

# ChinaFAQs

## The Network for Climate and Energy Information



# China's Ten Key Energy Efficiency Projects

## CHINA'S "TEN KEY PROJECTS" TO SAVE ENERGY

It's a "top ten" list you've probably never heard of. But China's "Ten Key Projects" initiative may revolutionize the way that nation produces and uses energy.

The billion dollar effort, launched in 2004 and incorporated into the China's latest economic development plan, provides financial incentives for local governments and industry to pursue a wide range of energy-saving projects. The goal is to conserve the equivalent of some 250 million metric tons of coal equivalent (Mtce), preventing emissions of over 600 million tons of CO<sub>2</sub>.<sup>i,ii</sup>

The "Key Projects" target technological improvements in ten areas (see Table 1 below). Some projects aim to improve industry's use of energy, and are linked to another of China's major energy-saving initiatives, the "Top-1000 Energy Consuming Enterprises Program" (see ChinaFAQs fact sheet: "Efficiency, a Thousand Companies at a Time"). Others target residential and government energy use or specific technologies like green lighting.

A number of China's industrial producers lag behind their global peers in energy efficiency—causing a drain on resources, excess pollution, and

lost profits. Chinese cement, copper, and paper-makers, for instance, use between 45% and 120% more energy per ton than European and US competitors. Common equipment like motors, boilers and pumps often run with up to 20% less efficiency.<sup>iii</sup> And energy use in commercial buildings is set to grow rapidly unless design inefficiencies are remedied. For instance, heat loss through exterior walls is 3-5 times higher than similar buildings in Japan and Canada.<sup>iv</sup>

The biggest gains from "Key Projects" are expected to come from efforts to renovate coal-fired industrial boilers, build combined heat and power systems in urban areas, deployment of new technologies and processes that save oil, and build more energy efficient residential and commercial spaces.<sup>v</sup>

China has earmarked roughly \$1 billion in incentives for implementation of five of the ten key projects (coal industrial boilers or kilns, waste heat recovery/waste power recovery, petrochemical conservation or substitution, electrical machinery energy saving system, and energy system optimization). To qualify for this funding, which comes from China's Ministry of Finance, enterprises must apply to one of 20 technical assistance centers established by the government.

### Key Points

- In 2004, China launched its "Ten Key Projects" initiative, a billion dollar program that provides financial support for energy-saving projects ranging from the power sector to construction across the nation.
- The Chinese government approved nearly 550 applications in 2007 and more than 1,200 applications in 2008.

Applicants have to undergo a comprehensive energy audit, demonstrate that they have adequate accounting and management systems in place, and show that the project will save at least the equivalent of 10,000 mtce.

Applicants get 60% of the project's capital costs upfront – but the remaining 40% is not provided until after the technology is installed and actual energy savings are evaluated. If independent reviewers conclude that the project is successful, applicants can also receive financial awards linked to the amount of energy saved.<sup>vi</sup>

So far, there has been plenty of interest. In 2007, officials approved 546 projects and in 2008 received

more than 1,200 applications. Final results won't be known until all the projects are finished, but China's focus on industrial and residential efficiency and technology is an important step towards curbing emissions. The goals for energy savings of the 10 Key Projects are provided below.

**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/>.**

**Table 1: Ten Key Projects for Energy Savings**

	Key Projects	11 <sup>th</sup> FYP Stated Energy-Saving Goals	11 <sup>th</sup> FYP Energy Savings (Mtce)	11 <sup>th</sup> FYP CO <sub>2</sub> Emission Reductions (MtCO <sub>2</sub> )
1	Renovation of coal-fired industrial boilers	35 Mt coal during 11th FYP	25	69
2	District level combined heat and power projects	35 Mtce/yr in 2010	85	244
3	Waste heat and pressure utilization	7 Mtce/yr in 2010	21	60
4	Oil conservation and substitution	38 Mt of oil	8	16
5	Motor system energy efficiency	20 TWh/yr in 2010	17	4
6	Energy systems optimization	Not stated		
7	Energy efficiency and conservation in buildings	108 Mtce	100	323
8	Energy-efficient lighting saving	29 TWh	12	25
9	Government procurement energy efficient products	Not stated		
10	Monitoring and evaluation systems	Not stated		
	TOTAL		268	743

Source: LBNL estimates and calculations based on National Development and Reform Commission (NRDC), 2006. Implementation Suggestions of Ten Key Energy-Conservation Projects during the Eleventh Five-Year Plan, NDRC Department of Resource Conservation and Environmental Protection Document #: [2006] 1457.

Note: Mt = million tons, FYP = Five Year Plan, Mtce = million tons of coal equivalent (1 tce = 29.7 GJ = 27.8 MBtu), CO<sub>2</sub> = carbon dioxide, TWh = terawatt-hour.

Total of individual programs is higher than stated savings goal of 250 Mtce in 2010. Values are based on primary (source) electricity, accounting for losses during electricity generation, transmission, and distribution; value for oil conservation and substitution includes only 8 Mtce for oil conservation because 7 of the 8 efforts outlined focus on fuel substitution, while only one focuses on oil saving.

## Notes

<sup>i</sup> Energy use and energy savings are reported in Chinese units of million metric tons of coal equivalent (Mtce). One Mtce equals 0.29 exajoules (EJ) and 0.28 quadrillion British thermal units (Quads).

<sup>ii</sup> "China Medium and Long Term Energy Plan," presentation by Lu Wenbin, China's National Development and Reform Commission, Beijing, 2005.

<sup>iii</sup> Williams, Robert (Sept. 2005) "The Chinese Motor System Optimization Experience: Developing a Template for a National Program," Paper for Energy Efficiency in Motor-Driven Systems International Conference, Heidelberg, Germany. Available: [www.gfse.at/fileadmin/dam/gfse/gfse7/EEMODSfinal2.pdf](http://www.gfse.at/fileadmin/dam/gfse/gfse7/EEMODSfinal2.pdf).

<sup>iv</sup> Lin J and Zhou N (August 2007), "The reality of future scenarios of commercial building energy consumption in China," LBNL: Berkeley, CA. p. 9-10.

<sup>v</sup> "The Greening of the Middle Kingdom: The Story of Energy Efficiency in China," by Mark D. Levine, Nan Zhou, and Lynn Price, I The Bridge. U.S. National Academies of Sciences. Volume: 39, Number: 2 - Summer 2009.

<sup>vi</sup> In eastern China, companies can receive \$29 for every ton of coal equivalent saved per year above 10,000 tce. In mid- and western China, the rate is \$36 for every tce saved.

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