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, the war on pollution was reinforced by a revised Environmental Pollution Law that increased penalties for polluters and integrated 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 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.

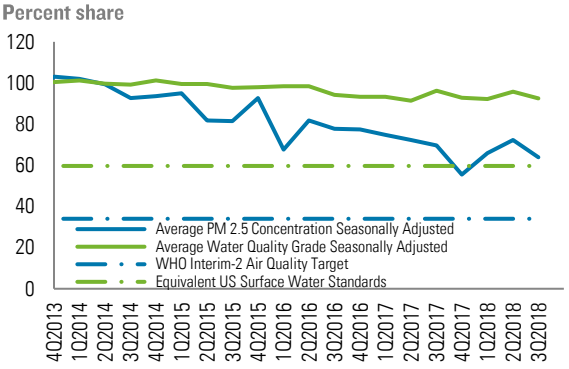
- The State Council created a new Ministry of Ecology and Environment (MEE) in March 2018, consolidating scattered pollution enforcement and environmental powers from seven agencies. The previous Ministry of Environmental Protection had been sharply criticized even by domestic observers for feeble policy 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. Changes 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



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

- There was a modest and potentially temporary improvement in environmental performance, an upgrade from last quarter's neutral assessment.

- Both air and water quality indices improved, but progress was not uniform: Beijing City's large improvement in air quality was an outlier, and

modest improvements in water quality likely resulted from declining industrial activity, meaning conditions may deteriorate if the government uses stimulus to boost heavy industrial growth.

- Beijing invigorated environmental enforcement measures, including new soil protection laws and renewed pressure on local governments to decrease pollution levels. However, authorities simultaneously relaxed some winter pollution targets, reflecting a continuous struggle to balance environmental goals against ensuring rapid economic growth.

THIS QUARTER'S NUMBERS

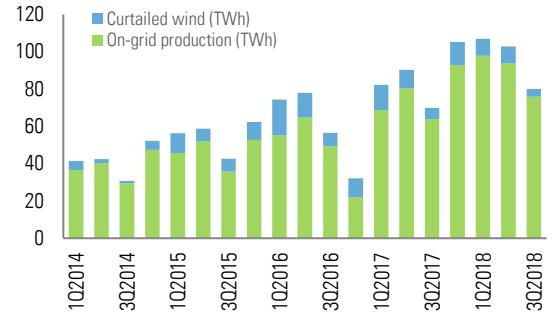
In 3Q2018, our average airborne particulate pollution (PM 2.5) index decreased by 5.6% from 2Q2018, indicating improved air quality. We attribute most of this improvement to air quality changes in the city of Beijing, where PM 2.5 levels improved by 16% from the previous quarter. Our index controls for seasonality appear to corroborate media reports from this summer touting Beijing's visibly "blue[er] skies," after coal plants were replaced with natural gas. July 2018's PM 2.5 rating for Beijing was one of the lowest observed since 2008. At the same time, the other four cities we monitor showed mixed performance. Chengdu and Shenyang saw modest pollution decreases, by 1.7% and 4.9%, respectively, while pollution in Guangzhou and Shanghai slightly increased. Such volatile pollution numbers suggest clean air progress in China is far from sustained or uniform.

The water quality index improved after a decline in 2Q2018. Water quality increased 3.3% from the previous quarter, though changes in availability of monthly and weekly pollution data throughout the survey period limit the direct utility of quarter-on-quarter (qoq) comparisons. Given that China's water quality closely tracks industrial production, the improvement is likely related to reduced industrial output during the review period. Industrial value-added declined to its lowest levels since 2016 amid a broader growth slowdown. Moreover, improvements in water quality were not uniformly distributed: pollution in the Pearl and Yangtze river basins deteriorated even as the overall index improved.

After making capacity additions throughout 2017, China is using its wind power assets more efficiently. In 3Q2018, **Wind Energy Curtailment**, essentially meaning the amount of wind power wasted because it cannot be transmitted to the electricity grid, dropped to 5% of wind power generation. This represents the second-lowest mark in our dataset since 2013. China's electric vehicle market also continues to expand. While overall auto sales declined in 3Q2018, **Sales of NEVs** as a percentage of all vehicles sold reached 4.8% in the review period, an increase of nearly 1 percentage point from the previous quarter and a new quarterly high.

