



BluEarth Renewables

Global Insight Series

Energy Transition Part 1: The Future of Renewable Energy

Renewable Platform Perspectives
on Navigating the Evolving Global
Development Landscape

DIF Capital Partners brings together its global renewable energy experts and portfolio companies to discuss the latest opportunities and challenges in the sector, and the critical role of leading mid-market renewable energy platforms in driving forward the energy transition.

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Executive Summary

The decarbonization of the global economy represents a large-scale and attractive investment opportunity – from renewable power generation, to more efficient heating and cooling of buildings through district heating and geothermal solutions, to conversion of waste into energy, to the electrification of transport.

- The push to achieve science-based carbon reduction targets coupled with rising electricity use has led to accelerating demand for renewable energy from governments, utilities, corporates and individuals alike. Supported by the attractive economics of renewables, the energy transition is accelerating at a rapid pace.
- Geopolitical disruption in Europe has increased focus on security of supply and reducing reliance on fossil fuels, further supporting the case for domestic renewable energy generation. In North America, the Inflation Reduction Act represents the largest government incentive package for the renewable energy industry to date.
- A significant amount of public and private capital will be required to execute the energy transition, and mid-market renewable energy platforms are driving much of the investment forward, accounting for the majority of transactions by volume in the sector¹.

- The mid-market renewable strategy is focused on identifying targeted pockets within structural megatrends, and providing the capital and value creation expertise to build, scale and maximize the value of development platforms.
- The influx of capital into building intermittent renewable generation, but without the commensurate investment into upgrading and reinforcing power grid infrastructure is resulting in widespread grid congestion and curtailment. This has increased development timelines for utility-scale projects, which has been exacerbated by periodic disruptions in supply chains. The opportunity set has therefore shifted in favor of investors with the experience of providing patient, long-term capital and navigating multiple development cycles.
- Grid challenges are creating opportunities for other renewable technologies. Wind power is benefitting from its increasing scarcity value relative to solar in some markets. Distributed generation, which bypasses the transmission network altogether, is seeing a rapid acceleration as the power system decentralizes. Flexible battery storage is becoming a key enabler for the energy transition given its ability to store and shift renewable generation and provide critical grid stability services. Furthermore, co-location of renewable technologies (e.g. solar with battery and/or wind) is gaining momentum as a way to maximize scarce grid connections by building more than one technology behind a single connection point.
- As a result, investors with broad local presence, deep industry expertise, and multi-technology and geographically diversified portfolios are well positioned to capture the full scope of the opportunity set, ensure strong downside protection, and capitalize on opportunities created by the evolving renewable energy landscape.

1 Infralogic

Green Street Power Partners



Event Overview

London, March 2024

DIF Capital Partners recently hosted its “Global Renewable Energy & Storage Industry Days” as part of our broader energy transition investment vertical.

This event brought together our global team of in-house energy transition experts, industry advisors and renewables portfolio company leadership to discuss industry trends, opportunities and challenges in the evolving renewable energy and storage landscape.

This forum is one lever within our value creation toolkit whereby DIF’s sector experts and portfolio companies are brought together to foster collaborative discussions across our specialized industry ecosystems.

DIF Capital Partners has built a 16-year global track record of buying, building, scaling and operating renewable energy and storage assets and platforms across multiple market cycles. This, coupled with our boots-on-the-ground presence in 12 countries, underpins our ability to navigate the evolving renewable energy opportunity landscape to source the most compelling risk-adjusted returns in the infrastructure mid-market.

DIF’s Global Renewable Energy Track Record

16 Years	75+
Renewable Energy Track Record	Renewable Energy Investments to Date
7,700 MW	140,000 MW
Operating or Under Construction Capacity	Development Pipeline
8	40+
Diverse Renewable Technologies	Global Power Markets
2,400,000+	
tCO2e Avoided Annually	Note: figures shown on a gross basis



