

## Energy and Climate Goals of China's 12th Five-Year Plan

The 12<sup>th</sup> Five-Year Plan (FYP) adopted by the Chinese government in March 2011 devotes considerable attention to energy and climate change and establishes a new set of targets and policies for 2011-2015.<sup>1</sup> While some of the targets are largely in line with the status quo, other aspects of the plan represent more dramatic moves to reduce fossil energy consumption, promote low-carbon energy sources, and restructure China's economy. Among the goals is to "gradually establish a carbon trade market." Key targets include:

- A 16 percent reduction in energy intensity (energy consumption per unit of GDP);
- Increasing non-fossil energy to 11.4 percent of total energy use; and
- A 17 percent reduction in carbon intensity (carbon emissions per unit of GDP).

### Energy

The relationship between energy and economic growth matters greatly in China; without a reduction in energy intensity since the late 1970s, the country would need to consume three times the energy it does today to sustain its economic growth. At the center of China's 11<sup>th</sup> Five-Year Plan (2006-2010) was a target to decrease the overall energy intensity of the economy by 20 percent. This target was implemented in response to increases in energy intensity experienced between 2002 and 2005, the first increase experienced after several decades of rapidly decreasing energy intensity. To reverse the unexpected increases in energy intensity, the government mobilized a national campaign to promote energy efficiency, targeting in particular the largest and least efficient energy consuming enterprises. The Top 1,000 Program targeted approximately 1,000 companies (consuming about one-third of the country's energy) for efficiency improvements.

The 12<sup>th</sup> FYP builds directly on the 11<sup>th</sup> FYP energy intensity target and its associated programs, setting a new target to reduce energy intensity by an additional 16 percent by 2015.<sup>2</sup> While this may seem less ambitious than the 20 percent reduction targeted in the 11<sup>th</sup> FYP, it likely represents a much more substantial challenge. It is likely the largest and least efficient enterprises have already undertaken efficiency improvements, leaving smaller, more efficient plants to be targeted in this second round. Under preparation is a new "Top 10,000" program, which is modeled after the Top 1,000 Program but adds an order of magnitude of companies to the mix. But as the number of plants grows, so do the challenges of collecting accurate data and enforcing targets.

The closure of inefficient power and industrial facilities also helped contribute to the decline in energy intensity during the 11<sup>th</sup> FYP period, with a reported 72.1 GW of thermal capacity closed.<sup>3</sup> Total plant closures are equivalent to 16 percent of the size of the capacity added over the period. An additional 8 GW of coal plants are reportedly to be shut down in 2011 alone with further closures no doubt on tap over the next five years.

While final data are not yet available, the country likely fell short of meeting its 11<sup>th</sup> FYP energy intensity target of 20 percent, instead achieving in the range of 19.1 percent. There is no doubt, however, that much was learned through efforts to improve efficiency nationwide. Many changes were made to how such national targets are enforced at the local level, including the incorporation of compliance with energy intensity targets into the evaluation for local officials.



The 12<sup>th</sup> FYP includes a target to increase non-fossil energy sources (including hydro, nuclear and renewable energy) to 11.4 percent of total energy use (up from 8.3 percent in 2010).<sup>4</sup> While not formally enshrined in the 12<sup>th</sup> FYP, another recent notable announcement is a cap on total energy consumption of 4 billion tons of coal equivalent (tce) in 2015.<sup>5</sup> To meet the cap on energy consumption, annual energy growth would need to slow to an average of 4.24 percent per year, from 5.9 percent between 2009 and 2010. The government is also trying to slow GDP growth rates, targeting 7 percent per year – far below recent growth rates. Lower GDP growth rates make it even more challenging for China to meet energy and carbon intensity targets, since energy and carbon need to grow more slowly than GDP for the country to achieve declining energy and carbon intensity.

## **Carbon**

In the lead-up to the Copenhagen climate negotiations in the fall of 2009, the Chinese government pledged a 40-45 percent reduction in national carbon intensity from 2005 levels by 2020. To achieve this 2020 target, the 12<sup>th</sup> FYP sets an interim target of reducing carbon intensity 17 percent from 2010 levels by 2015. Whether this target will result in a deviation from China's expected carbon emissions over this time period depends on the corresponding GDP growth, but many studies have found that this target will be challenging for China to achieve without additional, aggressive policies to promote low carbon energy development.<sup>6</sup>

Also promised in the 12<sup>th</sup> FYP is an improved system for monitoring greenhouse gas emissions, which will be needed to assess compliance with the carbon intensity target, and to prepare the national GHG inventories that, under the Cancún Agreements, are to be reported more frequently to the UNFCCC and undergo international assessment.

