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The 2024 EPBD Implementation: Germany's Path to Building Decarbonisation

Exploring Germany's innovative financing, technical solutions, and policy pathways for large-scale building renovation.

ABSTRACT

Germany faces one of its greatest infrastructure challenges in the wake of the revised 2024 Energy Performance of Buildings Directive (EPBD). The regulation requires all new buildings to reach zero emissions by 2030 and mandates a complete phase-out of fossil fuels by 2040. Yet with only 6% of Germany's building stock currently compliant, the scale of investment needed (estimated at €60-65 billion annually) is immense. Properties that fail to meet the standards will increasingly face financing restrictions, exposure to carbon penalties, and discounts of up to 30% in market value. Energy-as-a-Service (EaaS) offers a practical solution, allowing building owners to overcome capital barriers through performance-based contracts that align both with compliance and generate positive cash flow. This white paper examines how Germany's strategy, supported by specialized EaaS investors such as Solas Capital, is addressing the financial gap ahead of the May 2026 deadline.

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Introduction

Europe's building challenge lies at the heart of its energy transition.

The European building sector, comprising approximately 250 million buildings, accounts for 40% of the EU's energy consumption and 36% of greenhouse gas emissions. Around 85% of buildings in the EU are older than 25 years and around 75% have poor energy performance.¹

With the implementation of the most complex version of the Energy Performance of Buildings Directive (EPBD) to date, the European Commission aims to achieve a zero-emission and fully decarbonised building stock by 2050. The directive's overarching goal is to reduce energy demand while lowering costs for households and companies. Germany faces an especially significant transformation. Millions of residential buildings require modernization by 2040. The revised Directive, enacted on May 2024, sets ambitious milestones:

- Zero-emission standards for new buildings by 2030
- Prioritization of worst-performing 43% of building stock for renovation, with 16-19% of worst-performing non-residential buildings to be renovated by 2033
- Complete fossil fuel phase-out by 2040.
- Mandatory solar installations on public and commercial buildings from 2027

Among EU member states, Germany confronts perhaps the most complex implementation challenge. Its extensive residential and commercial building stock requires substantial upgrades, compounded by stringent tenant protection laws, a federal structure that leads to varies regional implementation, and the highest absolute number of buildings in need of renovation anywhere in the EU.

The stakes are substantial. Buildings that fail to meet minimum performance standards risk restricted access to finance, as banks increasingly classify inefficient properties as transition risks, limiting lending and applying higher interest rates. From 2027, these properties will also face operational penalties through the EU ETS2 carbon pricing mechanism starting 2027. Market analyses further suggest that energy-inefficient buildings may experience substantial value discounts, depending on their location and type.

Since 2024, Germany's Building Energy Act (Gebäudeenergiegesetz – GEG) has required that new heating systems use 65% renewable energy. The Act also introduces differentiated timelines² for municipal heating planning. The new coalition government is currently discussing potential modifications to ease implementation, but the core obligations of the EPBD remain binding.

Understanding ETS2 - Carbon Pricing for Buildings

Starting January 2027 (Directive (EU) 2023/959)), the EU Emissions Trading System 2 (ETS2) will price carbon emissions from buildings and transport.

How it works: ETS2 operates as a "cap and trade" system where the EU sets a maximum limit (cap) on total emissions, which decreases over time. Fuel suppliers must purchase emission allowances for every ton of CO2 their fuels will produce when burned, creating a carbon price that flows through to end consumers. Unlike direct carbon taxes, the market determines the price through supply and demand of

¹ European Commission, "Energy Performance of Buildings Directive"

² Bundesministerium für Wirtschaft und Energie, Übersicht zum Gesetz für Erneuerbares Heizen, 2025

these allowances, though the EU has set initial price caps to prevent excessive costs during the transition period.³

Impact on buildings:

- Carbon price: €45-55/ton CO₂ by 2030
- Typical German household (20,000 kWh gas/year = 4 tons CO₂):
 - 2027-2029: Additional €180/year
 - 2030: Potentially €220/year
- Example: A Class G apartment (150 kWh/m²) will face €800-1,200 higher annual costs than a Class B apartment
- Buildings using gas/oil heating face immediate cost pressures
- ➔ Creates market-driven incentive for efficiency improvements



European market data shows that green-certified properties command rental premiums of 5-10%, depending on asset class and certification tier. However, this advantage is steadily diminishing as energy efficiency shifts from a market differentiator to a regulatory requirement. In Germany, most buildings will need significant upgrades to comply with the 2030 standards. At the EU level, the European Commission estimates that €275 billion annual investment⁴ is required for building renovation, with Germany's share amounting to approximately €40-60 billion per year.

