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THE NEXT PHASE OF ENERGY TRANSITION INVESTING: BUILDING AND INDUSTRIAL DECARBONISATION

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THE NEXT PHASE OF ENERGY TRANSITION INVESTING: BUILDING AND INDUSTRIAL DECARBONISATION

Energy Efficiency and Behind-the-Meter Assets:
Fixed, Liability-Matching Cash Flows for Institutional
Infrastructure Portfolios

ABSTRACT

Increasing cash flow volatility is reshaping the risk-return and asset-liability matching characteristics of energy transition investments. Shorter contract durations and merchant price exposure in utility-scale renewables create portfolio diversification considerations for institutional investors seeking stable, contracted infrastructure returns. Behind-the-Meter and Energy Efficiency assets to decarbonise European buildings and industry offer a complementary allocation within energy infrastructure portfolios, delivering long-term, contracted cash flows backed by essential building services and shielded from power price volatility.

With buildings accounting for 40% of the EU's energy consumption, a €150+ billion annual funding gap exists to meet regulatory mandates (EPBD, ETS2) and reduce energy dependence. For institutional investors, the convergence of structural demand and regulatory tailwinds create an opportunity to maintain a de-risked energy transition allocation that supports European climate, competitiveness and energy security goals.

Author: Sebastian Carneiro

Co-Author: Christina Hounisen

Maintaining the Infrastructure Premium in an Evolving Asset Class

The infrastructure investment case for utility-scale renewables is changing. This creates a strategic opening for institutional investors to capture the next wave of energy transition growth, whilst preserving liability-matching, low-volatility characteristics.

From Contracted to Merchant: The shifting Economics of Utility-Scale Renewables

Utility-scale Renewables (e.g. wind and solar parks) and Battery Energy and Storage Systems (BESS) have long been core infrastructure allocations, attracting significant investments over the past decade¹. While this trend will continue as demand for clean energy rises to power European data centres and electrification, investors are observing a 'new normal' of renewables-dominated electricity markets increasingly defined by power price volatility, changing contract structures, and higher interest rates.

For several decades, utility-scale renewables offered predictable returns through 15-25year government Feed-in-Tariffs (FITs) or long-term corporate Power Purchase Agreements (PPAs) that eliminated electricity price risk. Today's reality looks markedly different:

- Contracts are shifting to "Pay-as-Nominated" structures (off-takers pay only for actual demand);
- PPA durations are trending below 7-10 years²;
- Market-linked pricing mechanisms are replacing fixed rates, introducing merchant price exposure and volume risk.

These contractual changes are compounded by a market paradox: as renewable penetration increases – accounting for 50% of total EU electricity supply in 2024³ – scale creates its own complexities. Rapid deployment without adequate storage has triggered price volatility, with negative price events reaching record frequency in 2025⁴. Grid infrastructure has not kept pace – transmission bottlenecks force curtailment, whilst 2,500 GW of renewable projects including BESS remain stuck in global grid queues⁵. This ultimately leads to lost revenue for asset owners while stressing the need for adopting an 'energy-as-a-whole'-approach to energy transition investing.

¹ IEA, World Energy Investment 2025

² Pedretti & Pexapark, 2025, 'Next Gen IPP Playbook' (Pexapark 2025)

³ IEA, World Energy Investment 2025, p. 197

⁴ Farhat, 'Europe Saw Record Surge in Negative Power Prices in 2025' (Bloomberg, 5 January 2026)

⁵ IEA, Electricity Report 2026, p. 46

When Energy Transition Infrastructure Starts Behaving Like Private Equity

These structural changes affecting utility-scale renewables—evolving PPA structures, power price volatility, and higher refinancing costs—have fundamentally altered the investment proposition of supply-side infrastructure. Independent power producers (IPPs) are evolving from passive "build-and-hold" strategies to active energy platforms that increasingly resemble utilities⁶.

As energy investment experts, Gerard Reid and Laurent Segalen, note on their podcast "Redefining Energy", renewable energy infrastructure is increasingly gaining private equity characteristics – with IPPs turning into specialised, customer-centric platforms where value comes from trading portfolios and managing risk, not simply electricity generation. This evolution moves the asset class away from its traditional infrastructure characteristics: contracted cash flows backed by essential services with limited operational complexity are being replaced by merchant exposure, active management requirements, and revenue optimisation through sophisticated trading operations⁷.

Gerard Reid in Episode 213 'Big Funds, Bigger Bets – Inside Infrastructure's Power Shift':



"The game in renewables has been all infrastructure and now [...] they (red. private equity firms) are going in and creating the platforms that are actually suitable for managing these new renewables assets going forward, and they require and they get a higher return for what they are doing"

– Gerard Reid (ep. 213, 28:25)

While utility-scale renewables remain central to the energy transition, this shift towards private equity-style bundling of assets across geographies and technologies combined with trading rooms, fundamentally alters the risk-return profile institutional investors have historically associated with renewable energy infrastructure. The challenge for institutional investors becomes fulfilling energy transition allocation targets whilst preserving liability-matching, low-volatility cash flows.



Ultimately, this presents an opportunity for investments in Energy Efficiency and Behind-the-Meter assets which maintain these infrastructure asset class attributes, while offering exposure to a critical pillar of Europe's energy transition: building & industrial decarbonisation.

