

“European climate policy isn’t ‘Weak’ ”

Data supplement to [letter to Editor of Washington Post](#)

Published 4 June 2019

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Letter as published:

The May 29 editorial “[Going Green](#)” referred to European climate policy as a “weak system” with “inadvisable national-level initiatives.” The renewable-energy efforts in Europe, led from Germany but encoded in national targets across Europe, have led to a technology revolution, with the cost of solar photovoltaic systems falling by a factor of almost 10 in the past decade, and of contracted offshore wind energy in the North Sea [by more than half in the past five years](#). The European Union’s carbon-pricing system has been successfully strengthened, contributing over the past decade to a halving of carbon dioxide emissions [from U.K. electricity](#) and a 30 percent reduction [in German hard coal consumption](#). How exactly is that weak?

This note provides supporting data and source for the four main statements in the letter published by the Washington Post.

1. ‘The costs of solar photovoltaic systems falling by a factor of almost 10 in the past decade’

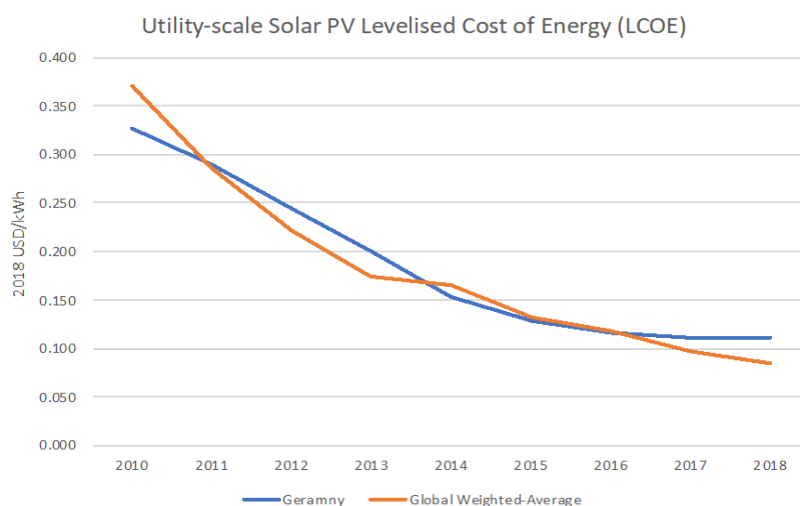


Figure 1: Utility-scale Solar PV Levelised Cost of Energy (LCOE) – Germany & Global Weighted-Average
Note: Data for 2010-2018 from IRENA (2019, Figures 2.6 & 2.7)

The International Renewable Energy Agency provide data series on costs since 2010. Figure 1, above, illustrates that solar PV costs (standard life-cycle costs per kWh production) between 2010 and 2018 reduced by 66% in Germany (data reported for utility-scale installations) and by 77% for global weighted-average costs. The IPCC’s Special Report on Renewable Energy Sources IPCC (2011, p.382, Figure 3.18) reported that minimum PV prices per kW in Europe (for units smaller than 100kW) reduced by around 30% between 2008 and early 2010. Together these indicate cost reductions of 80-85% over the past decade.

2. '[the cost] of contracted offshore wind energy in the North Sea [has fallen] by more than half in the past five years'

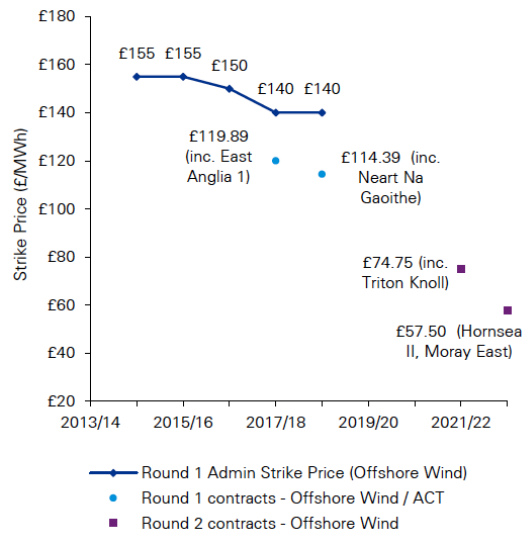


Figure 2: UK offshore wind cost reduction (Source: KPMG, 2017)

Figure 2 illustrates the results from Rounds 1 and 2 of the UK's 'Contracts for Difference', for offshore wind. In the first round (2015), a price of £119.8/MWh was achieved by a project in East Anglia, for delivery in 2017/18. In Round 2 (2017), a price of £57.50 was achieved by the Hornsea II, Moray East project, for delivery in 2022/23 – a 52% reduction.

Data also directly available from BEIS

<https://www.gov.uk/government/publications/contracts-for-difference/contract-for-difference>.

