

## BATTERIES, OFFSHORE WIND LEAD CLEAN ENERGY COST CUTS AS RENEWABLES CONTINUE TO UNDERCUT COAL AND GAS\*

New research from Bloomberg NEF (BNEF) shows that the cost of lithium-ion batteries has fallen by 35% over the past year to \$187/MWh, while the cost of offshore wind is almost a quarter (24%) lower than this time 12 months ago.

Meanwhile, the costs of installing the more established technologies of onshore wind and photovoltaic (PV) solar also continued to fall. The levelized cost of energy for onshore wind projects starting construction at the start of this year was \$50/MWh, 10% lower than a year ago, while solar projects are 18% cheaper at 57/MWh. Elena Giannakopoulou, head of energy economics at BNEF, commented: "Looking back over this decade, there have been staggering improvements in the cost-competitiveness of these low-carbon options, thanks to technology innovation, economies of scale, stiff price competition and manufacturing experience.

"Our analysis shows that the LCOE per megawatt-hour for onshore wind, solar PV and offshore wind have fallen by 49%, 84% and 56% respectively since 2010 . That for lithium-ion battery storage has dropped by 76% since 2012, based on recent project costs and historical battery pack prices." The fall in the cost of batteries is important because it opens up new opportunities for intermittent renewables including solar and wind to do many of the jobs that coal- and gas-fired power stations and nuclear, currently do. Battery energy storage co-located with solar and wind farms are starting to be competitive with coal and gas power, even without subsidies, in providing "dispatchable power" that can be delivered when it is needed. Battery storage can provide back-up power for renewable projects for anything from one to four hours at a time, BNEF says.

Tifenn Brandily, energy economics analyst at BNEF, said: "Solar PV and onshore wind have won the race to be the cheapest sources of new 'bulk generation' in most countries, but the encroachment of clean technologies is now going well beyond that, threatening the balancing role that gas-fired plant operators, in particular, have been hoping to play." The advance of offshore wind is also hugely significant, because the technology has long been seen as an expensive generation option in the near term compared to onshore wind or solar PV.

But those costs have come down much more quickly than forecast thanks to technological advances, larger turbines and auction programs for new capacity – offshore wind is now below \$100/MWh globally, with some European projects coming in well below that, compared to more than \$220 just five years ago.

\*"Batteries, Offshore Wind Lead Clean Energy Cost Cuts As Renewables Continue to Undercut Coal and Gas", Forbes