

How countries with potential can reap big benefits from the solar boom

Developing countries generally have the most solar potential, but investment and policies will need to change for them to realise it.

By **Nick Ferris** 11 Jan 2021 (Last Updated 8 Feb 2021)

“Solar is the new king,” announced the International Energy Agency in its 2020 World Energy Outlook. Maturing technologies, and increased investor and political confidence in renewables, are set to bring solar photovoltaic (PV) power out from the shadows. Global solar capacity will increase 273% in the next decade, from 692,296MW in 2020 to 1,889,138MW in 2030, predicts market intelligence data from GlobalData.

The sun emits enough power each second to satisfy total human energy needs for two hours, but only in recent years, as the levelised cost of generating PV power has fallen below the cost of fossil fuels, have governments really started to make use of this potential.

“Last year, if you average the spread of the highest and lowest costs of solar, for the first time solar was cheaper than all other power sources, according to the investment bank Lazard,” says Michael Schmela, head of market intelligence at SolarPower Europe, an industry organisation.



A maintenance engineer at a utility solar plant in Uganda. (Photo by Isaac Kasamani/AFP via Getty Images)

Schmela believes the world is at a “turning point”, highlighting in particular the high rate of solar PV installation in China. Between 2015 and 2020, solar capacity in the

country grew from 42,730MW to 239,218MW – a nearly six-fold increase, to around a third of the world’s current PV capacity.

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China is joined at the top of the solar leader board by other major economic powers such as the US, Japan and Germany. However, while these countries have the greatest means to invest in the technology, they are rarely those with the greatest solar potential.

Untapped potential

Analysis by the World Bank shows the southern African nation of Namibia has the best solar potential, followed by Chile, Jordan and a host of other Middle Eastern nations. At the other end of the table is rainy Ireland, which is joined at the bottom by other northern European nations including the UK and Norway.

Of the top 20 countries with the highest potential, only three – Chile, Mexico and South Africa – are in the top 20 for installed solar capacity. Meanwhile, only four of the countries with the greatest installed solar capacity feature in the top 100 for potential: the US at 89, India at 95, Australia at 48 and Spain at 82.

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This finding doesn't negate the use of solar in less sunny countries. "Even in the UK and Scandinavia you can have solar," says Peter Droege, president of the European Association for Renewable Energies. "Although the technology is not as effective as in other countries, it remains a cost-effective power source."

Countries with high practical potential would benefit most from a greater focus on solar power infrastructure, however.

Ethiopia, which boasts a population of 109 million, could generate sufficient energy to satisfy its existing needs by covering just 0.003% of its land with solar panels, estimates the World Bank. A similar tale is true for Mexico, where covering 0.1% of land with solar panels could provide electricity for all of its 126 million people.

Most countries with high solar potential are poorer, less developed and have lower access to reliable electricity supplies, factors which can help make solar a good clean energy fit.

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"In rural areas without electricity there is a strong case for solar," says Ed Gilliland, senior director at The Solar Foundation, a US non-profit organisation.

"People are not used to having 24/7 electricity – so to come along with a low-cost power source, even if it is intermittent like solar, can be a massive advantage," he says. "It is certainly better than nothing – and if you can recharge a few batteries then that becomes even more useful."

Small-scale solar can also be a good solution in countries with under-developed grid systems.

"The most important thing with solar is to put it where people are using it," says Droege. "You don't have to transmit it and you have the immediate use of power and income generation at source. That is the big difference with fossil fuels, which are centralised and require more complicated infrastructure."

Indeed, solar power looks set to boom in poorer countries over the next decade. The 25 countries with the highest solar potential will increase their total solar capacity from 24,831MW in 2020 to 144,828MW in 2030, predicts GlobalData. This is a near six-fold increase, and a far higher rate of growth than the 25 countries with the lowest solar potential, whose total capacity is set to grow from 110,270MW to 218,821MW.

Remaining challenges

For this potential to be achieved, however, governments will need to have the courage to turn their backs on incumbent oil companies, and shift subsidies and investment from fossil fuels to renewables, says Droege. Globally, the fossil fuel industry received \$5.2trn in subsidies in 2017, up from \$4.7trn in 2015, estimates the International Monetary Fund. Global renewables subsidies were, in comparison, a mere \$140bn in 2016.

Ensuring a level playing field and stable policy frameworks will be vital for the growth of renewables. "Solar costs have become cheaper over time, but our costs are fixed back in time," says Wayne Keast, a managing partner at Inspired Evolution Investment Management, a South Africa-based private equity firm that specialises in funding solar energy projects in Africa.

"Ten years down the line, we still have a fixed price per kilowatt-hour – but governments might turn around in future and say 'we are not going to pay you

anymore,' he says. "We need a really reliable guarantee of payment, and this is tricky to get hold of."

Power purchase agreements, which are often used to finance bigger renewables projects, including solar parks, can be complicated for an immature market to manage.

"When governments are less sophisticated, it takes longer to negotiate and it pushes up costs," says Keast. "Governments might demand the price of solar offered in a more reliable solar power nation like Spain, which is usually not feasible. After negotiations go past a certain point, the return risk profile changes and it is not worth investing."

The price of associated technologies, such as batteries, also needs to continue to fall to make the technology economically feasible for all, adds Keast.

Schmela is optimistic solar will achieve its potential everywhere.

"There is hardly anyone who accurately forecast how quickly solar would grow over the last two decades," he says. "The modern solar age began in Germany at the start of the century with the introduction of feed-in tariffs and other subsidies. The solar market evolution then followed in Japan, China, the US, India and Australia. We have arrived at a time when lenders are willing to back solar on a large scale in the Middle East and Africa. Solar can increasingly compete without subsidies if the political frameworks are right. The time has come, solar is about to really take off."

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