

ChinaFAQs

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Renewable Energy In China: An Overview

Current Energy Production in China

Although China still relies on coal to produce around two-thirds of its total primary energy,¹ in recent years it has rapidly promoted renewable alternatives, including hydro, wind, solar and biomass power.² Additionally, growth in demand for coal is projected to slow in the coming years.³ China currently ranks first in terms of installed wind power and hydropower. China is also the world's leading manufacturer of solar photovoltaic cells, with a 30% global market share.⁴

Currently, China gets about 9% of its primary energy from non-fossil sources.⁵ China's 12th Five Year Plan (12FYP) sets out a specific goal of 11.4% of total primary energy from non-fossil sources by 2015, and 15% by 2020.⁶ China has been following up on its goals with significant investments in renewable energy, including over \$65 billion invested in 2012.⁷ If China's efforts to transform its energy sources are successful, these renewables would displace dirtier fuels such as coal, helping China slow growth in greenhouse gas emissions.

Sources of Renewable Energy

In China, renewable energy sources, such as wind, solar photovoltaic, and hydropower are mostly used to make electricity rather than provide heat. However, biomass (such as trees and crops) is often burned to produce heat, mostly in rural areas, and sometimes converted to liquid fuel. Here is some of the key information on renewable sectors in China:

- **Hydropower** is the country's single largest renewable power source, providing about 18% of China's total electricity.⁸ China currently has 229 GW of installed hydropower, making it the world's largest generator of hydropower with about a quarter of the world's total.⁹ In addition to the better-known, large-scale hydroelectricity projects, China is the world's biggest user of small-scale hydropower. Estimated capacity for small hydro is 73.6 GW.¹⁰ By comparison, total small hydro capacity in the United States is 49.6 GW.¹¹ The official Chinese target for all hydropower in 2015 is 290 GW.¹²
- **Wind** is the second leading source for renewable power in China, with installed capacity in 2013 reaching 89 GW.¹³ The Chinese market for wind power is growing very rapidly, currently the fastest in the world:¹⁴ China's wind power capacity has increased over a hundredfold in the past decade.¹⁵ The current target for wind in 2015 is 100 GW.¹⁶

Key Points

- Currently, China gets about 9% of its total primary energy from non-fossil sources. Official targets aim to increase that share to at least 11.4 % in 2015 and 15% in 2020.
- Solar Power: China is the world's largest producer and exporter of solar cells (PVs). China currently has about 19 GW of solar installed, with a target of at least 35 GW installed by 2015
- Hydropower: China is the largest hydropower generator in the world, with about 229 Gigawatts (GW), and a target of 290 GW for 2015.
- Wind Power: China ranks 1st in the world in installed wind power capacity, with 89 GW. China is also the world's fastest-growing installer of wind, and it aims to have 100 GW of wind installed by 2015.

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- **Solar** production from China accounted for nearly 30% of global solar PV supply in 2012. Although China is already the world's largest supplier of photovoltaic cells, the industry has been internationally oriented, relying mainly on exports.¹⁷ However, recent difficulties in the international market have led China to greatly increase its focus on domestic deployment.¹⁸ In 2013 China installed 12 GW of solar PV, 50% more than any country had ever installed in a single year before 2013.¹⁹ China currently has about 19 GW of installed solar PV,²⁰ and has a target of over 35 GW of solar PV to be installed by 2015.²¹
- **Biomass**, such as wood, peat and energy crops, so far plays a relatively small role overall, but is important in some niches. Some biomass is burned to provide heat, some is converted to "biogas" for a variety of uses, and some is converted to liquid fuels. Government plans, however, call for scaling up biomass use. China is the world's third largest producer of fuel ethanol (2.5% of world's total in 2012).²² China also has almost 10 GW of biomass power installed,²³ and aims to increase this number to 13 GW by 2015.²⁴ In rural areas, the goal is to have 50 million households using biogas as their primary source of energy.²⁵

Promoting Renewable Energy in China

China has established a legal framework for promoting renewable energy, through its Renewable Energy Law, which promoted renewable energy by combining mandated targets, market-based incentives, and direct subsidies.²⁶ One major challenge is connecting "intermittent" sources of electricity like wind or solar to the national grid. However, new policy initiatives are attempting to address the problem. For example, China is looking at the idea of a renewable energy quota, which would require a certain amount of total electricity consumption to come from renewable sources, thus lessening the amount of idle intermittent power.²⁷ These type of policies, along with tax breaks, preferential loans, and other financial incentives that encourage investors to back renewable ventures help explain why China is making significant progress on renewable energy, and how it is working towards overcoming the various obstacles that arise.²⁸

For more information see:
[Renewable Energy In China: A Graphical Overview of 2013](#)

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

- ¹ BP. 2013. BP Statistical Review of World Energy June 2013. (London: BP p.l.c.) Retrieved at: <http://www.bp.com/statisticalreview>
- ² "China's 12th Five Year Plan (2011-2015) (12FYP)— the Full English version." Translated by: Delegation of the European Union in China. Online at: <http://www.britishchamber.cn/content/chinas-twelfth-five-year-plan-2011-2015-full-english-version>
- ³ <http://press.ihf.com/press-release/energy-power/chinas-coal-market-not-promised-land-international-suppliers>
- ⁴ REN21. 2013. Renewables Global Status Report: 2013 Update (Paris: REN21 Secretariat). Retrieved at: <http://www.ren21.net/REN21Activities/GlobalStatusReport.aspx>
- ⁵ BP
- ⁶ 12FYP. This includes 40 GW of nuclear by 2015, along with the renewable energy targets mentioned below
- ⁷ PEW, "Who's Winning the Clean Energy Race 2013." Data available at: <http://www.pewenvironment.org/campaigns/pew-clean-energy-program/id/8589935316/>
- ⁸ <http://www.eia.gov/countries/cab.cfm?fips=CH>
- ⁹ REN21
- ¹⁰ PEW
- ¹¹ PEW
- ¹² "ChinaFAQs: What Are China's National Climate and Energy Targets?" <http://www.chinafaqs.org/library/chinafaqs-what-are-chinas-national-climate-and-energy-targets>
- ¹³ REN21
- ¹⁴ REN21
- ¹⁵ <http://www.chinafaqs.org/blog-posts/building-our-clean-energy-industries-learning-chinas-experience-wind-power>
- ¹⁶ "ChinaFAQs: What Are China's National Climate and Energy Targets?"
- ¹⁷ <http://www.wri.org/publication/china-overseas-investments-in-wind-and-solar-trends-and-drivers>
- ¹⁸ <http://online.wsj.com/article/SB10001424127887323706704578229570073217326.html>
- ¹⁹ <http://about.bnef.com/press-releases/chinas-12gw-solar-market-outstripped-all-expectations-in-2013/>
- ²⁰ PEW
- ²¹ ChinaFAQs: What Are China's National Climate and Energy Targets?"
- ²² REN21
- ²³ PEW
- ²⁴ <http://www.cnred.org.cn/english/manageInfo.do?action=showColumn&type=article&typeld=102>
- ²⁵ <http://www.cnred.org.cn/english/manageInfo.do?action=showColumn&type=article&typeld=102>
- ²⁶ http://www.npc.gov.cn/englishnpc/Law/2007-12/13/content_1384096.htm
- ²⁷ http://www.chinadaily.com.cn/business/2012-02/28/content_14715039.htm
- ²⁸ Gallagher, K.S. 2013, "Why and how governments support renewable energy," Daedalus, Volume 142, Issue 1, 59-77. Online at: http://www.mitpressjournals.org/doi/abs/10.1162/DAED_a_00185

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