

ChinaFAQs

The Network for Climate and Energy Information



Renewable Energy In China: An Overview

CURRENT ENERGY PRODUCTION IN CHINA

Although China still relies on coal to produce more than two-thirds of its total energy, in recent years it has rapidly promoted renewable alternatives, including hydro, wind, solar and biomass power.ⁱ China is now the world's largest producer of hydropower and could soon become the leading installer of wind capacity. China is also the world's leading manufacturer of solar photovoltaic cells.ⁱⁱ

Currently, China gets about 7% of domestic energy from renewable fuels.ⁱⁱⁱ The national government has set a goal of boosting that share to at least 15% by 2020, a target supported by a mix of mandates and incentives.^{iv} Reaching that goal could require an investment of \$300 billion, which would make China a major player in the growing global renewables market.^v If successful, these renewables would displace dirtier fuels such as coal, helping China slow growth in greenhouse gas (GHG) emissions.

SOURCES OF RENEWABLE ENERGY

Renewable energy sources are mostly used to make electricity in China, particularly wind, solar photovoltaic, and hydropower. Biomass (such as

trees and crops) is often burned to produce heat, mostly in rural areas, and sometimes converted to liquid fuel. Here are some of the key renewable sectors targeted:

- **Hydropower** is the country's single largest renewable power source, providing about 13% of China's electricity, and 6% of its total energy.^{vi} 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 60 gigawatts (GW), and China has added 4 to 6 GW annually in recent years. By comparison, total small hydro capacity in the United States is 3 GW.^{vii} The official target for all hydropower in 2020 is 300 GW.^{viii}
- **Wind** is the second leading source for renewable power in China, with installed capacity in 2009 reaching 25.8 GW (2nd in the world, behind only the United States).^{ix} The Chinese market for wind power is growing very rapidly: 13.8 GW of new power, installed in 2009, effectively doubled China's installed wind capacity for the fifth time in as many years.^x According to some experts, wind turbines could conceivably produce all the additional electricity China will need between now and 2030.^{xi} The current target for wind in 2020 is 100 GW.^{xii}

Key Points

- Currently, China gets 7% of its total energy from renewable sources. Official targets aim to increase that share to at least 15% in 2020.
- Solar Power: China is the world's largest producer and exporter of solar cells (PVs). In 2008, China manufactured nearly 40% of all PV cells in the world.
- Hydropower: China is the largest hydropower generator in the world, with about 150 gigawatts (GW) currently, and a target of 300 GW for 2020.
- Wind Power: China is the world's fastest-growing installer of wind energy, doubling total capacity in 2009 to more than 25 GW. China now ranks 2nd in the world in installed wind capacity, behind only the United States.

- **Solar** production from China accounted for nearly 40% of global supply in 2008. Although China is already the world's largest supplier of photovoltaic cells, the domestic solar market, is currently underdeveloped.^{xiii} Government targets for domestic solar energy in 2020 recently increased from 1.8 GW to 20 GW.^{xiv} Researchers say more than two-thirds of China's land area gets more than enough sunlight to make the technology attractive domestically.^{xv} Aside from photovoltaics, solar water heaters have been a success story: low-cost, emission-free solar water heaters are installed in 10% of Chinese homes.^{xvi}
- **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 already the world's third largest producer of fuel ethanol (2.9% of world's total in 2008).^{xvii} In rural areas, the goal is to have 80 million households, or roughly 300 million people, using biogas as their primary source of energy.^{xviii}

PROMOTING RENEWABLE ENERGY IN CHINA

China has established a legal framework for promoting renewable energy, supported by enabling regulations combining mandated targets, market-based incentives,

direct subsidies and some innovative policy measures.^{xix} One major challenge is connecting "intermittent" sources of electricity like wind or solar to the national grid. Utilities, therefore, are mandated to open transmission lines to renewable generators, with ratepayers bearing part of the extra costs. Feed-in tariffs guarantee renewable energy producers a steady, high price for the electricity enabling them to compete with coal producers. Tax breaks, preferential loans, and other financial incentives encourage investors to back renewable ventures. For example: a direct subsidy announced in March 2009 of 20 RMB (about \$2.92 USD) per watt on solar power will help promote the development of China's domestic solar market.^{xx}

At current rates of growth, analysts say China could exceed its goals for renewable energy production over the next decade. That, in turn, could curb the growth of China's greenhouse gas emissions more quickly than expected.

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 U.S. Energy Information Administration, Country Analysis Brief: China, July 2009
- ⁱⁱ The Energy Foundation (2008), "Fact Sheet: China Emerging As New Leader In Clean Energy Policies." Retrieved at: <http://www.efchina.org/FNewsroom.do?act=detail&newsTypeId=1&id=107>.
- ⁱⁱⁱ U.S. Energy Information Administration, Country Analysis Brief: China, July 2009
- ^{iv} Carberry and Hancock (Sept. 2009). "The China Greentech Report 2009," China Greentech Initiative.
- ^v The Energy Foundation, "Fact Sheet." (2008).
- ^{vi} In 2007, hydropower produced 430 billion kilowatt hours of electricity, providing 14.1% of generation. U.S. Energy Information Administration, "Country Analysis Brief: China," July 2009.
- ^{vii} REN21. 2009. Renewables Global Status Report: 2009 Update (Paris: REN21 Secretariat). Retrieved at: http://www.ren21.net/pdf/RE_GSR_2009_Update.pdf.
- ^{viii} "The China Greentech Report 2009," China Greentech Initiative.
- ^{ix} Global Wind Energy Council (2010), "Global Wind 2009 Report," available at: www.gwec.net.
- ^x McElroy et al., 2009. "Potential for Wind-Generated Electricity in China." Science, Vol 325; "The China Greentech Report 2009," China Greentech Initiative, p. 36.
- ^{xi} McElroy et al., 2009. "Potential for Wind-Generated Electricity in China."
- ^{xii} "The China Greentech Report 2009," China Greentech Initiative.
- ^{xiii} Seligsohn, Heilmayr, Tan, and Weischer. "China, the United States, and the Climate Change Challenge." October 2009. World Resources Institute Policy Brief.
- ^{xiv} "The China Greentech Report 2009," China Greentech Initiative.
- ^{xv} The Energy Foundation, "Fact Sheet." (2008).
- ^{xvi} Seligsohn, Heilmayr, Tan, and Weischer. "China, the United States, and the Climate Change Challenge." October 2009. WRI Policy Brief.
- ^{xvii} BP Statistical Review of World Energy, 2009. Retrieval at: www.bp.com
- ^{xviii} Medium and Long-Term Development Plan for Renewable Energy in China, 2007.
- ^{xix} "The Renewable Energy Law of the People's Republic of China," adopted at the 14th session of the National People's Congress, February 28, 2005.
- ^{xx} Seligsohn et al (2009). "China, the United States, and the Climate Change Challenge."

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