

Air Pollution in Emerging Economies and Its Implications

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The smog that swept across Beijing and the central and eastern parts of China in January 2013 caused respiratory problems in many people and led some factories to temporarily shut their operations down. It provided a paradigmatic case where air pollution can create serious economic and social repercussions. Air pollution is emerging as a significant environmental issue not only in China, but also in other developing countries. New Delhi witnessed the worst smog on record in its air pollution meters to date in November 2012,¹ which revealed the serious nature of environmental problems that have been eclipsed by the growth-centered economic

policy so far. The air pollution problem that related with economic and environmental perspectives is a borderless issue that affects multiple countries and regions at once. In this report, we examine the current status and ripple effects of air pollution in developing countries to draw out implications.

1. Air Pollution in China and Impacts

The main factors of air pollution include sulfur dioxides (SO₂), nitrogen dioxides (NO₂), and particulate matters (PM)².

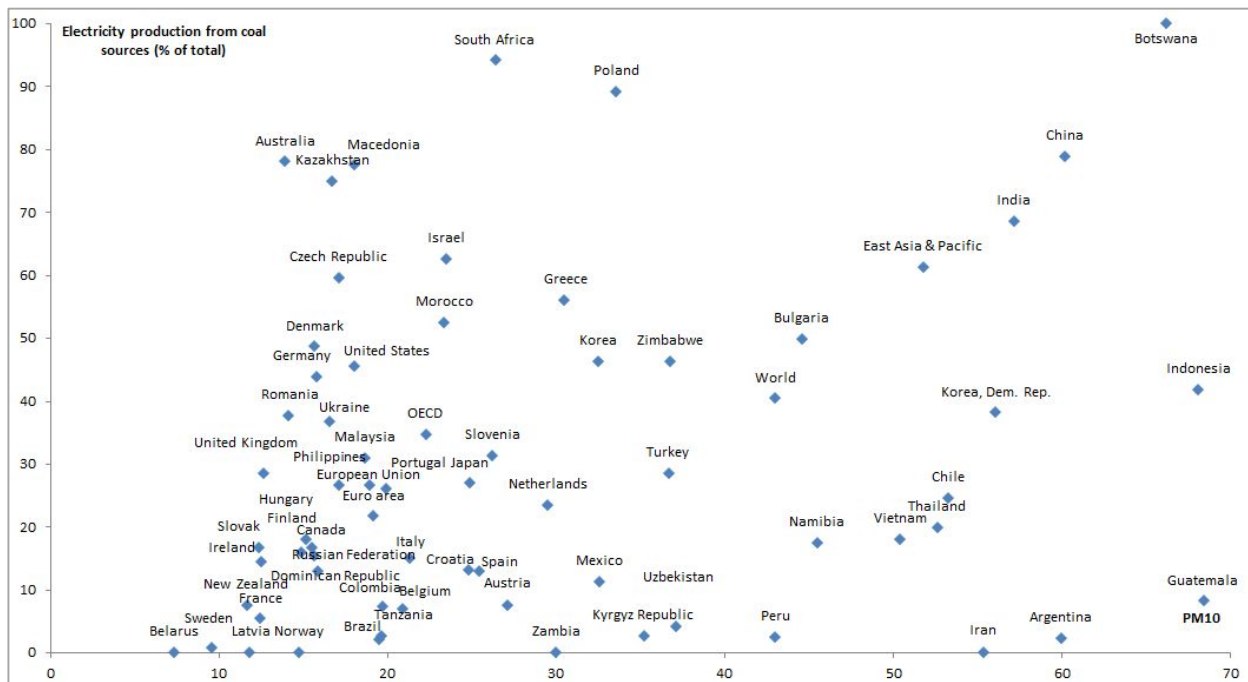
¹ Victor Mallet(2012), "Toxic smog shrouds New Delhi," *Financial Times*. (November 7)

² The particles are identified as either PM₁₀ (10 micrometers or less in diameter) or PM_{2.5} (2.5 micrometers or less in diameter).

