An Intense Push for Energy Efficiency

Key Points

- Although a dominant image of China's economic boom has been billowing smokestacks from burning coal, its efforts to increase energy efficiency are noteworthy.
- China is on track to meet a goal of reducing national energy intensity by 20% by 2010. This target, set in 2005, is the cornerstone of a set of policies to cut energy and emissions growth.
- As a direct result of policies, greenhouse gas emissions are measurably lower today than under the "business as usual" scenario. These gains suggest that real progress is possible in the future.

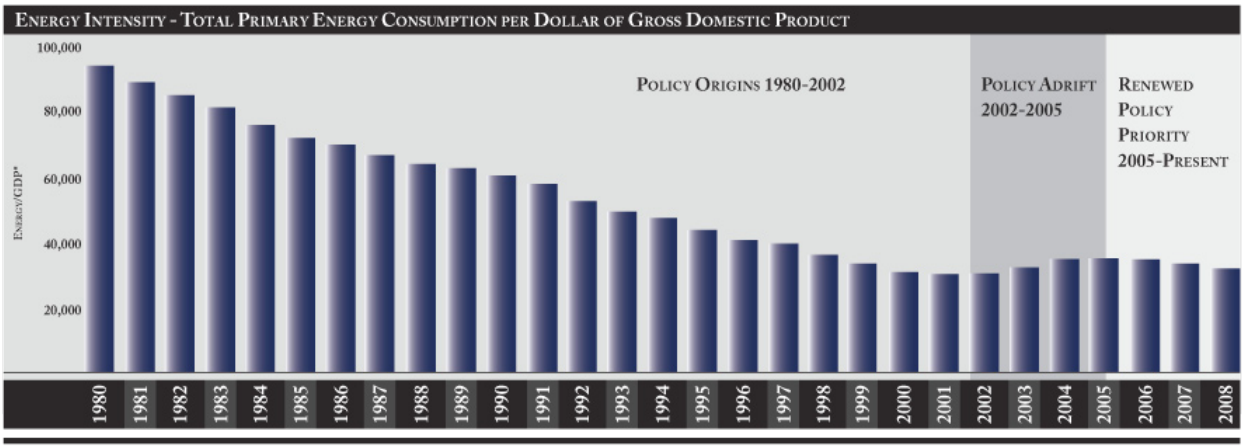
NATIONAL ENERGY EFFICIENCY TARGETS AND POLICIES IN CHINA

Over the past few years, China has been pursuing one of the world's most ambitious programs to improve energy efficiency.

The effort, launched in 2005, was prompted by warnings that changes in China's economy were rapidly undoing the effects of policies that had previously led to improvement in national energy efficiency.[i] Between 1980 and 2000, China's economy quadrupled in size while energy consumption had only doubled, a sign of continually improving energy efficiency.[ii]

Yet, in the early 2000s, an array of factors — including fast growth in exports and heavy industries — began to reverse the trend of efficiency gains. Overall energy use, air pollution, and greenhouse gas emissions soared.

TIMELINE OF CHINA'S ENERGY EFFICIENCY POLICIES[1]



Policy Origins (1980-2002): A variety of domestically-developed policies and programs led to early successes improving national energy efficiency. Significant investments in energy efficiency, and the establishment of centers of expertise for energy efficiency throughout the nation helped China grow its GDP faster than energy demand.

- Energy efficiency investments accounted for more than 10% of total energy investments in 1981. Investment later increased to 12%, before slowly declining to a sustainable level of 5-6%.
- Investment programs spurred development of new institutions, such as the China Energy Conservation Investment Corporation and the Bureau of Energy-Saving and Comprehensive Energy Utilization in the State Planning Commission (SPC). More than 200 energy-conservation service centers at local and provincial levels were established throughout the country, employing more than 7,000 people.

Policy Adrift (2002-2005): Three major factors contributed to energy efficiency becoming a lower priority for policy makers, and the overall energy intensity of China increased.

- Joining the World Trade Organization in 2001 brought about a rapid increase in trade, supported primarily by industrial growth for export markets.
- Increased wealth and prosperity of a large portion of China's people (especially in the eastern provinces) and the associated construction of buildings and infrastructure to serve this population
- Rapid migration of people from rural areas, where they had consumed little energy, to urban areas, where energy consumption is typically much higher.

Renewed Policy Priority (2005-Present): Launched in 2005 in the 11th Five-Year Plan, new policies stem from a realization that unchecked demand growth will impede economic development.