⁶ Pedretti & Pexapark, 2025, 'Next Gen IPP Playbook' (Pexapark 2025)

⁷ Redefining Energy, 'Big Funds, Bigger Bets: Inside Infrastructure's Power Shift' (ep 213, 26 January 2026)

The Structural Alternative: Energy Efficiency and Behind-the-Meter as a De-Risked Allocation

On the other side of the system (the 'demand side') stands an underfunded energy transition asset class, yet central to achieving Europe's climate and energy security targets. The decarbonisation of buildings and industrial facilities – through Energy Efficiency (EE) and Behind-the-Meter (BTM) assets – represents the third pillar of the energy transition.

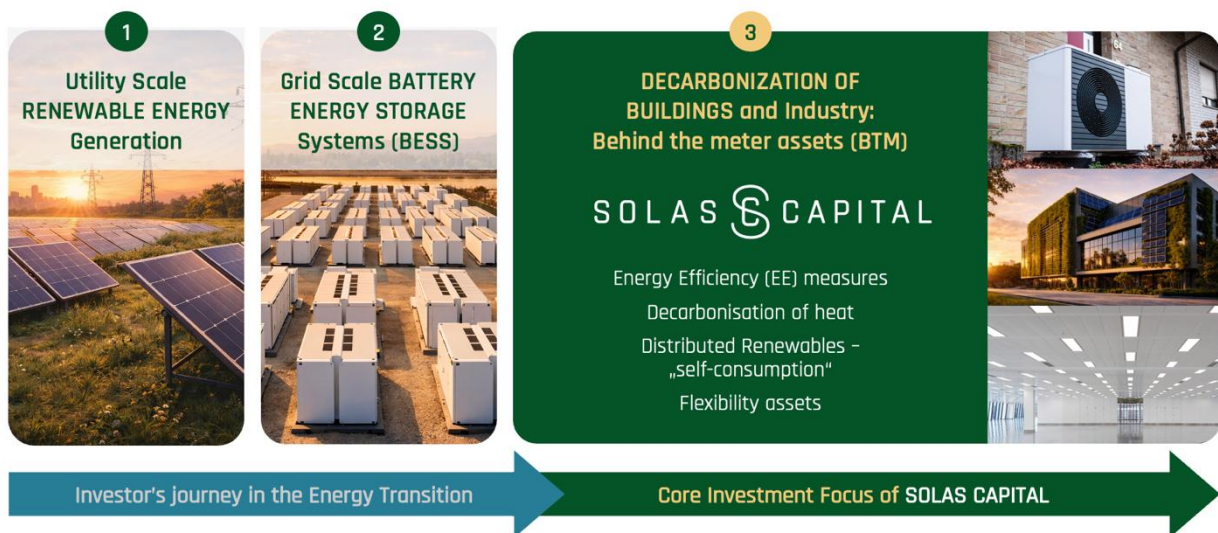


Figure 1: Graphic Illustration by Solas Capital.

As a de-risked allocation with fixed-income type returns, this asset class presents a strategic complement to traditional utility-scale renewables with diversification effect in investor portfolios due to several advantageous attributes:

- **No correlation to wholesale power markets:** EE/BTM assets are placed on the demand side of the system, insulated from electricity price risks while bypassing congested grids entirely;
- **Asset-backed, liability-matching cash flows:** The project financing model for EE/BTM assets provide long-term contracted cash flows (8-15 years) backed by essential building services;
- **Regulatory tailwinds creating structural demand:** EU mandates (EPBD 2024, ETS2 from 2027) drive deployment, supported by strong political energy security and price stability priorities.

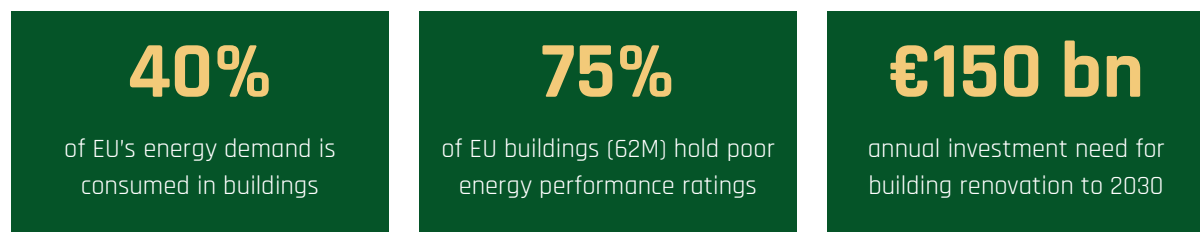
The €150 Billion Investment Opportunity Behind the Meter

Decarbonising EU's building sector presents a €150+ billion annual investment opportunity with structural demand driven by binding EU regulation and energy security priorities.

Energy efficiency remains the most cost-effective solution for reducing energy use and emissions: for every €1 invested, Europeans save an estimated €12 over time through proven technologies like heat pumps, building management systems (BMS), and envelope renovation⁸. Despite short payback periods, limited information and high upfront costs leave building renovation rates at just 1% annually— with 75% of Europe's building stock remaining energy inefficient⁹.

