



# **Net Zero investment opportunities for global listed infrastructure**

August 2021

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## Executive Summary

The world's mandated target to achieve net zero greenhouse gas emissions will create a wealth of investment opportunities for all investors in the coming years and decades. Specifically, the energy transition from fossil fuels to clean energy will challenge current business models as energy providers adapt to changing customer demand and new regulation. The challenge for investors (especially those focused on the global listed infrastructure sector) will be to decide which companies are best placed to benefit from this ever changing and complex investment landscape.

This paper investigates the current and anticipated solutions which are expected to play a major role in our journey to a net zero outcome. Our analysis borrows from the International Energy Agency's latest report, "Net Zero 2050: A roadmap for the global energy sector". This report outlines the requirements to decarbonise the energy sector, offers a framework to classify potential solutions and shows how they fit into the overall net zero objective.

The electrification of fossil fuel intensive sectors coupled with a substantial increase in renewable electricity generation are two key pathways especially relevant to global infrastructure investors. The transition of these sectors will contribute most to reducing carbon dioxide emissions and are first in line for deployment and upscaling over the next decade.

Gaining clarity over the net zero pathway naturally leads to a consideration of the investment opportunity. Our analysis shows that investors must look beyond the recognised benchmarks to gain a meaningful exposure to this transition. Redpoint's global quantitative approach to investing is well placed to both identify these opportunities and include them in an overall diversified and risk managed portfolio. For investors seeking to manage their risk budgets in a Your Future Your Super benchmark regime, our approach can deliver a valuable exposure to this critical transition theme within a client specific risk budget.

## Introduction

Article 2 of the Paris Agreement of 2015 aims to limit global warming to below 2, and preferably to 1.5 degrees Celsius, compared to pre-industrial levels. In order to achieve this, it is widely accepted that greenhouse gases (GHGs) need to be at net zero (reduced or offset) by 2050.

Current efforts to reach this target fall short. Individual country pledges and targets put us on a path to limiting global temperatures by 2.4°C above pre-industrial levels by 2100. Actual implemented government policy is projected to result in global temperatures rising 2.9°C. (*Climateactiontracker 2021*)

Fulfilling the aims of the Paris Agreement remains within reach despite current projections. This view is supported by a marked change in attitudes and awareness towards climate change in the last 5 years. This is evidenced by pledges to reach net zero emissions by mid-century by over 44 countries, representing 70% of global CO<sub>2</sub> emissions (*IEA 2021*). Similar steps are also being taken by a growing number of corporates, increasingly focused government policy such as the European Green Policy (*European Commission 2021*) and large cost reductions for renewable technology which has boosted investment demand (*IRENA 2020*).

It is safe to say that the transition to a decarbonised world is well and truly underway for the energy sector. This is critical given that this sector generates three quarters of the world's greenhouse gases in the form of carbon dioxide (*ourworldindata, 2021*). More than four times more renewables-based generation capacity was added globally in 2020. Furthermore, more renewable power has been added to the grid in each of the last seven years relative to fossil fuel and nuclear sources combined. (*IRENA, 2021*)

## Transition Pathways

Many organisations have modelled the potential pathways to net zero emissions between now and 2050. These cover a board range of eventualities targeting temperature rises in line with the Paris Agreement (1.5 to 2 degrees) as well as other scenarios where existing, though inadequate, pledges and policies are projected to result in temperature increases above the Paris target. These organisations include the Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA), International Renewable Energy Agency, Bloomberg's New Energy Finance (BNEF) and numerous oil and gas companies such as BP, Equinox and Total.

The outcomes of these analyses provide us with an insight into the potential investment opportunities that will exist over the coming decades. The modelling explores future energy needs and the technologies and investment required to decarbonise the energy sector. Unsurprisingly, opinions vary on the expected energy demand out to 2050, and on the technologies that will ultimately be successful in replacing unabated fossil fuels. However, there is a broad consensus that multiple energy sources and technologies will need to be adopted. In turn, this underpins the fact that a large investment uptick is required from today's levels.