- In 2005, China set a mandatory goal of reducing energy intensity by 20 percent from 2005 levels by 2010.
- The "Top-1,000 Energy-Consuming Enterprises Program" was established to set targets for and monitor the energy efficiency improvements of China's 1,000 largest companies, which together account for approximately one-third of national energy use.
- In 2006, China's energy intensity decreased by 1.8%—the first improvement since 2001—and in 2007 and 2008, energy intensity decreased by 4.0% and 4.6%, respectively. Preliminary statistics suggest efficiency gains could be even greater in 2009.

*Btu per year 2000 U.S. dollars in market exchange rates

[1] Based on Levine, M.D., N. Zhou, and L. Price. Summer, 2009. The Greening of the Middle Kingdom: The Story of Energy Efficiency in China. The Bridge (National Academy of Engineering).

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In 2005, China's leaders formally recognized that the reversal posed a serious problem, and issued a high-level directive: a mandatory goal to reduce by 20% the energy intensity (energy consumption per unit GDP) of China's economy by 2010.[iii]

Only by lowering the amount of energy required for economic output, they decided, could investment from capital-intensive energy supply products be devoted to a more balanced, environmentally favorable, and sustainable economic growth.

REDUCING ENERGY INTENSITY GROWTH: 20% BY 2010

The initiative launched an array of energy saving efforts, some echoing the measures that produced the economy-wide efficiency gains of the 1980s and 1990s. This time, however, changes in China's economy and political culture restrained the central government's ability to simply order curbs in energy demand. Instead, officials turned to policies that included both "sticks" and "carrots," ranging from new regulations and taxes to incentive programs for companies that reduced energy use (see the ChinaFAQs fact sheet "Efficiency, A Thousand Companies at a Time").

The new efficiency push seems to have paid off. In 2006, China's energy intensity decreased by 1.8%—the first improvement since 2001.[iv] That gain in energy intensity was followed in 2007 by a 4% improvement and, in 2008, by a further reduction of 4.6%. Preliminary statistics suggests efficiency gains could be even greater in 2009.[v]

China appears to be on track to meet its 20% reduction target for 2010, which would reduce warming emissions by some 1.5 billion metric tons of CO_2.[vi] This reduction is approximately equal to the total annual CO_2 emissions of Texas, California, Florida, and Ohio combined.[vii] China's CO_2 reductions under its energy intensity target may be the largest national mitigation effort currently underway.[viii]

For further reading: ChinaFAQs: "Efficiency, A Thousand Companies at a Time" (WRI, 2009); Levine et al., "The Greening of the Middle Kingdom" (LBNL, 2009); and Lin et al., "Achieving China's Target for Energy Intensity Reduction in 2010" (LBNL, 2006)

This fact sheet is a product of ChinaFAQs, a joint project of the World Resources Institute and experts from leading American universities, think tanks and government laboratories. Find out more about the ChinaFAQs Project at: http://www.ChinaFAQs.org/.

Notes

[i] Lin, J., N. Zhou, M. Levine, D. Fridley. 2007. "Taking out 1 billion tons of CO2: the magic of China's 11th Five-Year Plan?" Berkeley, CA: Lawrence Berkeley National Laboratory.

[ii] Lu, Y. 1993. Fueling One Billion: An Insider's View. London, U.K.: Paragon Press.

[iii] China's National People's Congress. 2005. 11th Five-Year Development Program.

[iv] Although this was below the level on track to reach a 20% reduction by 2010. Levine, MD., Zhou, N. , and Price, L. (Summer 2009), "The Greening of the Middle Kingdom: The Story of Energy Efficiency in China." The Bridge, National Academies of Engineering, Volume: 39, Number: 2.

[v] National Development and Reform Commission (NDRC). 2009. "National and Provincial Development and Reform Commissions Held a Meeting on Resources Conservation and Environmental Protection in Xi'an, March 31, 2009." http://hzs.ndrc.gov.cn/newgzdt/t20090331_270198.htm.

[vi] The reductions are relative to a base case with 2005 energy intensity. Levine et al. (2009), "Greening of the Middle Kingdom".

[vii] Based on annual totals for 2005. Climate Analysis Indicators Tool (CAIT US) version 3.0. (Washington, DC: World Resources Institute, 2009). Available at http://cait.wri.org.

[viii] Lin J., N. Zhou, M. Levine, and D. Fridley, "Taking out 1 billion tons of CO2: The magic of China's 11th Five-Year Plan?" Energy Policy 36 (2008), 945-970.

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v6.5 Published November 12, 2009