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EXCUSE ME, WHILE I KISS THE SKY

A THREE DIMENSIONAL APPROACH TO INVESTING IN EUROPEAN RENEWABLES

KGAL
REAL INVESTMENTS

WELCOME

This paper is an introduction to the new world of European renewables investment – a sector able to deliver attractive levels of regular income and capital appreciation to asset owners. The market is at perhaps the most electrifying point for investors: mature and proven, competitive and able to replace conventional energy – and with societies demanding more change towards sustainable economies.

The market is at a perfect point for investment

The maturity is reflected in the fact that European renewable capacity grew by 77 % and production by 44 % in the last decade alone[1]. Many governments have felt comfortable enough to withdraw subsidy regimes – the feed-in tariffs that helped kick start the adoption of so many technologies. But there's a lot more to come. As of today, renewables account for some 19.7 % of the EU's energy consumption. The goal is to increase these numbers to 32 % by 2030 and then achieve climate neutrality by 2050[2]. Such a growing market offers remarkable opportunities to invest with interesting levels of diversification. And this is what really marks Europe out as a holistic investment universe.

Stability was one of the key characteristics that first attracted us to European renewables in 2003; initially caused by the subsidy regimes in place. Now – nearly 20 years on – diversification is the driving factor.

1. ASSET LIFE STAGES.

There are multiple opportunities to invest through the life of an asset – from development to operation. Moreover, just about every investable project has room for improvement through imaginative asset management, which can boost total returns.

2. OFFTAKE SCHEMES.

As feed-in tariffs disappear from view in many countries, they've been replaced by a varying mix of auctions, power purchase agreements (PPAs) and merchant pricing. This creates more options for the sale of generated electricity.

3. TECHNOLOGIES.

From PV panels to onshore wind – and hydro to geothermal – there is a large and growing field of asset categories. And within each asset type there are multiple technologies. This is real diversity, of the sort that only private markets investment can offer.

We think of this as diversification in three dimensions. Combined, they create a portfolio of resilient, cash-generating and sustainable assets delivering the returns expected by modern asset owners – and contributing to the global low carbon economy.

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GENERATING POWER AND RETURNS

Renewable energy is now indisputably an asset class of its own. It is well established – and growing. The International Renewable Energy Agency (IRENA) says that annual investments in renewables must triple to USD 800 billion by 2050 to fulfil key global decarbonisation and climate goals[3].

> **Renewable energy assets have proved resilient in times of crisis**

It is clear that much of the capital will have to come from the private sector – especially pension funds and insurance companies. Therefore, projects will need to satisfy investors' desires.

SO WHAT'S IN IT FOR THE INVESTORS? WE THINK THERE ARE FIVE ADVANTAGES.

CASHFLOWS.

Allocations to the asset class have delivered relatively stable and predictable cashflows, with the benefit of capital appreciation. For example, a well-diversified portfolio of European renewables has delivered a 7.9 % total return over a 10-year period, with the majority being cash-driven[4]. By shifting from subsidy backed to privately contracted routes to market, this characteristic can be preserved.

CONTROL.

Private equity investments give asset owners significant levels of control and governance. These include better opportunities to manage downside risks and enhance returns through imaginative asset management.

CORRELATIONS.

The asset class has a low correlation to both public market assets and the broader core infrastructure space. For example, it showed a correlation to the FTSE All World Europe Index of 0.34 and the FTSE Global Core Infrastructure (GCII) Index of just -0.02.[5]

