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Conclusion

[...]

Both crude steel and cement production fell, and the cement industry's ultra-low emission retrofitting was extensively launched.

In 2022, China's crude steel production was 1.013 billion tons, a 2.1% drop and a YoY decrease of 22.243 million tons. Despite the decrease for two consecutive years, output remained high, and the iron and steel industry still faces an arduous task of reducing pollution and carbon emissions. The ultra-low emission retrofitting of a total of 207 million tons of crude steel capacity across the country was completed. However, among the enterprises that completed ultra-low emission retrofitting, the effects were dissimilar, and some enterprises falsified their emissions data, consequently dampening the effects of pollution emission reduction.

China's 2022 cement production was 2.12 billion tons, the lowest in the past decade, with a YoY decrease of 10.8%. Nevertheless, the cement industry is still plagued by issues such as overcapacity, a significant difference in the utilisation rate of regional capacities, few adopted alternative fuels, and inadequate application. After the power and the iron and steel industries, the cement industry's ultra-low emission retrofitting was extensively launched. The China Cement Association published the association standard "Ultra-Low Emission Standard of Air Pollutants for the Cement Industry," which serves as the basis and reference for the industry's ultra-low emission retrofitting. Meanwhile, Guangdong, Henan, and Shandong provinces set the goal of completing ultra-low emission retrofitting for all cement capacities during the 14th Five-Year Plan period and introduced corresponding implementation measures.

The results of loose coal control in key areas require consolidation. Heating with renewable energy in non-key areas is gradually gaining importance.

The "Action Plan on the In-Depth Fight to Eliminate Heavily Polluted Weather" requires the complete elimination of loose coal in the plain areas of the BTH region and its surrounding areas and the Fenwei Plain before the heating season in 2025. As the introduction of clean heating in the two key areas comes to an end, the key to eliminating loose coal lies in the consolidation of transformation results. Some of the cities that have completed the transformation are seeing the return of loose coal and their clean-heating equipment lying idle due to the higher costs of clean heating in rural areas, late subsidy payments, the preference of empty nesters for burning coal, and

poor building insulation.

In 2022, loose coal control was stepped up in non-key areas. The number of cities covered by clean heating demonstration projects, as supported by the central government funds for air pollution prevention and control, grew to cover those in northeast and northwest China. In conjunction with national policies that support heating with renewable energy in rural areas, some pilot cities also explored the use of renewable energy for heating in winter in line with local conditions, further clarifying the transformation targets for renewable energy heating.

With rapid multimodal development, the optimisation of the transportation structure progressed smoothly.

China's "road-to-railway" and "road-to-waterway" freight flow diversion has achieved remarkable success, while its combined rail-water transportation has progressed by leaps and bounds. In 2022, the national railway and waterway freight volumes grew by 9.5% and 12.3%, respectively, compared with 2020. The achievement of the 14th Five-Year Plan's goals of attaining "10% and 12% growth in the national railway and waterway freight volumes compared with 2020 by 2025" look promising. Meanwhile, the container volume of combined rail-water transportation to and from ports reached 8.75 million twenty-foot equivalent units in China, a YoY growth of 16%.

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Recommendations

Revise the ambient air quality standards promptly to consolidate the leading and driving role of standards.

China's PM_{2.5} concentration remains high, and O₃ concentration is also showing a rising trend. Although the number of cities meeting the standard for PM_{2.5} continued to grow in 2022, the overall national annual mean concentration of PM_{2.5} fell significantly behind the values in developed countries and those stated in the WHO Global Air Quality Guidelines (AQGs). As the Blue Sky Defense War enters a stage that requires sustained and determined efforts, some cities have begun setting less stringent targets for air quality improvement and slowed down their actions. China needs to set stricter air quality management targets, which can play a strong leading and binding role in improving its cities' air quality. Internationally, the updated AQGs in 2021 are the bellwether for the revision of air quality standards, and both the European Union and the United States have put forward their targets based on health protection. They plan to tighten their air quality targets and

standards as they enforce stricter limits on key air pollutants, such as PM_{2.5}.

Based on local health effects and benchmark studies, China should learn from existing international research, guidelines, and methodology to promptly revise its ambient air quality standards, strengthen cities' air quality management systems to meet the standards, and devise refined management strategies based on health risk control to continue improving air quality and further protecting public health. It is recommended that governments conduct a review of the health effects of air pollution in China as well as benchmark research on standard revision method systems during the 14th Five-Year Plan period. Proposals for the revision of standards should be initiated, stricter limits for PM_{2.5} considered, and O₃ concentrations during the peak season added as a new indicator.

Introduce supporting incentive policies for the retrofitting of coal-fired power units to improve their adjustment capability and carefully control the increased number of coal-fired power projects.

With its dual-carbon goals, China needs to coordinate the retrofitting of existing coal-fired power units with the scale of newly built units to actively and steadily promote the low-carbon transformation of the power industry and ensure that coal power gradually shifts from being the primary power source to becoming a supporter of basic security and regulation,.

[...]

Promote the extensive connection and integration of multimodal transportation to provide greater room for the optimization of the transportation structure.

Driven by different policies, China's multimodal transportation is developing by leaps and bounds but still faces relatively strong pressure to pick up speed. To achieve the goals of the 14th Five-Year Plan, the container volume of combined rail-water transportation to and from ports needs to achieve a minimum compound annual growth rate of 17%. The development of multimodal transportation requires further impetus from improved carrying capacity and connection level. Meanwhile, to promote combined rail-water transportation, the building of green collection and distribution systems for port areas needs to be accelerated.

It is recommended that the central and local government departments enhance the construction of special railway lines and collection and distribution systems. The seamless connection between railway port stations and storage yards at ports needs to be improved to enhance infrastructure interconnection. Meanwhile, the green assessment of ports should be stepped up, and an assessment

system including indicators such as the ratio of connected special railway lines and seamless connections should be introduced to encourage the faster achievement of the development targets of combined rail-water transportation. Furthermore, organisation and coordination should be strengthened. The “single-order system” and the standard rules for combined rail-water transportation needs to be promoted and perfected, respectively. Last but not the least, the building of smart ports should be expedited to create more channels for combined rail-water transportation that are smarter and more exemplary and efficient.