White Paper | June 2026

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Renewable Infrastructure Investment: How Much Is Too Much?

The infrastructure investment universe is expanding rapidly, driven by the megatrends of the energy transition and digitalization. Within it, renewable infrastructure has emerged as a fast-growing segment, attracting record institutional capital and, in many portfolios, allocations that now dominate every other sub-sector. Yet as conviction in the theme deepens, so does a critical and underexamined question: how much is too much?

Drawing on public and private market data spanning 2010 to 2025, this paper examines the portfolio-level effects of varying renewable concentration and offers a practical framework for capturing the structural tailwinds of the energy transition without sacrificing the stability and diversification that define infrastructure as an asset class.

Executive Summary

- Renewable infrastructure is a fast-growing segment of the global infrastructure universe, with institutional allocations surging on the back of the energy transition, energy security, supportive policy frameworks and accelerating corporate demand for clean power.
- As allocations have grown, so has the need to understand where the risks of renewable sector concentration begin to erode potential returns. This paper asks a simple but underexamined question: how much renewable infrastructure is too much?
- Throughout public and private markets, the historical data suggest that renewable exposure of approximately 50 – 60% offers a practical balance between risk-adjusted outcomes and concentration risk. While private-market results may support higher renewable allocations, this more moderate range recognizes that diversified infrastructure benchmarks are likely to become increasingly renewable-oriented over time, raising investors' total effective renewable exposure.
- Above the 50 – 60% range, risks compound quickly. Portfolio outcomes narrow around power prices, policy continuity and interest rates, while liquidity, exit multiple compression, and regulatory exposure all increase.
- Capturing the energy transition theme requires both conviction and discipline. A 50 – 60% renewable allocation, paired with diversified infrastructure exposure and sub-sector and geographic diversification within the renewable sleeve, is the level at which ambition and rigor converge.

Introduction

Infrastructure investing has undergone a quiet but profound transformation over the past 15 years. What was once a narrow universe of contracted, yield-oriented assets (schools, hospitals, toll roads, ports, airports and regulated utilities) has expanded into a dynamic, multi-thematic asset class that increasingly intersects with two of the most consequential structural forces of our time: the digitalization of the economy and the global energy transition.

These two themes have redefined deal flow, return expectations and portfolio construction logic alike. On the digital side, data centers, fiber networks and wireless towers have emerged as critical infrastructure underpinning the modern economy. On the energy side, wind, solar, battery storage and grid modernization assets have seen a surge of institutional capital, driven by falling technology costs, policy tailwinds and an expanding base of offtake demand from both utilities and corporate buyers.

This evolution has created both opportunity and complexity for portfolio construction. The opportunity lies in higher return potential, as development projects offer a potential return premium to operational assets. The complexity lies in ensuring that enthusiasm for any single theme, or potentially interconnected themes, does not erode the diversification and low-volatility attributes that make infrastructure a resilient asset class in the first place.

This paper focuses on renewables, one of the fastest-growing and arguably most debated segments of the infrastructure universe. The analysis that follows draws on data spanning 2010 – 2025, with particular focus on the 2017 – 2025 period, where comparable public and private market data is available. Our goal is not to question the well-established merits of renewable infrastructure, but to assess how different levels of renewable concentration have historically affected risk and return while preserving the diversification benefits that define the asset class.

Why the Question of "Too Much" Renewable Allocation Matters Now

Renewables now account for roughly a quarter of global infrastructure deal flow, making them the single largest sub-sector by transaction volume (see figure 1). Yet, according to our own analysis, many institutional investors, particularly in Europe where ESG mandates and net-zero commitments are most deeply embedded, have pushed renewable allocations to as much as 50% of their infrastructure portfolios. Some have gone further still, explicitly excluding fossil fuel-linked assets in pursuit of alignment with the Paris Agreement and internal sustainability frameworks. Excluding hydrocarbon-linked assets (pipelines, LNG terminals, gas-fired generation assets) removes roughly a quarter of the available deal flow universe, narrowing the opportunity set.