The 12<sup>th</sup> FYP establishes the goal of "gradually establish[ing] a carbon trade market," but does not elaborate. A handful of provinces have announced interest in piloting carbon trading schemes. The Tianjin Climate Exchange, partially owned by the founders of the Chicago Climate Exchange, is positioning itself to be the clearinghouse for any future carbon trading program.<sup>7</sup> While some have suggested that Guangdong province may be targeted for a pilot program at the provincial level, other reports speculate that the program would begin within a single sector, such as the power sector, or begin by including only state-owned enterprises, which are often the target of early government policy experiments (as was the case with mandatory market shares for renewable energy placed on the large state-owned power companies). Other likely locations for pilots might include China's low-carbon cities and provinces.<sup>8</sup>

Implementing a carbon trading scheme in China, even on a small-scale or pilot basis, will not be without significant challenges. Concerns have already been raised from both domestic and foreign-owned enterprises operating in China about how the regulation could affect their bottom lines. But the key challenge is likely technical, resulting from the minimal capacity currently in place to measure and monitor carbon emissions in China.

## **Industrial Policy**

The 12<sup>th</sup> FYP also includes many new industrial policies to support clean energy industries and related technologies. Industries targeted include the nuclear, solar, wind and biomass energy technology industries, as well as hybrid and electric vehicles, and energy savings and environmental protection technology industries.<sup>9</sup> These "strategic and emerging" industries are being promoted to replace the "old" strategic industries such as coal and telecom, (often referred to as China's pillar industries), which are heavily state-owned and have long benefited from government support.<sup>10</sup> This move to rebrand China's strategic industries likely signals the start of a new wave of industrial policy

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support for the new strategic industries which may include access to dedicated state industrial funds, increased access to private capital, or industrial policy support through access to preferential loans or R&D funds.

Other targets encourage increased innovative activity, including a target for R&D expenditure to account for 2.2 percent of GDP, and for 3.3 patents per 10,000 people. During the 11<sup>th</sup> FYP period, an estimated 15.3 percent of government stimulus funding was directed towards innovation, energy conservation, ecological improvements and industrial restructuring.<sup>11</sup>

	The <i>old</i> pillar industries	The <i>new</i> strategic and emerging industries
1	National defense	Energy saving and environmental protection
2	Telecom	Next generation information technology
3	Electricity	Biotechnology
4	Oil	High-end manufacturing (e.g. aeronautics, high speed rail)
5	Coal	New energy (nuclear, solar, wind, biomass)
6	Airlines	New materials (special and high performance composites)
7	Marine shipping	Clean energy vehicles (PHEVs and electric cars)

Sources: "Decision on speeding up the cultivation and development of emerging strategic industries"

(国务院通过加快培育和发展战略性新兴产业的决定), *www.gov.cn*, September 8, 2010, [http://www.gov.cn/ldhd/2010-09/08/content\\_1698604.htm](http://www.gov.cn/ldhd/2010-09/08/content_1698604.htm); HSBC, *China's next 5-year plan: What it means for equity markets*, October 2010.

## Other Targets

The 12<sup>th</sup> FYP also includes targets to increase the rate of forest coverage by just over 21 percent and the total forest stock by 12.5 million hectares by 2015. Also mentioned are targets for the construction of 35,000 km of high-speed rail and improvements in subway and light rail coverage, as well as a goal to connect every city with a population greater than 500,000.<sup>12</sup>

## Outlook

The 12<sup>th</sup> FYP provides a glimpse into the minds of China's leadership as it lays out a methodological plan for moving the country forward. It includes a strong emphasis on new energy and climate programs and clearly illustrates China's commitment to increased environmental protection. The Plan itself provides a framework for progress, but leaves the details of implementation to policy makers, with many new policies and programs likely to follow in the coming weeks.

Some of the targets will no doubt prove challenging to implement. The national energy and carbon intensity targets will prove particularly difficult if economic growth rates slow in line with targets put forth in the plan.

