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Disposal Facility of Nantian POPs in Xiangtan City, Hunan, China. © IECO 2016.

## Independent Evaluation: Environmentally sound management and disposal of obsolete POPs pesticides and other POPs in China

The project's overall objective was to promote environmentally sound management and to dispose 10,000 tons of accumulated Persistent Organic Pollutants (POPs) pesticide wastes and 1,000 tons of dioxin-rich incinerator fly-ash to fulfill China's obligations under the Stockholm Convention. The total project budget at design was USD 42,059,000, of which USD 9,959,000 was funded by the Global Environmental Facility (GEF) and USD 32,100,000 was expected to be co-financed by the Government of China and participating firms. The project was implemented between 2009 and 2018 by UNIDO and executed by the Foreign Economic Cooperation Office (FECO) of the Ministry of Environmental Protection in China.

### Main evaluation findings

The project was an important milestone in developing a national system for sound management of POPs in China. It had remarkable impacts and contributed to an important reduction of risks to human health and the environment through the removal of harmful POPs. The project effectiveness was highly satisfactory, meeting or exceeding all its objectives. The project adopted an integrated approach to foster behavioural change that addressed key barriers at the national, provincial and local levels, by incorporating key actors from the public and private sectors; by focusing on removing barriers to the adoption of best available

technologies and best environmental practices (BAT/BEP) to manage and dispose POPs; and by putting in place mechanisms that continue to catalyse changes beyond project completion.

### Accomplishments of the project

#### An important contribution towards reducing health risks to millions of people

The project soundly disposed of 6,352 tons of harmful pesticide POPs (DDT/HCH) and 42,000 tons of soils contaminated by DDT/HCH, all known legacy stock piles of POPs pesticides. The amount of toxic POPs wastes disposed is far beyond the expected target at design. The evaluation estimated that the sound disposal of the POPs pesticides and pesticides wastes reduced the health risks to a population of 4.3 to over 15 million people. For example, in Hunan province alone, the removal of POP pesticides in the Nantian chemical plant has greatly reduced the risks of contamination of the Xiangjiang river which supplies drinking water to the city of Changsha with a population of four million people. Furthermore approximately 50,000 tons of dioxin rich fly ash was disposed. The project helped reduce around 146.3 g-TEQ of dioxin, which is about three to five times higher than planned and has reduced human health risks in the metropolitan area of Beijing with a population of 20 million and in the city of Tianjin with a population of one million.

## Help transform POPs management in China into an environmentally sound system

The project strategy addressed simultaneously all the key conditions necessary to redirect POPs management towards a more sustainable path. The policy and regulatory framework has been strengthened to clarify procedures and standards and to provide incentives to adopt the newly introduced technologies. A series of technical guidelines and standards for the environmentally sound management of obsolete POPs pesticides stocks and wastes was also developed.

During the project duration, several state-of-the-art techniques were used or were developed. The project tested and customized these techniques to specific

context in China that are used for POPs waste disposal including cement kiln co-processing, thermal-desorption, fly ash water-washing, high-temperature sintering for building materials and ball mining. Some of them were successfully adopted by cities and business participating in the project. Most of the selected technologies were at a stage where they could be tested and adapted in an industrial setting. This allowed the project to engage the business community and to develop and test competitive business models. Concurrently, the project helped to develop capacities in the public sector on regulation, enforcement, stakeholder engagement and coordination across levels of government and sectors.

## Factors of success

**Ownership among the different levels of the public administration** proved to be critical factor to the project accomplishments. This is most apparent in the high levels of cofinancing that was realized by the end of the project (USD 80 million), doubling the expected co-financing at project design. Ownership did not come automatically but had to be cultivated. Raising awareness among decision makers was also key to build the political will to adopt new regulations. For example, when concerns arose on the suitability of international standards for conditions in China, the project introduced pilot interventions to generate evidence to convince policy makers that such standards were suited to local conditions. Thus, for example, the government adopted standards on dioxin limits in fly ash that are the same as those in Europe.

**Information and outreach to the local communities** helped build local support for – or at least prevented opposition to – the clean-up of toxic POPs wastes, which was a politically sensitive issue for the government and a major concern for the project management. From the start, the project design emphasized the health benefits for the local populations. The project also provided information and raised awareness in communities surrounding contaminated sites and took actions to address local concerns. All of which proved to be key in preventing unrest and gaining community support for cleanup operations. Participating communities also came to understand the risks of dioxins and POPs and became more vocal in demanding action.

**Incentives to participating firms** were important to engage businesses in adopting technologies. The adoption of new technology allowed firms to provide a social service (disposal of harmful pollution, e.g. dioxins) at a time when the cement plants in Beijing faced risks of being closed by the city authorities due to cement overproduction capacity in region. Adopting new technology allowed them to continue operations and provided an extra source of income for the treatment of fly ash and helped with modest reductions in the costs of inputs.

**Mechanisms to further catalyze adoption of regulations and technology** was key to speed up the national transformation in the management and disposal of POPs. The project developed regulatory guidelines for provinces on POPs and hazardous waste management, which are being adopted with the support of FECO beyond the 13 provinces and cities where the project operated. These regulations, once adopted and mainstreamed, have been critical in generating incentives for cities and companies to adopt new technology. The two participating corporations started replicating the technologies introduced by the project prior to project completion. They have filed for patents for fly ash processing technologies and are planning to include, as part of their business model, the provisioning of support services to replicate the technologies introduced by the project.