The attractions of renewables are real and well documented. Solar and wind now represent some of the lowest-cost sources of new power generation globally. Offtake demand is structurally strong: hyperscalers and large corporates with decarbonization commitments are signing long-dated power purchase agreements (PPAs) at scale, providing the contracted revenue visibility that infrastructure investors value. Improving battery storage technology is progressively reducing the intermittency risk that once tempered enthusiasm for variable renewables.

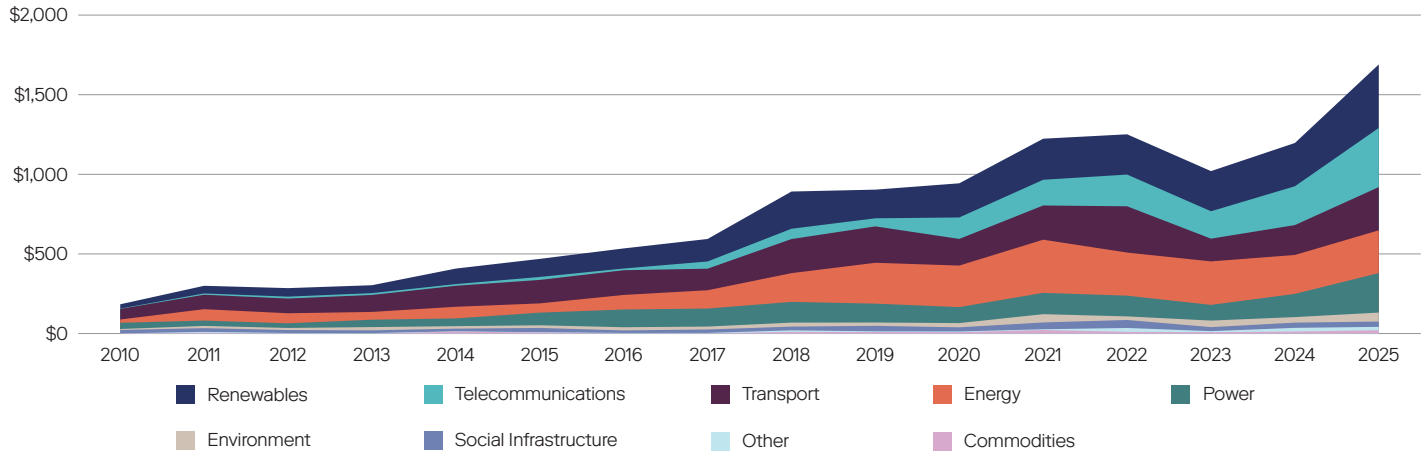
Two recent developments in particular illustrate the stakes of getting renewable concentration wrong. The first is the passage of the U.S. administration's One Big Beautiful Bill Act (OBBBA) in July 2025, which materially curtailed the Inflation Reduction Act's (IRA) wind and solar tax credit framework. Wind and solar facilities beginning construction after July 4, 2026, must be placed in service by December 31, 2027, to retain eligibility for the Section 45Y and 48E credits, effectively eliminating federal support for new development beyond a narrow two-year window. The repeal is projected to remove approximately $500 billion in subsidies over 10 years, with wind and solar the primary targets. The second is the outbreak of conflict involving Iran in February 2026, which has disrupted global energy supply chains, elevated oil and gas prices, and introduced fresh inflationary pressure into an environment where renewable development costs are already sensitive to interest rate levels.

Together, these developments present a genuinely dual-sided picture. The Iran conflict and the resulting disruption to global oil and gas supply chains have, in many respects, strengthened the long-term structural case for renewable infrastructure. Energy security has re-emerged as a first-order policy priority across governments that had previously framed the energy transition primarily as a climate imperative, and domestically generated renewable power is increasingly viewed as a strategic hedge against the supply volatility that hydrocarbon-dependent energy systems carry.

FIGURE 1

Unlisted Infrastructure Investment Across Sectors Has Risen Rapidly

Closed Infrastructure Transactions by Year & Sector



Source: Infralogic. Data as of April 2026. Includes announced and closed equity transactions across general partners and corporates and institutional investors.