Portfolio Company Attendees

- Harald Överholm, CEO**
Alight, Nordics
 Solar platform focused on Commercial and Industrial Sector
- Grant Arnold, CEO**
BluEarth Renewables, North America
 Multi-technology independent power producer
- Ewelina Szulc, MD**
Klara Renewables, Poland
 Operating and greenfield wind platform
- Amit Gudka, CEO**
Field, Europe
 Flexibility platform, specializing in grid-scale storage technologies
- Jason Kuflik, CEO**
Green Street Power Partners, United States
 Fully integrated distributed solar generation platform
- Anton Milner, CEO**
ib vogt, Global
 Solar and battery storage platform
- Gerben Smit, CEO**
Novar, Northwest Europe
 Independent power producer focused on solar and battery storage
- Charles Lhermitte, COO**
Qair, Global
 Multi-technology renewable energy and storage platform
- Scott Gilbert, MD**
Verdant Energy, United Kingdom
 Co-located solar and battery storage platform



Qair

The Global Renewable Energy & Storage Landscape

The transition of global electricity grids from brown to green represents one of the largest and fastest growing long-term infrastructure investment opportunities.

“There is still a large gap between global renewables targets and what has actually been installed. You just need to position yourself in these long-term growth markets.”

– **Gerben Smit**, CEO of Novar

The global electricity grid is in the midst of a large-scale transition from a thermal, centralized and analog system to a renewable, decentralized and digitized system. This overhaul of electrical infrastructure, across generation, transmission and distribution will require significant capital over the next half century. Indeed, an estimated \$21 trillion² will need to be invested by 2050 to secure this transition.

The energy transition is being driven by a confluence of structural megatrends: decarbonization, decentralization and electrification. At the heart of this are two key drivers: (i) rapidly growing off-taker demand for green power, and (ii) a precipitous decline in capex costs that have made utility-scale wind and solar the cheapest sources of bulk power on the grid today³. Further pushing up demand is the continued rise in global electricity use, which could increase as much as three-quarters globally by 2050⁴ – from the electrification of vehicles, and heating and cooling systems, to ever-increasing data consumption and power demand from data

centers. As Grant Arnold, CEO of BluEarth Renewables said, “Every single energy forecast that we see is going up. Renewables remains a great long-term macro trend to ride.”

Ambitious government and utility renewables targets to combat climate change is further increasing renewable energy demand. However, a large gap between targets and operating capacity still exists, with the goal at COP28 to triple renewables capacity to at least 11,000 GW by 2030⁵. As a result, DIF’s portfolio companies confirmed that utilities globally have maintained their robust procurement volumes for renewables, underpinned by long-term contracts with power producers.

Corporate buyers represent the largest growth market for renewable energy, driven by ambitious sustainability goals. Corporate demand remains in its early-stages, and sophistication varies widely. DIF’s portfolio companies see the largest proportion of corporate demand for utility-scale solar and wind projects in order to secure green megawatt-hours and renewable energy credits. More sophisticated buyers are seeking bespoke, flexible and shaped solutions to match their demand and supply profiles. Harald Överholm, CEO of Alight, observes that the corporate buyer pool remains largely untapped as these buyers come up the learning curve on renewable energy. “Corporates are a huge potential universe of buyers, but do they even know they are buyers? Our biggest barrier, and our biggest opportunity, is how well commercial and industrial customers know the product and its value.”

Moreover, we are at an important inflection point where utility-scale wind and solar generation are economically competitive today without the need for subsidies, a trend that battery storage is set to follow with up to 7% CAGR cost declines expected over the next decade⁶. With rising demand and declining costs, the energy transition is seeing a rapid acceleration.

² BloombergNEF

³ International Renewable Energy Agency

⁴ U.S. Energy Information Administration

⁵ COP28 UAE

⁶ U.S. National Renewable Energy Laboratory

The Critical Role of the Mid-Market in Driving the Energy Transition

The infrastructure mid-market is driving much of the energy transition forward, accounting for nearly 70% of renewable energy transaction volume over the last two years.