The EU's Energy Performance of Buildings Directive (EPBD) mandates energy efficient residential and non-residential buildings to achieve an 11.7% reduction in energy consumption by 2030¹⁰.

With Europe's building sector accounting for 40% of the EU's energy consumption and 50% of the block's gas consumption used to heat, cool and operate buildings, sector decarbonisation is critical for reducing energy dependence and ensuring the competitiveness of European businesses – top pan-European priorities.



This creates a €150+ billion annual investment gap through 2030 to meet EPBD mandates¹¹ – representing substantial deployment opportunities for institutional capital into an underfunded segment of the energy transition, and supported by a clear, pan-European political commitment.

EU Energy Commissioner, Dan Jørgensen, at the IEA 10th Global Conference on Energy



“To fight climate change, to provide our citizens with clean and affordable energy, and for our security, energy efficiency must be at the center of everything we do”

– Dan Jørgensen, EU Energy Commissioner

⁸ European Commission, [Energy efficiency awareness](#)

⁹ European Commission, Directive 2024/1275 (EPBD)

¹⁰ Ibid.

¹¹ European Commission, [Funding the future: EU's building renovation push | BUILD UP](#)

Buildings Becoming Active Energy System Participants

Beyond the regulatory mandate, buildings represent a technology-enabled infrastructure investment at the centre of Europe's electrification agenda, evolving from passive real estate assets to active platforms within the energy system. By leveraging digitalisation, advanced storage technologies, and on-site generation, buildings can now generate, store, and flexibly consume energy—transforming traditional brick-and-mortar holdings into distributed energy infrastructure and potential profit centres that sell surplus power back to the grid. Buildings become Prosumers.



Figure 2: AI-generated picture by Solas Capital.

This technology-enabled positioning directly addresses Europe's most critical energy transition challenge: grid infrastructure expansion has not kept pace with renewable energy generation, creating forced curtailment and price inefficiencies that leave the EU with substantially higher electricity costs than other major economies¹². Rather than waiting for lengthy grid expansion, building-level EE/BTM installations deliver immediate system benefits by reducing demand at the point of consumption, capturing value from local renewable generation, and providing distributed flexibility to balance variable output—alleviating pressure on transmission infrastructure.

Combined non-energy charges accounting for a growing share of energy bills¹³, i.e. grid fees comprise up to 25% of electricity costs in countries like Germany¹⁴, on-site generation and efficiency measures directly support industrial competitiveness and affordability through reduced energy costs.

¹² IEA, World Energy Investment 2025

¹³ IEA, Electricity Report 2025

¹⁴ IEA, Germany Energy Policy Review 2025

Behind-the Meter Energy Infrastructure: Technologies and Business Models

EE and BTM investments offer fixed cash flows shielded from wholesale electricity prices through long-term service contracts backed by essential building services.

EE and BTM projects deploy commercially proven technologies that have delivered reliable performance for decades. These technical interventions fundamentally reduce energy consumption across buildings, industrial processes, and infrastructure systems, while lowering utility bills and improving the indoor climate (better air quality, lighting etc.).

Core Solutions include:

- **Advanced HVAC (heat, ventilation, A/C) & Heat Pumps:** Industrial and residential heating systems achieving 300-450% efficiency versus fossil fuel alternatives.
- **Building Management Systems (BMS):** Intelligent controls optimising energy consumption in real-time based on occupancy, weather patterns, and grid signals.
- **On-site PV generation and battery storage:** Rooftop solar for self-consumption use commercially optimised with behind the meter battery solutions.
- **Efficient Lighting & Industrial Equipment:** LED systems and modern industrial machinery like electric motors and pumps cutting electricity consumption by 50-80%.

CASE STUDY

Solas Capital's Partnership with Signify - the World's Leading Lighting Company

Multiple European Markets | Light as a Service | Energy Reductions: 50-80%

Formerly known as Philips Lighting, Signify (Euronext: LIGHT) is the world's leading lighting company – with €6.1 billion in revenues, a presence in over 70 countries, and eight consecutive years in the Dow Jones Sustainability World Index. Solas Capital's framework agreement with Signify reflects our strategy of pairing proven technology with blue-chip counterparties – while supporting European energy security and competitiveness priorities. The partnership further diversifies our project partner portfolio, applying the same structured financing model that has proven effective across Solas Capital's broader platform to accelerate deployment of a best-in-class, cost-effective EE technology.



The Technology

Signify is a recognised world leader in lighting, offering innovative LED solutions and connected lighting (LED, communication devices, sensors etc.). LED retrofits are among the most commercially proven energy efficiency interventions available: electricity consumption reductions of 67% versus conventional lighting, documented across thousands of commercial and public sector installations, with no operational disruption and a short payback profile. This translates into CO₂ savings of approx. 800 tons per €1 million invested.

The Financing Mechanism: Energy-as-a-Service Models

Despite proven technology and straightforward economics, building owners face a critical obstacle: upfront capital requirements. A single building operator, industrial company, or municipality often lacks the financial capacity to fund comprehensive energy upgrades—even when payback periods are attractive.