Increase in the use of coals and the sales of automobiles exacerbate air pollution in China. Automobiles are major emitters of nitrogen compounds, carbon monoxides, carbons, and particulate matters. Since 2009, China has topped the list of countries with the largest volumes of automobile sales for three years in

a row. The industrial demand for coals is also on a steep rise, consuming almost 49% of all coals being distributed worldwide (as of 2011). China relies on coals for 79% of power generation (Figure 1). Coals are also widely used to run factories and heat households in China.

Figure 1. The Use of Coals in the Generation of Energy and Particulate Matters



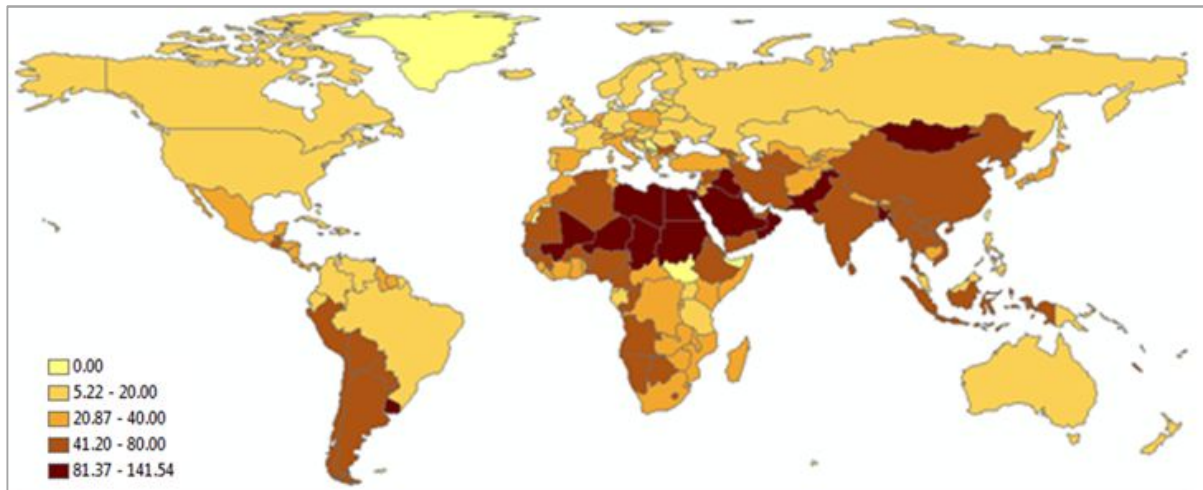
Source: 2012 World Development Indicators, World Bank

As the smog generated in China spreads over to Korea and Japan, air pollution has become a problem not only of China, but also in the entire East Asia. According to Korea's National Institute of Environmental Research and Ministry of Environment, the PM₁₀ concentration in Seoul reached as high as 147 $\mu\text{g}/\text{m}^3$ on January 2013. The Chinese public is growing critical of the environmental issues, compelling the Chinese officials to figure out ways to mitigate and prevent air pollution. The Chinese media no longer insist that environmental pol-

lution is inevitable and increasingly feature air pollution in headlines and cover articles.

2. Air Pollution in Emerging Economies

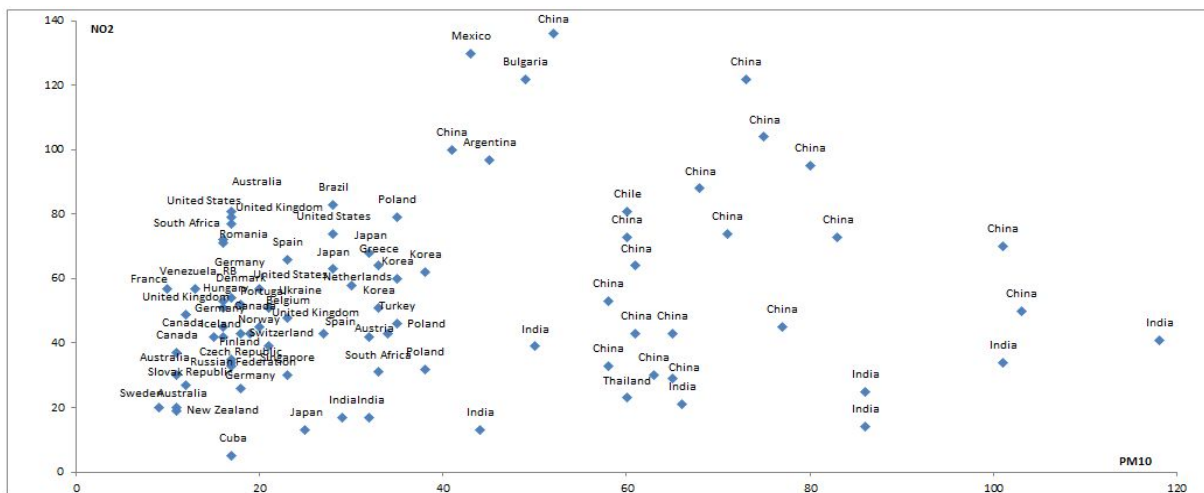
While air pollution is raising concerns worldwide, emerging economies have particularly high rates of air pollution. Most of the countries with PM₁₀ concentration levels in excess of the WHO guideline (20 $\mu\text{g}/\text{m}^3$) are located in Asia and Africa (Figure 2).

