BlackRock
Real Assets

Global Renewable Power Insight 2020

Winds of change

How to invest in renewables today

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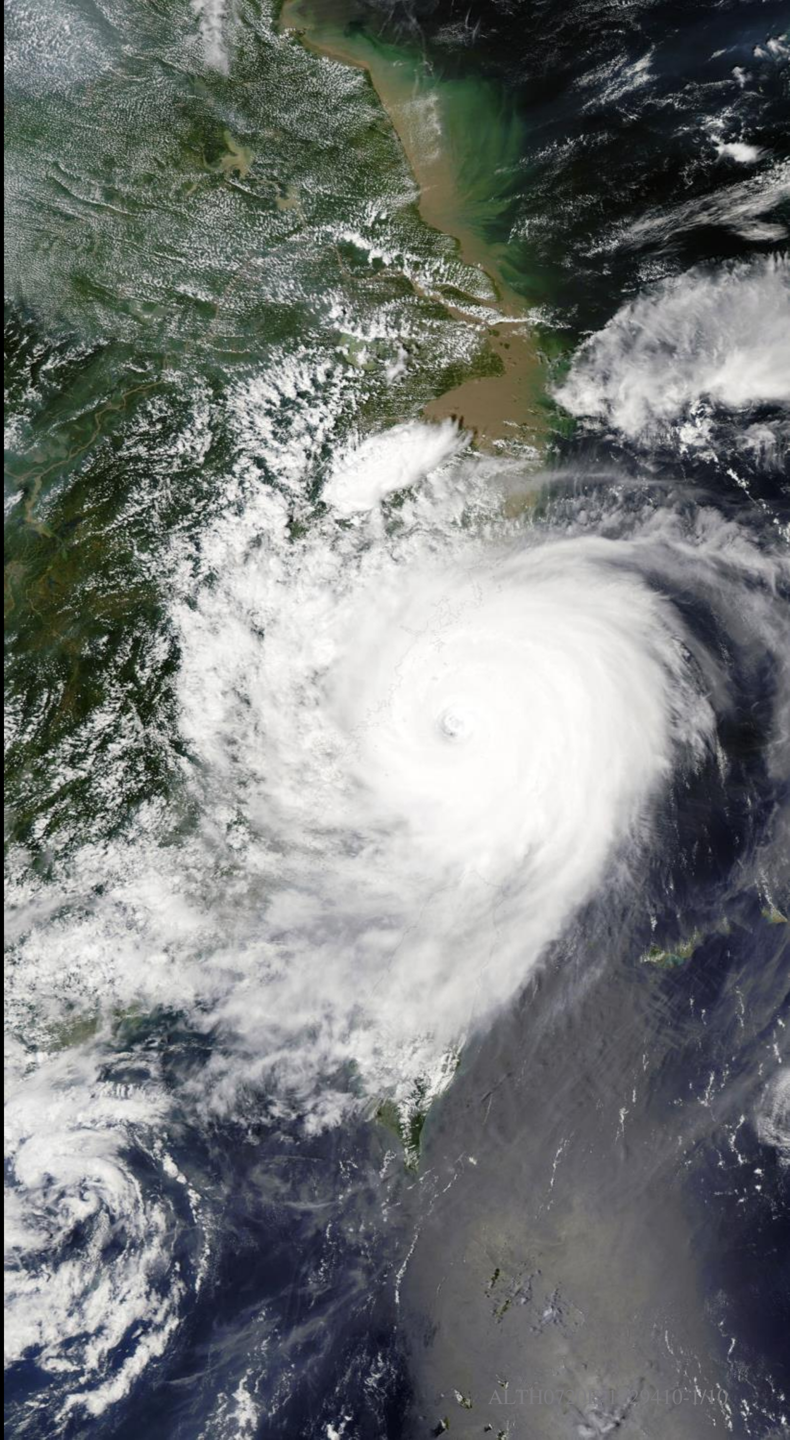

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"A renewables allocation builds up portfolio resilience – through its independent cash flows and strong sustainability features."