The Solution: Energy-as-a-Service (EaaS) models eliminate this barrier by transforming future energy expenditures into immediate savings which then finance the infrastructure upgrades. Building owners enter fixed-price service contracts with **Energy Service Companies (ESCOs)** where guaranteed energy cost reductions provide the cash flows to repay the equipment investment—whilst simultaneously reducing operational costs and environmental impact.

What makes such projects especially attractive from an investor perspective is that cash flows from underlying project contracts are predominantly fixed, measured, and guaranteed through the contractual arrangements between the ESCO and end-customer.

Under these models:

1. Specialised ESCOs finance, install, and maintain all equipment
2. Building owners pay zero upfront costs—instead signing long-term service agreements (8-15 years) with the ESCO
3. Fixed service fees are contractually set below current energy costs—guaranteeing immediate savings for the customer
4. All technical, performance, and maintenance risks transfer to the ESCO—ensuring guaranteed outcomes

A typical project structure looks like this:

Customer Perspective		EaaS Provider Perspective	
Energy costs before EE measure	EUR 50k p.a.	Investment costs for EE measure	EUR 50k
Energy costs after EE measure	EUR 25k p.a.	Fixed quarterly payment from customer	EUR 5k (EUR 20k p.a.)
Fixed quarterly payment to EaaS provider	EUR 5k (EUR 20k p.a.)	Financing costs p.a. (6% annuity over 5 years) = Investment vehicle gross return	EUR 14,420
Contract term	5 years	Maintenance costs p.a.	EUR 1k
Savings p.a.	EUR 5k (=50k-25k-20k)	EaaS provider profit p.a.	EUR 4,580 (=20k-14,420-1k)
Customer savings over the entire contract term	EUR 25k	EaaS profit over the entire contract term	EUR 22,900

Table 1: Calculation example for a typical EE project with a service contract.

This model creates a win-win-win structure:

- **Building owners:** Zero capital outlay, immediate cost savings, guaranteed performance
- **ESCOs:** Long-term contracted revenue, profitable service margins
- **Institutional investors:** Predictable cash flows backed by essential building services

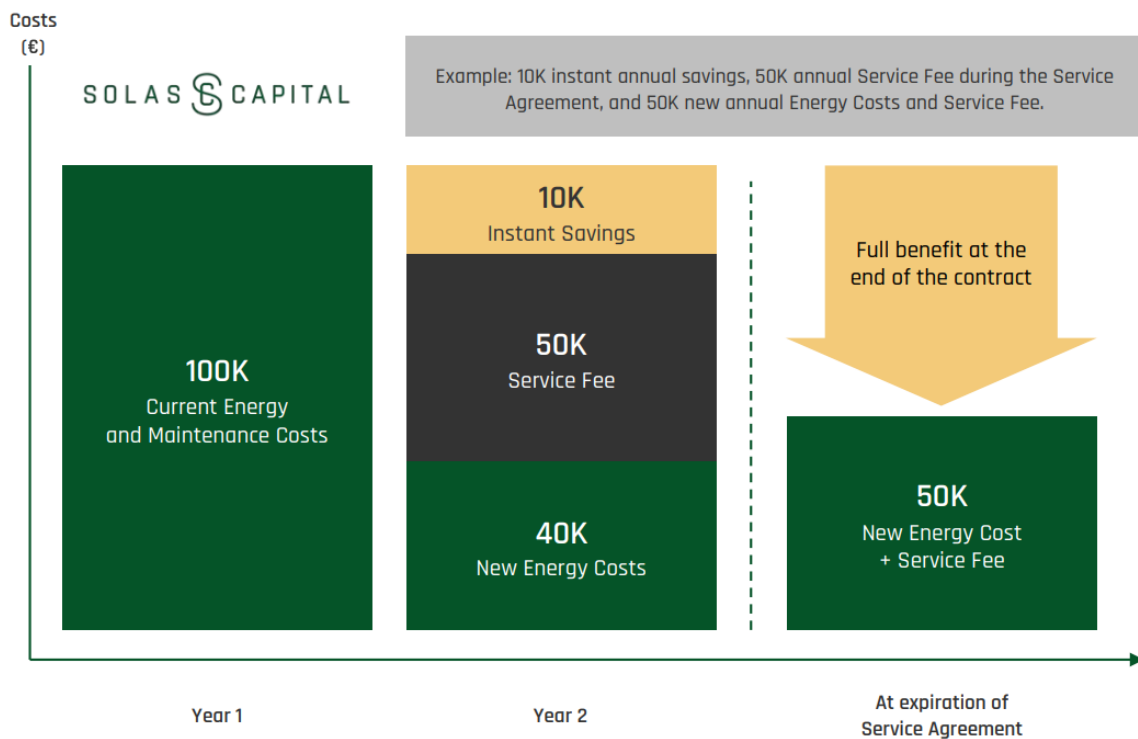


Figure 3: Illustration of customer savings achieved through the EaaS model.



Solas Capital acts as the bridge: By understanding both the funding needs of project partners and requirements of investors, we are the financial intermediary, providing the necessary project funding for ESCOs to install integrated decarbonisation solutions across building facilities. In turn, investors get an infrastructure quality and EU-Taxonomy eligible allocation with fixed-income type returns.

