

Commentary on Chapter 7

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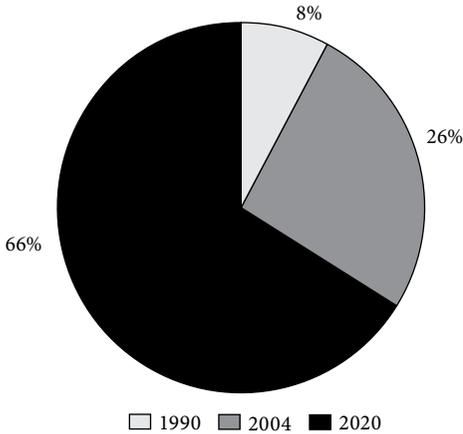
The dramatic and now established phenomenon of rapid Asian economic growth has global implications for resource use, and energy resources are among the most prominent of these in the minds of policy makers. Complex interactions between patterns of national growth, energy intensity, and resource development will ultimately determine the shared destiny of the world's economies, but we are clearly entering a new era of energy awareness and competition. In East Asia, economic dynamism over the past three decades has been accompanied by sharp increases in energy needs. The sustainability of Asia's growth experience will depend critically on how the region's governments manage their growth and technological progress.

Like the broader Asian economic picture, recent attention to East Asian energy demand has centered on the People's Republic of China (PRC), where explosive growth and its induced energy requirements have forced the country to look abroad to secure energy supplies. Between 1993 and 2004, the PRC moved from being a small net exporter of oil to the world's second-largest importer. Given the country's limited natural gas reserves, increasing the share of natural gas in its energy mix to lessen its predominant reliance on coal will require a heavy dependence on imports from the Russian Federation, Central Asia, Indonesia, and Australia. The PRC's coal resources, too, are affected by physical and economic constraints. Despite a 200-plus year reserve of this carbon fuel, the PRC became a net coal importer in early 2007.

The PRC's electric power expansion provides a useful case in point. Figure C.7.1 shows the PRC's capacity up to 2020, expanding sixfold over two 15-year intervals. The incremental increase in the latter period alone (shaded black) is larger than the entire installed capacity of the European Union in 2005.

As East Asian countries further integrate into the global economy, the region's energy supply-demand dynamics become increasingly implicated in global energy markets and spill over to far-away economies. Competition for scarce fossil-fuel resources has the potential to drive up energy prices across continents in world oil markets, regional natural gas markets, and potentially even coal markets. More indirectly, higher energy prices in East Asia could pose a risk to global economic stability via transmission along global supply chains that are increasingly dependent on Asian linkages. For these reasons, better visibility regarding East Asian energy trends has become ever more

Figure C.7.1 *Estimated Share of the People's Republic of China's Coal-Fired Generation Capacity (gigawatts) Built by 1990, 2004, and to be Built by 2020*



Note: Percentages are shares of an estimated 800 gigawatts of 2020 coal-fired generation capacity. For example, 26% of this capacity had been built by 2004. This assumes that targets for alternative generation sources and coal-fired power plant efficiency are met, and electricity demand grows as fast as GDP growth.

Source: Kahrl and Roland-Holst (2006).

important within the region and elsewhere.

This chapter examines the regional and global implications of East Asia's future energy demand growth. Using the MIT Emissions Prediction and Policy Analysis (EPPA) model, a multiregional computable general equilibrium model, the authors analyze the effects of a range of economic growth, energy price, and energy efficiency scenarios on East Asia's energy demand growth and economic growth. In addition, they consider the effects of East Asian energy demand growth and energy price shocks on world energy markets, particularly on natural gas markets.

The authors rightly conclude that East Asian energy needs

over the next two decades are highly uncertain, varying by as much as a factor of two from their own baseline to their high-growth scenario. They also evaluate the adverse regional growth effects that would come from rising energy prices, estimating potential growth reductions of up to 0.6% a year. Internationally, the spillover effects of growth in East Asian energy demand on regional and global energy markets could be considerable. The authors estimate an East Asian "growth premium" on world oil markets that could be as high as \$25 a barrel by 2025. Additionally, the dynamic demand growth in Asian regional gas markets could increase gas prices in Europe.

These are very important trends for regional policy makers and their multilateral counterparts. To a significant extent, markets will regulate scarcity through price increases, and the attendant adjustments will vary significantly across the globe. Countries with high levels of initial capital and technology will be more adaptable, while less advanced economies may experience unwelcome trade-offs between energy and other essential commodities or energy and economic growth. By historical standards, both the price and growth effects that the authors offer seem moderate. If the global economy

were to experience higher price trajectories and volatility, the economic impact would be at once more dramatic and more complex. For example, sustained recessions in OECD economies accompanied the great energy shock of the 1970s, and this downturn was transmitted to developing economies via falling OECD absorption. While an energy price contagion is very unlikely, the growth drag of steadily rising prices will likewise be shared by both energy-intensive countries and their trading partners.

The composition of adverse energy price effects will be determined by a combination of adaptability (already mentioned) and purchasing power. For example, if the PRC currency were to appreciate by 20%, this would substantially discount dollar-denominated energy from a PRC perspective, but not for other countries. Another concern would be a reversal of economic convergence, the fortuitous global trend where lower-income countries have grown faster than higher-income countries. Rising energy prices could ration energy access and its growth benefits in poorer countries.

These perspectives may be unduly pessimistic, but it is clear that the rapid emergence of populous Asian economies portends a new global landscape of energy use. We know the conventional resources to meet these needs are increasingly constrained, and the promises of greater efficiency, renewable alternatives, and nuclear power remain uncertain. For these reasons, global energy markets will continue to arbitrate access to conventional resources, and efforts by economists to elucidate the implications of this can make essential contributions to more effective policy. Much of this work remains to be done, but the authors have made a very important contribution to our understanding of the economics of global energy linkages.

Reference to Commentary

Kahrl, Fredrich and David Roland-Holst. 2006. "China's Carbon Challenge: Insights from the Electric Power Sector." Working Paper 110106, Department of Agricultural and Resource Economics, University of California, Berkeley. November.