Historical Trends in Renewable Allocation

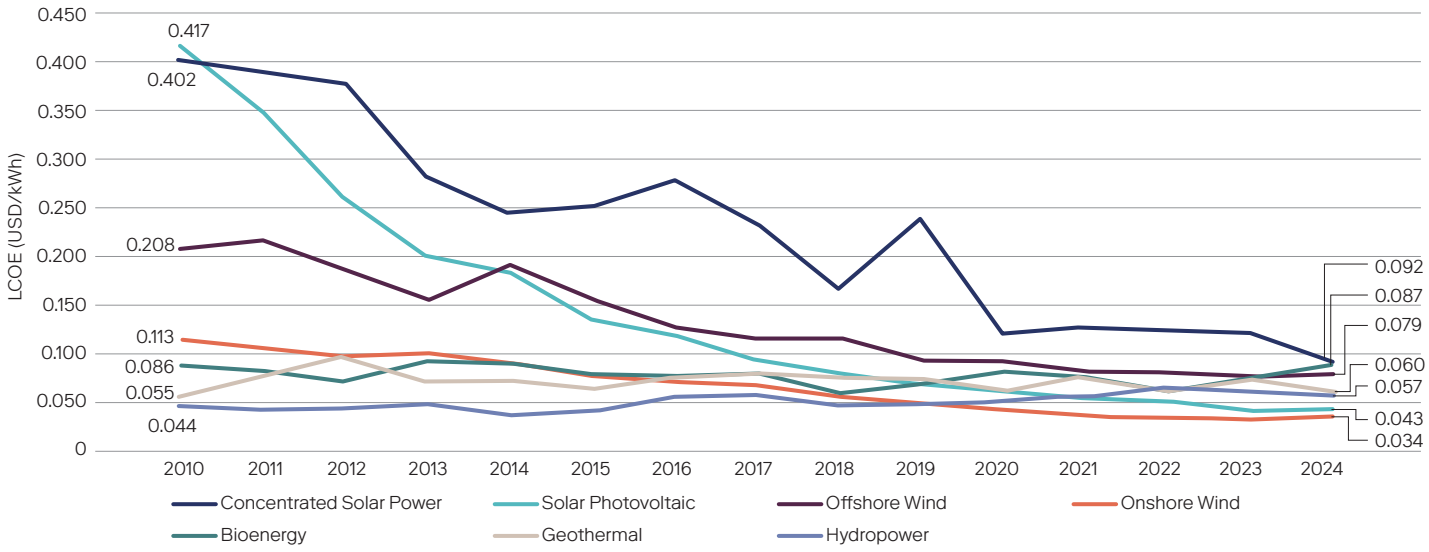
Renewable infrastructure concentration growth is a phenomenon largely of the past 15 years. Prior to 2010, wind and solar assets were largely the domain of development-stage companies and project finance lenders, with limited presence in the diversified unlisted infrastructure funds that institutional investors preferred. Policy support existed (feed-in tariffs in Germany, Spain and the U.K. were well established by the late 2000s), but deal flow was modest, technology costs were high and performance track records were thin.

Since 2010, the landscape has shifted dramatically. Three forces have driven the transformation. First, technology costs collapsed: utility-scale solar levelized cost of energy analysis (LCOE) fell by more than 90% between 2010 and 2024, and onshore wind by over 70%, fundamentally changing the economics of renewable development (see figure 2).

FIGURE 2

Renewable Technology Costs Have Collapsed

Renewable Energy LCOE Decline (2010 – 2024)



Source: IRENA, "Renewable Power Generation Costs in 2024", March 2025.

Second, policy frameworks matured and scaled: the EU Green Deal, REPowerEU, the U.K. Contracts for Difference (CfD) auction regime, and the U.S. IRA collectively deployed hundreds of billions of dollars in public support and created the long-term revenue certainty that infrastructure investors require. Third, ESG integration accelerated, with Sustainable Finance Disclosure Regulation (SFDR), Task Force on Climate-related Financial Disclosures (TCFD) and International Sustainability Standards Board (ISSB)-driven[1] disclosure frameworks creating institutional pressure to decarbonize real asset portfolios.