³ Directive (EU) 2023/959, OJ L 130, 16.5.2023, Articles 30a-30h; Commission Communication COM (2021) 551 final, "Proposal for Social Climate Fund," July 14, 2021

⁴ European Commission official EPBD site

The EPBD: Key Provisions and Objectives

What is Europe's roadmap to transform buildings by 2040?

The Energy Performance of Buildings Directive (EPBD) 2024, published as Directive EU/2024/1275 on May 8, 2024, establishes Europe's most comprehensive building decarbonization framework.⁵ The directive entered into force on May 28, 2024, with member states required to transpose provisions into national law by **May 29, 2026**. However, specific requirements have staggered implementation dates from 2025 through 2040.⁶

Key deadlines and targets:

- 2025: End fossil subsidies (Jan 1st,)
- 2026: EPBD transposition (enforcement and penalties begin) (May 29th)
- 2027: Solar requirements for public buildings begin
- 2028: Zero-emission requirement starts for PUBLIC buildings only
- 2030: All new buildings must be zero-emission
- 2033: 26% of worst non-residential (cumulative, not new target)
- 2040: Fossil fuel phase-out target (with possible extension to 2045)

Immediate Phase (2025-2027):

- **January 1, 2025:** Discontinuation of all financial incentives for standalone fossil fuel boilers ⁷
- **December 31, 2025:** Member states submit draft building renovation plans to European Commission ⁸
- **May 29, 2026:** Deadline for member states to transpose EPBD into national law⁹
- **December 31, 2026:** Member states submit final national building renovation plans¹⁰

New Building Standards (2028-2030):

- **January 1, 2028:** All new public buildings must be zero-emission buildings¹¹
- **January 1, 2030:** All new buildings must achieve zero-emission standards¹²

Existing Building Renovations (2030-2035):

- **2030:** 16% average reduction in residential building primary energy use compared to 2020 baseline¹³

⁵ Directive (EU) 2024/1275 of the European Parliament and of the Council, Official Journal of the European Union, May 8, 2024

⁶ European Commission, "Energy Performance of Buildings Directive," May 2024

⁷ Directive (EU) 2024/1275, Article 17(15)

⁸ Directive (EU) 2024/1275, Article 3

⁹ Directive (EU) 2024/1275, Article 35

¹⁰ Directive (EU) 2024/1275, Article 3 (3)

¹¹ Directive (EU) 2024/1275, Articles 7 (1)

¹² Directive (EU) 2024/1275, Article 7

¹³ Directive (EU) 2024/1275, Articles 7, 9, and Annex III

- **2033:** 26% of worst-performing non-residential buildings renovated (cumulative with 16% from 2030)¹⁴
- **2035:** 20-22% reduction in average primary energy use of residential building stock compared to 2020¹⁵

Fossil-Fuel Phase-out:

- **2040:** Target date for phase-out of fossil fuel boilers, with possibility to extend to 2045 under specific conditions¹⁶