The most recent, and in our view one of the most comprehensive pathway analyses, is the International Energy Agency's (IEA) **Net Zero Emissions by 2050 Scenario**. This report outlines what is needed for the global energy sector to achieve net zero carbon dioxide (CO<sub>2</sub>) emissions by 2050. The report offers a framework that could potentially allow the world to reach the Net Zero objective conditional on other sectors also being successful in reducing their contributions to the remaining carbon dioxide and GHG emissions.<sup>1</sup>

The IEA's report was in fact a multi-agency data modelling exercise which was also peer reviewed by many government officials and international experts. (IEA, 2021). The report highlights both the complexity of the energy transition and the fact that it will occur over an extended timeframe. The IEA concedes that their report outlines one of many potential pathways. Pathway uncertainty is caused by a lack of clarity and consistency in government policy, uncertainty over end consumer behaviour and potential for technological breakthroughs (IEA, 2021). The report itself focuses on the most technically feasible, cost effective and socially acceptable pathway and lists 400 clear milestones across multiple sectors and technologies.

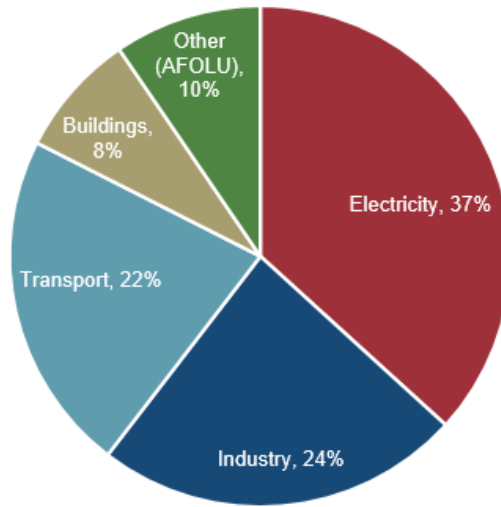
### **The Big Picture**

Currently the world emits approximately 51Gigatonnes (Gt) of greenhouse gases, of which 36Gt come from CO<sub>2</sub> produced by the energy sector (Ourworldindata 2021). Figure 1 below shows the sector split of CO<sub>2</sub> sources that make up the 36Gt total. Power production via the burning of coal, oil and gas causes the largest share followed by transport, primarily road, and industry which is dominated by iron, steel, chemicals and cement manufacturing. The heating of buildings, mainly residential, and agricultural activities such as deforestation make up the rest.

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<sup>1</sup> The bulk of non-energy GHGs come from Agricultural activities such as livestock enteric fermentation, deforestation, crop burning and rice cultivation which contribute the majority of other GHGS such as Methane and Nitrous Oxide. (ourworldindata.org, 2021)

