



# China's Energy Conservation Accomplishments of the 11th Five Year Plan

**As China moves to implement a suite of energy-saving measures in its new 12th Five Year Plan (FYP), a recent study looks back at what was accomplished under the just-ended 11th FYP – and offers recommendations for strengthening future efforts.**

“Many of the energy-efficiency programs implemented during the 11th FYP... appear to be on track to meet – or in some cases even exceed – their energy-saving targets,” concludes the study\*, published in Energy Policy by researchers at the Department of Energy’s Lawrence Berkeley National Laboratory in Berkeley, California and a colleague in China. “It seems likely,” they add, that the 11th FYP’s goal of reducing China’s energy intensity – the amount of energy consumed per unit of Gross Domestic Product (GDP) – “will be met or nearly met.”

## BACKGROUND

The energy-saving measures mandated in the 11th FYP, which covered the period 2005 to 2010, came on the heels of a “dramatic reversal” in China’s efforts to improve its energy use, the authors note. From 1980 to 2002, China experienced a 5% average annual improvement in energy intensity. But from 2002 to 2005, those gains were eroded by a dramatic surge in energy consumption, raising concerns about energy security, economic sustainability,

and environmental impacts, including climate change. In response, in 2005 China’s central government set a goal in the 11th FYP of improving energy intensity by 20% by 2010.

To reach that goal, the government launched a range of new programs and policies. They included:

- The Ten Key Projects program, which focused on using economic incentives and technical strategies to improve the efficiency of everything from coal-fired industrial boilers and motors, to promoting “green” lighting and alternatives to oil-based fuels
- The Top 1000 Energy-Consuming Enterprises Program, which mandated a suite of energy-saving steps for the biggest firms in nine industrial sectors
- Building energy efficiency programs, which aimed to make newly-constructed buildings more efficient and to retrofit older structures
- Small plant closures, which targeted the most polluting and least energy-efficient facilities for closure
- Appliance standards and energy-efficiency labels, which aimed to curb energy use by new appliances and provide consumers with more information

## Key Points

- China’s mounting energy demand spurred by rapid economic growth prompted important energy-saving measures in its 11th Five Year Plan.
- Researchers found that many projects conceived to improve energy intensity were on track to meet or surpass their goals, while others have lagged.
- The study offers recommendations for strengthening future efforts.

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To see how well these programs performed, the authors first estimated how much energy China would have consumed if it had not taken any steps to curb consumption, and its economy and population had continued to grow. “This so-called ‘counter-factual baseline’ can only be estimated,” they note, “since it describes a situation that did not happen.” Then, the researchers calculated – using available statistics and analyses of specific programs and policy instruments – how much energy was saved by each program or set of policies (see Figure).

## RESULTS

Overall, the research team concludes that “China’s total energy use in 2008 was 10% lower than it would have been without policy intervention.” Cumulatively, China saved the equivalent of about 527 million tons of coal.

They also found that many projects were on track to meet or surpass their goals. “Most of the Ten Key Projects, the Top-1000 Program, and the Small Plant Closure Program will meet or surpass the 11th FYP savings goals,” they note. “China’s appliance standards and labeling program has become very robust.”

Efforts to improve building efficiency and reduce industry’s share of the economy, however, have lagged. Although “China has greatly enhanced its enforcement of new building energy standards,” the authors found that “energy-efficiency programs for buildings retrofits, as well as the goal of adjusting China’s economic structure to reduce the share of energy consumed by industry, do not appear to be on track to meet the stated goals.”