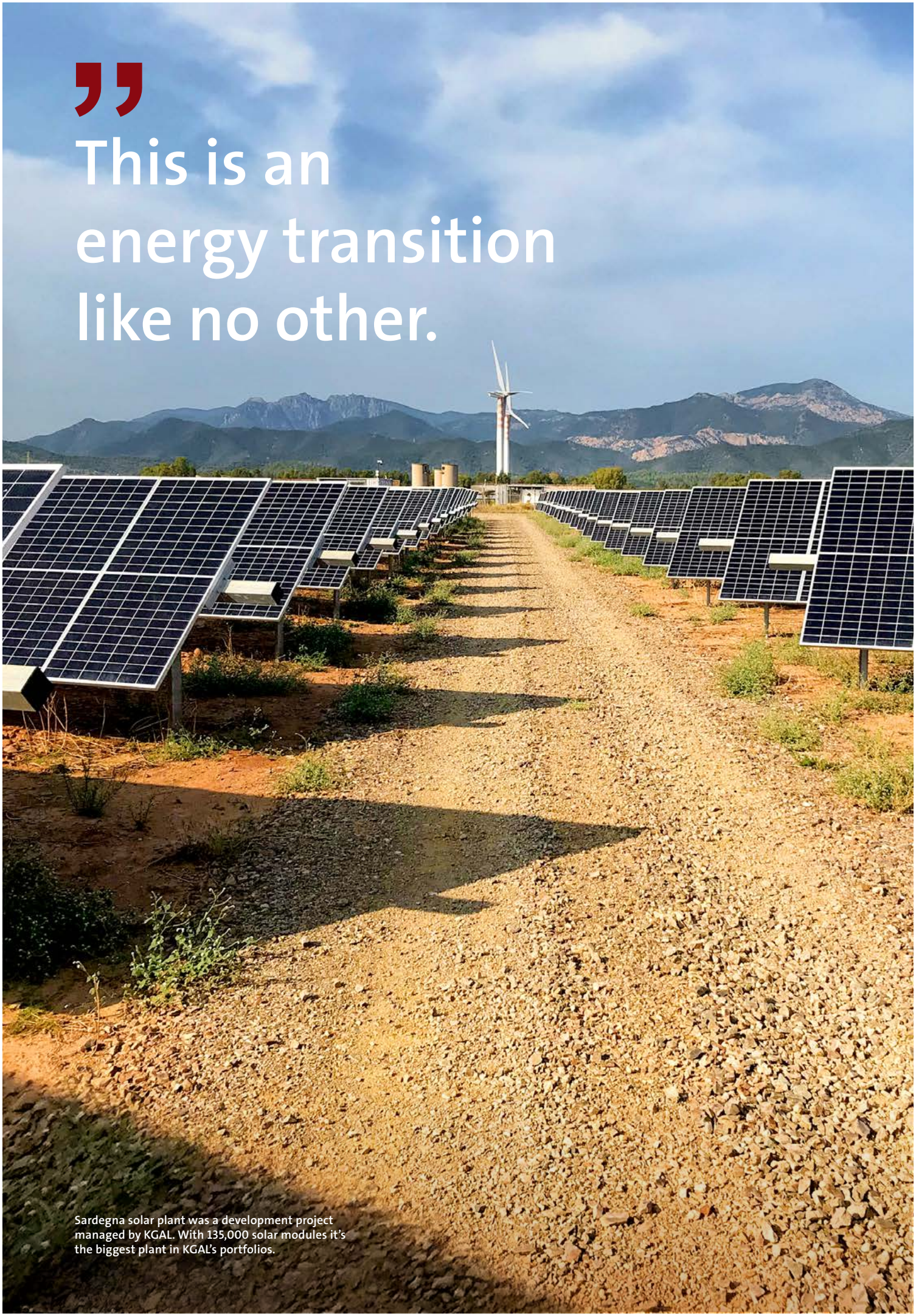
CONTINUITY.

Renewable energy assets have proven resilient in times of crisis. In 2020, everyone found out what they already knew: electricity generation is of systemic importance. Moreover, regulators have been flexible in that they have continued approval processes and price auctions held up in the face of low merchant pricing.

CARBON.

Lastly, the role of renewables in a greening global economy can never be overstated. This is an asset class for any limited partners wishing to be part of the European Green Deal, boosting allocation to sustainable or low carbon assets – and demonstrate it to policyholders, unitholders and underlying beneficiaries.

While the earth's climate remains in grave danger, the opportunity for asset owners to make a meaningful difference has never been greater.



Sardegna solar plant was a development project managed by KGAL. With 135,000 solar modules it's the biggest plant in KGAL's portfolios.