**Figure 1: Carbon emissions 2019, split by end sector**

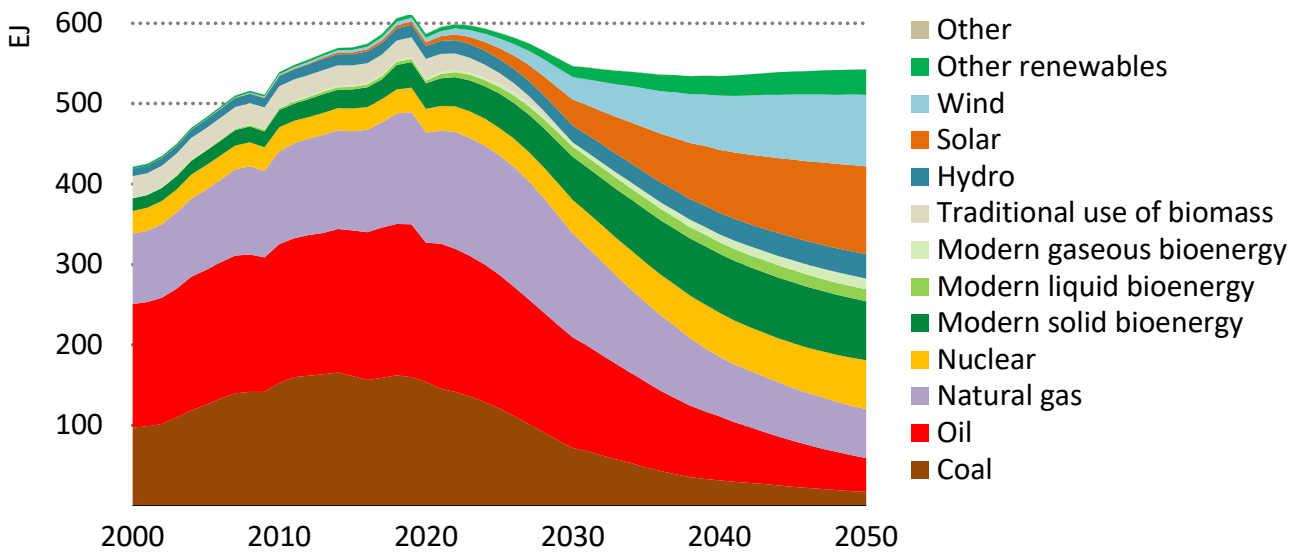


Source: IEA

Net Zero is achieved by reducing the above sources of carbon and offsetting those sources that cannot be reduced. Net Zero needs to be achieved in the next thirty years against a background setting where carbon emissions would logically increase due to rising population, GDP growth and improving living standards. The report also sets out to reach additional objectives from the United Nation’s Sustainable Development Goals (Footnote No. 7 Affordable and Clean Energy). The IEA report contemplates several solutions using a range of available measures and technologies which are summarised in the following charts.

Figure 2 shows the share of energy supply from 2000 to 2050 across a range of sources. Renewables and nuclear power are expected to displace most fossil fuel use over the next few decades. The proportion of energy supply from fossil fuels is expected to fall from 80% in 2020 to just over 20% in 2050. It is interesting to note that all primary sources of fossil fuels (oil, coal and natural gas) are still expected to be in use by 2050. This is required to power hard to abate sectors such as long-distance travel (shipping and aviation), the production of non-energy goods and to prolong the life of recently built power plants (in combination with carbon capture technologies).

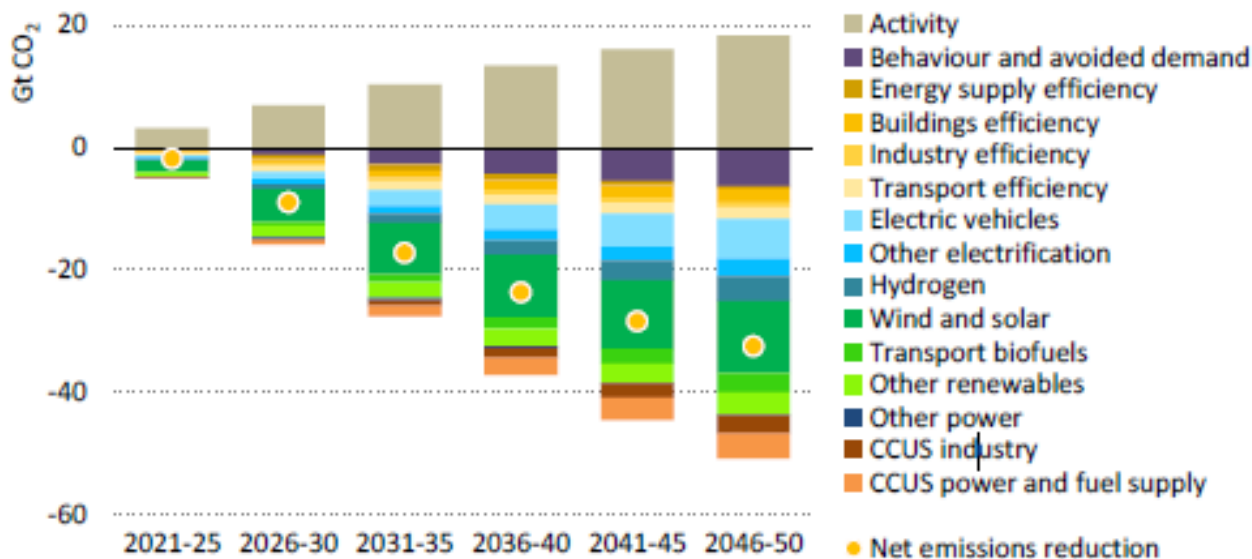
**Figure 2: Total energy supply in the NZE**



Source: 'International Energy Agency (2021), Net Zero by 2050, IEA, Paris

Figure 3 shows the expected CO<sub>2</sub> increase from activity (approximately 18Gt) and how this will be neutralised from 2020 to 2050, along with the existing 36Gt. A variety of measures are required, however renewables (specifically solar and wind) and the electrification of end sectors, such as transport, contribute over 50% over all 5 year periods.

