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The renewable energy investment case

Ganesh Suntharam and Toby Bellingham

The energy sector is currently at the early stages of a major restructure from fossil fuels to clean energy. This evolution will continue for decades, supported by a globally coordinated effort to transition to the green economy by investing trillions of dollars into renewable power generation.

This structural change will transform the business models of established energy and utilities companies. Electricity generation will be compelled to transition away from fossil fuels and embrace clean energy infrastructure and its associated technologies.

The renewable and clean energy sector has seen numerous important developments over the past decade. These have transformed the sector from a highly speculative and experimental investment prospect to one which is more securely established.

This presents investors with an opportunity to participate in steady and stable returns with similar characteristics to those of other infrastructure sectors. Expectations for escalating multi-decade growth and development in the sector is expected to underpin the investment case for renewables as a valuable, long-term investment.

Global commitment to renewables

The Paris Agreement, signed in 2016, set a target for the 196 government signatories to limit the increase in global average tempera-

tures to within 1.5 degrees above pre-industrial levels by reducing greenhouse gases.

This agreement, along with the establishment of universal objectives such as the UN Sustainable Development Goals (SDGs), forms the core of a coordinated effort by governments around the world to raise awareness and individually commit to reducing their own carbon footprints through Nationally Determined Contributions (NDCs). By 2019, 172 countries had renewable energy targets, with 161 having established their renewable energy policies.

There are many signs that these agreements are now bringing about real change: China has recently announced plans to achieve carbon neutrality by 2060. President Biden has recommitted the US to the Paris Agreements as well as announcing potential infrastructure spending and renewables tax cuts; and Europe has established the Green Deal, a set of policy initiatives that commits to a climate neutral Europe by 2050.

At the same time, there is also a growing pledge by corporates to renewable sources of energy. For example, the RE100, a collective of over 280 businesses, has committed to sourcing 100% of their energy needs from green electricity by 2050 or sooner. Many in this group source their energy from renewable energy companies directly via Purchase Power Agreements.

Such commitments lay the foundations for a virtuous cycle where supporting policies put in place by governments, pave the way for in-

vestment in the sector which de-risks the sector, leading to attractive and sustainable investment returns which then supports further renewable energy development.

Governments have made efforts to attract capital into the renewables sector by:

- setting clear policy objectives and targets to increase visibility for companies looking to develop energy generation, transmission and storage projects as seen in the Green Deal, established by the European Commission
- promoting co-investment and blended finance mechanisms that share the risks and returns among stakeholders. This has further increased interest from institutional investors, developers, commercial and development banks looking to provide more capital into the sector. Project examples include Walney offshore wind farm in the UK and the Butendiek offshore wind farm in Germany
- providing guarantees (via development banks) and insurance products that mitigate credit and default risk by a counterparty. Mitigation of default risk has increased certainty around the successful development of the asset, while additional guarantees, particularly in relation to forward power purchase agreements, has increased the likelihood of operational success once the asset has been commissioned. These are more prevalent in emerging economies, where risks are higher
- introducing renewable energy quotas and obligations—an incentive system where the government sets the percentage or an amount of energy that comes from renewable sources such as the Renewable Energy System quota scheme in Sweden
- setting regulatory and pricing policies such as feed-

in-tariffs which set the price of renewable energy production, potentially over long timeframes. These have been enacted in over 50 countries worldwide

- providing tax incentives, such as investment and production tax credits, accelerated depreciation and tax reductions; and grants and subsidies to promote renewable energy production. The US government promotes these at various government levels.

Some of these actions pose a potential risk if revoked. However, the commitments made are supportive of further accommodative policies geared towards the ambitious targets adopted by most governments.

Cost reduction through technological advancement

Renewable energy is particularly sensitive to declining costs of equipment. Having no fuel costs during the operational phase of a project means a significant portion of the 'Levelized Cost of Electricity' (LCOE) of renewable energy is accounted for at the initial stages of the project. This is a key difference to traditional utility business models that pay for their 'fuel' as an ongoing expense.

As Figure 1 demonstrates, the cost of renewable energy generation has reduced dramatically over the last decade, especially for wind and solar which are now at grid parity (comparable cost) to coal production, making them a competitive choice for utility grade production. Costs for coal have remained stable at around US\$100/megawatt hours (MWh), while wind and solar have decreased by 30% and 82% to US\$84/MWh and US\$68/MWh respectively.