As China moves into its 12th FYP, the authors say it will be “important to maintain and strengthen the existing energy-saving policies and programs that are successful, while revising programs or adding new policy mechanisms to improve the programs that are not on track to achieve the stated goals.” They offered an array of specific recommendations for improvements, including:

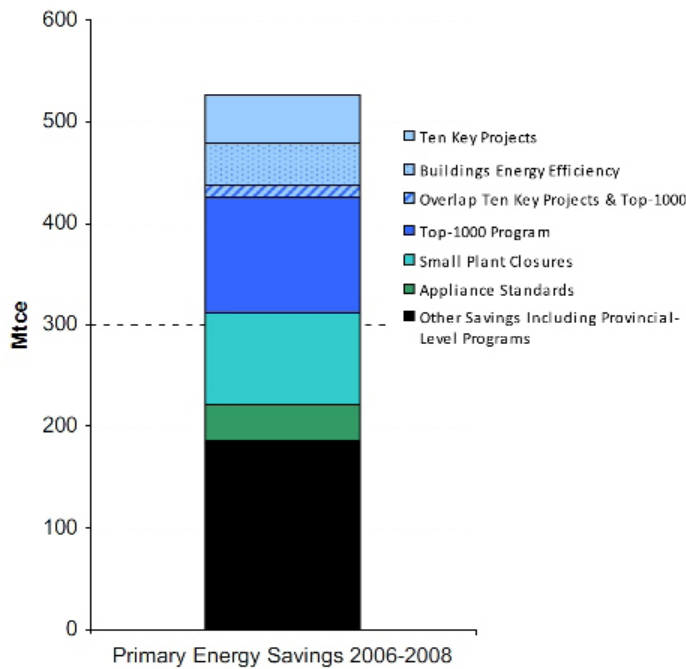
- Maintain existing policies and programs that are successful, including those that have trained personnel to track and manage energy use, develop implementation guidelines, and create financial incentives for energy saving.
- Continue to build China’s National Energy Conservation Center to facilitate information dissemination and training, and strengthen the capacity of provincial energy conservation centers. The use of standardized auditing and benchmarking protocols, for instance, could create consistency across the provincial centers.
- Continue and expand the largely successful Top-1000 Program during the 12th FYP, extended to include additional large, energy-intensive enterprises, and strengthened to be more effective.
- Build capacity to systematically collect and analyze data focused on end-use energy consumption. Such capacity could be built at organizations such as the Energy Research Institute, the National Energy Conservation Center, or the National Bureau of Statistics.
- Allocate targets more scientifically. In particular, a bottom-up analysis considering the energy and economic situation in each province or sector would help to determine realistic energy-saving potentials and provide a better basis for target allocation.
- Increase the level of public reporting regarding energy-saving policies and programs, and standardize the metrics for targets and reporting. Public sharing of data would increase attention to energy-saving programs, encourage consistency in data reporting, and encourage enterprises and government offices to achieve their goals.

- Expand the enforcement of building energy standards that have been effective in large urban areas to the rest of the nation, and continue to emphasize energy management of large-scale public and governmental buildings
- Combine explicit market mechanisms, such as energy pricing reform and tax incentives, with administrative measures, such as binding targets and controlling market access through permits, to encourage a structural shift away from energy-intensive, low value-added production

The ideas found in the 12th Five-Year Plan, adopted in March 2011, agree with some of these and other recommendations mentioned in the LBNL study, for example, expanding

the 1000 Enterprises Program to a 10,000 Enterprise Program and adding a target for carbon intensity. Premier Wen Jiabao also stated in a March 2011 Work Report that China would put in place “well-equipped statistical and monitoring systems for greenhouse gas emissions, energy conservation and emissions reductions” to ensure these new policies are tracked and properly implemented (See [ChinaFAQs: “How does China’s 12th Five-Year Plan address energy and the environment?”](#)).

Continuing to focus on energy efficiency will be a critical component to achieving a 16% reduction in energy intensity and 17% reduction in carbon intensity by 2015 targeted by the new plan.



2006–2008 estimated energy savings from 11th FYP programs and policies.

*\*This fact sheet is based on: Price, L., et al., Assessment of China’s energy-saving and emission-reduction accomplishments and opportunities during the 11th Five Year Plan. Energy Policy (2011), doi:10.1016/j.enpol.2011.02.006.*

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