**Figure 3: Average Annual CO<sub>2</sub> reductions in the NZE Pathway**



Source: 'International Energy Agency (2021), Net Zero by 2050, IEA, Paris.  
\*CCUS is Carbon Capture, Utilisation and Storage

The feasibility of each of these solutions varies, both technically and commercially, while some means are not yet available today. Carbon capture and low emissions fuels are not expected to make their contribution until after the 2030's. The electrification of energy via nuclear and renewables is viable today and is expected to do much of the heavy lifting now and all the way through to 2050 and beyond.

### **Solutions Framework**

To construct a basis for our thinking in respect of the decarbonisation pathway we can group the above measures and technologies into the solutions framework listed below.

- Reduced Energy Use
- Electrification
- Renewables
- Low Emissions Fuels
- Negative Emissions

There is a logical order to these solutions.

Firstly, it makes sense to start by reducing energy consumption where possible. This can be achieved through behavioural changes such as increased recycling, reducing excessive energy usage and transport switching (ie: cycling not driving) and increasing energy efficiency measures in industry via management systems, regulated building codes and fuel economy standards in transportation.

The IEA report shows that total final consumption is expected to fall by 16.5% between now and 2050, this reduction is most visible in the transport and buildings sectors as can be seen in Table 1.

**Table 1: Energy Demand (Total Final Consumption) under the NZE pathway 2020-2050**

ENERGY DEMAND	2020	2030	2040	2050	% CHANGE
Industry	157	170	169	160	1.9%
Transport	105	102	85	80	-23.8%
Buildings	127	99	89	86	-32.3%
Other	23	22	20	18	-21.7%
<b>Total (EJ)</b>	<b>412</b>	<b>394</b>	<b>363</b>	<b>344</b>	<b>-16.5%</b>

Source: 'International Energy Agency (2021), Net Zero by 2050, IEA, Paris.

Secondly, we must **electrify** as many end sectors as possible using carbon free sources such as **renewables** and nuclear. For industrial production that means converting low and medium temperature (<400°C) processes such as cooking, pressurisation, sterilisation and bleaching to electrical power from renewable sources. In buildings, the use of electric heat pumps replace gas for space heating and in transport most vehicles can be electrified. Energy storage will also play a major role going forward. Battery storage, alongside dispatchable energy such as nuclear, hydro and geothermal help overcome the inconsistencies associated with wind and solar.

Thirdly, for end sectors and processes that are hard or costly to abate, **low emissions fuels** such as liquid biofuels (from waste and woody energy crops), biogas (from municipal solid waste), hydrogen and synthetic hydrocarbon fuels can all be used as fuels themselves or in the production of other fuels (such as ammonia or kerosene) to power long distance travel (trucking, shipping and aviation) and heavy industry (steel and chemical production).

And lastly, **negative emission** technologies can capture carbon at the source or from the atmosphere and geologically store it. These methods will deal with emissions from vary hard to abate sectors such as cement or from recently built plants where decommissioning is uneconomical.

More broadly, any excess CO<sub>2</sub> that is not dealt with by these three solutions can be offset by direct air capture (DACs) technology or natural climate solutions (NCS) such as afforestation. Indeed, negative emission technologies may need to be used to offset other sectors' greenhouse gases (methane and nitrous oxide) if solutions for these cannot be found. Under the pathway proposed by the IEA's report the counteracting effect of carbon capture completes the transition to Net Zero emissions