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The world is changing and so should our investment portfolios. Portfolio resilience has to go beyond government bonds and consider alternative return sources that can provide income and diversification. As the largest opportunity in private infrastructure, renewables is increasingly being asked to play that role in traditional portfolios. At the same time, rising investor allocations, increasing market participants and declining subsidies are changing the investment landscape. For investors today, navigating these 'winds of change' will be essential to get the most out of this resilient asset class.

Finding best relative value

Renewables markets are regionally moving through different cyclical phases and at different paces, reflecting local trends in demand, supply and policy. It is important to identify areas of relative value globally and avoid pockets of overheating. A single country or region approach results in reduced return potential and elevated risks as it constrains optionality and diversification by weather patterns, regulatory regimes and capital market conditions.

Take risks you can manage

Investing in renewables is not about avoiding risk altogether. It is about taking risks that are well understood, and being equipped to manage those risks in order to generate resilient, risk-adjusted performance. Construction and late-stage development risks are idiosyncratic and more directly manageable than long-term power price assumptions. At today's competitive market for operating assets, we see material risk in more mature assets, as the return profile for operating assets is skewed to the downside

Position your portfolio for change

Decarbonization and electrification are reshaping the energy industry and beyond. Just as quickly as renewables has disrupted conventional power generation, the asset class opportunity is itself evolving as it reaches scale. Investors should be equipped to position their investment approach and strategy in line with the market evolution. Being dynamic in portfolio positioning and embracing change are critical to getting the best out of the investment opportunity.

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Theme 1

Finding best relative value

Renewables represented **50%** of global infrastructure deal flow in 2019[1], making it the **largest opportunity in the asset class by some distance**, driven by the global energy transition from two thirds fossil fuels to two thirds renewables.

This has presented an enviable breadth of deployment possibilities for investors globally, recognizing it has been accompanied by record capital inflows to the asset class. Over the past three years, one-third of capital raised was renewables-focused, **creating an LP's dilemma in renewables manager selection**[2]. LPs have never had as many renewables fund choices. Managers with experience directly in the sector, deep resources and global reach are best positioned to navigate today's market.

Renewables markets are moving through different cyclical phases regionally. Where capital inflows have been met by a slowdown in greenfield activity or change in policy, **overheated pockets have developed, particularly in brownfield assets**. In the UK, 343 onshore wind farms were commissioned in 2017, versus only 23 in 2019[3].

Weathering this uneven landscape requires an understanding and capability to capitalise on relative value by region and sector globally (*see chart on following page*). **Local trends in demand, supply and policy differ by market**, and while the global opportunity set offers tangible diversification benefits, it takes local and sector expertise to capture them successfully.

Asia Pacific represents the future powerhouse of renewables, with over half of the world's electricity expected to be generated in the region by 2030[4]. With growing populations, economic growth and a smaller installed base of renewables capacity today, the region can expect to lead investment activity over the coming decade.

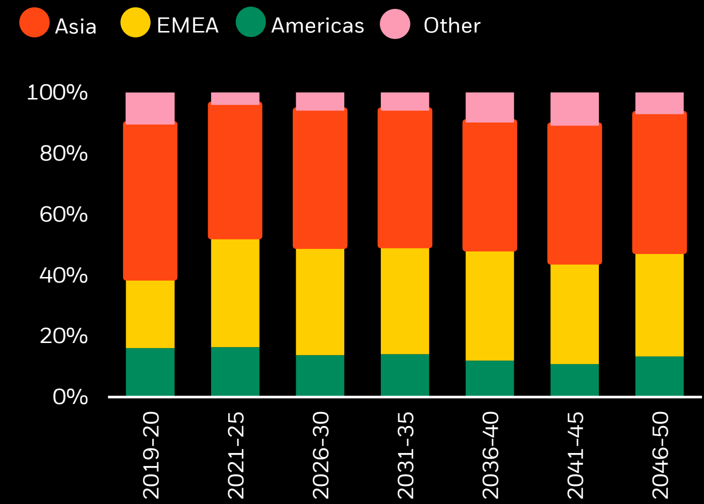
Taiwan and Japan remain home to attractive 20-year feed-in-tariffs for those who can originate an investment pipeline. South Korea has targets to add a remarkable **42GW** in renewables capacity over the next decade – equivalent to the UK's entire installed renewables capacity today[4].