EE & BTM Assets: Distinct Infrastructure Debt Characteristics

EE and BTM investments benefit from long term and fixed cashflows and are ideal to be structured as an asset-backed, private credit strategy with fixed-income type returns, distinct from utility-scale renewables and conventional corporate lending.

While utility-scale renewables are central to achieving Europe's climate and energy independence targets, the increased exposure to volatile power prices alter their fit within infrastructure portfolios traditionally constructed around predictable, asset-backed cash flows.

For institutional investors, adding EE and BTM assets provide a strategic opportunity for maintaining a resilient energy transition allocation that delivers regular pay-outs without market price risk due to their distinct characteristics:

- **Cash Flow Predictability:** 8-15-year service agreements with fixed, fully amortising offtake structures align naturally with pension fund and insurance company liability profiles, whilst fixed contractual structures and the placement of assets behind the meter eliminate exposure to wholesale power price fluctuations.
- **Seniority of Payment:** The "bill for heat" sits at the top of payment hierarchies for both corporate and residential obligations. Energy for heating, cooling, and industrial processes is non-discretionary—these are the last services to be cut by building occupants during economic downturns, which creates resilient cash flows.
- **Asset-Backed Security with Proven Performance:** Physical equipment (heat pumps, solar installations, BMS systems) provides tangible collateral, with performance guaranteed by the ESCO, while the energy savings potential is not weather dependent.

Core differentiators between EE/BTM and utility-scale renewable infrastructure are:

Dimension	EE & BTM Assets	Utility-Scale Renewables
Cash Flows	<ul style="list-style-type: none"> o Fixed, contracted payments, independent of energy prices 	<ul style="list-style-type: none"> o Merchant-exposed, PPA structures, resource variability
Return Drivers	<ul style="list-style-type: none"> o Interest + amortization, high predictability 	<ul style="list-style-type: none"> o Equity cash yields + merchant tail + residual asset value
Duration	<ul style="list-style-type: none"> o Short-medium term (4-15 years) 	<ul style="list-style-type: none"> o Long-term (15-25+ years)
Construction Risk	<ul style="list-style-type: none"> o Low; financing typically occurs post-commissioning 	<ul style="list-style-type: none"> o Common; EPC and integration risk significant
Technology Risk	<ul style="list-style-type: none"> o Minimal; standardized technologies with ESCO performance guarantees 	<ul style="list-style-type: none"> o Long-term performance dependent (weather, degradation)
Regulatory Exposure	<ul style="list-style-type: none"> o Low; no planning permission needed for building upgrades 	<ul style="list-style-type: none"> o Medium-high; sensitive to tariffs, permitting, & PPA renegotiation
Portfolio Construction	<ul style="list-style-type: none"> o Granular diversification (hundreds of assets) 	<ul style="list-style-type: none"> o Concentrated (10-25 large assets)

Table 2: EE/BTM renewables vs. traditional infrastructure/utility-scale renewables.

Critically, these investments share infrastructure insulation from economic cycles: building occupants prioritise energy payments even during downturns, providing the cash flow stability that defines defensive infrastructure allocations.

Political Tailwinds: Why Building Decarbonisation Merits Portfolio Allocation

Europe's policy landscape has made building decarbonisation a structural investment priority. Four converging forces – energy security, the European Performance of Buildings Directive, and carbon pricing – underpin the long-term case for institutional capital allocation.

Driving Force 1: The Dual Imperative - Energy Security and Economic Competitiveness

The 2022 energy crisis fundamentally reshaped Europe's strategic priorities. Wholesale gas and electricity prices reached historic levels, with industrial electricity prices rising from €132/MWh in 2020 to €238/MWh by the second half of 2022. Household prices mirrored this trajectory, peaking above €500/MWh in several Member States including Germany, while household gas prices remained almost twice pre-crisis levels into 2023. The crisis exposed the bloc's dependence on fossil fuel imports whilst leaving industrial energy costs 2-4 times higher than those of its main trading partners, posing a threat to European competitiveness¹⁵.

- RePowerEU was launched in direct response, establishing energy efficiency in buildings as central to solving Europe's affordability and competitiveness challenge;
- The initiative targets 30 million heat pumps by 2030, alongside ambitious building renovation and rooftop solar mandates.
- In Germany, current heat pump installations already reduce gas imports by 8.4 billion cubic metres annually¹⁶, corresponding to more than 10% of the country's total natural gas imports in 2023¹⁷.

Yet the challenge persists. According to the IEA's Electricity 2026 report, EU household electricity prices rose 36% on average from 2019-2024—faster than inflation and incomes in many countries—whilst average industrial costs remain roughly double those in the United States, a competitiveness gap that continues to pressure energy-intensive sectors¹⁸.

IEA Executive Director Dr. Fatih Birol on IEA's Energy Efficiency 2025 Report:



"Energy efficiency has the power to enhance people's lives and livelihoods through greater energy security, more affordable bills, improved economic competitiveness and lower emissions"

The IEA's conclusion is direct: more flexible and efficient use of existing energy infrastructure is essential to contain system costs and deliver savings for consumers. This makes buildings emerge as a central part of the solution as every kilowatt-hour saved at building level relieves pressure on strained grids whilst lowering energy costs.