The result has been a steady upward march in renewable allocations. Unlisted infrastructure AUM has expanded rapidly over this period, growing at ~16% CAGR and rising from $183 billion in 2010 to $1.6 trillion in 2025. Deal flow into wind, solar, storage and grid modernization has accelerated in every consecutive year, with corporate power purchase agreements (PPAs) and hyperscaler-driven demand providing an additional demand catalyst beyond traditional utility offtake.

The historical trend is unambiguous: renewable infrastructure has moved from a niche to a core allocation, and the policy and demand environment suggests the structural tailwinds remain intact. The question is no longer whether to allocate, it is how much to allocate.

[1] **SFDR** is a European Union regulation introduced in March 2021 to improve transparency, combat greenwashing and promote sustainable investment. **TCFD** is a global framework created in 2015 by the Financial Stability Board to help companies disclose climate-related risks and opportunities. **ISSB** is an independent body established by the IFRS Foundation in 2021 to develop a global, standardized baseline for sustainability-related financial disclosures.

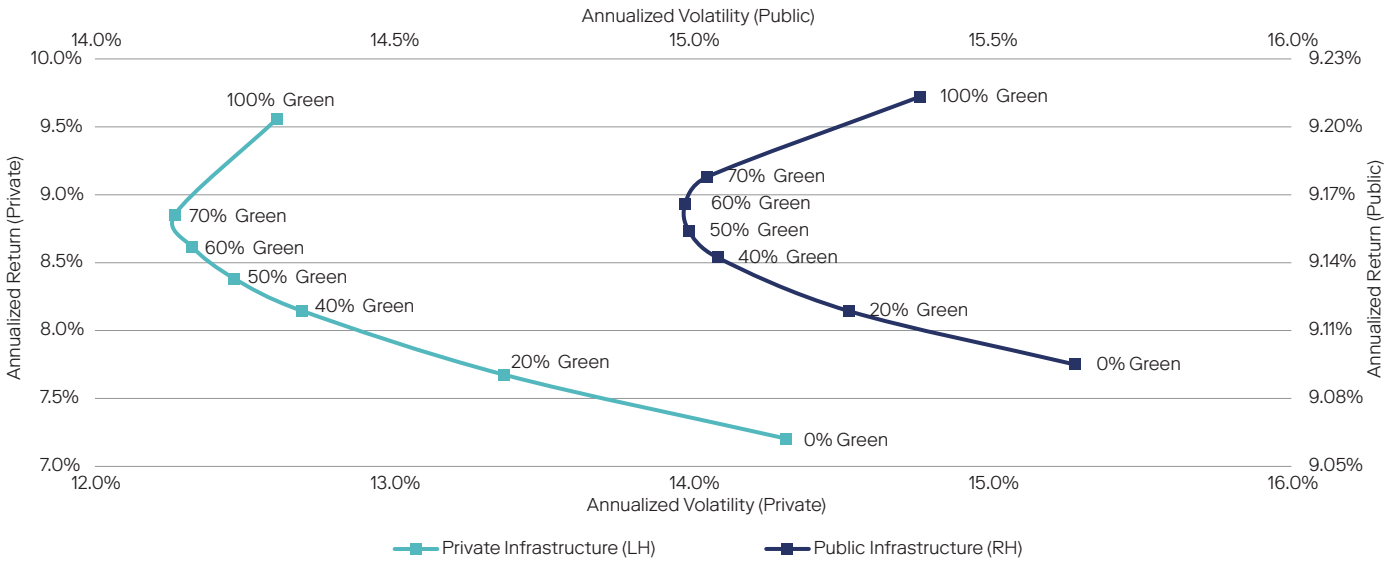
Portfolio Historical Performance with Varying Renewable Allocation (2017 – 2025)

The 2017 – 2025 period captures the modern era of renewable infrastructure investing, one characterized by policy maturity, technology cost deflation and accelerating institutional capital flows. Crucially, both public and private market data are available across this window, enabling parallel analysis across market structures and a direct comparison of how concentration risk manifests differently depending on how infrastructure is accessed.