In Europe, investors need to be increasingly selective when investing in traditional onshore wind and solar. Renewables assets are highly sought after in developed European countries with low yielding bond markets. Offshore wind presents the most scalable European opportunity in our view, and most growth is seen in France, Iberia and the Nordic regions.

The U.S. experiences similar supply-demand dynamics as Europe, however remains the **most active renewables market after China**[1]. The surge in growth of commercial & industrial solar assets is generating portfolio opportunities that are often fully contracted with diversified, long-term, fixed power purchase agreements. In addition, the U.S. benefits of a growing contingent of carbon-conscious companies that look to buy cheap electricity from wind and solar projects directly.

APAC: the future powerhouse of renewables

Clean energy investment by region (USDbn)



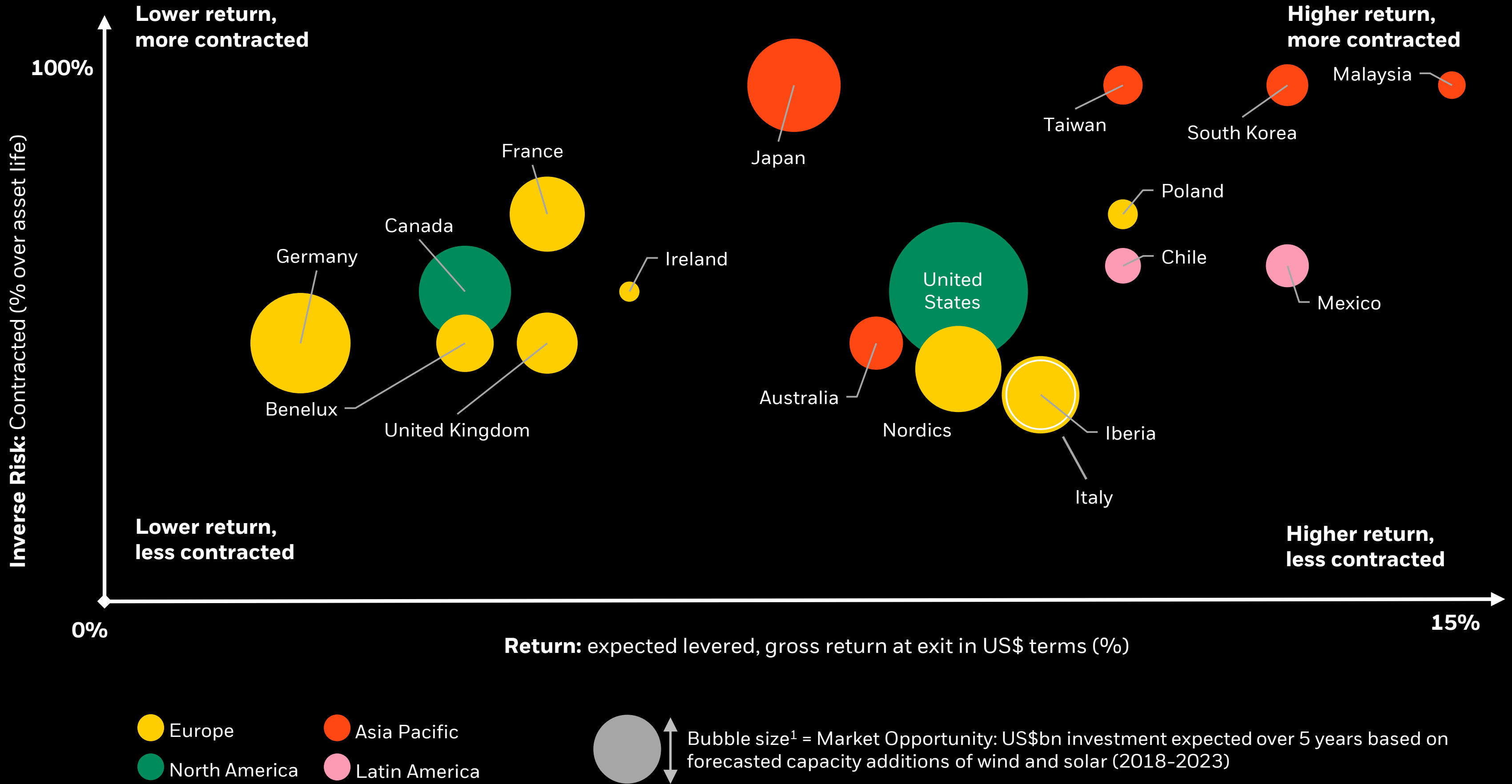
Source: BNEF, Linklaters, as of September 2019. For illustrative purposes. There is no guarantee that any forecasts and forward-looking expectations made will come to pass