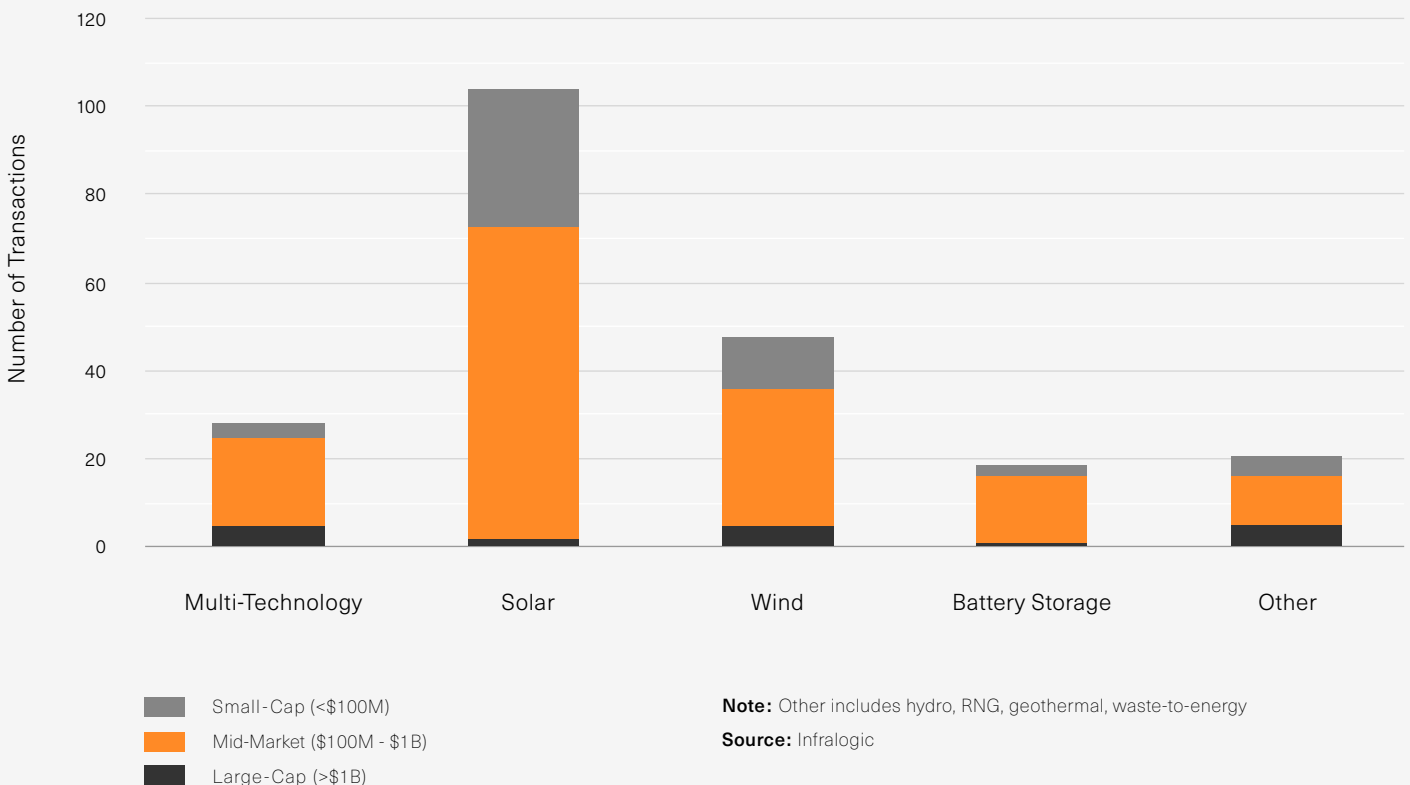
The scale of capital required to achieve national renewable energy targets is significant, and the majority of companies driving this investment are mid-market development platforms. Indeed, the mid-market (defined as transactions with a deal value between \$100 million and \$1 billion) accounted for 67%⁷ of renewables transactions by volume between 2021 and 2023. This mid-market entry point typically allows infrastructure investors, particularly those with global reach, to identify targeted pockets within broader structural megatrends such as energy transition.

Within the identified opportunity set, investors are then able to provide the capital and value creation expertise to build, scale and maximize the value of the development platforms, with the goal of exiting to the widest possible universe of buyers. The mid-market also supports the opportunity to build highly diversified portfolios across multiple geographies and technologies to both capture the full scope of the energy transition opportunity, and to build in strong downside protection through diversification.

