清洁空气创新中心
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Air Quality Management Assessment Report of Changzhou City (2015)

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Executive Summary

The city of Changzhou, located in Jiangsu province, plays an important part of the Yangtze River Delta's economy. Changzhou is the birthplace of the Southern Jiangsu Economic Model, and has been one of the leaders of the Delta in economic growth over the past 20 years. In recent years, haze pollution episodes typical of fine particulate matter ($PM_{2.5}$) as primary pollutants happened frequently in the city, negatively impacting public health and social well-being. While Changzhou continues to grow rapidly, heavy environmental pollution is constraining its economic expansion. Changzhou City's government, under the guidance of the State Council and Jiangsu Province's government, has made great efforts to improve its air quality, and has successfully lead the nation in certain management and scientific research areas for air pollution control..

In 2013, China's State Council has issued the *Air Pollution Prevention and Control Action Plan* (also called the *Ten Measures of Air*), which explicitly sets a goal for Jiangsu province to reduce annual $PM_{2.5}$ concentration by 20% of its 2012 concentration levels by 2017. One year later in 2014, the Jiangsu Province's government published the *Implementation Scheme for the Air Pollution Prevention and Control Action Plan in Jiangsu Province* as the No.1 official document of the year, marking the requirements even more explicit. Meanwhile Changzhou City's government published the *Implementation Scheme for the Air Pollution Prevention and Control Action Plan in Changzhou City* in March 2014, furthering the push for setting and attaining clean air targets. To help Changzhou meet targets in the *Ten Measures of Air*, strengthen its air quality management and environmental protection administrative efficiency, support policymaking efforts, and ultimately make long-term air quality improvements, the Secretariat of Clean Air Alliance of China (CAAC) analyzed the current state of air quality management with CAAC's assessment tools to generate this *Air Quality Management Assessment Report of Changzhou City*, with support from the Envir*onmental Protection Agency of Changzhou City, Changzhou Institute of Environmental Science and the Energy Foundation. Air Quality Management Assessment Report of Changzhou City examined Changzhou's air pollution* situation and challenges in 2014, and judged the city's overall performance in air quality management, as well as the current situation and future potential of co-control measures. It's revealed that Changzhou's air pollution situation is extremely severe. Even though the city has already made some progress, there is still much room for improvement.

1. Air quality analysis:

Changzhou failed to reach the national air quality standards; main pollutants of concern are $PM_{2.5}$ and PM_{10}.

Amongst the six pollutants regulated by national air quality standards, in 2014,

Changzhou met standards for sulfur dioxide (SO_2)、nitrogen dioxide (NO_2)、and carbon

monoxide (CO), but failed to meet standards for annual $PM_{2.5}$, PM_{10} and ozone (O_3) concentrations. Of the pollutants that did not meet standards, the $PM_{2.5}$ exceeded limits most severely, by 91%, and followed by PM_{10} and O_3, exceeding by 49% and 7% respectively.

2. Challenges in air pollution control:

Changzhou faces many challenges in the future due to its weak self-purification capacity, dirty energy and industrial structures and growing motor vehicle inventory, making it necessary to take actions in these areas.

Self-purification Capacity: Changzhou has a relatively weak self-purification capcity.

Industrial Structure: In 2014, the ratio of secondary industry to third industry in Changzhou is 1.07, and the secondary industry is till larger than third industry. Moreover, in 2013, 37% of Changzhou's industrial output value of enterprises above designated size comes from pollution-intensive industries, including steel, cement and chemical industries. Additionally, there are a large number of small and medium sized private enterprises in Changzhou, most of which have weak responsibility of environmental protection. This makes environmental supervision and law enforcement difficult and costly.

Energy Structure and Consumption: Coal accounts for approximately 57.38% of the primary energy consumption for enterprises above designated size. In the future, Changzhou should focus on controlling coal use more strictly and develop other energy sources, especially renewable energy.

Motor Vehicle Emissions: In 2014, Changzhou has 870,000 motor vehicles, averaging 18.5 vehicles per 100 people. The rapid growing number of vehicles will put more pressure on pollution treatment and prevention measures of Changzhou in the future.

3. Integrated air quality management assessment:

Changzhou should develop a more comprehensive air quality management system.

Management Structure: Changzhou City's government has made good attempts at implementing integrated air quality management, for example, main leader promising the air quality improvement target in the public, and government establishing cross-departmental cooperation mechanism for air quality management. However, improvements can be strengthened in the areas such as coordinating joint prevention and control measures with other Yangtze Delta municipalities.