A RAPIDLY CHANGING WORLD

This is an energy transition like no other. When humans transitioned in the past – from wood to coal, and then from coal to coal-plus-oil – they changed the world around them profoundly. But at no point did their very future depend on the scale and speed of the transition. Now, if the world fails to further decarbonise its electricity consumption, quickly and sustainably enough, it risks failing to achieve necessary climate change targets. In the words of the IPCC: "Limiting global warming to 1.5°C instead of 2°C could result in around 420 million fewer people being frequently exposed to extreme heatwaves, and about 65 million fewer people being exposed to exceptional heatwaves, assuming constant vulnerability."[6]

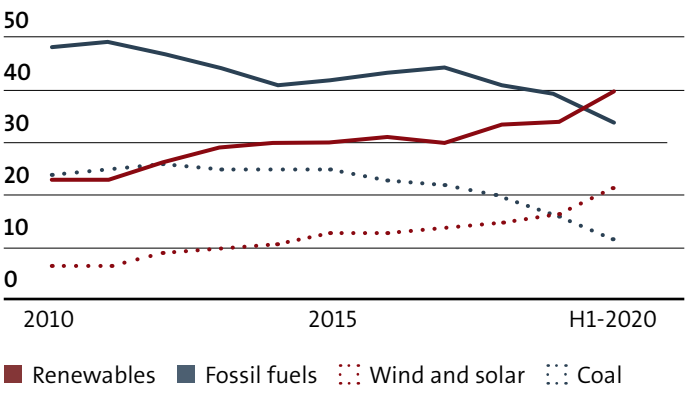
We're making a start. In the first half of 2020, renewables generated more electricity in the EU than fossil fuels for the first time[7]. But this crossover is based partly on temporary factors – such as COVID – and it would be easy to become complacent and let fossil fuels regain prominence.

Therefore, there is much more to do. As asset owners contemplate the bigger picture, they have in front of them a well-developed European renewable energy market moving from established regimes and support mechanisms towards more market driven, competitive structures. The figure below demonstrates just how sophisticated the European energy market now is. It shows the rapidly changing mix of generation capacity. It's notable how the more investable assets – especially PV and wind – make up increasingly significant proportions of both generation and capacity.

These trends are forecast to continue. During the next five years, the renewable generation fleet across Europe is expected to grow at 6.6 % CAGR[8]. Moreover, renewables play a key role in the EU Green Deal[9] as it moves to a clean-energy, sustainable and carbon-neutral economy over the next generation. Few other European asset classes benefit from such solid and continuous public and political support. This all means investment opportunity.