In an increasingly multifaceted development landscape, mid-market platforms with proven management teams and high-quality development pipelines are particularly well positioned given their agile and nimble scale. This embedded flexibility allows them to pivot quickly in the face of secular changes in the macro environment, for example, by looking to new growth markets, or expanding capabilities into adjacent technologies. However, building an operating base with sufficient operating cash flows to fund development spend remains essential to managing through the inherent lumpiness of development.

⁷ Infralogic

Renewable Energy Transaction Volume 2021-2023



Navigating Disruption in the Development Cycle

Although renewables, particularly solar, has seen rapid growth globally over the last decade, underinvestment in transmission and periodic supply chain constraints have resulted in disruption across the utility-scale development cycle, and accordingly increased the need for patient, agile capital coupled with deep local industry expertise.

“The economics for renewables are there, and the demand is there. The biggest constraint today has become how you deliver the supply.”

– Anton Milner, CEO of ib vogt

Growing demand for clean generation has attracted an influx of capital into the sector, with approximately \$2.7 trillion invested between 2019 and 2023⁸. However, while the penetration of renewable energy has seen strong and accelerating growth, dynamic supply chain trends influenced by geopolitical events, along with secular underinvestment in grid infrastructure have resulted in an increasing level of complexity across the development lifecycle. This evolution of the industry in turn requires strong local presence and industry expertise to navigate challenges, as well as to capitalize on emerging opportunities.

The International Energy Agency (IEA) estimates that there are 3,000 GW of renewable energy projects currently in grid connection queues around the world – approximately five times the amount of solar and wind that was added in 2022⁸. However, investment in transmission infrastructure has not kept pace with the growth in renewables, resulting in grid congestion in many markets.

Indeed, the IEA estimates that reaching national renewable energy targets will require the addition or refurbishment of over 80 million kilometers of grids by 2040, which is the same size of the entire existing global grid. As a result, all our portfolio companies report that securing interconnection has become increasingly challenging, and often represents the gating item for commercialization.



These longer development timelines accordingly require patient capital to move projects from early stage to commissioning. However, the disruption is also creating opportunities, particularly in the mid-market, for experienced renewable power investors to source high-quality development platforms seeking a capital partner with deep industry expertise to fuel further growth.

DIF's diversified portfolio companies are taking a strategic approach to the evolving development landscape, leveraging their management teams' experience navigating multiple development cycles. For example, ib vogt in Europe, prioritizes taking development positions early and ensuring that they build a well-diversified pipeline by stage in order to mitigate the lumpiness of development. “The key for these positions is conversion and the inherent capabilities needed for that,” explains CEO Anton Milner, “and then developing the projects from early stage to realization rapidly, reliably, and economically.”

Qair has leveraged its global and multi-technology diversification in the face of this grid-related disruption. As COO Charles Lhermitte described, “It is possible to have a slowdown in one market, but an acceleration in others. Diversification is the name of the game.” Qair's focus on building a bench of talent locally in all the markets they operate in has supported a nimble approach to development which supports their ability to pivot around both challenges and opportunities. It then looks to adapt its business plan around changes in regulations, and shift technologies based on permitting and interconnection timing.

Likewise, BluEarth Renewables does not expect grid connection queues to speed up in North America. It therefore focuses on geographic diversification, particularly across the more fluid U.S. power systems, to ensure optionality and prioritize their pipeline around the most attractive projects.

Overall, DIF's portfolio companies emphasized that while renewable energy development has always been intensely local, the current market disruption has only increased the need for a boots-on-the-ground approach in order to navigate these nuanced changes in the local regulatory environment, market conditions, and to build relationships with development partners and off-takers.

⁸ International Energy Agency

Emerging Opportunities in Renewable Energy

Grid congestion, particularly for utility-scale solar, has in turn created opportunities for other technologies such as distributed generation and battery storage. This is serving as a tailwind for investors who have established multi-technology portfolios.