FIGURE 3

Increasing Green Infrastructure Exposure Changes the Risk-Return Profile

Private/Public Infrastructure Portfolio Historical Performance (2017 – 2025)



Source: Neuberger, EDHEC and S&P Global. See important disclaimers and disclosures at the end of this document. The chart illustrates the return-risk profile of infrastructure portfolios as the allocation to green infrastructure increases from 0% (diversified) to 100%. Private and public infrastructure are shown separately, each tracing the historical risk-return profile across the green allocation spectrum. Private infrastructure is measured on the left axes, public infrastructure on the right. Both series use historical annualized returns and volatility. Estimates based on historical monthly returns from 01/31/2017 to 12/31/2025. The weight of Global Diversified at each point is calculated as 100% minus the percentage of the green index represented in the chart.

Private Green Infrastructure: represented by EDHEC InfraGreen®, which tracks the monthly performance of 100 unlisted infrastructure companies/projects (64% projects vs. 36% companies based on market cap, $15.61B market cap in total). Industrial breakdown is 100% renewable, with a strong focus on wind power generation (70.5%), complemented by solar (24.5%) and hydroelectric (5.0%) power. Geographically, the index has relatively limited U.S. exposure (7.63%) and is more heavily weighted toward the United Kingdom (21.55%), Australia (15.15%), Italy (10.17%), Spain (9.86%) and Ireland (8.61%).

Private Diversified Infrastructure: represented by EDHEC Infra300®, which tracks the monthly performance of 300 unlisted infrastructure companies/projects (26% projects vs. 74% companies based on market cap, $402.42B market cap in total), selected to form a representative sample across TICCS (The Infrastructure Company Classification Standard) categories from an underlying universe of over 9,100 firms in 27 countries. The index also has relatively limited U.S. exposure (10.35%), with larger weights in the United Kingdom (30.01%), France (21.77%) and Australia (13.73%).

Public Green Infrastructure: represented by Dow Jones Brookfield Global Green Infrastructure index, which comprises 54 listed pure-play infrastructure companies, each generating at least 70% of their cash flows from core infrastructure activities. Constituents are rigorously screened for sustainability and ESG standards and are weighted using a modified market-cap methodology. ESG-related constraints and economic factors drive constituent selection, supporting a global transition toward sustainable infrastructure solutions.

Public Diversified Infrastructure: represented by S&P Global Infrastructure index, which comprises 74 listed infrastructure companies, each selected to represent the global listed infrastructure industry while maintaining high liquidity and tradability. The Index supports diversified investment across essential sectors and geographies, maintaining stringent standards for liquidity and tradability.

As shown in figure 3, increasing green infrastructure exposure changed the historical risk-return profile of both private and listed infrastructure portfolios, but through different channels. In private infrastructure, greater green exposure was historically associated with improved return and volatility outcomes across most of the allocation range, with the efficient point in our sample falling at a relatively high green weight of roughly 70%. In listed infrastructure, the benefits were more limited, which may reflect higher common exposure to public-market factors and stronger correlation between listed green and diversified infrastructure, as shown in figure 4.

We would caution, however, against reading the ~70% as the optimum green allocation in the private market. We believe a more conservative target of 50 – 60% is the more defensible planning range, for two reasons. First, the private benchmark carries limited U.S. exposure, so the precise location of the optimum is sensitive to benchmark construction and may not translate to a U.S.-oriented mandate. Second, as decarbonization continues, the diversified benchmark is itself likely to carry progressively more renewable exposure, which should reduce the incremental dedicated green allocation needed to capture diversification benefits over time. A 50 – 60% range also sits closer to the more modest benefit observed in the listed series, lending additional consistency across the two perspectives.

Taken together, we read the data as supporting a substantial but capped green allocation (on the order of 50 – 60%) that captures the bulk of the historical diversification benefit while leaving headroom against data uncertainty, geographic concentration and a benchmark that is itself greening. The ~70% sample optimum is best understood as a historical reference point rather than a forward-looking target.