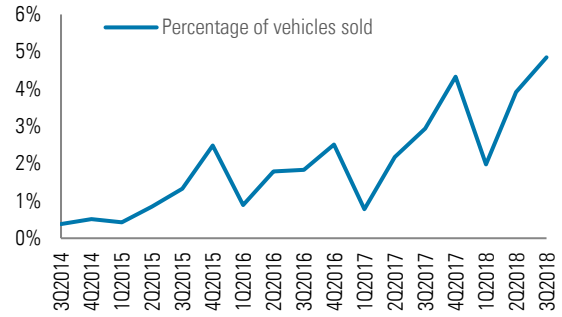
Non-Fossil Fuel Electricity Generation nominally increased by 1 percentage point qoq to 29% of all electricity generation in 3Q2018. However, seasonal adjustment reveals that non-fossil-fuel generation was seasonally low. Our measurement of the amount of electricity generated from non-fossil sources decreased by 7.8% from 2Q2018 to 3Q2018, marking the third consecutive quarterly decline. This reinforces our view that increases in renewable energy generation are being offset by larger increases in overall electricity demand, forcing energy suppliers to use coal power to make up the difference (see our **Fall 2018** edition). As new renewables installation fails to keep pace with increasing electricity demand, coal-fired power will remain ingrained in China's energy mix.

Supplemental I: Wind Energy Curtailment
Terawatt hours (TWh)



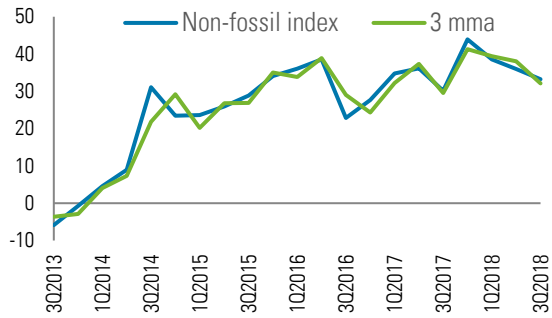
Source: National Energy Administration, Rhodium Group.

Supplemental 2: Sale of New Energy Vehicles
Percent



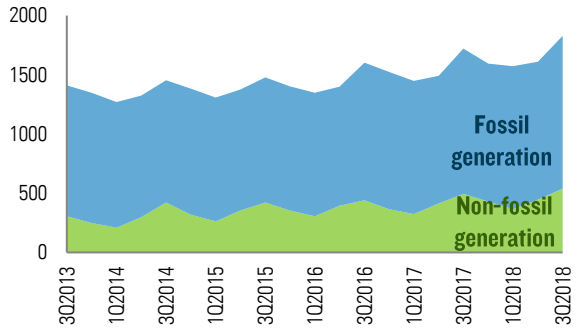
Source: China Association of Automobile Manufacturers

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

More aggressive policy enforcement was critical in reducing air pollution throughout the review period, but the prospects of sustained air quality action are uncertain as winter approaches and annual heating needs spike. This is a concern as the central government gives more leeway to local officials to set environmental and production targets, while it focuses more on pro-growth measures. During the winter months, enforcement will likely soften from the rigorous measures enforced in winter 2017–2018. On September 27, the Ministry of Ecology and Environment (MEE) announced that it would curtail mandatory winter production cuts in heavy polluting industries like steel and plastics. In the initial draft plan from August, the MEE had suggested northern cities might face cuts of up to 50% of production capacity in its final winter antipollution plan. This represents a partial relaxation of the pollution cuts in the Jing-Jin-Ji region (Beijing-Tianjin-Hebei) that we discussed last quarter, threatening to contravene summer air quality improvements. While the draft plan aimed to reduce the number of winter high air pollution (PM 2.5) days by 5% from last year, new directives lower the target to 3%. This represents an even more drastic reduction from the 15% target rumored to be under consideration in August. Early reports from November and December suggest that smog levels increased in Northern China, in line with typical seasonal patterns.

New soil protection laws enacted August 31 will require authorities to set national soil pollution standards and conduct regular, publicly available soil examinations. China's polluted soil remains a threat to human health and agricultural production, with a 2014 government report revealing that nearly 20% of China's farmland is contaminated with chemicals, improperly disposed waste, and heavy metals. This makes soil pollution a threat not just to local residents' health but also to national food security. By policing the soil, the new measures could also help cut down on water contamination via runoff. The new law specifically grants local governments enforcement responsibility. However, long-term viability will depend on funding; while the law stipulates central and provincial governments will establish pollution cleanup funds when no party responsible for the pollution can be identified, details are limited and a funding source has not been identified.

The central government also continued to press for stronger local environmental inspections and enforcement, consistent with actions during the last review period. In its report on the latest round of provincial environmental inspections issued on September 28, the MEE reported that industrial compliance with environmental inspection rounds was improving, with 60% of cited violations corrected within weeks. However, these reports should be interpreted with caution. While the enforcement push is real, many of the corrective measures are focused on meeting short-term environmental targets (such as shutting down a single noncompliant factory) rather than long-term efforts (such as industry-wide water pollution enforcement). As the campaign continues, more pushback is possible from local officials concerned with offsetting the slowing economy.