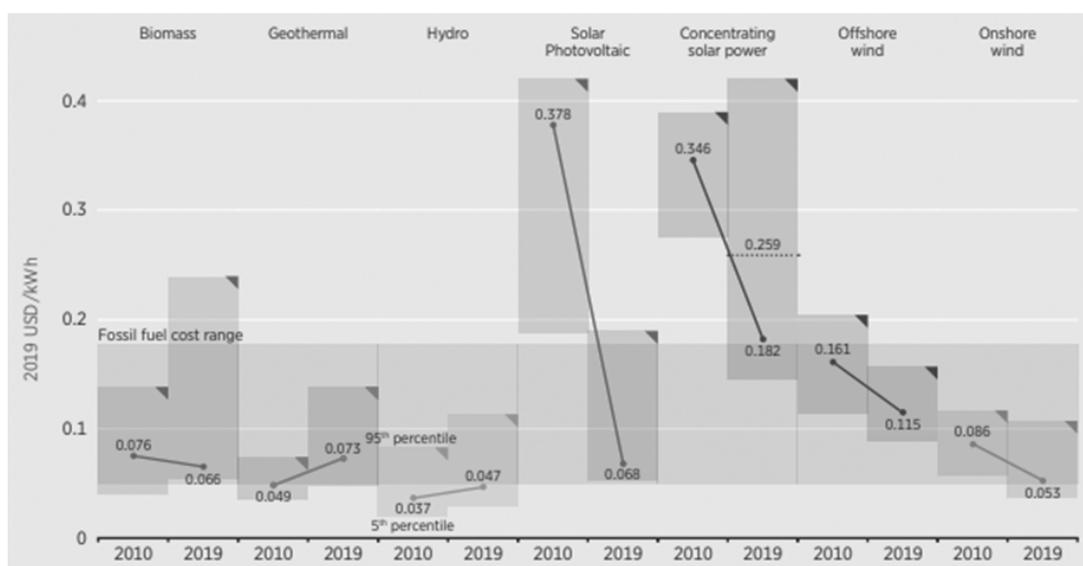
These cost reductions have been driven by technology advances, competitive procurement, declining finance



The quote

Expectations for escalating multi-decade growth and development in the sector is expected to underpin the investment case for renewables as a valuable, long-term investment.

Figure 1. Cost reductions in renewable energy generation over the past decade



Source: Global weighted average LCOE from utility-scale renewable power generation technologies, 2010 and 2019 (IRENA 2020)



The quote

From a portfolio perspective, renewable energy companies bring diversification benefits and possible dividend increases as they become more mature and their technologies become more conventional.

costs and a growing base of experienced, internationally active developers, some of which are listed companies. The result being the emergence of an established, scalable industry that now generates three times more new energy than fossil fuels (Bloomberg, 2020) and will continue to benefit from further cost reductions in both established technologies and complementary enablers such as battery storage.

Increasing investment to meet global ambitions

Energy production contributes around 74% of worldwide greenhouse gases, and the transition from fossil fuels to renewable energy will be a major contribution reducing greenhouse gases which should see large-scale capital flows into renewable power in virtually every jurisdiction.

Global commitments have so far stimulated an increasing amount of investment in renewable energy to date and since the signing of the Paris Agreement in 2016, an average of US\$305 billion p.a. (see Figure 2) has been invested in new renewable energy capacity.

Figure 2 illustrates increasing and stable investment trends where solar and wind now dominate not only in dollar investment but in capacity addition (righthand axis diagonal line) as costs rapidly decrease for these two technologies.

This is far short of the expected demand required to meet these targeted commitments. The projected underlying demand for renewable energy generation assets over the next 30 years is enormous as underlying energy consumption increases in addition to its transition from fossil fuels to renewables.

The International Renewable Energy Agency (IRENA) estimates that US\$22.5 trillion or \$775 billion p.a. to 2050 is projected to be required in renewable power capacity generation alone, a 250% increase of today's investment, to fulfil the transition to a low carbon economy and to meet these targets.

In capacity terms, Bloomberg's long-term energy transition scenario forecasts put global (inclusive of fossil fuels) energy capacity at 20,400 gigawatts (GW) by 2050, from 7,658 GW today.