RENEWABLES BEAT FOSSIL FUELS

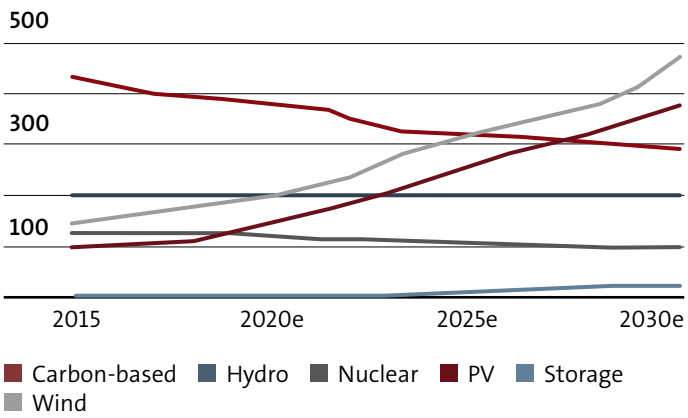
EU-27 electricity generation in %



Source: EMBER; July 2020

THE EUROPEAN ENERGY MIX

Generation capacity in GW



Source: BloombergNEF, New Energy Outlook 2020

DIVERSIFICATION IN THREE DIMENSIONS

→ 1. ASSET LIFE STAGES

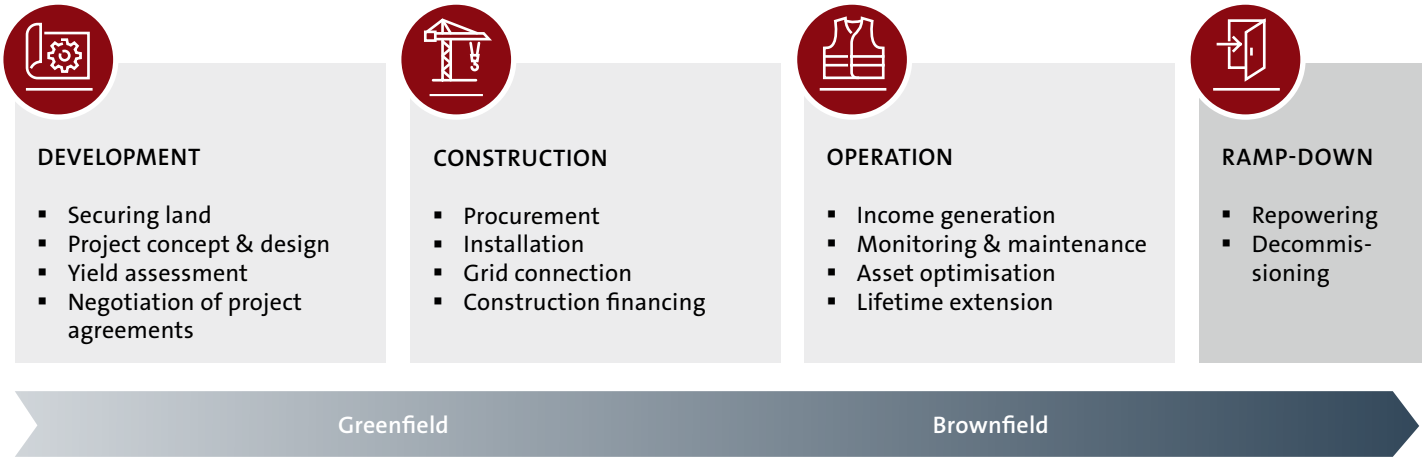
Asset owners have three typical entry points into European renewables along the lifespan of projects, from greenfield to brownfield. These are during project development, when a project is ready to build (RTB), and after its commercial operation date (COD) when it has started to generate electricity.

Unlike previously, entering projects during the development stage can now be significantly more attractive. This is because the market has evolved into a mature and diverse opportunity set – mainly without tariff regimes – that give an experienced investor opportunity to select and structure assets that suit their specific risk and return requirements.

For example, development risk in a mature market, like the UK, Spain or Sweden, looks very different from a rapidly growing market, like Poland, or a newer market, such as Bulgaria. Onshore wind in Sweden might offer opportunities to invest at the planning stage and dispose at the operational stage – whereas a comparable Polish asset could be more attractive at late stage development and held for longer.

Add the advantage of different regulatory regimes, with different electricity pricing mechanisms plus a broad choice of technologies utilising different natural resources, and asset owners have a robust and resilient portfolio capable of delivering attractive levels of income and capital uplift.

DIFFERENT ENTRY POINTS FOR INVESTORS



RENEWABLES IN ACTION: **A GREENFIELD CASE STUDY**

A well-diversified portfolio of European renewable assets should certainly consider greenfield exposure.

While brownfield investments can deliver returns from the very start, greenfield investments take time to reach this stage. They need to move through their development and construction phases, with all of the challenges they can bring. However, once they reach the point of generating electricity (at COD), they're in a position to deliver higher returns over time. This is because they've arrived at the operational stage at cost – not through a secondary market price.

A good example of a highly-regarded greenfield asset is the onshore wind farm Bäckhammar, at Värmland, Sweden. KGAL acquired it in late 2018 during its development stage.

This was a particularly appealing asset. The wind in this part of Sweden can be strong – and a velocity of 7.2 m/s at a height of 132 m is certainly strong enough for attractive future yields. However, it was far from being bankable, simply because there were no workable contracts in place to sell the electricity.
So KGAL worked in partnership with the developer to structure the asset appropriately.

The Bäckhammar windfarm has been generating since summer 2020 – selling already over 50 GWh.

KEY ACHIEVEMENTS:

COMPLETE PROCUREMENT	→	Negotiate EPC, TSA and BOP contracts with state-of-the-art features and guarantees
MINIMISE PRICE RISK	→	PPA tender, selection and negotiation with quality counterparty
DEBT ARRANGEMENT	→	Long-term debt financing at competitive rate
PROJECT COMPLETION	→	Delivery of a state-of-the-art wind project on time and on budget despite the challenges of the COVID pandemic

→ 2. OFFTAKE SCHEMES

Europe boasts almost a quarter of the global total of installed capacity – some 600 GW – spread across more than 30 countries[10]. While there is a high level of homogeneity – especially in the EU countries – there are differences that investors can exploit across different countries. This is because different jurisdictions use different approaches to support renewables mostly through the pricing of electricity. In some cases, these differences are profound – in other cases subtle – but pricing structures can be allocated to four areas.

