

CLEAN ENERGY'S POLE VAULT MOMENT

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APOLLO AND BP STEP FORWARD INTO THE US OFFSHORE MARKET.

In August, Apollo Global Management and Italy's Toto Group Holdings, S.p.A. announced a \$265 MM immediate investment, with provisions for potentially more, and a partnership in Toto's US Wind, Inc. affiliate, which has submitted Federal approval for the construction of a 1,300 MW wind farm on 80,000 leased seabed acres off the coast of Maryland. Less than a month later, on September 10, BP plc announced a \$1.1 billion purchase of 50% of Equinor's US offshore wind platform, consisting of two parcels of seabed leases comprising just over 200,000 acres off the coasts of New York and Massachusetts. *(Note: PJ SOLOMON advised US Wind, Inc. and Toto Group on the Apollo partnership and investment.)*

These two transactions were each completed prior to any final approval of a major US offshore wind farm from the Federal Bureau of Ocean Energy Management (BOEM); there are nine Construction and Operation Plans - COPs - filed now with BOEM for major offshore projects totaling 8.5 GWs and awaiting approval. The "go" signals that these transactions, and the significant other development expenditures, supply chain building, ports construction activities, and massive ongoing engineering and design work indicates that the offshore wind industry is moving past the conceptual barrier of US Federal government delay, essentially treating ultimate BOEM approval (in some form) as a *fait accompli*. It's an important step forward for the sector, within a promising, game-changing segment across the US renewables landscape.

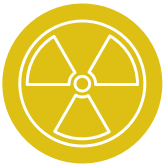
These two data points are yet another signal that in the US, energy transition more broadly is underway, and moving rapidly ahead with force.

MOVING BEYOND ANKLE-HIGH FENCES. In March of 2020, we posted a [column](#) which called out certain annoying obstacles slowing the expansion of the United States' renewable energy sector, "Skyscraper Turbines and Ankle-High Fences." We considered certain minor yet persistent barriers and suggested there are relatively painless ways to skip over them; confident in the end that developers of, and investors in clean energy will realize attractive growth and returns, and help society limit carbon emissions.

That benign moment, early this year, now seems the distant past, for all of us. In the tumultuous and painful months since, most of the US has confronted both its own mortality and its vast cultural fissures, new and old. Our attention is fully drawn; in this remarkable period of self-reflection, concern, and even outrage, we see a clearer picture of our remarkable collective potential as humans to overcome challenges. Conversely, we have also seen how the rejection of collective action can have negative, even disastrous results.

So, in the absence of any other new developments, the issue of climate change could be expected to be totally drowned out by the urgency of a pandemic, domestic protests, and an intensely heated US presidential campaign. Thinking about such a long-term issue might even be considered a luxury good at a time of more pressing crises.

CLEAR SIGNALS FROM THE PLANET. In this turbulent moment, there has been an unrelenting, elevated cadence of warning signs from nature, keeping the global warming topic quite high on the list of political priorities:



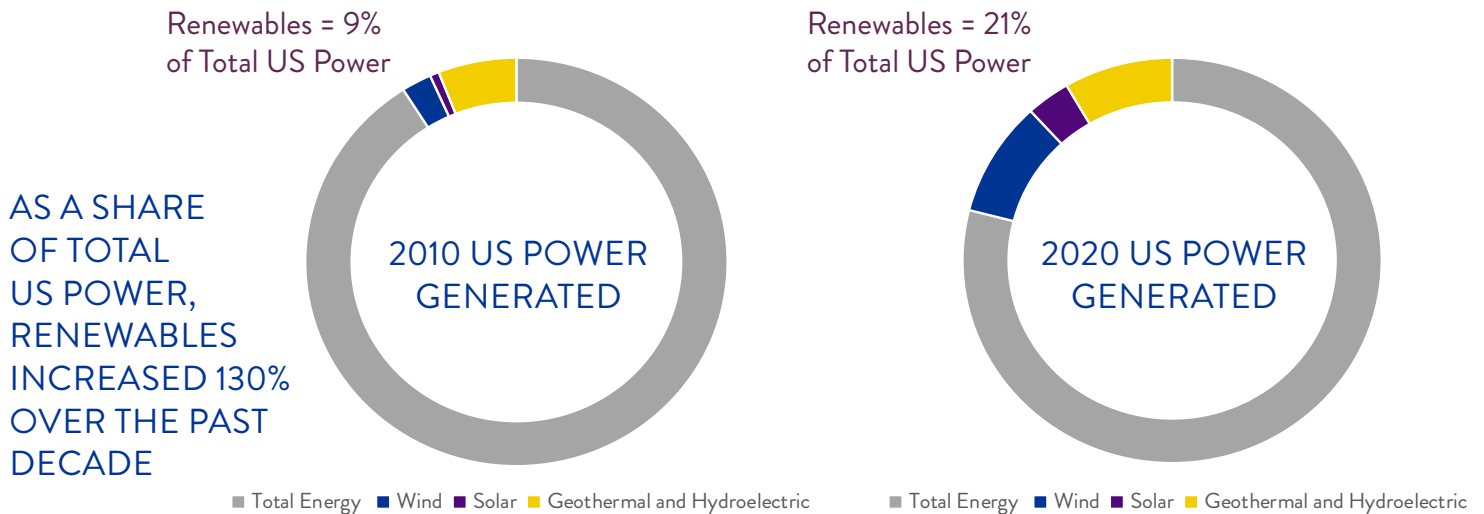
- untamed, record-setting wildfires in Australia and California¹
- yet another active US hurricane season²
- a soaring new record temperature (On August 17, 2020, Death Valley, CA witnessed the highest temperature ever reliably recorded on Earth, 130 degrees F)³
- more of the trend of raw data demonstrating our alarmingly steep climb in average global temperatures⁴: and
- a variety of other alarming signals from nature⁵ (arctic wildfires, polar ice melting on a scale not seen before, drying rivers, etc.)

In fact, climate change has all the markings of an important and resilient priority upon which larger segments of our society appear committed and ready to take collective action to defuse, as a recent Yale study suggests⁶. And of course, in rejecting steps to reign in climate change, many scientific and NGO research illustrates that the outcome has the potential for excessive and unknown costs, including systemic financial market risks, according to a September, 2020 report of the US Commodities and Futures Trades Commission.⁷

STEADY, MODEST GAINS... As we argued in March, the CEOs and everyday professionals of the renewables industry aren't all thinking in massive, existential terms – these individuals and teams are focused on their companies' strategies and their individual responsibilities – seeking to achieve market share gains in providing energy, in growing profitably, and of course in exploiting an enormous upside opportunity. Multiple technological breakthroughs continue to lower costs and dramatically improve the efficiency of renewable power supply.⁸ In parallel, materials science discoveries have enabled the same for large scale energy storage,

which is an essential grid requirement to buffer intermittency. A recent study from the US Energy Information Administration (EIA) explains these advances in detail.⁹

...BUT A VERY LONG WAY TO GO. Still, despite market share-focused competitors, technological boosts, and potentially even solutions for many of those Ankle-High Fences noted in our last piece, until this point in time, there has yet to be what we'll call a Pole Vault Moment for a sector that collectively contributes a still very modest wedge of the nation's electricity generated, despite impressive growth in the fleets of solar and wind projects.



To wit: according to EIA data, over the last decade (base year 2010), power generated from wind has exhibited strong growth: from 94.6 TWh (2.3% of the total US generated power) to an expected 350.0 TWh in 2020 (9.2% of total generation, based on results from the first six months of 2020). Similarly, solar has exploded from a miniscule 1.2 TWh generated in 2010 (0.03%) to an expected running rate of 128.7 TWh for a full year 2020 (3.4%). Adding the relatively static contributions from geothermal and hydroelectric generation, renewable power from all sources will contribute approximately 800 TWh of generation in 2020, 21.0% of total US generation, up significantly from 9.0% in 2010, and an increase of 130% over the decade.

CLEARING THE BAR: GRID PARITY. In analysis released by the US Energy Information Administration in February the “levelized” cost of power from solar and wind (meaning the cost to build, finance, maintain and decommission), was at or better than the levelized avoided cost of electricity (in most regions, from efficient gas-fired combined cycle generation). This is a complex calculation, as it incorporates projected operating behavior of specific plants against projected and variable demand models for future periods. Still, it demonstrates that in many significant US electricity markets the levelized cost of wind and solar are at or near the levelized cost of the lowest cost alternative.