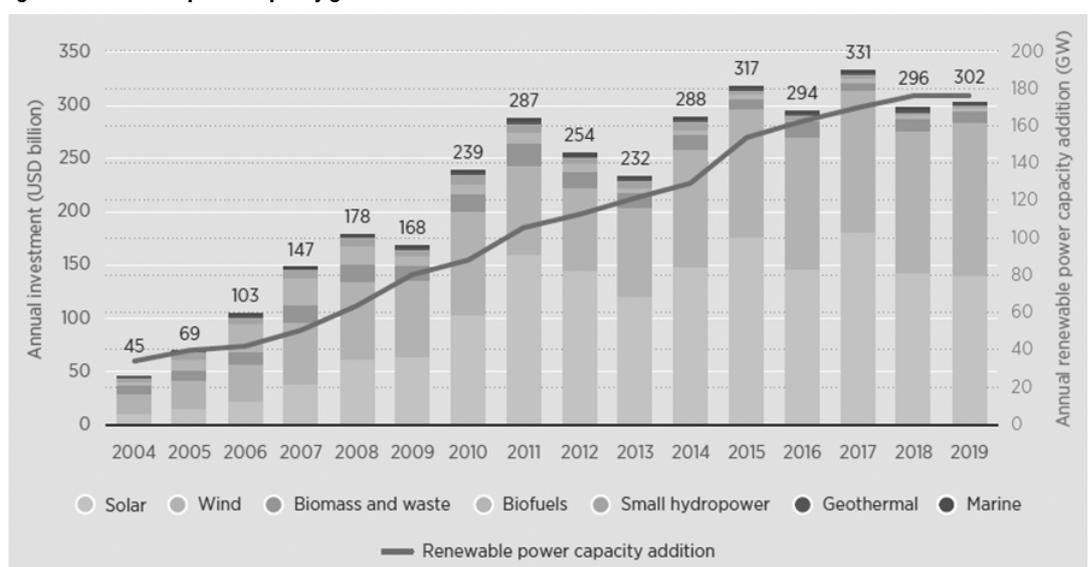
Table 1 shows the technology demand split over this period. All renewable sources of energy are expected to expand, but clearly solar and wind, supported by batteries will see the largest increases, dominating energy capacity by 2050.

Table 1. Sources and capacity of energy generation now (2020) versus forecasts for 2050

Source	2020 capacity (GW)	2050 capacity (GW)	% change
Biomass	143,002	195,704	37%
Coal	2,091,056	1,497,398	-28%
Gas	1,754,804	3,154,113	80%
Geothermal	13,808	25,662	86%
Hydro	1,335,202	1,714,709	28%
Nuclear	383,231	350,090	-9%
Wind	706,031	4,134,554	486%
Oil	308,039	158,354	-49%
Batteries	11,196	1,292,620	11,445%
Solar	779,041	7,696,734	888%
Other	133,341	171,150	28%
Grand total	7,658,751	20,391,088	166%

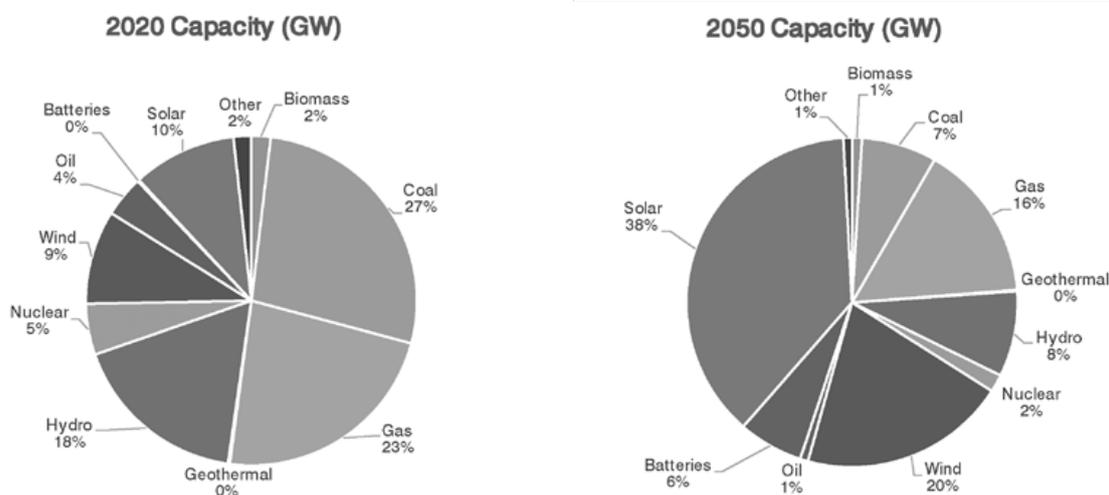
Source: Bloomberg New Energy Finance (BNEF)—long-term capacity outlook (Bloomberg 2020)

Figure 2. Renewable power capacity generation



Source: Global renewable energy investment excluding large-scale hydro (>50 MW) (left y-axis), by technology, and renewable energy power capacity additions (right y-axis), 2004-2019 IRENA (2020)

Figure 3. Rising share of solar and wind in total energy generation by 2050



Source: Bloomberg New Energy Finance (BNEF)—long-term capacity outlook (Bloomberg 2020)

The pie charts in Figure 3 show the expected change in sources of energy capacity over the next 30 years from coal and gas in 2020 to solar and wind in 2050.