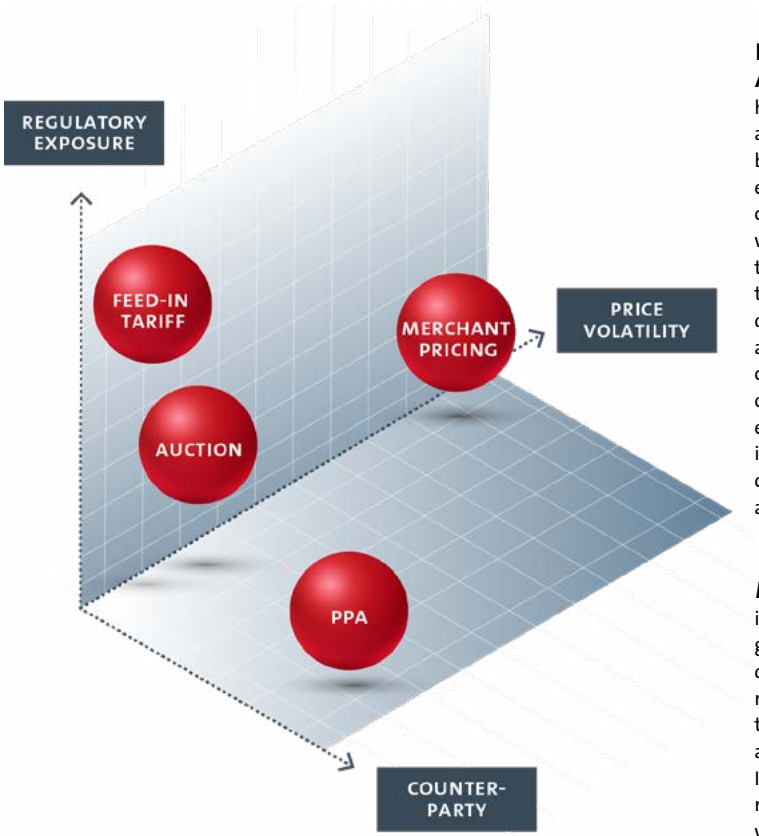
Again, an asset owner wishing to allocate to a diversified, robust pool of assets can use this diversity to their advantage.

The key to successful investment in the asset class is to blend different pricing mechanisms while minimising embedded volatility. For example, one method is to ensure a high proportion of fixed price agreements, to support stability and resilience, allied with residual exposure to the more volatile merchant pricing, which provides optionality and flexibility.

SELLING ELECTRICITY REQUIRES A BALANCING ACT BETWEEN THREE KEY CONSIDERATIONS

AUCTIONS
are conducted by regulators and the process provides high levels of certainty and security to each party. They work by requiring asset managers to "bet" into the process to secure an appropriate pricing level – and given that asset managers are contracting with a sovereign or sovereign-backed entity, there is limited default risk. They tend to last for up to 10 years and in some markets, for certain asset types, they can stretch to 25 years.

FEED-IN TARIFFS (FITS)
are government programmes to promote use of renewable electricity generation technologies through subsidies. FITs used to be the main method of electricity pricing, but have now been withdrawn in most European countries – given the volume of investment in renewables – and are more common in "new" markets, wishing to ramp up private investment.



POWER PURCHASE AGREEMENTS (PPAS)
have emerged as a key method of agreeing long-term, fixed prices between electricity sellers and buyers. In this arrangement, the seller of electricity enters into a contract with a private company – either the buyer or an intermediary – and this introduces an element of credit default risk. Credit enhancements are therefore a vital component of PPAs. An experienced market operator can structure PPAs to ensure advantageous pricing – irrespective of low or volatile merchant pricing. This is a key part of active asset management.

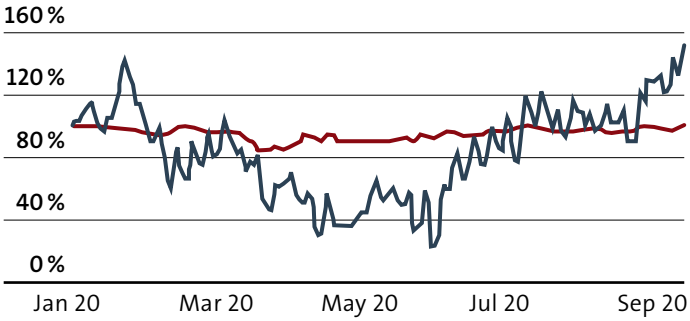
MERCHANT PRICING
is the fluctuating daily price for generated electricity – which can display significant volatility. For most asset owners this volatility is too unappealing – especially when auctions and PPAs can eliminate it. In certain circumstances, limited merchant risk can play a role in a well-diversified portfolio – and it is particularly popular with strategic investors.