Figure 2. Particulate Matter (PM₁₀) Concentration

Note: Countries on which no relevant information is available are marked with zero (0).
Source: 2012 World Development Indicators, World Bank.

According to an OECD analysis,³ 70% of populations living in cities with a population of 100,000 or greater each outside the OECD member states are exposed to PM₁₀ concentration levels higher than the WHO's most lowest standard (potential target at IT-1). Pollution by PM₁₀ is especially prominent in Asia and Africa, regions whose PM₁₀ concentration levels

are expected to continue their upward trajectories until 2050. The World Bank also shows that a majority of cities whose PM₁₀ and NO₂ concentration levels exceed the WHO's annual guideline (PM₁₀ = 20 $\mu\text{g}/\text{m}^3$; NO₂ = 40 $\mu\text{g}/\text{m}^3$) are concentrated in emerging economies, especially cities in China (Figure 3).

Figure 3. PM₁₀ and NO₂ Levels in Major Cities around the World

Note: Combining the PM₁₀ data from 2009 and NO₂ data from 2001 on 111 cities (each with a population of 100,000 or greater) of 53 countries.

Source: 2012 World Development Indicators, World Bank

³ OECD(2012), "OECD Environmental Outlook to 2050," OECD Publishing [retrieved from <http://dx.doi.org/10.1787/9789264122246-en>].

Indoor air pollution presents a serious threat to health in these countries as well. According to WHO analysis, indoor air pollution is responsible for the premature deaths mostly in developing countries. Almost half of these death are from pneumonia in children under 5 years of age.⁴ Death by indoor air pollution stands out in African countries where more than 50% of households use solid fuels, such as biomass, coals, and woods for cooking and heating (Figure 3).

3. Implications for Korea

A. Pioneering Environmental Industries and Markets in Emerging Economies

As the governments of emerging economies pay greater attention to air pollution, the environment-related industries in these countries are likely to expand further. This presents a reason for the Korean government to provide active support for Korean businesses seeking to enter these markets. As the demand for air-pollutant reducing facilities, industrial wastewater or sewage treatment facilities, and other such systems will increase with the increasing interest of governments and the public in environmental issues, the Korean government needs to respond strategically to the growing demand for these systems by enhancing the scope and extent of support for Korean environment-related businesses that may benefit from the expanding environmental markets in emerging economies.

The Korean government needs, especially, to make greater efforts to respond to the expanding environmental industries worldwide, as

Korea exports fewer environment-related goods and services than other comparable countries.