"Asia renewables today is reminiscent of Europe 10 years ago. South Korea is building 42 GW in wind and solar this decade alone[4] – that's equivalent to the UK's entire installed base today."

Rory O'Connor
Global CIO & Head of Europe
BlackRock Renewable Power

Theme 1

Balancing risk, reward and addressable opportunity



Source: BlackRock, proprietary analysis performed by the Global Renewable Power Team, June 2020. Capacity market data is taken from Bloomberg New Energy Finance. Return is based on market data points and does not reflect investment strategy. This material is not intended to be relied upon as a forecast, research or investment advice, and is not a recommendation, offer or solicitation to buy or sell any financial instrument or product or to adopt any investment strategy.

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Theme 2

Take risks you can manage

In today's market, brownfield assets have the potential to carry greater risk than greenfield assets. Even if operating assets offer current cash yield, accepting low returns means that investors have less risk buffer if performance is below expectations. Fewer value drivers to optimize operating assets, leave less opportunities to create value and mitigate downside risks.

The return profile of brownfield assets are therefore increasingly **sensitive to long-term power price forecasts**, which is a risk that is difficult to manage in many markets. All of these factors skew the return profile to the downside for operating assets.

Operating assets in current market conditions favour sellers, with heavy competition stemming from core infrastructure funds and well-capitalized strategic players to first-time institutional investors.

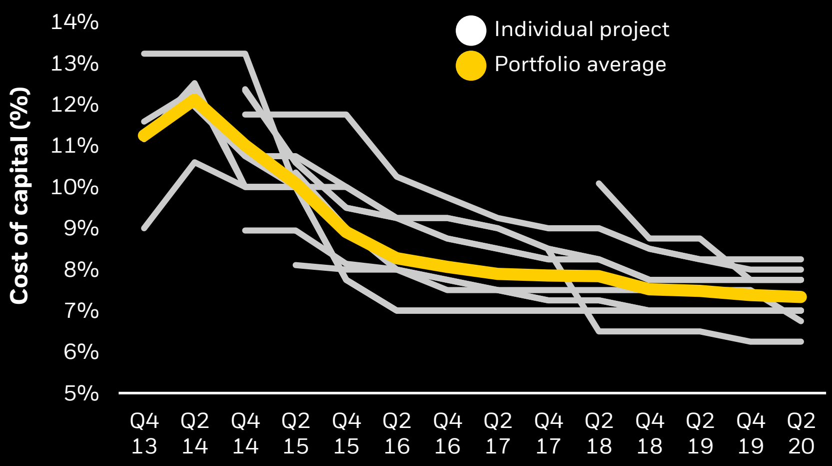
The perception of greenfield assets in renewables has been that they are higher risk, driven often by the discussion around development and construction. We believe this **typecasting of greenfield investment** reflects an overgeneralization of greenfield risks in renewables compared to other infrastructure sectors where greenfield typically comes with more project complexity and longer construction timelines.