The risk to financial investors of relying on merchant pricing alone became all too apparent in 2020. It tumbled, driven down by COVID-related disruption, the peaking supply from wind generation and following broader volatility in energy prices.

However, asset owners can protect against such volatility and achieve high levels of security. This is possible through well-structured offtake agreements such as contract for differences (CfD) resulting from an successful auction participation or privately negotiated PPAs, which reflect long-term future electricity price expectations or hedging requirements of the offtaker.

The auction process in particular is well established. Poland, illustrated below[11], provides a recent and excellent example of their use in a developing and maturing market.

PPAS OFFER STABILITY IN TURBULENT TIMES



PEXA Euro comp. tracking average price levels for PPAs

ELIX 5d avg Base Load represents the market price for electricity in an integrated European single market

Source: Pexapark, Bloomberg NEF, EEX, own research

POLISH RENEWABLES AUCTIONS — A CASE STUDY

As part of Poland's commitment to EU targets, it expects offshore wind to play a key part in bringing the country closer to a target 21–23 % share for electricity generated by renewables. The December 2020 auction for renewable energy projects above 1MW capacity awarded 2.5 GW not just to wind but also PV projects. Organisations with ready-to-build renewable energy projects were eligible to participate – provided they met specific financial and regulatory criteria. Bidders had to propose the price at which they would sell their electricity production – resulting in the Polish Energy Regulatory Office awarding 101 contracts, priced from PLN 162.83/MWh (approx. € 36 EUR/MWh) upwards, for mainly wind projects but also some solar.

→ 3. TECHNOLOGIES

The huge breadth of European weather and natural resources offer further diversification opportunities as there is, for example, only little correlation between the wind in Poland and the sun in Italy, if at all.

And, with a long-term declining trend in the Levelised Cost of Electricity (LCoE), utilising such natural resources has never been less capital-intensive – and more secure, reliable and accessible – for asset owners.

SOLAR AND WIND ARE WIDESPREAD TECHNOLOGIES, BATTERY STORAGE HAS HIGH EXPECTATIONS

SOLAR

The growth in electricity generated by EU solar assets has been nothing short of dramatic, rising from just 7.4 TWh in 2008 to some 115.0 TWh in 2018[12]. This growth comes from many different technologies in different locations, ranging from monocrystalline to PERC modules, and fixed mounting to doubleaxis tracking. Notably, LCoE for solar assets have dropped by over 80 % over the last 10 years

HYDRO

The biggest projects, such as giant dams, are almost always sovereign enterprises. But opportunities remain for small-scale hydropower projects that exploit differences in water levels or run-by-river.

OTHERS

Geothermal, tidal and biomass are niche asset types that may offer potential in the 2020s. Identifying assets with sound business profiles is key in this segment.

High investment opportunity — Low investment opportunity

WIND (ONSHORE AND OFFSHORE)

In 2018, wind power was the single largest source for renewable electricity generation in the EU[13]. And here as well, the technology continues to develop. Wind turbines continue to grow in size – given the correlation between blade radius and the torque that drives the generators – and the latest generation of wind turbines now reach hub heights of 150 m, twice the height when compared to first generation turbines. There is also technological diversity: geared vs. gearless transmission or aerodynamic design of blade and nacelle, to name just two.

STORAGE

Whilst being seen as a niche opportunity by many investors, electricity storage facilities are also potentially attractive. Examples could be pumped hydro, with its long-standing track record, or the quickly evolving battery-based storage. These assets do not generate electricity themselves; however can offer benefits when situated alongside generating assets, to improve the feed-in profile and thus profitability.

THE VALUE OF ACTIVE ASSET MANAGEMENT

Asset management plays two roles. First of all, there is maintenance – managing risk and maintaining value. Things sometimes go wrong: a blade on a wind turbine can break or, a routine check finds serial defects with photovoltaic panels.

These are issues that require careful, meticulous and above all active asset management. This means experts with the right technical expertise, who understand the characteristics of the plant, and who work with local partners to deliver a shared goal.