¹⁵ European Commission, 'Energy Prices and Costs in Europe' (February 2025)

¹⁶ Bundesverband Wärmepumpe, Market statistics 2024

¹⁷ IEA, Germany Energy Policy Review 2025

¹⁸ IEA, Electricity Report 2026

Driving Force 2: The EPBD – A Regulatory Mandate for Building Renovation

The revised Energy Performance Buildings Directive from 2024 requires the phase-out of on-site emissions from fossil fuels for all new buildings in the EU – by 2028 for publicly-owned buildings and by 2030 for all others¹⁹.

Specific requirements include:

- **Solar-ready Buildings:** Where technically and economically feasible, larger new non-residential buildings from 2027 and all new residential buildings + covered parking spaces from 2030 should be equipped with solar technology.
- **Buildings as Prosumers:** Buildings should be able to respond to external market signals and adjust their energy consumption, generation or storage accordingly, thereby acting as prosumers – the dual role of producing and consuming energy – providing flexibility to the grid.
- **Minimum Energy Performance Standards:** The worst-performing 16% of non-residential buildings must be upgraded by 2030 and 26% by 2033, whilst residential buildings must achieve a 16% reduction in average primary energy use by 2030 and 20-22% by 2035 – effectively setting a compliance clock for building owners across the EU.

Germany exemplifies the investment opportunity: With 75% of residential buildings still relying on fossil fuels for heating, the country faces a €60-65 billion annual investment requirement through 2030, totalling €400-600 billion by 2045²⁰ (see our White Paper on Germany's renovation challenge).

Driving Force 3: ETS2 - Carbon Pricing as a Market-Driven Efficiency Mandate

Starting January 2027, the EU Emissions Trading System 2 (ETS2) extends carbon pricing to the buildings and transport sector through the Directive (EU) 2023/959:

- With CO₂ prices projected at €45-55/tonne by 2030²¹, an EE Class G apartment will face €800-€1,200 higher annual costs than an EE Class B unit – a gap will widen as prices increase toward 2030 and beyond.

With ETS2, price signals will become self-reinforcing across the buildings sector, creating a market-driven renovation mandate that compounds every passing year – strengthening the investment case for Energy-as-a-Service models operating across the European building stock.

¹⁹ European Commission, Directive 2024/1275 (EPBD)

²⁰ EU Building Stock Observatory, Country Factsheet Germany 2024

²¹ European Commission, 'Proposal for Social Climate Fund' COM(2021) 551 final

Driving Force 4: Banking Regulation and Transition Risks in Real Estate Portfolios

Banking regulation is explicitly targeting energy efficiency in buildings, making the energy performance of real estate assets an active risk management and disclosure obligation. EU banks subject to the Capital Requirements Regulation (CRR) and Capital Requirements Directive (CRD) are now required under the **EU Pillar 3 ESG disclosure framework** to publicly report the EU Taxonomy justification of their real estate loan portfolios through the Green Asset Ratio;

- **Green Asset Ratio:** Qualifies mortgage exposures as taxonomy-eligible only where the underlying property achieves Energy Performance Class A or falls within the top 15% of national building stock by energy performance²².

In addition, the European Banking Authority's (EBA) **Guidelines on ESG Risk Management** applying from January 11, 2026 further requires these institutions to integrate transition risk into their credit risk frameworks – with the energy performance of buildings expected, where relevant, to be reflected in the default risk assessments of borrowers and collateral valuations²³.



With research already showing that energy inefficient buildings face valuation discounts – energy efficient buildings enjoy sale price premiums ranging from 3% to 15% in residential buildings and 13% to 20% in commercial buildings²⁴ – banks and other financial institutions have a strong incentive to improve the energy efficiency ratings of their mortgage portfolios.

²² European Commission, EU 2021/2139

²³ EBA, Final Guidelines on the Management of ESG Risks 2025

²⁴ IEA, Asset Values 2025

From Investment Case to Portfolio Allocation: Accessing Building Decarbonisation with Solas Capital

For institutional investors seeking to diversify their energy transition infrastructure portfolios, building decarbonisation delivers contracted, liability-matching returns from an asset class underpinned by strong regulatory tailwinds. Translating this diversification opportunity into a scalable portfolio allocation requires a partner with market access, technical expertise, and a proven aggregation model.

Individual EE and BTM projects remain too small for direct institutional deployment, whilst the technical complexity demands specialised evaluation capabilities that most investors lack. As experts in the Energy-as-a-Service business model with Europe's largest investment team dedicated to energy efficiency financing, Solas Capital bridges this gap through our specialised strategy:

- **Market Access:** Established relationships with 15+ leading ESCOs across European markets provide pipeline visibility and proactive capital deployment;
- **Aggregation & Diversification:** Aggregation of hundreds of individual projects across geographies, SMEs, residential houses, large corporates, and public sector lowers risk. To date, our strategy has financed 4,500 projects across 9 European countries;
- **Technical Expertise:** Deep understanding of both funding needs and technical requirements for building and industrial decarbonisation, with ongoing performance monitoring ensuring portfolio performance;
- **EU-Taxonomy Alignment:** Investments aligned with the Sustainable Finance Directive's (SFDR) Article 9 / Dark Green fund classification deliver measurable, verified emissions reductions that investors with sustainability mandates look for.