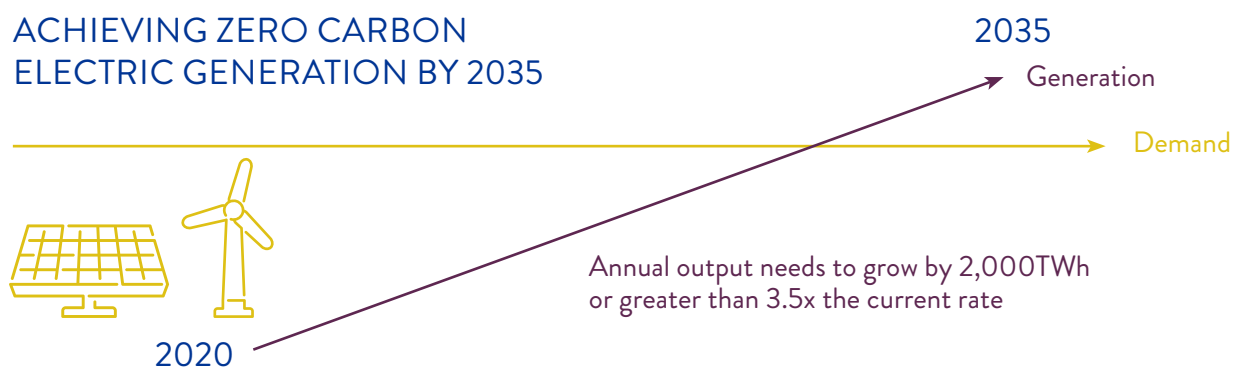
In industry parlance, the name for that condition is grid parity... and renewable energy is there, in many regions, an achievement with enormous implications.

Without fuel counterparties, transport, or storage, without pollution or emissions of any kind, without significant decommissioning clean-up costs, and with ambitious renewable portfolio standards passed into law in 29 separate states, achieving grid parity is the energy market equivalent of clearing the bar. Thus, it's clean energy's "pole vault moment."

MUCH TO DO LIES AHEAD. A central plank of presidential candidate Joseph R. Biden Jr.'s "Build Back Better" campaign is the so-called "Clean Energy Revolution." This ambitious, multi-tiered policy pronouncement calls for, among other things, a national zero carbon electric generation sector by 2035. Currently, national utility industry goals are headed in a similar direction, but at a much more modest pace: according to the industry association, Edison Electric Institute. "EEI's members collectively are on a path to reduce their carbon emissions at least 80 percent below 2005 levels by 2050," according to Brian Wolff, EEI's executive vice president for public policy and external affairs.¹⁰

What do these more aggressive plans mean for renewable energy growth? Assuming flat demand, the incremental annual generation from solar and wind power in the US would need to grow by at least 2,000 TWh, a multiple of >3.5 over fifteen years from the current run-rate in 2020.

ACHIEVING ZERO CARBON ELECTRIC GENERATION BY 2035



Can it happen?

For some context, renewable power has grown approximately 8% annually since 2010. Under these assumptions, a carbon-free grid requires yet another 15 years of 8% annualized (compounded) growth – from admittedly a higher base amount.

Maybe this new Pole Vault bar is achievable. What would it take?

POLITICAL HIGH HURDLES. Echoing into an already bitter political season, there is a cross-generational drumbeat of annoyance-turned-to-anger at decades of policy inaction despite the consensus scientific assessment that human-

induced global warming will bring catastrophic change if current trends are left unabated. Yet the political reality is that climate change is a partisan divide.

In 2009, the American Clean Energy and Security Act, known widely as the Waxman-Markey bill, calling for an economy-wide carbon tax, passed the House in a close, partisan vote in 2009. The bill was never even brought to the floor of the Republican-led Senate for discussion. In this context today, should Mr. Biden be elected President, significant support for “Clean Energy Revolution” legislation among Republicans in the Senate would have to materialize, diverging significantly from the past. The odds appear low: even in the extreme 2020 election outcome case that the US Senate becomes majority Democratic, it is not at all reasonably foreseen for the Democrats to obtain a 60-vote majority in this cycle. In this context, any new climate legislation would therefore need to have broad, bipartisan support.

