



New Investment Abroad

Can it Reduce Chinese Greenhouse Gas Emissions?

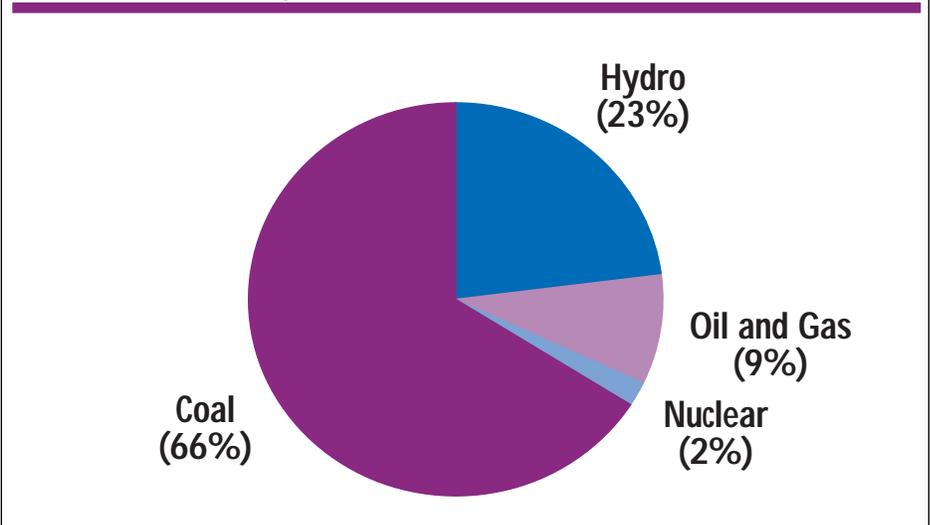
by Allen Blackman

In the next thirty years, developing countries will become the leading source of greenhouse gas emissions thought to cause global warming. Most of these emissions result from burning fossil fuels like coal and oil. Yet countries where weak public sectors and widespread poverty are pressing concerns are unlikely to be willing or able to undertake costly measures to lower emissions. Energy efficiency improvements may help resolve the dilemma. They not only reduce emissions of greenhouse gases but in some cases also significantly cut operating costs. Conceivably, firms in developing countries could be induced to invest in energy efficiency with minimal prodding. Foreign direct investment (FDI) by multinational corporations may be a principal means of transferring both the technology and the financial capital needed for such investments.

The Chinese electricity generating sector is an important test case for this hypothesis. China is already the world's third leading source of greenhouse gases and is likely to become the biggest contributor before the middle of the next century. China's fast-growing, almost exclusively coal-fired power sector is responsible for roughly a third of these emissions. In the early 1990s, China opened its doors to foreign direct investment in the power sector, a development that was met with a wave of enthusiasm by multinational corporations. What impacts has this recent opening had thus far?

Data from an original RFF survey of twenty American wholly-owned or joint-venture power plants in China suggest that FDI is indeed having a significant positive impact on energy efficiency. Average rates of coal consumption per kilowatt hour of electricity generated for the plants surveyed are considerably lower rates than rates for new Chinese plants of similar scale, and are even lower than rates for new American plants. The main reason is that almost a third of the twenty plants use

Sources of electric power in China



state-of-the-art generating technologies such as combined-cycle gas turbines (CCGTs) and circulating fluidized bed (CFB) boilers. These technologies have characteristics that make them especially attractive in China. Both CCGTs and CFBs accommodate the use of relatively cheap and plentiful low-grade fuels, a valuable feature given that the quantity and quality of fuel supply in China is uncertain.

In addition, unlike conventional steam turbines, CCGTs can be run efficiently even when started up and shut down on short notice as is often required in China. The plants in the RFF sample are even more efficient than rates of coal consumption indicate: a fifth of them use "waste" heat to generate heat or steam for industrial or residential facilities.

But not all the characteristics of FDI in China's power sector are encouraging from the standpoint of energy efficiency. To avoid the lengthy central government approval process for large plants and to minimize risk, early FDI tended to be in small-scale plants that are generally not as energy-efficient as large-scale plants. Perhaps more important, data from trade journals indicate that despite investors'

early enthusiasm, the volume of FDI in China's power sector will likely fall short of government targets for the year 2000 by a substantial margin. In large part, this shortfall is the result of persistent institutional barriers to FDI. Survey data suggest that the most important barriers are the uncertainties associated with the approval process for FDI projects, the regulation of the electricity sector, and the risk of default on power purchase contracts.

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 To download the related report "Foreign Direct Investment in China's Power Sector: Trends, Benefits and Barriers" (RFF Discussion Paper 98-50) by Allen Blackman and Xun Wu, access http://www.rff.org/disc_papers/1998htm. Hard copies may also be ordered by mail; see page 18.