With Solas Capital as the investment advisor, institutional investors can access building decarbonisation projects through a single relationship—capturing infrastructure-quality returns with EU-Taxonomy eligibility. This positioning allows investors to advance and capture the growth of Europe's energy transition whilst preserving the contracted, low-volatility cash flow characteristics that match institutional liabilities.

CASE STUDY

Partnership with PAUL Tech AG Finances Energy-Efficient Heating in Germany

Germany | Heating as a Service | Energy Reductions 20-40%

Recognised as a best practice of energy efficiency financing by the European Investment Bank, Solas Capital's partnership with PAUL Tech AG illustrates both the scalability of the Heat-as-a-Service (HaaS) financing model and the depth of the opportunity. PAUL Tech's patented technology optimises the heating systems of existing building, and from our initial financing agreement in 2023, we have now scaled the funding to cover more than 85'000 residential units – making this one of our most significant partnerships to date.



The Technology

PAUL Tech AG uses AI-driven, software-operated hydraulic balancing to optimise water flow within existing heating infrastructure.

The autonomous PAUL-AI collects data and manages the valves in the pipes of the hot water recirculation system on-site and ensures the system remains in constant real-time balance, allowing the temperature to be reduced from the standard 70°C to as low as 53°C. The installation reduces energy consumption by 20-40% while delivering substantial cost savings for tenants. The full PAUL NetZero solution integrates high-efficiency heat pumps and optional PV – moving buildings from energy class E to A (see example below of a financed project).

The Structure

PAUL Tech enters long-term service contracts with real estate customers, removing all upfront costs for installation due to the HaaS contract model. As the installation requires no structural alteration to the buildings, projects can be commissioned within 8 weeks, without interrupting ongoing building operations.

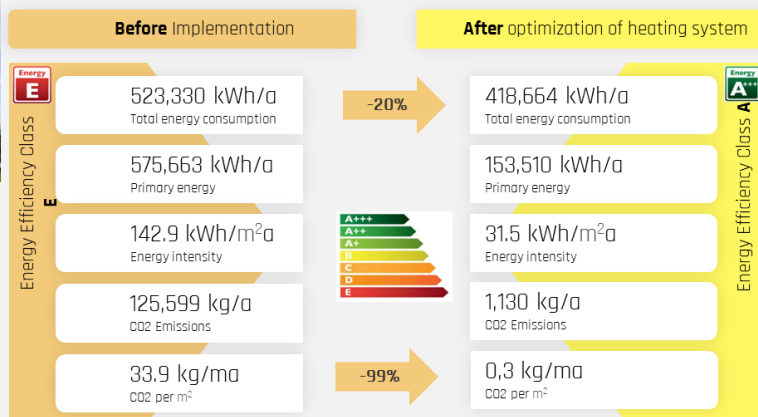
Through established B2B channels with property managers, PAUL Tech can deliver scalable, rapid deployment across Germany's fragmented residential market, which presents a €400-600 billion retrofit opportunity through 2045, driven by the need to transition 75% of buildings that still rely on fossil fuel-based heating.

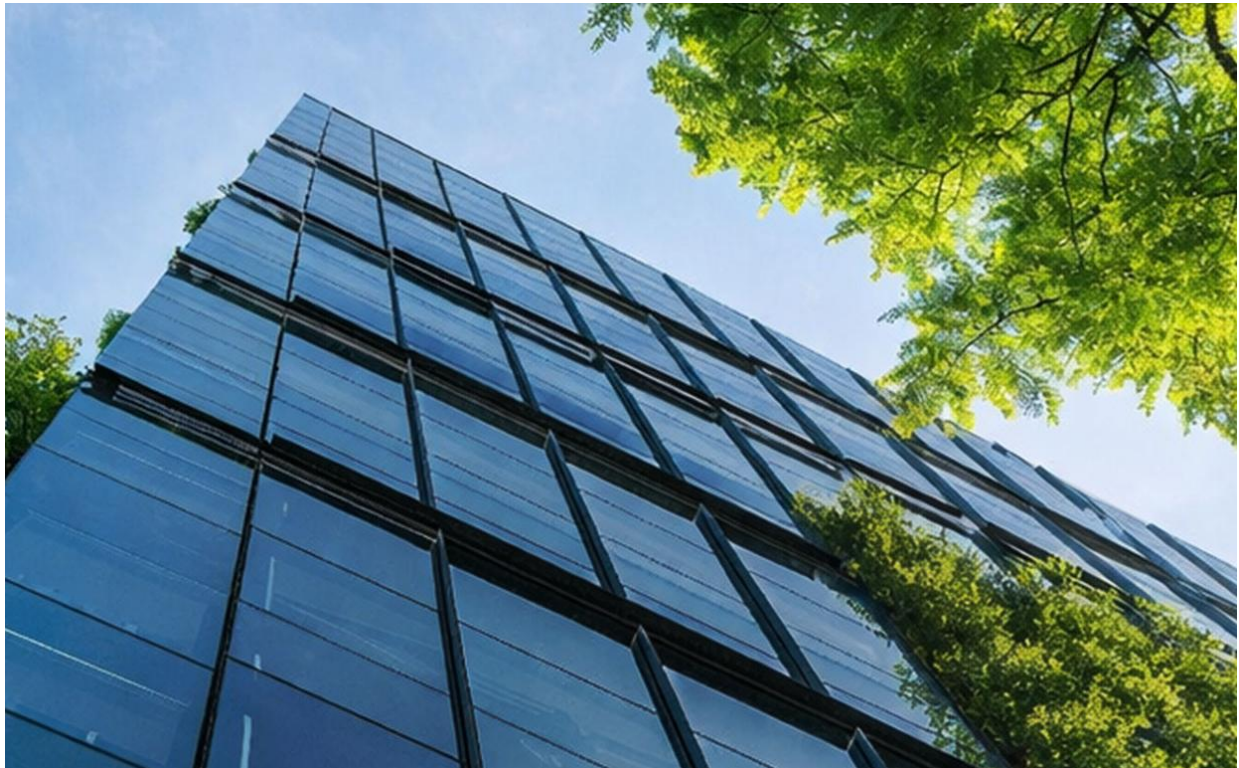
Solas Capital x PAUL Tech: Max-von-Laue Strasse, Remscheid, Germany