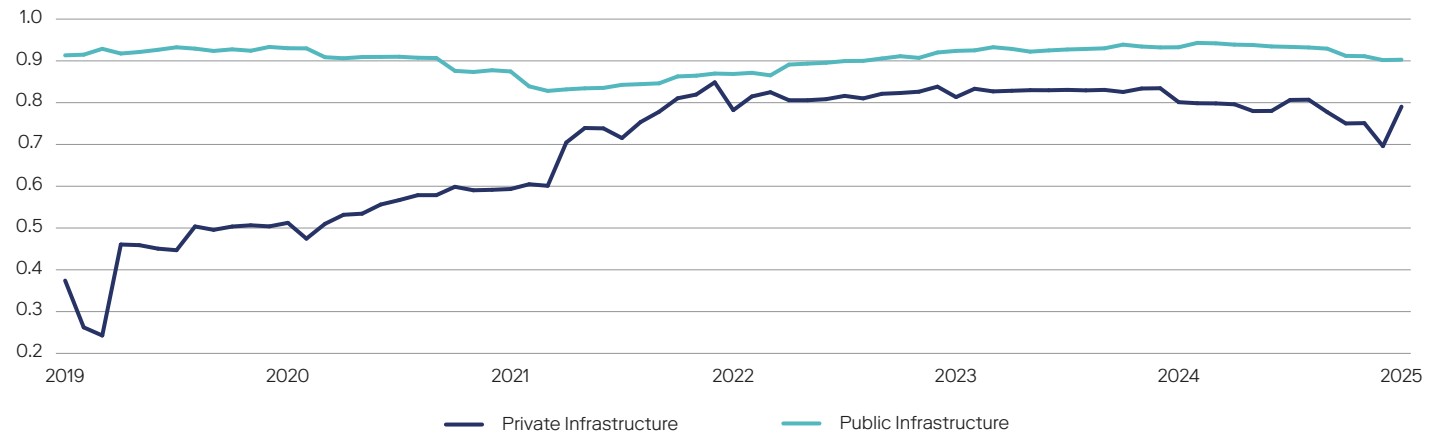
Rolling Correlations Between Green Infrastructure and Diversified Infrastructure

The rolling correlation between green and diversified infrastructure differs markedly across public and private markets, with important implications for portfolio diversification. In listed infrastructure, the correlation remained persistently high throughout the period, generally in the 0.85 – 0.95 range, suggesting that listed green and diversified infrastructure assets were influenced by common public-market factors, including interest-rate sensitivity, equity-market sentiment and macro conditions. Private infrastructure tells a more nuanced story: the 3-year rolling correlation was initially much lower than the listed-market correlation and gradually converged toward 0.75–0.85 between 2023 and 2025 as renewable energy became a more mainstream private infrastructure category. Despite this convergence, the private-market correlation remained below its listed-market counterpart over the period analyzed, suggesting that green and diversified private infrastructure benchmarks offered more differentiated return patterns. However, this comparison should be interpreted with caution given differences in benchmark composition, geography and valuation methodology.

FIGURE 4

Green and Diversified Private Infrastructure Offers More Independent Return Streams

Green vs. Diversified Infrastructure: 3-Year Rolling Correlation Across Public and Private Markets



Source: Neuberger, EDHEC and S&P Global.

Allocation Observations

In considering how renewable concentration has affected portfolio outcomes historically, the analysis shows that portfolios with a balanced mix of renewable and diversified infrastructure delivered the strongest risk-adjusted results across the metrics evaluated, although the pattern differed between public and private markets. In addition, the annualized returns observed across both the public and private index comparisons sit below those typically associated with value-add infrastructure, so the findings are better understood as observations based on the definitions, composition and behavior of the indices used in the study.

Crucially, the analysis also highlights the continuing role of diversified infrastructure—utilities, transport, gas and digital—in supporting inflation linkage, dispatchable power exposure and differentiated return drivers. It further suggests that, within the renewable sleeve, sub-sector and geographic composition remain important considerations in assessing overall portfolio outcomes.

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BB0121 06/26 IQ-001910