Active asset management is an alpha generator and can unlock previously unavailable investment returns.

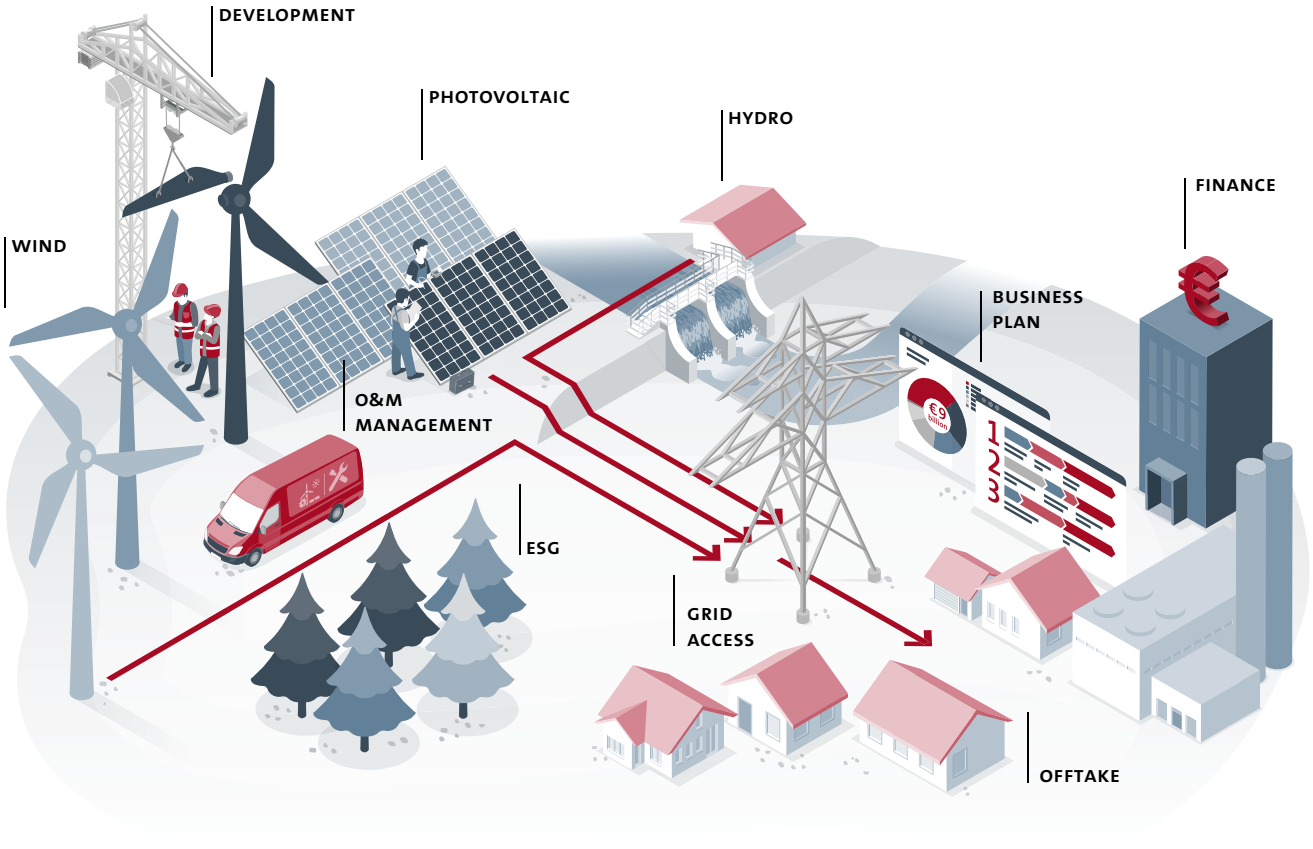
This ensures that electricity is generated and delivered at the forecasted levels – and that returns flow to investors.

Secondly, it's an alpha generator – unlocking previously unavailable investment returns. A proactive approach can boost revenue through technical or technology upgrades, or optimising the route to market via optimisation of the offtake scheme. Additionally, one of the biggest active asset management opportunities could come from financial enhancements – with optimised structuring, more attractive debt arrangements and other pragmatic approaches.

This demands skill, scale, confidence and knowing how to get the best out of contractors on the ground – irrespective of location – in often challenging circumstances.

