

Trends in Renewable Energy and some thoughts on climate change

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The range of investment opportunities in renewables is increasing and perhaps counter intuitively is most apparent in the USA, and obviously, Canada.

This is capitalism in action since the cost benefits of renewables are now comparable to fossil fuels.

More controversially we think the "Climate change from CO2 emissions" mantra is actually preventing a more constructive debate - the one about HOW we measure economic progress. GDP is probably an outmoded and misleading statistic to be using and maximising through incentives.

With recent extreme weather events and Greta Thunberg's proclamations that the end is near, renewable energy is currently a hot topic. Of course, the trend away from fossil fuels has been in train for some time, especially from oil and coal. These trends are only likely to accelerate from here onwards as improvements in technological know-how and greater political pressures gather pace. Most renewable sources of energy other than hydro-electric power, like wind and solar have had to be subsidised as costs per therm have been higher than traditional sources.

LCOE = levelized Cost of Electricity

Projected LCOE in the U.S. by 2022 (as of 2016) \$/MWh

Plant type	Min	Capacity-weighted average	Max
Wind onshore	43.4	55.8	75.6
Wind offshore	136.6	NB	212.9
Solar PV	58.3	73.7	143
Geothermal	42.8	44	53.4
Hydro	57.4	63.9	69.8
Natural-gas-fired conventional combined cycle	52.4	58.6	83.2
Natural-gas-fired advanced combined cycle	51.6	53.8	81.7
Natural-gas-fired advanced CC with CCS	63.1	NB	90.4
Natural-gas-fired conventional combustion turbine	98.8	100.7	148.3
Natural-gas-fired advanced combustion turbine	85.9	87.1	129.8
Biomass	84.8	97.7	125.3
Advanced nuclear	95.9	96.2	104.3
Solar thermal	176.7	NB	372.8
Coal with 30% carbon sequestration	128.9	NB	196.3
Coal with 90% carbon sequestration	102.7	NB	142.5

However, renewable energy costs continue to fall, particularly Wind, but Solar PV panel costs are also set to fall significantly with technology improvements. The US Energy Information Administration (EIA) has provided the table below. Of course, the figures are only from the USA - relative costs can vary widely across the world; but it does give a broad reflection of how costs are falling for renewable sources.

Historical summary of EIA's LCOE projections (2010–2019)

Estimate in \$/MWh		Coal	Nat. gas combined cycle		Nuclear	Wind		Solar	
of year	for year	convent'l	convent'l	advanced	advanced	onshore	offshore	PV	CSP
2010	2016	100.4	83.1	79.3	119	149.3	191.1	396.1	256.6
2011	2016	95.1	65.1	62.2	114	96.1	243.7	211	312.2
2012	2017	97.7	66.1	63.1	111.4	96	N/A	152.4	242
2013	2018	100.1	67.1	65.6	108.4	86.6	221.5	144.3	261.5
2014	2019	95.6	66.3	64.4	96.1	80.3	204.1	130	243.1
2015	2020	95.1	75.2	72.6	95.2	73.6	196.9	125.3	239.7
2016	2022 NB		58.1	57.2	102.8	64.5	158.1	84.7	235.9
2017	2022 NB		58.6	53.8	96.2	55.8	NB	73.7	NB
2018	2022 NB		48.3	48.1	90.1	48	124.6	59.1	NB
2019	2023 NB		40.8	40.2	NB	42.8	117.9	48.8	NB
Nominal change 2010–2019		NB	-48%	-49%	NB	-71%	-38%	-88%	NB

NB- not built

Check out the summary at the bottom of the table below in red for a positive trend.

So, going forward as fossil fuel plants naturally come to the end of their lives – or indeed have accelerated closure – then renewable sources are naturally going to take over simply because the economics are now on their side. Despite the negative rhetoric about, and from, the USA, installation of solar energy there accounted for almost 40% of the new electricity generation capacity in 2016.

It's only a matter of time that the same will go for electric vehicles vs petrol/diesel cars as battery technology advances and refuelling infrastructure is put in place and the price of electric vehicles falls. So arguably, just when the moral outrage is at its height, the solutions are close at hand?

