.

### Primary Indicator: Water and Air Quality Trends

Index, April 2013 = 100



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

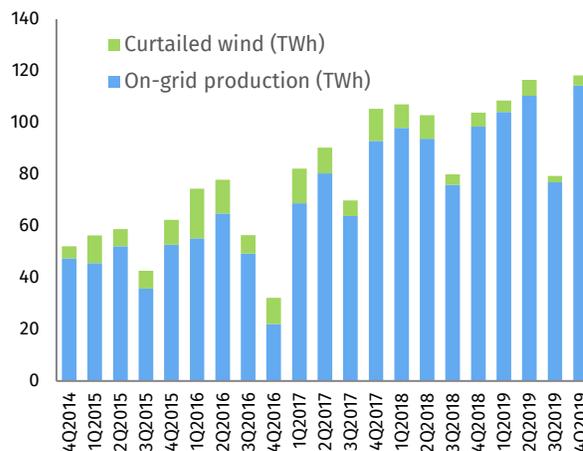
Renewable power efficiency and usage remained mostly unchanged from the previous quarter. Spilled wind—a measure of the amount of wind energy wasted because it cannot be efficiently transmitted to the power grid—decreased in 2019, suggesting measures to increase wind's contribution to the power supply are working (see **Wind Energy Curtailment**).

Replacing China's auto fleet with more environmentally friendly electric vehicles remains a key policy goal and is important for reducing pollutant emissions in the long term. However, sales of new electric vehicles (NEVs) fell in 4Q2019 due to continued phase-out of subsidies, consolidation of players in the market, and a broader downturn in the auto sector (see **Sales of NEVs**). This suggests NEV sales targets set by Beijing in 2017 will not be met by the end of the year.

The coronavirus outbreak will result in improved environmental conditions in coming quarters, but lasting changes will require sustained, intensified environmental policy development and enforcement. Even as labor migration restrictions are lifted and industrial activity resumes, travel around the country is still 70% below normal levels. Domino effects from COVID-19 will suppress external demand for Chinese manufactured imports, limiting domestic production and resulting pollution. China's official GDP contracted by 6.8% in the first quarter. Accordingly, air and water pollution—which track industrial and energy consumption trends—declined precipitously in 1Q2020. It remains to be seen whether Beijing will use this opportunity to prioritize environmental protection while recovery remains sluggish.

### Supplemental 1: Wind Energy Curtailment

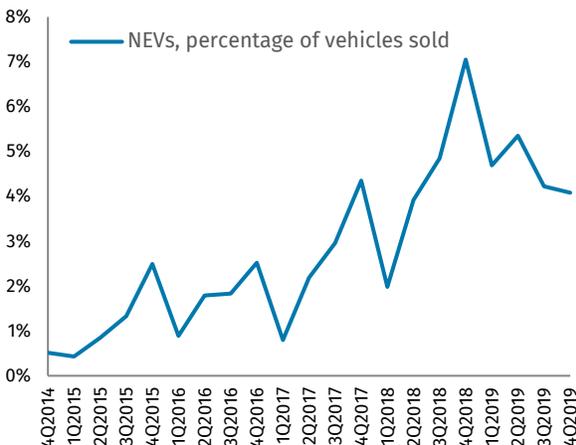
Terawatt hours (TWh)



Source: China Electricity Council, Rhodium Group.

### Supplemental 2: Sale of New Energy Vehicles

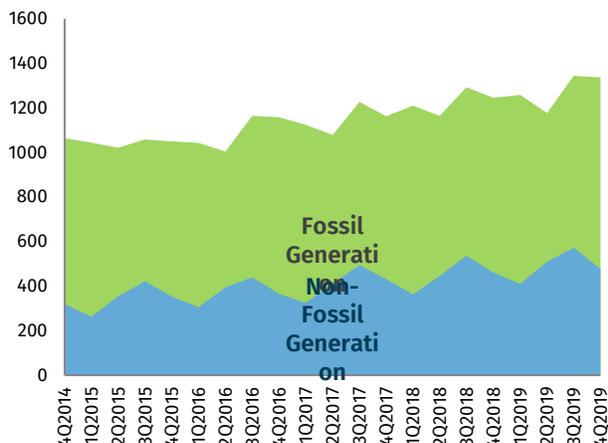
Percent



Source: China Association of Automobile Manufacturers, Rhodium Group.

### Supplemental 3: Overall Electricity Generation

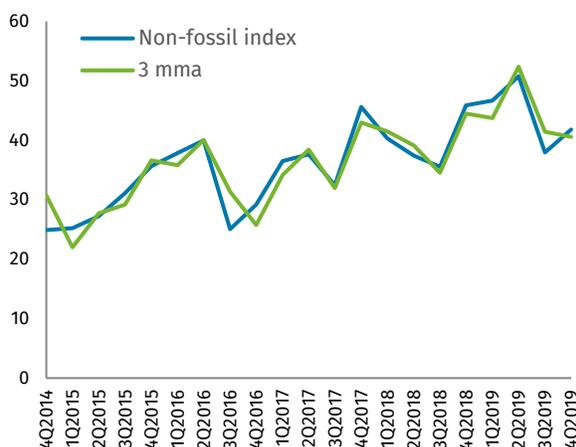
Billion Kilowatt-Hours



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

Prior to the COVID-19 outbreak, policymakers were focused on meeting long-standing 2020 domestic goals, including new targets for renewable energy. The COVID-19 crisis has changed the priorities: first to quickly implement environmental control measures like water monitoring to help contain the virus, and then to balance enforcement with the need to stimulate economic activity. While the reduction in industrial activity during the outbreak temporarily improved air quality indices, that progress will reverse when industrial production resumes. Officials typically favor growth over the environment when coming out of a recession.

Beijing’s environmental policy during the review period focused on limiting the spread of COVID-19. In February, the Ministry of Ecology and Environment (MEE) issued emergency guidance to increase wastewater treatment checks to stop waterborne spread. Beijing also announced revisions to the Wildlife Protection Law that would ban the trade and consumption of wild animals, including wildlife wet markets like the Wuhan market, where experts believe COVID-19 spread early on. However, observers are skeptical: results will depend on how a final law is formulated and enforced. Wildlife trade is a big business in China, employing 14 million workers according to a [2017 study](#), and officials likely will be reluctant to enforce a crackdown on the industry amid weak economic conditions. The ban is also unlikely to cover the use of animals in traditional Chinese medicine, limiting the potential for major strides in wild animal conservation and ending wildlife trade.

Other signs suggest environmental enforcement may be relaxed in response to the crisis. Although the MEE asserted that environmental standards would not be relaxed during the pandemic, many recent measures appear to do just that. On March 9, the MEE reported that it would “adjust” environmental enforcement for nearly 300,000 businesses facing cash shortages by giving inspectors the option to extend compliance periods and forgo penalties for minor violations. Some firms (e.g., low-emissions firms or manufacturers of needed equipment) will be exempted from environmental inspections, and criteria for several industries have been relaxed. It is unclear when MEE assessment procedures will return to normal. Given that the coronavirus will weigh down China’s economy for months if not years, authorities may extend lax enforcement, undermining reform commitments.