

# Renewable energy is expensive

**ALTHOUGH THE COSTS OF MANY RENEWABLE ENERGY TECHNOLOGIES ARE DECLINING, SOME STILL BELIEVE THAT “RENEWABLE ENERGY IS STILL TOO EXPENSIVE.” HOWEVER, IN MANY CASES, THAT IS SIMPLY NOT TRUE.**

The price reductions – and current low price levels – of solar PV are perhaps the most impressive. Although price levels vary depending on geography and a variety of other factors, some recent cost data are indicative:

- In 2017, solar auctions in Mexico and Saudi Arabia produced bids well below \$30/MWh
- Malaysia’s recent solar PV auctions have been far oversubscribed, and produced prices as low as \$80/MWh
- And in Thailand and other countries around the region, end-use customers are increasingly installing solar PV on rooftops, for economic reasons – even without subsidies or significant compensation for exports to the power grid.

Wind prices have also been declining. According to the International Renewable Energy Agency, the global average levelized cost of onshore wind has declined from \$400/kWh in 1983, to \$60/MWh in 2017 – an 85% decline, and we are seeing wind farms being built without any subsidies.

Figure 1 (see figure on the right) highlights the impressive downward trend in costs of wind and solar plants around the world. Multiple factors are driving the cost declines. While a primary driver is declines in technology costs, other factors that vary among projects, such as those below, also play important roles:

- Level of wind/solar resource. The greater the resource level, the lower the average cost per MWh.
- System size/capacity. Although wind and solar plants are largely modular (i.e., price tends to increase linearly with system size), there are some economies of scale; larger plants will tend to be lower-cost than smaller plants.
- Cost of land. This can vary significantly in different places. In some cases, the government even provides ‘free’ land to the project, eliminating that cost element.

- Required timing of COD (i.e., project completion). The longer the amount of time required for project completion, the lower the costs can be – because the project cost numbers can include future technology cost declines.

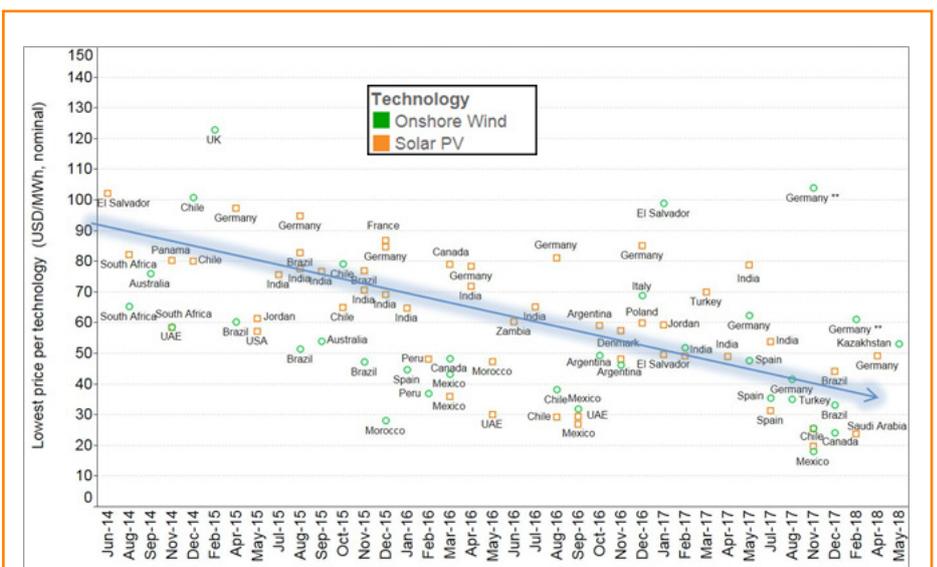
In any case, how low are the cost numbers reported above? For comparison, at today’s spot prices for liquefied natural gas (LNG) – a fuel that is already, or will soon become, a primary fuel source for new plants for many East and Southeast Asian countries – each additional MWh from an existing LNG-fired power plant currently costs around \$80/MWh. This means that at today’s LNG prices, electricity from new RE plants – at the prices referenced above – is often cheaper than electricity from existing LNG-fired plants – and that is without considering the cost of the gas-fired plant’s emissions.

In other words: increasingly, it is cheaper to build a new RE plant, than continue to operate an existing LNG-fired plant. Of course, gas prices can be volatile – and importantly, energy from



an intermittent renewable resource is not as valuable as energy from a dispatchable gasfired power plant – but it’s clear that RE can already compete with LNG-fired plants on a purely economic basis.

While LNG-fired power plants are not the only competitors to renewable energy (power from coal plants, or gas plants based on cheaper domestic natural gas, for example, is typically cheaper than power from LNG-fired plants), renewable energy is clearly not “too expensive” when compared to alternatives – and it is becoming more affordable every day, as costs continue to decline.



**FIGURE 1: RENEWABLE AUCTION PRICES HAVE FALLEN SHARPLY IN THE LAST TWO YEARS: CHILE, MEXICO AND SAUDI ARABIA RECORDED PRICES FOR SOLAR PV WELL BELOW \$30/MWH**