Renewables for global listed infrastructure

As the world continues to transition to a cleaner and more efficient energy future, it is worth considering the opportunities for global listed infrastructure portfolios.

Listed utility companies will be major players in the upcoming transition as they make changes to their energy and revenue mix. Some are more advanced than others. Companies such as NextEra are leading the way in terms of renewables adoption, with over 30% of revenue coming from hydro and wind generation.

However, in addition to the large traditional infrastructure utility companies, there is an increasing number of established, renewable energy infrastructure companies listed on global exchanges, and they will also benefit from the above discussed structural changes.

These potentially ‘new’ investments fit into the traditional definitions of utilities and infrastructure offering similar characteristics including contracted, long-term, regulated, inflation-linked revenue streams produced from energy generation assets.

With the ongoing growth of this the renewables sector, the attractiveness of renewable infrastructure from a fundamental perspective is hardly in question anymore. Hence, evaluating their investment merit should mostly relate to the well-known risks linked to traditional infrastructure investing.

These renewable infrastructure assets have a diversified mix of revenue streams from multiple renewable sources and geographies and are well ahead of traditional utility companies in terms of the transition to clean energy. Many have a first-mover advantage along with the technical expertise and experience in renewable energy generation. Globally, Europe has led the way in this sector with Danish company Orsted being a good example of a leading technological capability in offshore wind farming.

For investors looking to obtain an increased exposure to listed renewable infrastructure companies, typical benchmarks will not usually meet their needs. Most infrastructure benchmarks typically contain little exposure to renewable energy companies outside of the traditional utility companies, which themselves are still dominated by fossil fuels. NextEra Energy and Orsted are the only two companies that have an A1 new energy classification and feature in the FTSE Core Developed Infrastructure 50/50 and S&P Global Infrastructure indices.

Hence, given that energy is a rapidly evolving sector going through significant structural changes, and traditional benchmarks provide limited exposure to this theme, a research-based approach is required. This involves searching beyond the traditional indices to identify opportunities from a larger investable universe of listed infrastructure assets.

From a portfolio perspective, renewable energy companies bring diversification benefits and possible dividend increases as they become more mature and their technologies become more conventional. Outside the investment merits of this group of stocks, it is also worth noting their environmental, social and governance (ESG) attributes.

The ESG investment theme looks to be accelerating, with a recent research piece by Credit Suisse highlighting that companies involved solely in the clean energy transition are at the forefront of ESG investing. The report suggests that this cohort should benefit from favourable funds flow and changing ownership levels as investors look to add ESG influence beyond negative screening.

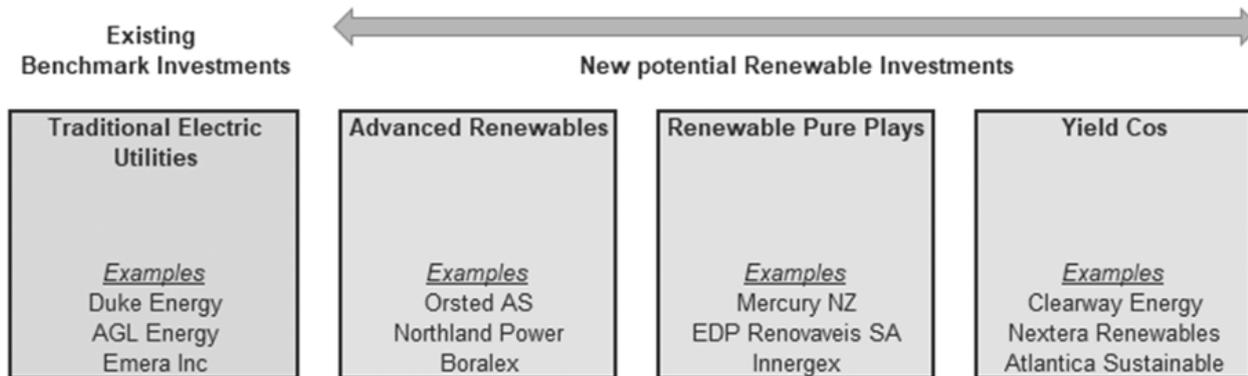
Categorisation of renewable assets

Together with traditional utilities, organisations with renewables exposure can be viewed as four distinct groupings:

- Traditional utilities
- Advanced renewables
- Pure plays
- Yield companies.