Building data, construction year: 1962

Total living space	3,696 m ²
Number of buildings/units	3 / 54
Energy source (former)	Gas
Heat pumps installed	9
Sensors installed	172
PV modules installed	224





Conclusion

Energy efficiency and Behind-the-Meter assets represent the third pillar of the energy transition, addressing a €150+ billion annual funding gap, whilst offering institutional investors infrastructure characteristics and diversification. For institutional investors, these assets uniquely combine predictable, liability-matching cash flows with insulation from wholesale power price volatility and evolving PPA structures that has introduced active management requirements and altered the investment proposition of utility-scale renewable infrastructure. The investment case rests on proven technologies, binding EU mandates and durable political support for energy efficiency and flexibility.

For the institutional investor, the takeaway is clear: the next phase of the energy transition will be won at the point of consumption, and accessing this opportunity through specialized partners like Solas Capital enables diversified exposure to building decarbonisation whilst preserving traditional infrastructure allocation characteristics. Investing with an 'energy system as a whole'-approach is now a strategic imperative for maintaining resilient energy infrastructure portfolios aligned with Europe's security, competitiveness, and climate objectives.

About Solas Capital

Solas Capital is the European specialist in building and industrial decarbonisation energy infrastructure investments. Unlike traditional renewable energy investments focusing on supply, we specialise in reducing energy demand at scale. With 40% of Europe's energy consumed in buildings, we address a crucial pillar of the energy transition advancing Europe's climate and energy security agenda.

We are Europe's largest investment team dedicated to financing energy efficiency projects in buildings. Our project finance strategy offers institutional investors fixed-income-like cash flows from EU Taxonomy-eligible assets.

We partner with energy service companies, structuring tailor-made project finance solutions to fund their energy efficiency and behind-the-meter projects across Europe. To date, our financed projects have delivered €429 million in cost savings, 4'319 GWh in energy reductions and avoided 1'709 kt of CO₂.

Find out more at www.solas.capital

www.solas.capital

info@solas.capital

Solas Capital AG
Seestrasse 353
8038, Zurich
Switzerland

**About Sebastian Carneiro**

Sebastian Carneiro is the Chief Executive Officer & Co-founder of Solas Capital AG, a specialised investment advisory firm that finances solutions for decentralised energy efficiency and behind-the-meter assets across Europe.

Sebastian has over 15 years of experience in project finance, including his previous role as Director at Europe's largest private energy efficiency fund. As a CFA Charterholder and engineer by trade, Sebastian is driven by developing innovative investment solutions that accelerate the deployment of green assets and make the energy transition a reality.

**About Christina Hounisen**

Christina Hounisen is a Business Development & Operations Analyst at Solas Capital.

Her background spans energy policy at the IEA, private sector renewable energy from a leading global offshore developer, and sustainability consulting.

She holds a MS in Sustainability & Social Innovation from HEC Paris and a BSc in International Business & Politics from Copenhagen Business School.

Disclaimer

This white paper is a marketing document which intends only to provide a general overview of investment strategies of energy efficiency and distributed renewable energy investments. This document is not intended to be, nor should it be construed or used as an offer to sell, or a solicitation of any offer to buy any securities, which offer may only be made at the time a qualified offeree receives a confidential final private placement memorandum describing the offering (the "issue document"). In the event of any conflict between information contained herein and information contained in the issue document, the information in the issue document will control and supersede the information contained herein. The information herein is not intended to provide, and should not be relied upon for accounting, legal or tax advice or investment recommendations. You should make an independent investigation of the information described herein, including consulting your tax, legal, accounting or other advisors about the matters discussed herein. Some figures may refer to the past or simulated past performance and past performance is not a reliable indicator of future results. Some figures maybe forecast only, and forecasts are not a reliable indicator of future performance. The information provided in this document have not been independently verified. The information contained herein is provided for informational purposes only, is not complete, and does not contain certain material information about Solas Capital and the presented investment strategies, including important disclosures and risk factors associated with the strategies. There can be no guarantee that the presented investment objectives or results -comparable or not to past performance- will be achieved.