

# Grid parity

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Jump to: [navigation](#), [search](#)

**Grid parity** is the point at which alternative means of generating electricity is at least as cheap as grid power.

For solar energy, it is achieved first in areas with abundant sun and high costs for electricity such as in [California](#), [Hawaii](#), [Spain](#)<sup>[1]</sup> and [Japan](#).<sup>[2]</sup> Many solar power advocates predict that grid parity will occur in the near future. In July 2009, a blog surmised that solar would possibly be able to cost-effectively compete with fossil fuels "within a matter of months," due to falling solar modular prices.<sup>[3]</sup> However, many other estimates are not as optimistic. In 2010 the [United States Department of Energy](#) predicted that the total levelized cost of photovoltaics would be nearly 40 ¢(US)/kWh in 2016.<sup>[4]</sup>

Grid parity has been reached in [Hawaii](#) and other islands that otherwise use fossil fuel (diesel fuel) to produce electricity. George W. Bush had set 2015 as the target date for grid parity in the USA.<sup>[5]</sup>

[General Electric's](#) Chief Engineer predicts grid parity without subsidies in sunny parts of the United States by around 2015. Other companies predict an earlier date.<sup>[6]</sup> the cost of solar power will be below grid parity for more than half of residential customers and 10% of commercial customers in the [OECD](#), as long as grid electricity prices do not decrease through 2010.

The fully-loaded cost (not price) of solar electricity is \$0.25/kWh or less in most of the [OECD](#) countries. By late 2011, the fully-loaded cost is likely to fall below \$0.15/kWh for most of the OECD and reach \$0.10/kWh in sunnier regions. These cost levels are driving some emerging trends:<sup>[7]</sup>

1. vertical integration of the supply chain;
2. origination of power purchase agreements (PPAs) by solar power companies;

## Contents

[\[hide\]](#)

- [1 Current costs](#)<sup>[when?]</sup>
- [2 Concentrating solar power](#)
- [3 Progress](#)
- [4 Wind power](#)
- [5 See also](#)
- [6 External links](#)
- [7 References](#)

[\[edit\]](#) [Current costs](#)<sup>[when?]</sup>

One company states that concentrating solar power costs 12¢(US)/kwh to produce, and expects this to drop to 6¢(US)/kwh by 2015 due to improvements in technology and reductions in equipment manufacturing costs.<sup>[8]</sup>

## **[edit]** Concentrating solar power

Abengoa Solar has announced the award of two R&D projects in the field of Concentrating Solar Power (CSP) by the US Department of Energy that total over \$14 million. The goal of the DOE R&D program, working in collaboration with partners such as Abengoa Solar, is to develop CSP technologies that are competitive with conventional energy sources (grid parity) by 2015.<sup>[9]</sup> Concentrating photovoltaics (CPV) could reach grid parity in 2011. Other companies predict an earlier date.<sup>[10]</sup> Oerlikon Solar has said its facilities will achieve grid parity by 2010 in connection with the opening of the company's new fully-automated thin-film pilot line at the Solar Valley in Trübbach, Switzerland.

## **[edit]** Progress

First Solar has indicated that its manufacturing cost has fallen in 2009 to 93 cents per watt, down 5% in three months and down 28% in a year. By 2014, it expects to drive down cost per watt to make solar modules to fall to between 52 and 63 cents. The biggest driver of the lower costs is better efficiency.<sup>[11]</sup> It is working to commercialize new manufacturing techniques that will increase the efficiency of multicrystalline solar cells. It is doing this with three methods: "Honeycomb" texturing the surface of a cell to increase its surface area and capture more sun; grooving the interconnect wires to allow sunlight to bounce around the module and mitigate the problems of bus-bar shading; and also making the metalization lines — which export the energy from the cell — smaller, cheaper and more efficient. By doing all this with manufacturing techniques that can be integrated into existing manufacturing lines, 1366 hopes to manufacture an 18% efficient multicrystalline cell in high volume and produce solar that is competitive with coal by 2013.<sup>[12]</sup>

Abound Solar (formerly known as AVA Solar),<sup>[13]</sup> a start-up formed by a Colorado State University engineering professor, is commercializing a method for manufacturing low-cost, high-efficiency CdTe solar panels.<sup>[14]</sup>

China's government has announced support<sup>[quantify]</sup> for its photovoltaic companies. Two companies, Yingli Green Energy and SDIC Huajing Power, have submitted a bid to build a 10-MW solar power plant to provide electricity to the national grid at a price of RMB 0.69 per kWh or US \$0.10 per kWh. At that price, solar energy will be just about as cheap as coal electricity in China.<sup>[15]</sup>

## **[edit]** Wind power

Grid parity also applies to wind power where it varies according to wind quality and existing distribution infrastructure. ExxonMobil predicts wind power real cost will approach parity with natural gas and coal without carbon sequestration and be cheaper than natural gas and coal with carbon sequestration by 2025.<sup>[16]</sup>

## **[edit]** See also

- [Feed-in tariff](#)
- [First Solar](#)
- [LDK Solar](#)
- [Microinverter](#)
- [Net metering](#)
- [Photovoltaics](#)
- [Renewable Energy Corporation](#)
- [Sunpower](#)
- [Suntech](#)
- [Thin-film solar cell](#)
- [Solar America Initiative](#)
- [Cost of electricity by source](#)

## **[edit]** External links

- [Cost of solar energy will match fossil fuels by 2013, claims Solarcentury \(the Guardian\)](#)
- [Solar quickly approaching grid parity](#)
- [Sustainable Energy Transition](#)

## **[edit]** References

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2. ↑ [Going for grid parity](#) 2005 article
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5. ↑ [Gaining on the grid](#)
6. ↑ [reuters.com](#)
7. ↑ <http://www.worldofphotovoltaics.com/vbnews.php?do=viewarticle&artid=24&title=economics-of-pv>
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- [Article](#)
- [Discussion](#)

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#### Views

- [Read](#)
- [Edit](#)
- [View history](#)

#### Actions

#### Search

- [Main page](#)
- [Contents](#)
- [Featured content](#)
- [Current events](#)
- [Random article](#)
- [Donate to Wikipedia](#)

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- [Help](#)
- [About Wikipedia](#)
- [Community portal](#)

- [Recent changes](#)
- [Contact Wikipedia](#)

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Print/export

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