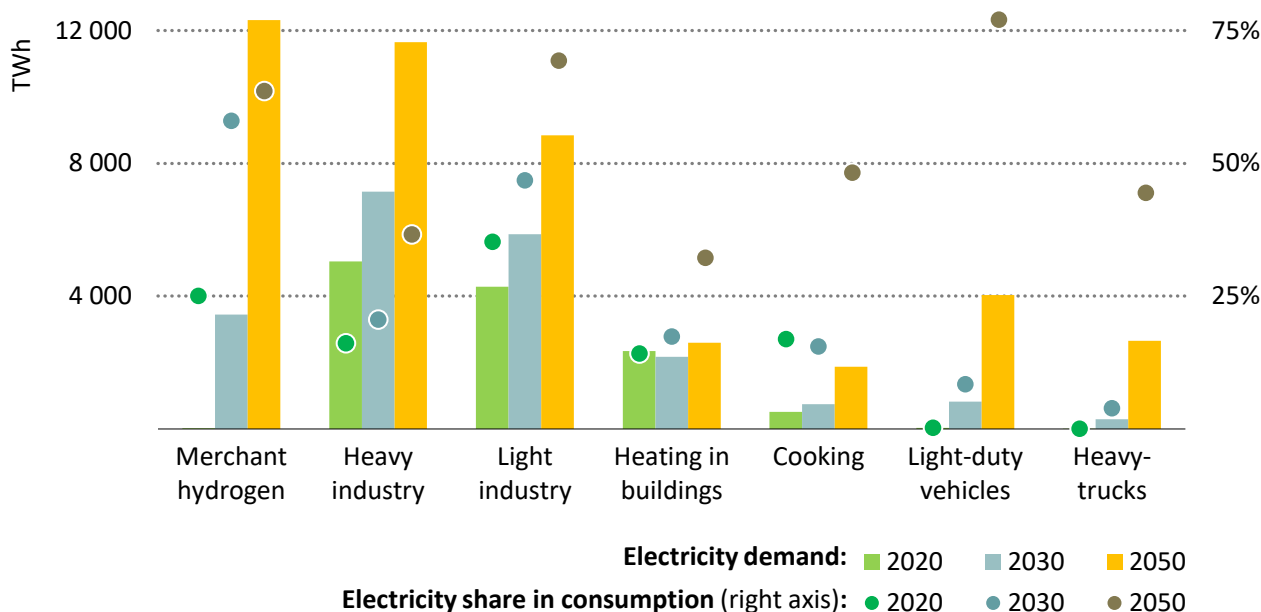
## Implications for Global Listed Infrastructure

### Electrification and Renewables

The electrification of key energy consumers supported by renewable power generation are key areas of investment opportunity for global listed infrastructure investors today.

The IEA's report expects electricity demand to increase almost 3-fold, a compound annual growth rate of 3.2%, between 2020 and 2050. (IEA 2021). This is driven by a combination of electrification of end sectors, as discussed above, rising populations, improved living standards in developing countries and the production of hydrogen by electrolysis. This, principally clean electricity, accounts for 50% of energy needs by 2050, up from 20% in 2020. (IEA 2021). Figure 4 shows the IEA's expected increase in demand of electricity in various applications between 2020-2050. Hydrogen production and industrial applications will require vast amounts of electricity compared to today.

**Figure 4: Global electricity demand and share of electricity in energy consumption**



Source: 'International Energy Agency (2021), Net Zero by 2050, IEA, Paris.

Table 2 shows the growth and split by electricity generation from various renewable technologies between 2020 and 2050. Renewable energy sources are central to emissions reduction. It is expected that these sources will be responsible for 87% of electricity generation by 2050. Solar and wind clearly dominate with over 75% share by 2050. There are smaller but equally important contributions to be made by dispatchable technologies such as hydro, concentrating solar power and geothermal sources plus nuclear and energy storage via batteries. The growth in renewable energy sources is facilitated by improved technology, falling costs and improved scalability. These factors are expected to continue improving in the future and will act to underpin the transition to renewable energy sources.

**Table 2: Renewables Generation growth between 2020-2050**

SOURCE	2020	2030	2040	2050	CAGR
Solar PV	821	6,970	17,031	23,469	12%
Wind	1,592	8,008	18,787	24,785	10%
Hydro	4,418	5,870	7,445	8,461	2%
Bioenergy	718	1,407	2,676	3,279	5%
BECCS	0	129	673	842	58%
CSP	14	204	880	1,386	17%
Geothermal	94	330	625	821	7%
Marine	2	27	77	132	15%
<b>Total TWh</b>	<b>7,660</b>	<b>22,817</b>	<b>47,521</b>	<b>62,333</b>	<b>7%</b>