3. '...a halving of carbon dioxide emissions from UK electricity'

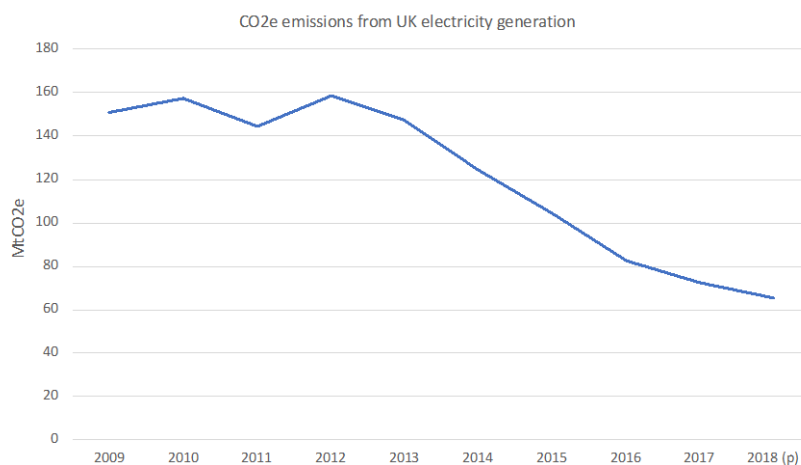


Figure 3: CO2 emissions from UK electricity generation 2009-2018 (Source: BEIS, 2019, Table 1)

Note: Data for 2018 is provisional

Figure 3 illustrates that CO₂e emissions from electricity generation in the UK more than halved in the past 5 years (from 147 Mt in 2013 to (provisionally) 65.2 MtCO₂e in 2018) – with an even bigger reduction (57%) compared to ten years earlier (173MtCO₂), and just over 200Mt in 1990.

The UK record reflects a combination of energy efficiency, renewable energy, and the UK carbon floor price: for detailed discussion see Grubb M. and D.Newbery (2018), UK Electricity Market Reform and the Energy Transition: Emerging Lessons, Energy Journal, Vol. 39, No.6 / working paper at <https://www.eprg.group.cam.ac.uk/eprg-working-paper-1817/>.

Note these are electricity data. Overall greenhouse gas emissions, including other sectors of the economy and all greenhouse gases, by 2018 had fallen to 38% below 1990 levels. Overall data including interactive data on electricity sector contributions available from <https://www.carbonbrief.org/analysis-why-the-uks-co2-emissions-have-fallen-38-since-1990>.

4. ‘.. 30% reduction in German hard coal consumption’

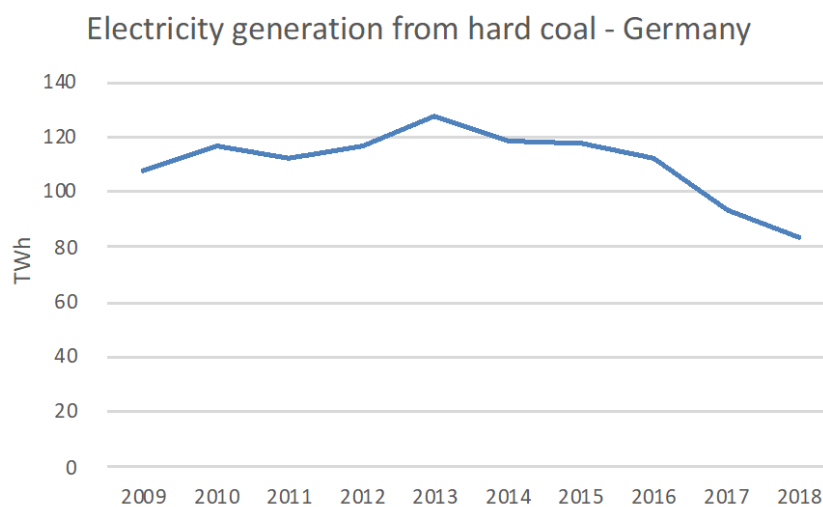


Figure 4: Annual electricity generation from hard coal in Germany (Source: AG Energiebilanzen, 2019)

Use of hard coal in Germany for power generation was roughly flat from 1990 to 2005 (between 140-150TWh/yr), dropping to around 120TWh/yr in the aftermath of the global financial crisis (which curtailed demand) and the introduction of the European carbon pricing system (ETS).

Figure 4 shows the generation of electricity from hard coal over the past decade, which fell to 83.2 TWh in 2018, a reduction of more than 30% from a peak five years ago (in 2013), and 23-29% below the 2009-2010 levels.

Market data for the first five months of 2019 show a steepening decline, suggesting far more than 30% reduction expected in annual emissions compared to 10 years previously: <https://www.smard.de/en/marktdaten/5542?marketDataAttributes=%7B%22resolution%22:%22month%22,%22from%22:1525959462795,%22to%22:1557494562795,%22moduleIds%22:%5B1001223,1004069%5D,%22selectedCategory%22:null,%22activeChart%22:true,%22region%22:%22DE%22%7D>

The growth of renewable energy under the German Energiewende initially displaced nuclear. The steepening decline of coal in recent years is due to combination of the rising scale of renewables and the rising European carbon (ETS) price, causing gas to displace hard coal. Note however that Germany has a significant fleet of lignite plants which at present are still running at baseload, and has more constraints on gas, than in the UK, so that overall emission reductions are likely to be much slower.

References

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BEIS (2019) *Provisional UK greenhouse gas emissions national statistics*, Department for Business, Energy and Industrial Strategy, London

IPCC (2011) *Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel on Climate Change*, Intergovernmental Panel on Climate Change

IRENA (2019), *Renewable Power Generation Costs in 2018*, International Renewable Energy Agency, Abu Dhabi

KPMG (2017) *Results that will blow you away: CfD allocation round two*, KPMG, London