Figure 4 provides a brief description of each category, with examples.

Figure 4. Four distinct groups of organisations offering exposure to renewables



Source: Redpoint Investment Management

Traditional utility companies

Utilities are currently generating the bulk of their energy from fossil fuels. As the energy transition gets underway, there is a wide divergence in the adoption of renewable energy technologies amongst traditional utility companies.

Research from the University of Oxford shows that only 10% of the world's electric utility companies (mainly in Europe) are prioritising investment in clean renewable energy over growing their capacity of fossil fuel power plants. (Some however have clear, renewable objectives such as AGL, which will decarbonise its generation by 2050 and offer all customers a carbon-neutral option).

Advanced renewables

These are energy generators that derive the majority of their economic value from renewable energy and associated technologies, but still have some exposure to fossil fuels, which are becoming a decreasing portion of their business models.

Renewable pure plays

These include utility-style companies that derive all of their energy from renewable sources.

Yield companies

These are listed entities that buy and operate completed renewable energy generation assets, often spun out of parent utility or renewable energy firms. They distribute proven revenues, under Power Purchase Agreements (PPAs) from assets such as established wind, solar, geothermal, and hydro.

These PPAs are often 15–30 years in length, create stable cashflows which are distributed to investors as dividends.

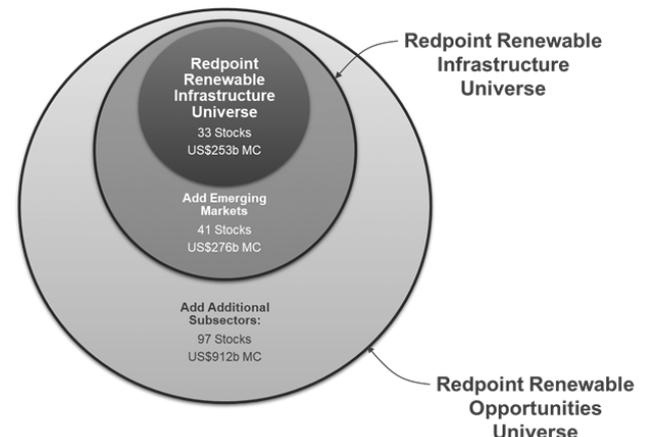
The main differentiating factor to other independent power producers is that yield companies typically produce power that is largely contracted with long tenures and have a focus on returning capital to shareholders via distributions, based on a Cash Available for Distribution (CAFD) target.

Stand-alone renewables portfolios

In addition to expanding the opportunity set within an existing global listed infrastructure strategy, there is also potential to create a

diversified standalone exposure to the renewables thematic. This can be done as either a standalone renewable infrastructure portfolio or as a broader renewable opportunities portfolio as shown in Figure 5.

Figure 5. Portfolio construction to include renewables



Source: Redpoint Investment Management

Staying within the renewable infrastructure universe allows investors to access the infrastructure characteristics of long-term, regulated, inflation-linked revenue streams solely from renewable assets.

Expanding the investment universe provides access to numerous additional sectors that contain listed stocks that will benefit from the energy transition. A standalone renewable opportunities portfolio can be constructed by investing across the full energy supply chain, gaining exposure to both established and developing trends in the power generation industry.

These trends would typically include:

- raw materials (lithium, rare earths) and speciality chemicals
- energy generation, transmission and retailing
- power generation equipment and components
- electric vehicles, smart grids, buildings and energy efficiency
- new technologies such as batteries, carbon capture and hydrogen.

Conclusion

The energy transition opportunity is underway and looks set to dominate a whole host of sectors and industries over the coming years. At its core, there is huge potential for above average risk adjusted investment returns, however this also comes with many unknowns. The huge scale, long timeframes and potential volatility of this energy transition will require investors to consider a diversified approach that considers both investment merit and portfolio risk.

Identification of those companies involved in this sectoral restructure is challenging. Index vendor rules for inclusion are evolving but a dedicated research-based approach is expected to be more responsive.

The creation of a renewables infrastructure investment universe is a necessary first step which permits a better assessment of the risk and return potential of this sub-group and its individual members. **FS**