Implementation of energy conservation and efficiency programs at the facility level will prove increasingly demanding as more and more facilities are incorporated into current programs. The non-fossil energy target relies on extensive increases in nuclear energy capacity, but growth in nuclear plants may slow as efforts to improve safety and regulation will be implemented in the aftermath of the recent Japanese nuclear disaster.<sup>13</sup> If nuclear targets are reduced, the share of renewable energy will need to increase even more than current targets propose.

Overall, China's Plan represents many ambitious climate and energy goals, and lays out a strategic roadmap for the county to endeavor to pursue over the next five years.

## Notes and References

<sup>1</sup> A full version of the plan (in Chinese) is available at [http://news.xinhuanet.com/politics/2011-03/16/c\\_121193916.htm](http://news.xinhuanet.com/politics/2011-03/16/c_121193916.htm) or at <http://www.chinacleanenergydb.com/general-strategic-plans/Five-Year-Plans/3-2011China12thFive-YearPlanonNationalEconomicandSocialDevelopment-Chinese.pdf?attredirects=0&d=1>.

<sup>2</sup> “Key targets of China's 12th five-year plan,” *Xinhua*, March 5, 2011. [http://www.chinadaily.com.cn/xinhua/2011-03-05/content\\_1938144.html](http://www.chinadaily.com.cn/xinhua/2011-03-05/content_1938144.html)

<sup>3</sup> Wen Jiabao. *Report on the work of the Government*. Delivered at the Fourth Session of the Eleventh China National People's Congress, March 5, 2011. <http://blogs.wsj.com/chinarealtime/2011/03/05/china-npc-2011-reports-full-text/>

<sup>4</sup> “China announces 16 pct cut in energy consumption per unit of GDP by 2015,” *Gov.cn*, March 5, 2011. [http://www.gov.cn/english/2011-03/05/content\\_1816947.htm](http://www.gov.cn/english/2011-03/05/content_1816947.htm); “Zhang: ‘Twelfth Five’ push to non-fossil energy to account for 11.4 percent share of primary energy” (张国宝: “十二五”末力争非化石能源占一次能源比重11.4%), *people.com.cn*, January 6, 2011. <http://energy.people.com.cn/GB/13670716.html>

<sup>5</sup> Fellman, Joshua. “China to Hold Primary Energy Use to 4.2 Billion Tons in 2015, Xinhua Says.” *Bloomberg*, October, 20, 2010. <http://www.bloomberg.com/news/2010-10-30/china-to-hold-primary-energy-use-to-4-2-billion-tons-in-2015-xinhua-says.html>

<sup>6</sup> See, e.g. Cohen-Tanugi, David. “Putting it into Perspective: China's Carbon Intensity Target.” NRDC White Paper, October 2010.

<sup>7</sup> The Tianjin Climate Exchange (TCX) is a joint venture of China National Petroleum Corporation Assets Management Co. Ltd. (CNPCAM), the Chicago Climate Exchange (CCX) and the City of Tianjin.

<sup>8</sup> In July 2010, NDRC announced the selection of official low carbon pilot provinces and cities, including the provinces of Guangdong, Liaoning, Hubei, Shaanxi and Yunnan, and the cities of Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang, and Baoding.

<sup>9</sup> “Decision on speeding up the cultivation and development of emerging strategic industries” (国务院通过加快培育和发展战略性新兴产业的决定), *www.gov.cn*, September 8, 2010, [http://www.gov.cn/ldhd/2010-09/08/content\\_1698604.htm](http://www.gov.cn/ldhd/2010-09/08/content_1698604.htm)

<sup>10</sup> Over 70 percent of SOE assets and profits are concentrated in the “old” magic 7 strategic industries. HSBC, *China's next 5-year plan: What it means for equity markets*, October 2010.

<sup>11</sup> HSBC, *China's next 5-year plan: What it means for equity markets*, October 2010.

<sup>12</sup> Seligsohn, Deborah and Angel Hsu. “How does China's 12th Five-Year Plan address energy and the environment?” *China FAQs*, March 7, 2011. <http://www.chinafaqs.org/blog-posts/how-does-chinas-12th-five-year-plan-address-energy-and-environment>

<sup>13</sup> Yue, Yang. “China may revise nuclear power target.” *Marketwatch.com* from *Caixin Online*, March 29, 2011. <http://www.marketwatch.com/story/china-may-revise-nuclear-power-target-2011-03-29>