In a solar park in Italy, a KGAL asset manager discovered flaws in the solar modules at an early stage that would have led to a failure in the medium term. KGAL asserted the warranty claim in lengthy negotiations and replaced 73,000 solar modules worth around € 5.7 million at the manufacturer's expense.

ACTIVE ASSET MANAGEMENT ALONG THE VALUE CHAIN



From development through financing, O&M management to the offtake – active infrastructure asset managers have multiple entry points to preserve value and generate alpha for their investors. Here are some of the most recent examples from KGAL's infrastructure funds:

WIND

At a wind farm in France, an analysis by KGAL revealed that an overly restrictive noise management plan had been implemented. In an optimisation project, a new plan was developed that increased annual earnings of around € 73,500.

PHOTOVOLTAIC

17,640 photovoltaic modules in a plant in Italy were discovered to have an irreparable serial manufacturing defect. High-tech replacement modules were obtained free of charge after lengthy but worthwhile negotiations with the module manufacturer. KGAL secured not only the investment's value, but also increased future yields.

FINANCE

During the acquisition of a Bulgarian PV project, KGAL identified refinancing potential of the existing credit facilities. Compared to when the initial financing was underwritten, the project had reached COD and had shown a stable track record for years. Due to this de-risked status of the assets in combination with the increased risk appetite of banks for renewable energy assets in the Bulgarian market, KGAL was able to refinance the debt. KGAL achieved a significant credit margin reduction while introducing an additional interest rate hedge.

OFFTAKE

Instead of renewing the contract with the original offtaker, KGAL put the PPA for 18 Italian solar plants out to tender in an elaborate procedure. The new terms and conditions are very attractive and will generate additional revenue of almost € 400,000.

SO WHAT'S IN IT FOR THE INVESTORS?

The title of this thought paper is a homage to the 1967 Jimi Hendrix song "Purple Haze". He always maintained it was a love song, inspired by his dreams and science fiction. Whatever kissing the sky actually means, a generation of asset owners is looking skywards for answers about how to generate sustainable investment returns – and we believe that our three-dimensional approach can deliver suitable answers.

It's well established that sun, wind, water and other renewable resources can help supply the electricity that societies increasingly need – and the investment returns asset owners require. In fact the conditions for long-term investment in European renewable assets have never been more aligned. We think the opportunity is electrifying. The technology is proven – and improving. Bigger wind turbines, more efficient PV panels, battery storage and ways of using descending water to generate power all add up to an exciting asset class. Our view is that a diversified investment approach is the optimal way of capturing such breadth of opportunity. This is why we believe in a three dimensional approach to diversification – exploiting differences between and across the long life cycles of assets, balancing the multiple ways of selling electricity and using the full range of natural resources, to the greatest possible effect.

All together, such an approach can offer

- Consistent and reliable *cashflows*
- Very high levels of *control*
- Low *correlations* with other asset classes
- Good *continuity*, through periods of crisis or volatility
- Sustainable assets that help address *carbon* exposure

THIS IS A PERFECT TIME TO INVEST.

REFERENCES

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KGAL's Bäckhammar wind farm
at Värmland, Sweden

ABOUT KGAL'S RENEWABLES EXPERTISE

KGAL Investment Management GmbH & Co. KG is a leading European renewables asset manager. It has a comparatively large team, a long heritage and a focus on solving the problems faced by modern asset owners.

Since its pioneering first investment in 2003, the business has acquired, developed or constructed around 140 renewable assets across nine developed and developing European countries – representing an infrastructure investment of over EUR 3 billion. This is one of the largest and most diversified Pan-European portfolios.

While it focuses on every significant asset type, KGAL is particularly proficient in PV and wind

- Its solar plants in Spain, Italy, Germany, France, the UK and most recently Bulgaria have a total capacity of around 384 megawatts.
- Onshore and offshore wind farms in Germany, France, Sweden, Finland and Poland offer a total capacity 627 megawatts and a total investment volume of € 1.1 billion.

What marks KGAL out is its ability to maintain and add value through an active asset management approach. Half of KGAL's 60-strong renewables team are asset management specialists and they work with local partners to manage and devise ways of maintaining or boosting the investment returns for every asset in their care.

Get more Insights into KGAL's infrastructure expertise in ***this video.***

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