Not all greenfield is equal. The early-stage construction and late-stage development phases offer attractive opportunities to secure an investment pipeline with trusted developers, with good visibility on major project milestones and approvals. Investors who are equipped to manage risks associated with these opportunities are in a better position to generate attractive risk-adjusted performance and invest their capital efficiently.

We believe that de-risking a construction and late-stage development project through to operations, offers investors the chance **to move from a buyer's market to a seller's market** (*see top right chart*).

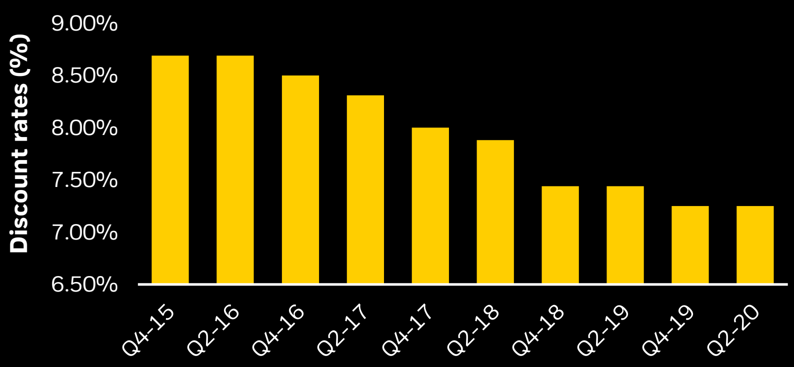
Picking the right market at the right time is important while doing this (*see bottom right chart*). Entering markets and sectors that are seeing higher growth rates and have the ingredients for stronger renewables demand going forward can drive outperformance. Expected demand in a given country could be the result of a growing need for electricity (particularly renewable), favourable support mechanisms or an increase in capital searching for renewables investment. Investors who participate in these markets early will benefit most from discount rate compression and a higher percentage of contracted revenues. This ultimately has the potential to lead to an improved risk-return outcome.

The value of de-risking: moving from buyer's market to seller's market



Source: BlackRock, June 2020. Representative data of projects moving from greenfield to brownfield as part of our renewable power strategies managed at BlackRock.

Discount rate compression: picking the right place, at the right time



Source: BlackRock, using proprietary data from BlackRock Renewable Power, June 2020. Implied levered cost of capital for onshore wind, offshore wind and solar assets in UK, France and Ireland markets, independently verified on a semi-annual basis.

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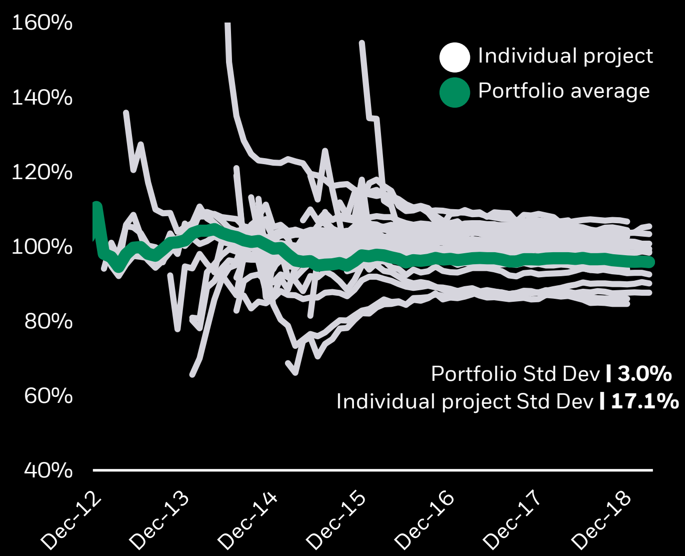
Reduced volatility in a global portfolio
Power production versus base case



Source: BlackRock, March 2019. Representative data of renewable strategies managed at BlackRock. Variation is based on 20 year implied uncertainty at the project level.

