**Solar-Based Electricity\* Already Dominates Fossil Fuels in New Electricity Capacity Installations: Which Countries Will Lead Clean Energy Job Growth & Technology in the 21st Century?**

BACKGROUND

New solar and wind installations now produce electricity at lower cost than fossil fuels do in about 30 countries, including the United States in some regions. New wind and especially solar prices continue to fall [rapidly](https://cleantechnica.com/2017/03/13/solarreserve-bids-24-hour-solar-6-3-cents-chile/), [with prices competitive with coal and natural gas.](https://www.greentechmedia.com/articles/read/cheapest-solar-ever-austin-energy-gets-1.2-gigawatts-of-solar-bids-for-less)

Given the continued increases in economies of scale and improvements in technological efficiency, the prices of wind and solar energy are poised to continue falling, and [these sectors are now dominating over fossil fuels for new electricity generation](https://assets.bwbx.io/images/users/iqjWHBFdfxIU/iGa2kIRA3VCI/v2/-1x-1.png) capacity. The present century will likely be the solar century, even as the last century was the century of oil. Perhaps the mass installations of solar panels that has begun in the oil exporting nations of the Middle East symbolizes a return to a global solar-based society.

IS THE UNITED STATES ON TRACK TO LEAD THE SOLAR-BASED ENERGY REVOLUTION?

More solar panels are made and installed in [China than in any other country.](https://www.scientificamerican.com/article/why-china-is-dominating-the-solar-industry/)

European and Chinese companies dominate the manufacturing and installation of wind turbines.

But the United States and its companies are a strong second or third in wind and solar manufacturing and installation, depending on year. [The combined job growth rates of wind and solar are 12 times the employment growth rate of the overall economy.](https://cleantechnica.com/2017/03/10/us-wind-industry-drive-quarter-million-jobs-2020-navigant/) [Employment in wind alone already surpasses coal.](https://cleantechnica.com/2017/03/10/us-wind-industry-drive-quarter-million-jobs-2020-navigant/)

[Yet European companies play a leadership role in North American wind projects.](https://cleantechnica.com/2017/03/13/european-developers-propose-offshore-wind-farms-off-long-island-marths-vineyard/) [See also this.](https://cleantechnica.com/2017/03/13/robotics-artificial-intelligence-decrease-offshore-wind-farm-maintenance-costs/):

Strong official support for wind and solar in China buttresses its emerging dominance in clean energy manufacturing and installation. The Chinese government recognizes that air pollution and climate change are already being felt with increasing intensity in many of its regions, and that fossil fuel combustion is the primary cause.

[Since 2015, China, and then Europe, surpassed the United States as the leading electric vehicle markets.](https://www.forbes.com/sites/bertelschmitt/2016/10/16/for-tesla-electric-car-sales-explode-in-all-the-wrong-places/#3f146d254a24) The EV market is an important complement to renewable electricity, providing 1) distributed electricity storage, 2) unpolluted urban skies, and 3) a larger market for batteries which is already improving economies of scale and [driving down prices.](https://cleantechnica.com/2015/09/21/tesla-gigafactory-battery-improvements-could-cut-battery-costs-70/)

POLITICS OF FOSSIL FUELS AND SOLAR-BASED ENERGY

On-again off-again federal support and some state level hostility to solar and wind has hampered the development of both industries domestically. (Support has mostly depended on which political party has been in control.) The US wind industry almost totally disappeared in the hostile policy environment of the 1980s and early 1990s. On the other hand, what started out as small companies in Europe, such as Vestas (Denmark), have turned into globally dominant enterprises, partly due to more stable and predictable government support there, enabling long term research and development.

Considerable uncertainty exists about the role that will be played by the Trump Administration in the US renewable energy industry. President Trump, Vice President Pence, Department of Energy Secretary Perry, and EPA Secretary Pruitt have all denied the scientific consensus that carbon dioxide plays a dominant role in present and future climate change. The Republican Party in the US is the only dominant political party of any developed country [that has expressed denial of the global scientific consensus on climate change. Research has suggested that available fossil fuel reserves has an influence on conservative climate politics in some countries.](http://www.readcube.com/articles/10.1111/polp.12122) Media favorable to this point of view emphasize the loss in jobs that would happen in a transition away from fossil fuels, while ignoring the larger number of renewable energy jobs that would be created.

Notwithstanding the situation in the United States, oil rich Norway currently has an aggressive electric auto adoption policy, with about half of all new autos sold there being plug-ins.

Some formerly influential Republican opinion leaders proposed in 2017 a [policy to limit greenhouse gasses](http://blog.ucsusa.org/rachel-cleetus/can-republicans-find-their-voice-on-climate-change-via-a-carbon-tax?_ga=1.104166725.455602712.1489522412). Some analysts believe that even if the national leadership is hostile to the growth of the wind and solar industries, there is recognition that voters, including conservatives in many wind and solar rich states such as Texas, favor the continued installation of wind turbines and solar farms. This is because they create local jobs, generate income for landowners, and help fund resources such as schools.

At present there is little discussion about construction of a continental scale electric grid that would lower consumer electricity prices by connecting supply and demand geographically on a 24 hour basis. The construction of such a grid would provide a national economic jobs stimulus at a time when wages have stagnated over the past decade. A national grid would benefit intermittent electricity sources by smoothing out supply fluctuations, reducing the need for expensive natural gas peaker plants.

With political leadership the role of the United States can be large in solar, wind, and the electric auto industries. These industries show every sign of being the big energy industries in this century. The core jobs in research and design in emerging industries have always been among the better paying professions. And local jobs in installation and maintenance cannot be outsourced to lower wage countries.

Will the United States lead or follow? Currently the political emphasis is looking backwards more than forwards. The old smokestack industries have more political power, because they have more money. The Italian political philosopher and pragmatist, Niccolò Machiavelli, once wrote about the difficulties of change. An English version of his much-quoted aphorism goes as follows:

*There is nothing more difficult to plan, more doubtful of success, more dangerous to manage than the creation of a new system. The innovator has the enmity of all who profit by the preservation of the old system and only the lukewarm defense of those who would gain by the new system*.

\*solar-based means hydro (wave, tidal, and dam-based), solar, and wind. Technically biomass is also solar-based.