The Delft Global Infrastructure fund has a number of predominantly Renewable Energy companies. These tend to be companies that were traditional fossil fuel-based energy companies that saw the trends early and started investing in renewables

The stocks:-

One of the biggest is **Transalta Renewables**, a Canadian listed company that many readers may be aware of because it manages gas fired plants in Western Australia. Gas fired plants now only account for 41% of its total electricity output. Currently, 54% of its output is from wind mainly in Canada/USA, 5% in hydro-electric and 1% in solar (a plant in New England). Transalta Renewable currently has a dividend yield of 5.7%.

Nextera Energy, another fund holding, is one of the USA's largest utility companies and certainly the world's biggest producer of electricity from wind and solar power. It's also the USA's biggest investor in energy infrastructure projects - between 2009 to 2018 it invested USD\$83bn.

In Europe we own **Encavis**, a German dedicated solar and online wind power generator. Encavis is showing consistent above average growth in the electricity through conservative, judicious management

The overall Delft Global Infrastructure strategy is broadly diversified both geographically and across infrastructure sectors. Not just utilities but highways, rail, airports, logistical infrastructure, oil storage and pipelines, telecoms infrastructure, etc. These areas of the stock market are generally less volatile than the overall market and yet can still deliver a decent and growing dividend yield. The current portfolio is yielding 4.5% and dividend growth is expected to be approximately 6.5% per annum.

& some thoughts on climate change:-

We couldn't sign off with a more general comment about the 'quality' (sic) of the debate on climate change and carbon emissions. We are putting too much junk into the atmosphere and onto land and into the oceans and yet we find it hard to reconcile that fact with a "big population" mantra in Australia without a consideration of ALL that that entails. Can we double Australia's population while pursuing the same lifestyle or incentives to consume as measured by GDP? Unlikely. We think that the right lens to view the challenge of reducing man-made impacts on the natural capital and other undesirable trends such as inequality, is to re-examine how we measure and thus incentivise economic progress.

Using the term "climate change deniers" to describe people who don't wish to immediately close all older technology is the WRONG insult to be using! The sooner that ceases then the sooner the debate can become wider; better grounded; and genuine improvements incentivised.

Climate has always changed and will always change. This is irrefutable and one of the key tenets of the "no need to do anything" brigade. Their perspective, that this temperature rise is within the range of long term history is reasonable, and encompasses the starting point chosen, (in 1883 Krakatoa exploded and caused a serious dislocation in weather patterns globally including temperature declines); the definition of average, (increased water vapour increases cloud cover so night time temperatures rise and thus the average will rise even if day time temperatures don't budge); and other effects such as atmospheric

pressure and yes it changes too, (pump up your bicycle tyres and see what happens to temperature when pressure increases) and water vapour – more water produces higher latent energy.

If you only posit that extreme weather is solely caused by CO2 emissions, and thus the only thing you need to do is to shriek about reducing / removing the carbon footprint then you are both incorrect and fighting the wrong fight; and a harder fight!

We think the debate and fight, should be wider. Argue to improve air quality for example (much easier to prove that it is declining in quality); focus on reducing the heat island effect of bad concrete to green space ratios with current development practices; focus on changing bad energy policy (why not more solar in Australia; and why no discussion about nuclear?) – in other words make it a wide remit. This is actually a chance to revisit and reform the incentives to produce and consume more regardless of the consequent degradation of the 'natural capital' - namely we still use an outmoded statistic called GDP, which politicians and journalists love but misunderstand and at 70+ years of age is no longer fit for purpose.

In other words, confining the debate to "CO2 and Climate Change", itself debatable, is a lost opportunity to have a broader debate about measuring economic progress NET of the costs of doing so – such as BROAD environmental impact and wealth inequality caused by pursuit of higher GDP.

Our first encounter with this idea was in the 2014 book by Professor Diane Coyle called "GDP: An Affectionate History". This examination of the GDP statistic itself is gaining traction. The book is worth reading. You should read it.

Contact us for direction to some of the more interesting articles too.

Delft Partners

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