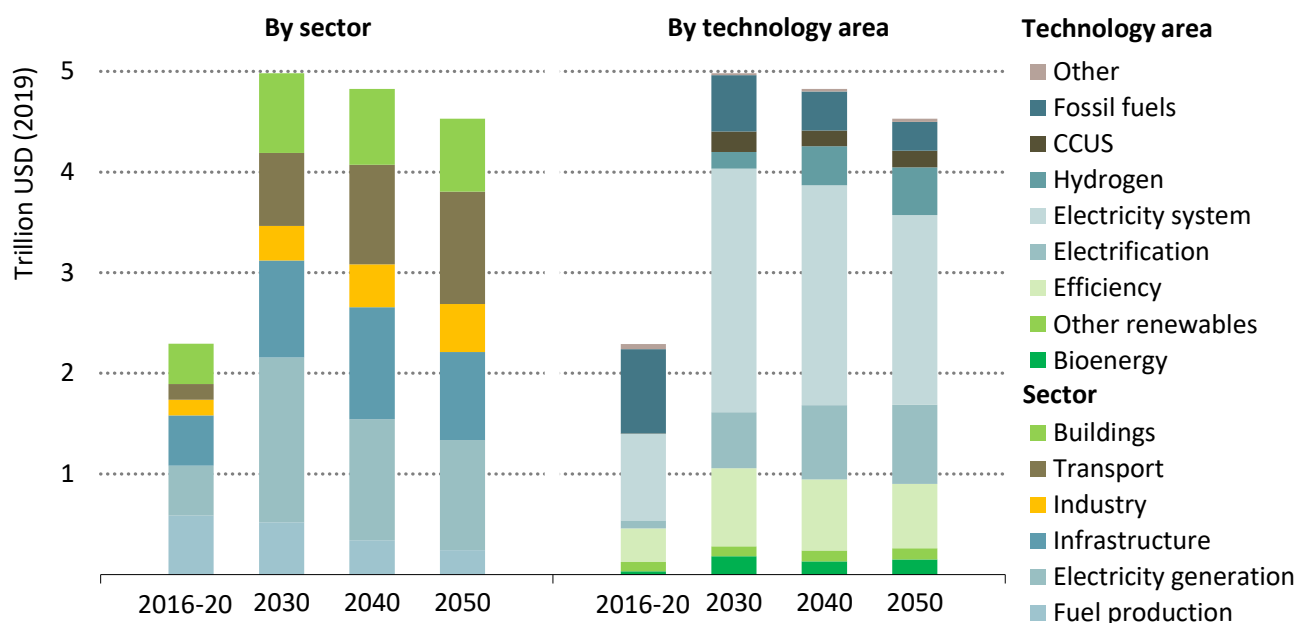
Source: International Energy Agency (2021), Net Zero by 2050, IEA, Paris  
 CSP = Concentrating Solar Power, BECCS = Bio Energy with Carbon Capture

**Investment Requirements**

The anticipated trends in electrification and renewable energy generation will require vast amounts of investment if net zero is to be achieved. The IEA’s report sees energy investment rising from 2.5% of GDP to 4.5% by 2030; the equivalent of US\$5 trillion per year.

Figure 5 shows the IEA’s predicted average annual capital investment required for their proposed 2050 net zero pathway. Electricity generation, of which the bulk is from renewable sources, commands a large share of this investment. This highlights the immediate investment opportunity for clean energy producers and distributors such as electric utilities and other renewable developers.

**Figure 5: Annual average capital investment required**



Source: International Energy Agency (2021), Net Zero by 2050, IEA, Paris

## **Future Possibilities for Listed Infrastructure**

Public elective vehicle (EV) charging, CO<sup>2</sup> pipelines and storage facilities, hydrogen terminals and energy storage are some of the other investment opportunities that will become available for infrastructure companies as technology improves, costs reduce and supporting policies are put in place. The IEA's pathway shows that these will all play a more defining role in the energy transition and will become potential investment opportunities as scale and commercialisation is realised.

This leaves the immediate opportunity clearly with electric utilities and other renewable energy generators which have become established leaders in their respective fields.

## **Redpoint's approach**

Our approach to infrastructure aims to capture the defensive growth characteristics of the infrastructure universe by creating a diversified portfolio that can be used as a core and liquid allocation to the sector.

There is significant debate over what constitutes an infrastructure company which is evidenced by the diversity of constituents within the main benchmarks constructed by FTSE Russell, Standard & Poor's and Dow Jones / Brookfield.

A further complication is that the new Your Future Your Super reforms specify a specific index for superannuation fund performance benchmarking purposes: the FTSE Core Developed Infrastructure Index. The challenge with this benchmark is that only one company, NextEra Energy Inc, meets our definition of a renewable energy company. It also has one of the largest weights in the benchmark (~5%). This presents a dilemma for super fund investors: do I take no risk and hold one solitary exposure to renewables or can I access a more diversified exposure to this thematic within a reasonable risk budget.

Redpoint believes that investors can gain a more diversified exposure to the potential benefits of the global transition to net zero. This requires a range of capabilities: security identification, stock selection and risk management which in combination can deliver improved risk adjusted outcomes. Our approach is both flexible and scalable to meet a range of risk budgets and responsible investment principles aimed at benefiting from this important global trend.