B. Tailoring ODA to Environmental Issues in Emerging Economies

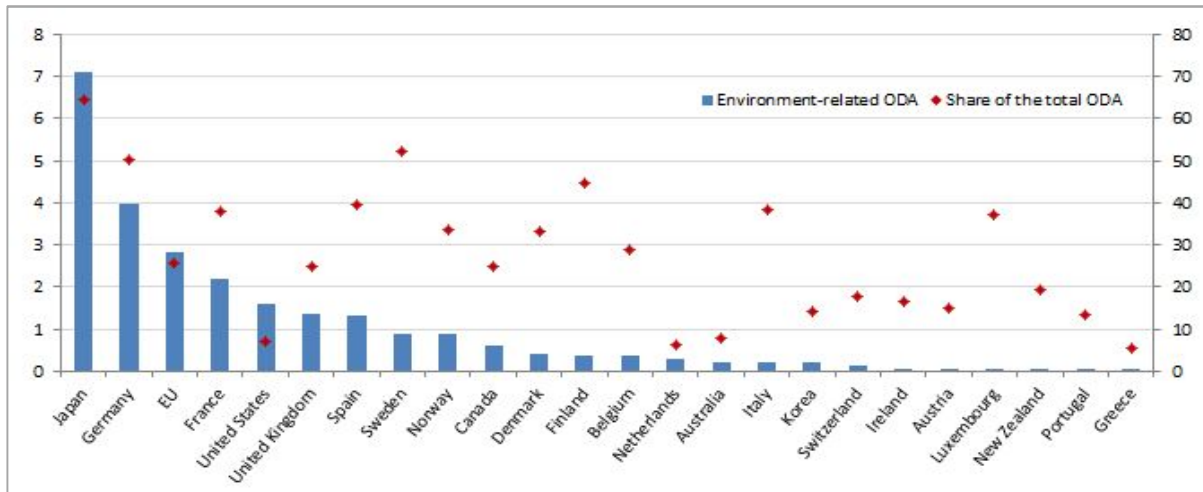
The Korean government may also need to use the official development assistance it provides for developing countries as a tool for promoting Korean companies and businesses in the expanding environmental markets of these countries. The OECD Development Assistance Committee (DAC) has pointed out that Korea makes comparatively less contribution to the environmental issues through its ODA than other OECD member states (Figure 4). This is a reason to call on the Korean government to develop international policy promoting the use of ODA for the environmental industries and markets in developing countries.

C. Ensuring the Consistency of the Environmental Policy

Since environmental issues, like air pollution, carry effects across borders, the Korean government needs to become more actively involved in international efforts to reduce pollution. The air pollution and spring dust storms originating from China thus cause direct effect to Korea. The government needs to tackle the environmental problems in neighboring countries more actively, not only through the Tripartite Environmental Ministers Meeting (TEMM) among Korea, China, and Japan as well as through diverse regional and multilateral agencies and environmental organizations.

⁴ WHO, "Air quality and health" [retrieved from <http://www.who.int/mediacentre/factsheets/fs313/en/index.html>].

Figure 4. Amounts of Environment-related ODA and Their Shares in Total ODA



Note: Yearly averages of 2009 and 2010, measured in the U.S. dollars (constant at 2009).
Source: OECD, <http://www.oecd.org/dac/aidstatistics/49929823.pdf>.

One good candidate in this regard is the Northeast Asia Subregional Program of Environmental Cooperation (NEASPEC).⁵

D. Enhancing Information Transparency and Incentives for Anti-Air Pollution Policy

The environmental authorities in Korea need to maintain the consistency and transparency of the environmental information they disclose if they want to maintain the public's trust. The false reports and data manipulation at environmental authorities in China has blinded the high officials about the gravity of China's environmental problem.⁶ The Korean government ought to enhance the supervision of the

air pollution standards and provide incentives for preventing air pollution. The Korean government will enforce the PM_{2.5} requirement in its environmental regulation in 2015. Its environmental standard, WHO's IT-2, is far from the recommended guideline. The Korean government needs to strengthen its efforts to enforce more strict environmental targets. It is impossible to meet these goals with strict commands and sanctions only. Recent trend in environmental regulations worldwide shifts from the command and control approach to the more market-based system that provides economic incentives. The Korean government ought to respond to this trend and develop policy incentives that motivate individuals and businesses to reduce pollutant emissions voluntarily. **KIEP**

⁵ NEASPEC is a consultative group involving the participation of South Korea, China, Japan, Mongolia, and Russia, as well as such international organizations as the UN Environmental Program (UNEP) and the UN Environmental and Social Commission for Asia and the Pacific (UNESCAP), whose delegates meet to discuss such environmental issues as spring dust storms, air and marine pollution, ecological preservation, and the like.

⁶ Jamil Anderlini(2013), "Beijing confronts pollution dilemma," *Financial Times*. (January 14)