U.S. Wind Power

Solar power is dominating new development activity in the U.S., accounting for approximately 70% of capacity in the transmission queue at the end of 2022⁹. This is in contrast to onshore wind which has higher relative barriers to entry – from early-stage land procurement and permitting to higher capital costs. Indeed, onshore wind accounted for just 14% of the transmission queue in the U.S. As a result, DIF's portfolio company BluEarth Renewables has been focused on building new wind projects in regions of the U.S. that have seen less wind development, and therefore with faster access to grid connections, and in regions with the optionality to sell into multiple markets. This has been supported by strong and growing demand from utility and corporate off-takers alike who have responded to this scarcity of wind projects coming to markets by saying, "We just want your wind profile".

Distributed Generation

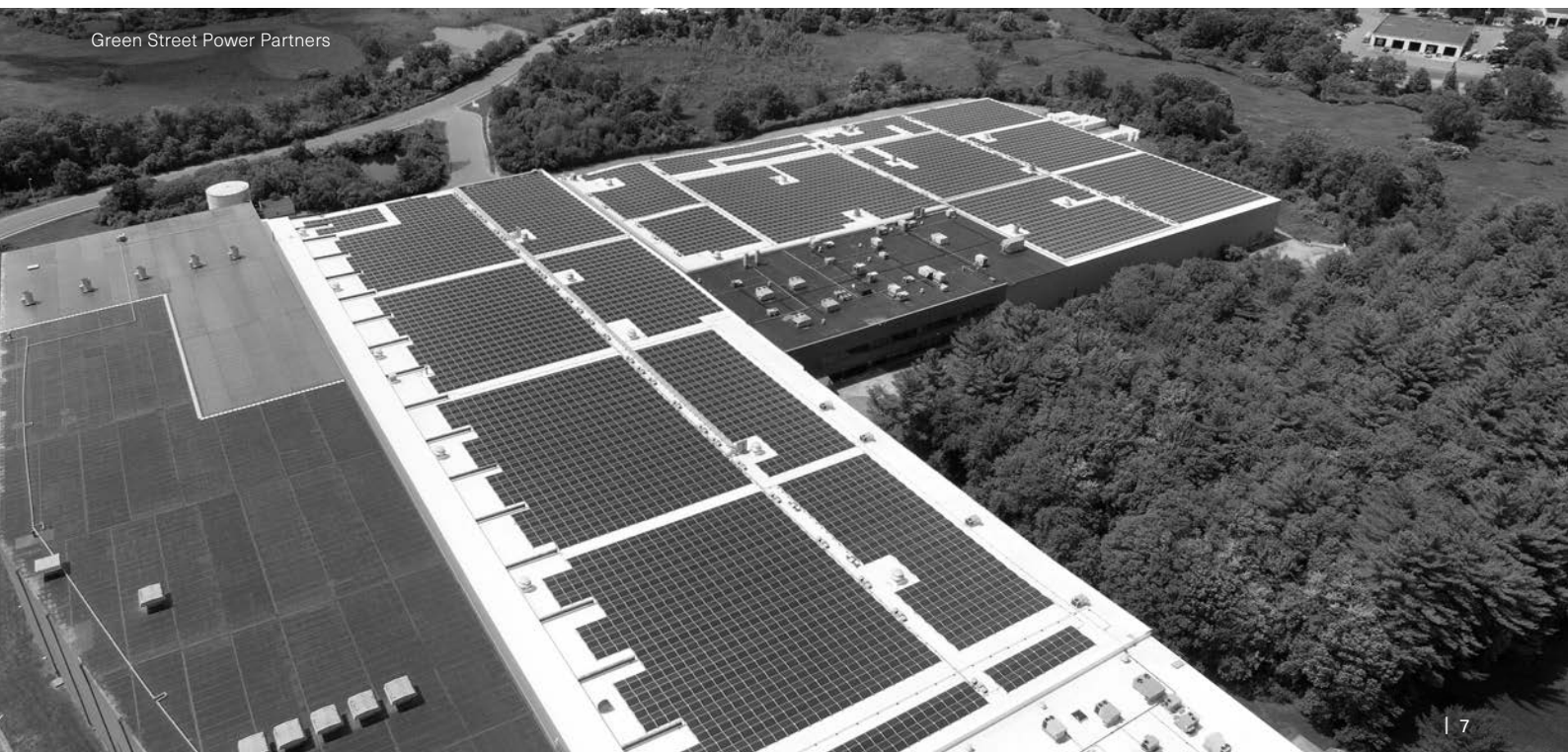
Lengthy grid connection queues are also supporting the commercial case for distributed generation, which refers to solar power located either directly on or close to a customer's site and is typically connected behind-the-meter, avoiding expensive grid charges for both the project and the customer. This allows distributed generation projects to bypass the transmission network and benefit from significantly shorter development timelines relative to utility-scale solar, and allows distributed generation to offset most of a customer's retail bill. Indeed, the CEO of Alight explained that demand for behind-the-meter projects far exceeds the current supply, and as more corporates come up the learning curve on onsite solar solutions, distributed generation should see rapid growth.