"You cannot control wind or sunshine. Global diversification is the only free lunch in renewables."

Peter Raftery
Global Head of Technical & Commercial Asset Management
BlackRock Renewable Power

Theme 3

Position your portfolio for change

Today, the world is facing some of its largest fundamental challenges. The findings from the UN's State of the Climate Report, published earlier this year, underlined (again) the urgency for far-reaching climate action from nations across the globe**.**

Climate change is being met by decarbonization and electrification that are reshaping the energy industry and beyond. Just as quickly as renewables has disrupted conventional power generation, the asset class opportunity is itself evolving as it grows. Investors should be equipped to position their investment approach and strategy in line with the market evolution. Being dynamic in portfolio positioning and embracing change are critical to get the best out of the investment opportunity.

Weather modelling has come a long way over the last decade, and prediction methods continue to improve. Nevertheless, natural uncertainty remains in any single project's energy production, both over the short-term and in the long-term. Global diversification of wind and solar investment naturally (and significantly) **reduces portfolio-level energy production volatility** both in the short and long-term (*see chart on left*).

Similarly, while power price markets are interconnected across regions and even countries, they remain idiosyncratic, providing additional diversification. Add to this diversification by regulatory regime, geopolitical risk and macroeconomic factors such as growth, base rates and inflation and the result in our view is **renewables is tailor-made for going global today, not regional**.

As renewables markets mature, support mechanisms that were designed to give the industry a leg-up are naturally being scaled back. Innovating new sources of contracted revenues is vital. **Corporate power purchase agreements are one clear route,** given the breadth and depth of companies seeking cheap and clean electricity. 19GW of corporate PPAs were procured in 2019, a 44% rise year-on-year. If RE100 companies meet their 210TWh shortfall by 2030 targets through wind and solar alone, this will represent 105GW of renewables build, or around US$98bn in investment according to BNEF[5].

Moving to where the contracted revenues are, is another option. Many countries in APAC still offer long-term, fixed price power purchase agreements, often through state-owned utilities such as in Taiwan, Japan and South Korea. Also, sectors such as commercial & industrial solar, the fastest growing renewables sector in the U.S., can be structured into portfolio investments that offer long-term, contracted revenues across a diversified fleet of small-scale solar projects. The offshore wind sector continues to benefit from government backed contracts, however the entry point of investment is essential, both from a risk and return perspective.

Electricity is replacing oil as the primary source of energy in the 21st century. Investors should look at the full value chain across this multi-faceted and multi-trillion dollar transformation. Increased renewables penetration is also creating substantial and necessary investment opportunity in electricity storage, distribution and consumption.

Conclusion

Adding renewables to the total portfolio

Investors are faced by fixed income yields that are at their lower bounds, equity dividends being cut or suspended, and portfolios carrying greater equity risks than before. At the same time, the **search for sustainability in the overall portfolio** is prioritized and tracked *(see next page)*.

In this light, investors are required to **rethink portfolio resilience and consider alternative return sources that can provide income and diversification** such as renewables. This trend is seen in the forward asset allocation decisions of some of the largest institutions. Recent survey results reported by IREI show that portfolio allocations to renewables will increase from 4.4% to 7.1%[6] over the next 5 years as **renewables increasingly becomes a standalone allocation**.

Investors should view holistically the income and return characteristics of a renewables strategy. Income from renewables compares favourably to yields in other asset classes and has proven to be **stable over time including during this pandemic** (*see top chart on right*).

Returns in renewable power projects are primarily driven by the availability of wind and solar resource, the capital costs to build new projects and the price of electricity. These idiosyncratic risks make **renewables a natural portfolio diversifier** and reduce equity risks in an overall portfolio (*see bottom chart on right*). Investors also increasingly value the inflation hedge renewables may provide.