Our approach to investing in global listed infrastructure is based on creating a more balanced exposure to a range of infrastructure subsectors: and there is no more essential a subsector than Electric Utilities. As renewables grow in importance, investors will need to be able to identify clean energy firms. Investment strategies will need to identify and consider both emerging firms with specialist knowledge and/or existing utilities transitioning their electricity generation. A subset of these firms will be the ones which will ultimately command considerable market share in coming years.

Our approach has always considered index vendor categorisation of companies as imperfect. This led us to implement an "add back" process in 2012 to capture a broader set of companies providing core infrastructure services across the globe. Having a broader investment universe has been a positive contributor to our delivery of excess returns over the past decade. The diversification opportunities provided by this approach has also enabled us to reduce stock specific risk and capture a purer essence of a global infrastructure return profile.

This approach has allowed us to invest in many companies which have outperformed their peers. NextEra was originally added to the strategy as part of this addback process back in 2013 but was not added to the benchmark index until March 2016. It is now one of the largest weights in the benchmark. Our approach is now perfectly positioned to assist with the capture of this emerging net zero investment opportunity.

To address this current opportunity, we have created an additional utilities subsector, Utilities – Renewables. This subsector will sit alongside and complement the existing Utilities – Traditional Electric subsector. To populate the new Utilities – Renewables subsector, we identify those

companies which are classified as utilities using the FTSE Russell Industry Classification Benchmark (ICB) and which have a large exposure to clean energy as defined by Bloomberg’s New Energy Finance (BNEF) ratings. This group is further filtered by market capitalisation, yield, debt and our proprietary Redpoint Rating which considers the underlying economic (growth and quality), environmental, social and governance (ESG) characteristics for each company. This is made possible by our global remit and the fact that we analyse over 10,000 listed global equities via our proprietary quantitative approach.

The end result, summarised in Figure 6, is a renewables exposure consisting of 8 companies. This selection of stocks creates diversity from a geographic and renewable technology standpoint. Our collective holding provides a higher forecast yield, lower debt, higher return on equity and lower valuation relative to the benchmark’s one solitary renewables constituent. Our experience provides us with conviction that this approach can provide better investment outcomes and improved risk adjusted outcomes versus a purely passive approach.

Participation in the growth of renewable energy, supported by its core role in the net zero transition, requires investors to look beyond the standard indexes. Redpoint’s systematic approach was built on this perspective and approach this contributed to our delivery of consistent above benchmark returns over the past decade.

**Figure 6: Investment metrics for the Subsector Utilities - Renewables for the Redpoint Global Listed Infrastructure Strategy and the FTSE 50/50 Core Developed Index.**

	FTSE 50/50 Renewables	Renewables Inv. Universe	Renewables in GLI Portfolio	Better Outcome
# Stocks	1	34	8	✔
Forecast Yield	2.0%	2.1%	2.7%	✔
ND/EV	23%	20%	18%	✔
IRR	7.7%	8.6%	7.8%	✔
EV/EBITDA	22.2	24.4	19.9	✔
Redpoint Rating	66%	40%	59%	
Economic Financial	47%	37%	43%	
Economic Non-Financial	46%	31%	46%	
Environmental Policy	73%	59%	75%	✔
Social Responsibility	92%	59%	88%	
Corporate Governance	91%	54%	80%	



## Conclusion

There are many pathways for the world to reach net zero emissions by 2050. Our understanding of the latest modelling is that the electrification of the economy supported by massive growth in renewable energy generation will be a major contributor if we are to meet reasonable targets to mitigate the effects of climate change caused by green-house gas emissions.

This points directly to a massive investment requirement and a related investment opportunity. There is no doubt that we can invest for good and at the same time benefit from making good investments.

Our experience over the past decade confirms our view that opportunities for global listed infrastructure investment often reside outside of the standard indexes: at least initially. A pure focus on any one infrastructure benchmark will not provide an adequately diversified investment universe to capture this net zero investment opportunity. Redpoint's approach to investing in global listed infrastructure has always looked beyond the index. This has not only delivered improved returns but complemented the way in which we manage and reduce risk in the portfolio. Our approach provides an effective and proven approach to investing in the renewables transition.

Taking a risk aware approach can enable superannuation investors to benefit from this opportunity while still meeting their risk budget needs imposed by the Your Future Your Super benchmarking requirements.

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