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 City 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 behind 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 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.

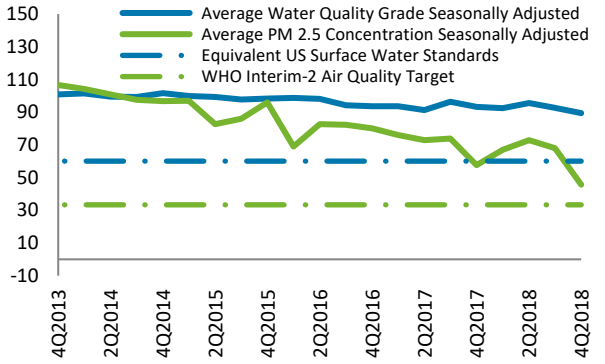
METHODOLOGY

To gauge environmental reform progress, we track measures of air and water pollution. For air quality, we focus on small particulate matter of 2.5 microns or less (PM 2.5), which is linked to adverse health effects and for which the World Health Organization (WHO) issues pollution guidelines. For water, we monitor the surface water quality of China's freshwater system. Lower levels in our air and water indices indicate improved environmental conditions. We seasonally adjust these indicators to account for annual weather patterns and energy consumption changes. Variations in these factors may also reflect developments in non-environmental areas, such as a macroeconomic slowdown or industry consolidation. To supplement our analysis, we examine China's alternative energy development, including sales of new energy vehicles (NEVs) and non-fossil-fuel electricity generation. We also track wind curtailment, the electricity lost when power operators restrict how much is transmitted from wind turbines to the power grid.

QUARTERLY ASSESSMENT AND OUTLOOK

Primary Indicator: External Financial Liberalization

Percent share



Source: U.S Department of State Air Quality Monitoring Program, China National Environmental Monitoring Center.

- Our assessment of current environmental outcomes is a modest but likely temporary improvement, continuing last quarter's trend.

- Both air and water quality indices improved. Water numbers may reflect stronger environmental enforcement, as well as a slowdown in industrial activity, but air quality numbers are likely distorted by hard-to-explain low December readings in some cities.

- Environmental policymaking focused on updating previous legislation, but enforcement lost some intensity as regulators were more sensitive to winter heating needs in northern China and prioritized boosting the economy.

THIS QUARTER'S NUMBERS

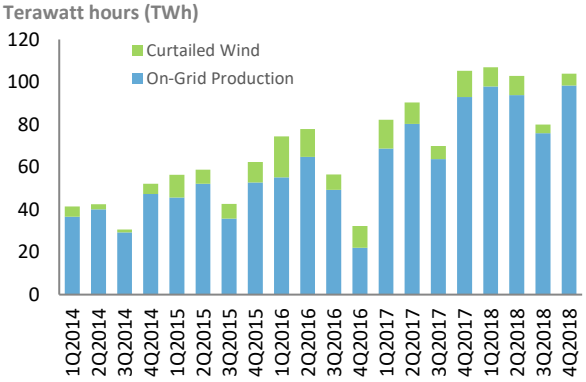
Our index indicates that air pollution appreciably declined at the end of 2018 in China's biggest cities, thanks in part to favorable weather conditions in Beijing in the latter half of December and a slowdown in industrial activity. In 4Q2018, the average airborne particulate pollution (PM 2.5) index decreased to its lowest levels since 2013 (see **Environmental Impacts**). These results should be read with some caution, however. Our indicator averages readings from only five monitoring stations and can be distorted by outlier results in a single city. In this quarter, extreme seasonally low December pollution levels in Guangzhou and Shanghai had an outsized effect on our index. Our own numbers and outside reporting suggest that air pollution increased in October and November. Though pollution levels decreased in all cities in December, the overall nationwide quarterly decrease was likely less dramatic than our index indicates.

The water quality index continued its improvement from 3Q2018 (see **Environmental Impacts**). Progress was consistent across China: of the eight river systems we track, only the Huang River deteriorated slightly. The Songhua River featured the largest water quality improvement, followed by the Yangtze River, which received special attention from policymakers in 2018 (see Policy Analysis below). This may reflect a push from last year to control waste discharge. The Soil Pollution Prevention and Control Law we discussed in last quarter and the "river chief" system, which designates responsibility for water improvement to specific local officials, may also be having positive effects, though a full analysis will have to wait until the government's June 2019water quality reports, which will mark a full year since all rivers were assigned a chief. As with air quality, water quality improvements are partly associated with slack periods in the economy, and the current surge in industrial production following ample economic stimulus is, conversely, likely to generate pollution.

Our **wind curtailment** indicator shows China utilizing its wind assets about as effectively as last quarter. Also known as "spilled wind"—wind power that is wasted because it cannot be transmitted to the electricity grid—wind curtailment was unchanged from 3Q2018. China continues to add wind capacity in an effort to reduce coal reliance; in 4Q2018, it produced the most wind energy since we began tracking in 2014. **Sales of New Energy Vehicles** as a percentage of all vehicles also increased. NEVs now make up approximately 1 in every 14 cars sold in China, and the market continues to grow despite uncertainty over government plans to end NEV producer subsidies in 2019.