Further supporting distributed generation's tailwinds is the decentralization of the power grid. Individuals can for the first time control their own power purchases. Community solar is a distributed generation solution whereby many off-takers – diversified across utilities, corporates and households – "subscribe" to the output of a single solar plant. As Jason Kuflik, CEO of Green Street Power Partners, put it, as more and more markets introduce community solar programs across the country, "Community solar will likely be the biggest way distributed generation grows in the U.S." With retail bills in the U.S. increasing at a 3% CAGR since 2013¹⁰, community solar further benefits from long-term contracts with revenues collected directly from the utility, and not individual customers.

⁹ Energy Markets & Policy, Berkeley Lab

¹⁰ U.S. Energy Information Administration

Green Street Power Partners





Field

Battery Storage

As the penetration of intermittent renewable energy continues to accelerate, there is a strong technical requirement for grid operators to seek flexible storage solutions to maintain system stability. Battery storage represents a cost-effective and low-carbon solution to this growing need for flexible power. Likewise, for investors with large portfolios of renewable generation, there is a strategic incentive to hedge the intermittent profile with storage assets. However, markets are still in the early stages of implementing regulations to support the economics of battery storage. Grid-connected batteries remain reliant on regulations and revenue structures, meaning investors must be selective about which markets to pursue, with a focus on markets that offer multiple and diversified revenue sources (“revenue stacking”) to ensure strong downside protection. For example, DIF’s European battery storage platform Field benefits from the U.K.’s multiple revenue sources. Their assets are able to secure long-term contracts for capacity, and further “stack” revenues from the provision of essential ancillary services that provide grid stability, as well as energy price arbitrage through load-shifting of power.

Co-location

A growing strategy to maximize the use of grid connections is to co-locate more than one type of technology behind a single point of connection. For example, co-locating solar and battery storage given their highly complementary grid usage profiles, with batteries likely to charge during periods of peak solar output, and discharge in the evenings when solar power is low or nil. DIF is executing this strategy through Verdant Energy, which owns a portfolio of more than 700 MW of co-located solar and battery sites across the U.K. There is also a growing trend of co-locating solar and wind which allows for a blended generation profile to create an attractive overall output profile for customers. Co-location is still in early stages, but represents a large and strategic opportunity to capture additional value given increasing grid scarcity.



Qair

About DIF

DIF Capital Partners is an infrastructure fund manager with more than EUR 17 billion of assets under management. DIF was founded in 2005 and has a leading position in managing mid-market investments, primarily in Europe and North America.

DIF follows two strategies: its traditional DIF funds invest in infrastructure projects and companies in the energy transition (incl. renewables) and utilities sector, as well as concessions. The firm's CIF funds invest in companies with strong growth potential that are active in infrastructure sectors such as digital infrastructure, energy transition and sustainable transportation.

With a team of over 240 professionals in 12 offices, DIF offers a unique market approach combining global presence with the benefits of strong local networks and investment capabilities. DIF is located in Amsterdam, Frankfurt, Helsinki, London, Luxembourg, Madrid, Milan, New York, Paris, Santiago, Sydney and Toronto.

In September 2023, CVC, a leading global private markets manager, announced that it would be acquiring a majority stake in DIF Capital Partners. Closing of the transaction is subject to regulatory approvals and is expected in Q2 2024.

For more information, please visit www.dif.eu or follow us on [LinkedIn](#).

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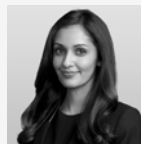
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