Portfolio resilience is more than income and diversification. It's making sure the portfolio is well positioned for structural themes. The shift toward sustainability is poised to give **renewables a potential return advantage for years to come**.

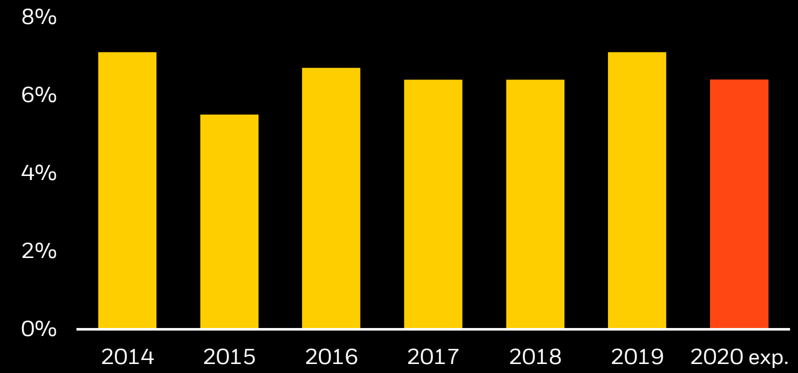
Looking at private markets, and beyond, investors have built up significant exposure to traditional energy and transport, and those areas are being heavily disrupted. As governments draw up Covid-19 stimulus packages, they are increasingly focused on making **the recovery as sustainable and resilient as possible**. The transition to cleaner energy generates abundant investment opportunities in renewables, representing $10 trillion over the next 30 years[7], but also **challenges investors allocation decisions of the past and the future.**

As the world is rapidly changing, it is essential to understand the return and risk dynamics of your private infrastructure portfolio, and how these interact with general markets factors such as economic growth, inflation, and sustainability.

We were at the energy crossroads several years ago, and the market has clearly chosen the direction it wants to go. Capturing the growth opportunity in renewables helps building **portfolios that are futureproof**, not only for the next 5 years, but for the next century.

Potential for stable income through cycles

Net cash yield profile of renewables



Source: BlackRock, June 2020. Average annualised net cash yield across BlackRock's current renewable power strategies since inception. 2020 expected yield is based on current forecasts as of June 2020.

Idiosyncratic risks improves diversification

Correlation matrix of renewables

	Global Agg	ACWI Equity	Real Estate	Direct Lending	Private Equity	**Renewable Equity**
Global Agg	1.00					
ACWI Equity	-0.02	1.00				
Real Estate	-0.10	0.89	1.00			
Direct Lending	0.21	0.82	0.76	1.00		
Private Equity	-0.07	0.82	0.79	0.74	1.00	
Renewable Equity	0.12	0.15	0.16	0.19	0.15	1.00

Source: BlackRock Aladdin, June 2020. Data derived from portfolio asset class mappings, using the Aladdin portfolio risk model. Representative data of renewable power strategies managed at BlackRock used as proxy for GRP Equity as of 2/28/2020.

Renewables delivers sustainability you can measure

US$1 invested provides **US$2** of impact[1]

SDG	Metric	Dollarized Impact (US$)[1]	Impact Multiple
6 Clean water and sanitation	Water savings from renewable power generation **141,021,789 m^3 water reduced**	**$ 284m**	**0.23x**
7 Affordable and clean energy; 13 Climate action	Greenhouse gas emissions avoided **39,128,766 tons of CO_2 emissions avoided**	**$ 1,737m**	**1.32x**
8 Decent work and economic growth	New jobs created **7,625 jobs created**	**$ 239m**	**0.16x**
11 Sustainable cities and communities	Community engagement **US$114m lifetime community contribution**	**$ 114m**	**0.08x**
	Portfolio Total	**$ 2,593m**	**1.78x**

Source: BlackRock, data as of 31 December 2019. 1)Based on representative data of renewables portfolio with US$1,650m in AUM at BlackRock. Please refer to the methodology and metrics under reference (8) hereafter. Metrics represent impact created over fund life. GRP II is closed to new investors. Sustainable Development Goal images sourced from UN.org, April 2019.