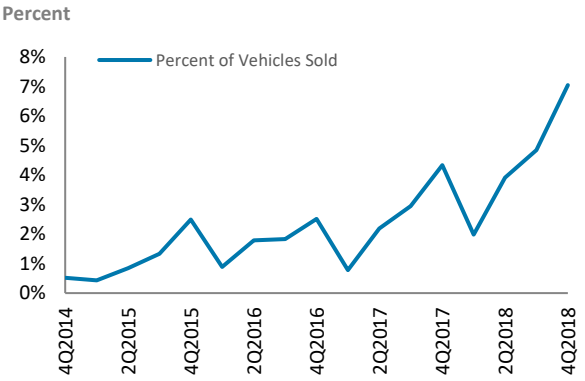
Non-fossil-fuel production nominally declined to 27% of all power, as rising demand for winter heat led to increased use of coal and other thermal power sources. On a seasonally adjusted basis, 4Q2018 renewable and nuclear energy production was actually higher compared to a year earlier, but most of this generation came in October. October 2018 non-fossil-fuel production was the highest in our index, but production quickly backslid in November and December as heating needs increased. These data indicate that China is making better use of non-fossil sources during the warmer months but is still struggling to fully utilize these sources in winter, when natural gas is the preferred coal alternative.

Supplemental 1: Wind Energy Curtailment



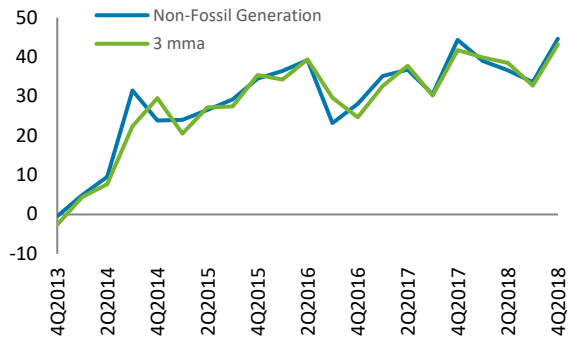
Source: National Energy Administration, Rhodium Group.

Supplemental 2: Sale of New Energy Vehicles



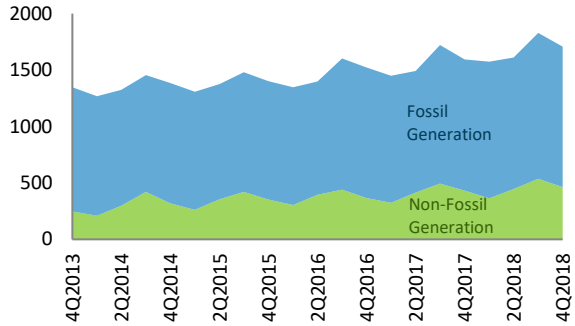
Source: China Association of Automobile Manufacturers

Supplemental 3: Non-Fossil Generation
Index (April 2012 = 0)



Source: National Bureau of Statistics.

Supplemental 4: Overall Electricity Generation
Terawatt hours (TWh)



Source: China Electricity Council.

POLICY ANALYSIS

While officials claimed that environmental enforcement remained a priority, regulatory activity ebbed in 4Q2018 as leaders sought to stabilize a faltering economy. Even as the December Central Economic Work Conference declared that fighting pollution is one of "Three Critical Battles," MEE officials in 4Q2018 promised that pollution controls would not be "simple and crude" and instead would provide flexibility to regions and businesses. This shift in tone comes after rigorous enforcement in the winter of 2017–2018 resulted in widespread factory closures and heating shortages, compounded by the need to avoid further weakening economic conditions amid a broader slowdown.

As we noted last quarter, northern cities were given flexibility to set their own winter pollution reduction targets in 2018–2019. This flexibility appears to have contributed to air pollution backsliding across northern China. Although our air pollution index only captures the northern cities Beijing and Shenyang, media reports suggest that PM 2.5 levels increased in other cities in China's northern manufacturing belt. For example, a Reuters report suggested that PM 2.5 levels in Henan province rose 12% in December compared to the previous year, with local officials blaming weather conditions.

Few concrete policy measures were released throughout the quarter. Most measures consisted of implementation details for previously passed laws. Most important of the new rules were December 4 airborne pollution control standards for pesticide production. China is the world's largest manufacturer and consumer of both chemicals and pesticides, producing more than 45,000 chemicals and 3.75 million tons of pesticides annually. China is phasing out more than 30 of the most toxic compounds, but remaining pesticides are still a threat on the farm, where they leach into soil and groundwater, and in the factory. Pesticide production emits toxic air pollutants, and lax safety protocols have caused chemical leaks and catastrophic industrial accidents. In November, an explosion and fire at a Hebei chemical factory killed 23 people. The new draft rules seek to reduce hazardous emissions and limit accident risks, detailing the maximum permitted levels for certain chemicals and organic compounds and requiring sealed production facilities and air purification equipment. While tighter rules are a step in the right direction, the MEE is moving slowly on this compared to more visible smog and water pollution laws: the law to regulate pesticide emissions was initially enacted in 2016.

Some region-specific environmental plans were also announced in the review period, including clean water plans for specific river basins. The Yangtze received attention in the "Action Plan for the Protection and Rehabilitation of the Yangtze River" released on December 31. The plan set out new controls on industrial and agricultural runoff and discharge, as well as schemes to invest in water purification and ecological development.

As domestic environmental enforcement tapered off in 4Q2018, China's international environmental engagement ramped up. At the 2018 United Nations Climate Change Conference (COP 24) in early December, Chinese negotiators signaled that they would accept uniform greenhouse gas standards—provided that developing countries could set their own timetables and were given financial support. China had previously argued that developing countries should be able to set their own standards. The shift was seen as a potentially important concession on what has up till now been a major sticking point in negotiations. China's position reflects domestic environmental pressure, as well as a desire to displace the United States as a leading voice in global climate efforts.