Scientific Planning and Emergency Response: In 2014, Changzhou established a pollutants emission inventory, and published pollution prevention and treatment actions plans and emergency response plans. However, the city still lacks adequate research to correlate total pollutant control with overall improvements in air quality, signifying that research efforts are yet to be able to fully support policymaking. This issue is currently

being actively addressed in 2015 and improvements may be seen in the future. It is recommended that Changzhou should implement air quality modeling simulation and forcast, co-control mechanisms to curb greenhouse gases (GHG), and publicize emergency response procedures so that they are open and accessible to the public.

Human and Capital Resources: Changzhou has always highly valued air pollution prevention and control work, and has established a dedicated office for air quality management under the environmental protection agency, with professional staffs and technically supported by both Changzhou Institute of Environmental Science and the Municipal Environmental Monitoring Center.. Despite the progress, Changzhou experiences a slight deficit of human and capital resources in administrative regions at the district level under the municipal jurisdiction. Given the severity of Changzhou's air pollution, It is suggested that Changzhou should increase the amount of financial investment dedicated to air quality management, research and monitoring and use these funds more efficiently.

Monitoring, supervision and information disclosure: Changzhou has no systematic mechanism of information disclosure, leaving substantial room for improvement. Additionally, the city has not yet established a sound post-evaluation mechanism for existing plans and measures. The penalty in supervision management implementation has not yet been executed because the new *Air Law* would be enforced since 2015. It is recommended that implementation should be strengthened in vehicles emission supervision and penalty enforcement in the future.

4. Air quality management and measures enforcement assessment:

Great efforts have been done. However, human capacity building for air quality management, number of supervision staffs, and the introduction of non-governmental capital should be improved in the future.

By assessing the management enforcement, measures enforcement and enforcement status of Changzhou, it was found out that great efforts have been done. However, human capacity building for air quality management, number of supervision staffs, and the introduction of non-governmental capital should be improved in the future.

5. Co-control measures analysis:

The co-control measures covering energy/industrial structure adjustment, transportation pollution control, diesel generator pollution control, non-road mobile pollution control and volatile organic compounds (VOCs) emission control should be promoted.

The direction, potential and implementation highlights for future co-control measures in Changzhou were analyzed after analyzing Changzhou's current implementation situation of co-control measures, by using Changzhou's pollutants emission inventory and clean air co-control measures list.

Sixteen co-control measures to be implemented in the near two or three years were selected. The measures include 8 policy/planning measures, such as “setting total coal consumption target for the 13th FYP”, “Planning the shuting down, stoping production, merging and changing of high-polluting industries and eliminating backward production for the 13th FYP” and “establishing public transportation special fund”. The measures also include 8 technical measures, such as “building Photovoltaic roofs”, “diesel buses to gas / electric buses”, “adding diesel particle filter (DPF) for diesel vehicles”, “leak detection and repair (LDAR) for chemistry”, and “straw utilization”

For the measures whose implementation are facing policy or technical obstacles in the near future, but having big co-control potentials in the long term, sustained attention should be paid and relative capacity building should be done in order to carry out those measures at the right time in the future. There are ten such measures including “developing transportation-oriented urban planning”, “upgrading onboard refueling vapor recovery (ORVR)” and etc.

This report focuses on the entire year of 2014. For 2015, Changzhou’s city government has listed “improving atmospheric air quality” as one of the top 10 major civilian-run realistic projects of the city, and is the top goal under the category of ecological civilization construction. Thousands of smaller measures have been planned to improve air quality with more active efforts in multiple facets, such as:

◎ Committing to set quantifiable permission to achieve targets to improve air quality;
◎ Compiling and completing a systematic pollutant emission inventory, which is planned to be finalized by mid-2015;
◎ Implementing co-control measures, and phasing out all the remaining over 20,000 yellow-label vehicles off the road before the end of 2015;
◎ Holding local governments responsible for polluting entities within their regions, to examine emission conditions of all polluting entities, including varieties of industrial parks. They will also be responsible for addressing formal complaints or petitions and establishing protocols for sudden heavy pollution incidents. Punishments shall be implemented accordingly, pushing for solutions that address the root of the problem, and should be announced to the public.

The air quality management and control measures updating condition mentioned above will be summarized, examined and evaluated in this report.