IN THE INTERIM... FINANCIAL INVESTORS ARE SHOULDERING THE BURDEN.

The action not taken by US government, however, is increasingly being taken by the private sector. Clearly defined Environmental, Sustainable, Governance (ESG) standards urged by investors of many stripes are now converted into specific actions and plans at a growing number of major financial institutions, such as the world’s largest asset manager, BlackRock, pension investors, sovereign wealth funds, and university endowments (my alma mater, Harvard University being among the latest to pledge a move to fossil fuel divestment)¹¹.

This impressive block of institutions, acting in their capacity as global asset allocators and thought leaders, in turn directs action among corporate actors, and has the potential to affect valuations, and with that, decision-making. The mantra for institutional investors seeking responsible alternatives for deploying capital is the use of third party, objective ESG parameters. As an entire information industry has now sprung up around collecting and privately publishing such ESG data, there is improved clarity for financial institutions to vet acceptable investments and avoid those that miss the criteria. Quite clearly, the impact of ESG ratings can materially affect the performance and valuations of public securities and the entities that issue them, a trend we see becoming more important over time.

BIG OIL IS RESPONDING, TOO. Which brings us back to BP, and its \$1.1 billion new investment in and partnership with Equinor (itself a Norway-headquartered energy conglomerate formerly known as Statoil); this step is a major move by BP into the US offshore wind market, to add to its already large wind and solar presence worldwide. In the environment described above, where publicly-owned companies are directly involved in producing or burning hydrocarbons in large volume, investors are not asking for ESG studies; they are asking for concrete transition steps to be taken.

Most (but not all) oil & gas supermajors and others have heard that call and are responding in force¹². Similarly, downstream and midstream energy players (refiners,

pipelines, gas gatherers and treatment providers) are taking major steps towards ESG standards and energy transition as well, aware that having an energy transition strategy is not just an attractive, synergistic opportunity (it is!), but is a survival tactic.

CROSSING THE BAR. In our client-focused, merger and acquisitions renewable energy practice, it's clear that one of today's most important, driving deal motivations is simply matching the funds needed for the ongoing energy transition to the developers of projects, across solar, wind, and storage and joint platforms.

These developers, track spikes on, are in full sprint; with new technologies, efficiencies, an inspired professional workforce, and ready access to a deep pool of capital, they are crossing the bar.

ADDITIONAL RESOURCES

NA Wind Speed Map:

<https://www.nrel.gov/gis/assets/images/wtk-100-north-america-50-nm-01.jpg>

N.A, Solar Irradiance Map:

<https://www.nrel.gov/gis/assets/images/solar-annual-ghi-2018-usa-scale-01.jpg>

Global Average Temperatures:

<https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

FOOTNOTES

1 <https://www.wired.com/story/the-terrible-consequences-of-australias-uber-bushfires/>; <https://www.fire.ca.gov/incidents>

2 <https://www.marketwatch.com/story/how-the-2020-hurricane-season-could-end-up-rivaling-the-worst-on-record-11598544359>

3 www.sciencenews.org/article/death-valley-hottest-recorded-temperature-earth

4 <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>;

5 <https://www.bloomberg.com/graphics/2020-race-against-heat/>

6 <https://climatecommunication.yale.edu/visualizations-data/ycom-us/>

7 CFTC.gov, Managing Climate Risk in the US Financial System. <https://bit.ly/2HtpLly>

8 <https://www.bloomberg.com/news/articles/2020-04-28/solar-and-wind-cheapest-sources-of-power-in-most-of-the-world>

9 https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf

10 <https://www.eenews.net/stories/1063565769>

11 <https://news.harvard.edu/gazette/story/2020/04/harvard-endowment-to-go-greenhouse-gas-neutral-by-2050/>

12 <https://www.spglobal.com/en/research-insights/articles/cross-currents-big-oil-and-the-energy-transition>

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