References

1) Source: IJGlobal, 2019 Deal Statistics. Based on number of deals. 2) Source: Infrastructure Investor, 2019 Fundraising Report. 3) Source: Renewable UK, 2019. 4) Source: Bloomberg New Energy Finance, 2020. 5) Source: Bloomberg New Energy Finance, 2020. 6) Source: IREI Institutional Investing in Infrastructure, 2019. 7) Source: Bloomberg New Energy Finance, 2020. 8) Impact methodology: BlackRock's Global Renewable Power Team takes a three-step approach with the ultimate goal of calculating impact that can be measured in dollars and compared across investments. Step 1: Identify key Sustainable Development Goals and associated metrics to be targeted for impact using the Global Impact Investing Network (GIIN)'s IRIS metrics as an effective accounting framework. Step 2: Measure impact created on a consistent and comparable dollarized basis for every potential investment using BlackRock-defined methodology to translate multiple units of impact (tons of CO2, jobs created, water saved, etc.) to dollars. Impact measurement can be aggregated to provide a topline figure for impact achieved (or targeted), which can then be mapped to SDGs and compared against global targets. Step 3: Integrate measure of impact into each stage of the investment decision-making process by normalizing dollarized impact by dividing level of impact (in dollars) by the size of total investment (in dollars) to calculate the Impact Multiple (IM) for each investment, allowing us to compare dollars invested to dollars of impact created. Calculating the IM creates metrics that are comparable across different investments which enables application throughout the investment process—not just as a post-investment reporting tool.

Risks

Capital at risk. All financial investments involve an element of risk. Therefore, the value of the investment and the income from it will vary and the initial investment amount cannot be guaranteed. Past Performance is not a reliable indicator of current or future results and should not be the sole factor of consideration when selecting a product or strategy. You may not get back the amount originally invested. Changes in the rates of exchange between currencies may cause the value of investments to diminish or increase. Fluctuation may be particularly marked in the case of a higher volatility fund and the value of an investment may fall suddenly and substantially. Levels and basis of taxation may change from time to time. Tax treatment depends on the individual circumstances of each client and may be subject to change in the future. **Infrastructure Funds:** Infrastructure Funds invest exclusively or almost exclusively in equity or debt, or equity or debt related instruments, linked to infrastructure assets. Therefore, the performance of an Infrastructure Fund may be materially and adversely affected by risks associated with the related infrastructure assets including construction and operator risks, environmental risks, legal and regulatory risks; political or social instability; governmental and regional political risks; sector specific risks; interest rate changes; currency risks; and other risks and factors which may or will impact infrastructure and as a result may substantially affect a fund's aggregate return. Investments in Infrastructure assets are typically illiquid and investors seeking to redeem their holdings in an Infrastructure Fund can experience significant delays and fluctuations in value. **Liquidity Risk:** The Infrastructure Funds' investments may have low liquidity which often causes the value of these investments to be less predictable. In extreme cases, the Fund may not be able to realize the investment at the latest market price or at a price considered fair. **Valuation risk:** Given the uncertainty inherent in the valuation of assets that lack a readily ascertainable market value, the value of such assets as reflected in the Infrastructure Funds' net asset value may differ materially from the prices at which the Fund would be able to liquidate such assets. **Lack of available investments:** There can be no assurance that the Infrastructure Funds will be able to locate, attain and exit investments that satisfy its investment objectives, or that the Infrastructure Funds will be able to fully invest its committed capital. **Redemption risk:** Infrastructure Funds are generally illiquid and therefore an investment is intended for long-term investors who are able to accept the risks associated with an illiquid investment and are able to commit their funds for the duration of the term. Redemptions, to the extent they are permitted, may be limited, postponed or altogether suspended in certain circumstances.

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