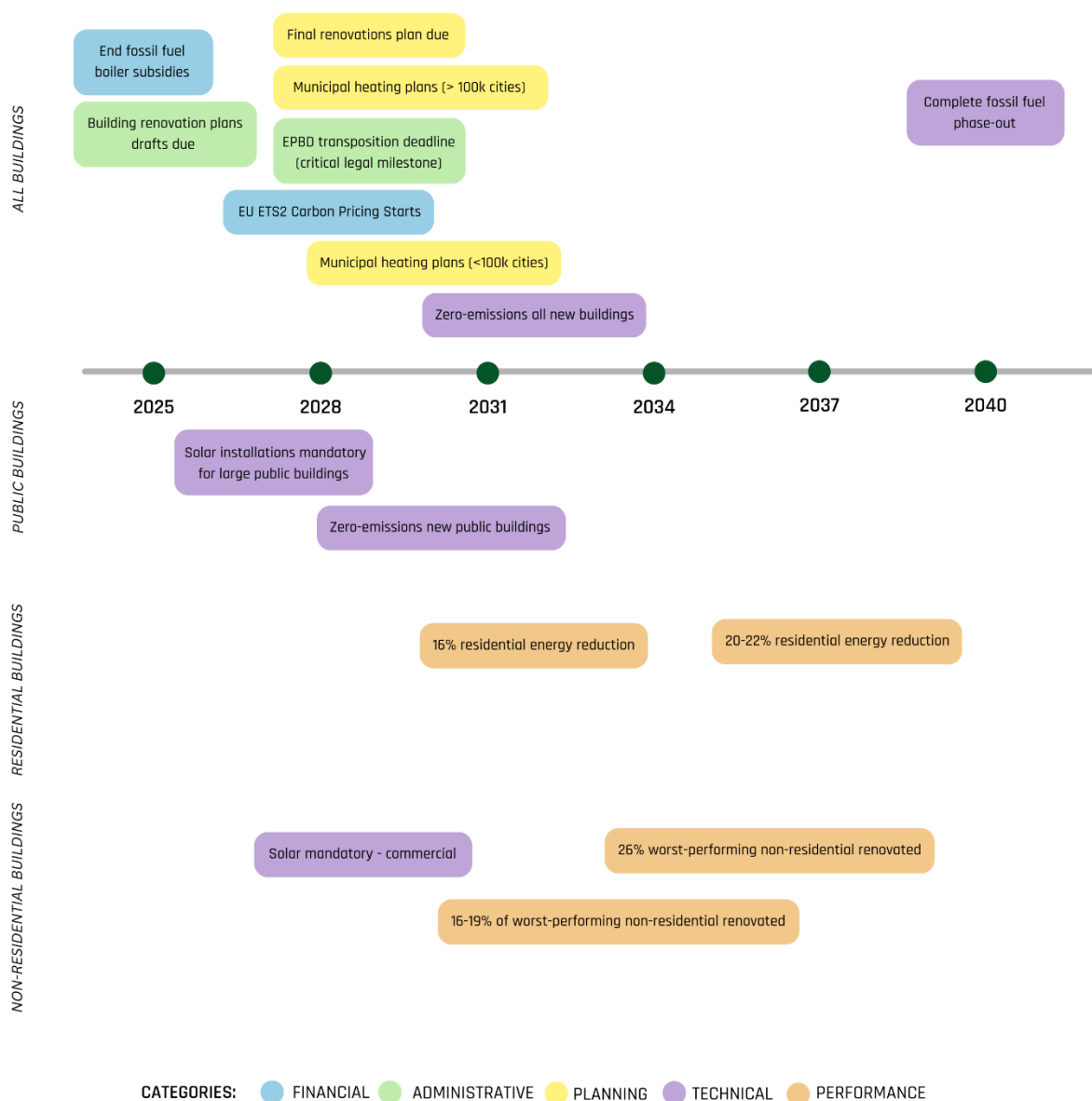


Figure 1: EPBD Implementation Timeline

¹⁴ Directive (EU) 2024/1275, Article 9 (1)

¹⁵ Directive (EU) 2024/1275, Article 9 (1)

¹⁶ Directive (EU) 2024/1275, Article 11(1)

The directive mandates that at least 55% of energy reductions must come from renovating the worst-performing 43% of the national building stock, ensuring social equity in the transition.¹⁷ This means member states must focus on renovating their least efficient buildings, as these offer the greatest potential for achieving the required energy savings in a cost-effective way.

German Implementation Strategy

Germany adopts the "Quartiersansatz" (neighbourhood approach), enabling portfolio-wide compliance rather than individual mandates. This aligns with tenant protection laws (Mieterschutz) while maintaining collective targets. The GEG requires differentiated timelines: 2026 for cities exceeding 100,000 inhabitants, 2028 for smaller municipalities.¹⁸

Non-compliant buildings face severe consequences beyond regulatory penalties. The European Central Bank's guide on climate-related risks requires banks to consider energy efficiency in their credit risk assessments, marking inefficient properties as potential stranded assets.¹⁹

While specific market data on financing restrictions varies by institution and is often proprietary, the fundamental challenge is clear: with most German buildings not meeting future EPBD standards, property owners face a combination of rising operational costs through carbon pricing and potential valuation impacts. The German government estimates modernization investments of several hundred billion euros will be needed through 2045, though precise figures depend on the scope and depth of renovations required.²⁰ Comprehensive retrofits typically require substantial investments, with costs varying significantly based on building condition and target efficiency level.

Market Implications and Compliance Overview

How does regulation reshape property values and investment strategies?

Germany's federal approach avoids mandatory individual renovations following political resistance. Instead, the neighbourhood strategy allows building portfolios to meet collective efficiency targets through cross-subsidization and shared infrastructure investments.²¹

The transformation of Germany's heating infrastructure is already underway. The shift toward renewable heating systems in new construction has accelerated dramatically. In 2023, 65% of newly completed residential buildings were equipped with heat pumps as their primary heating system, up from just 5% in 2009. Gas heating systems, which dominated with over 90% market share in the early 2000s, have declined to just 20% of new installations.²² This transition in new construction foreshadows the massive retrofitting challenge ahead for Germany's existing building stock.

The economic differentiation is already visible. Certified green buildings in Germany command rental premiums of 8-15% on average, with variations by city: Munich (12-15%), Frankfurt (10-14%), Berlin (8-

¹⁷ Directive (EU) 2024/1275, Articles 7, 9, and Annex III

¹⁸ GEG 2024, 571

¹⁹ ECB Guide on climate-related and environmental risks (November 2020)

²⁰ ECB, "Climate Risk and Financial Stability" (2024)

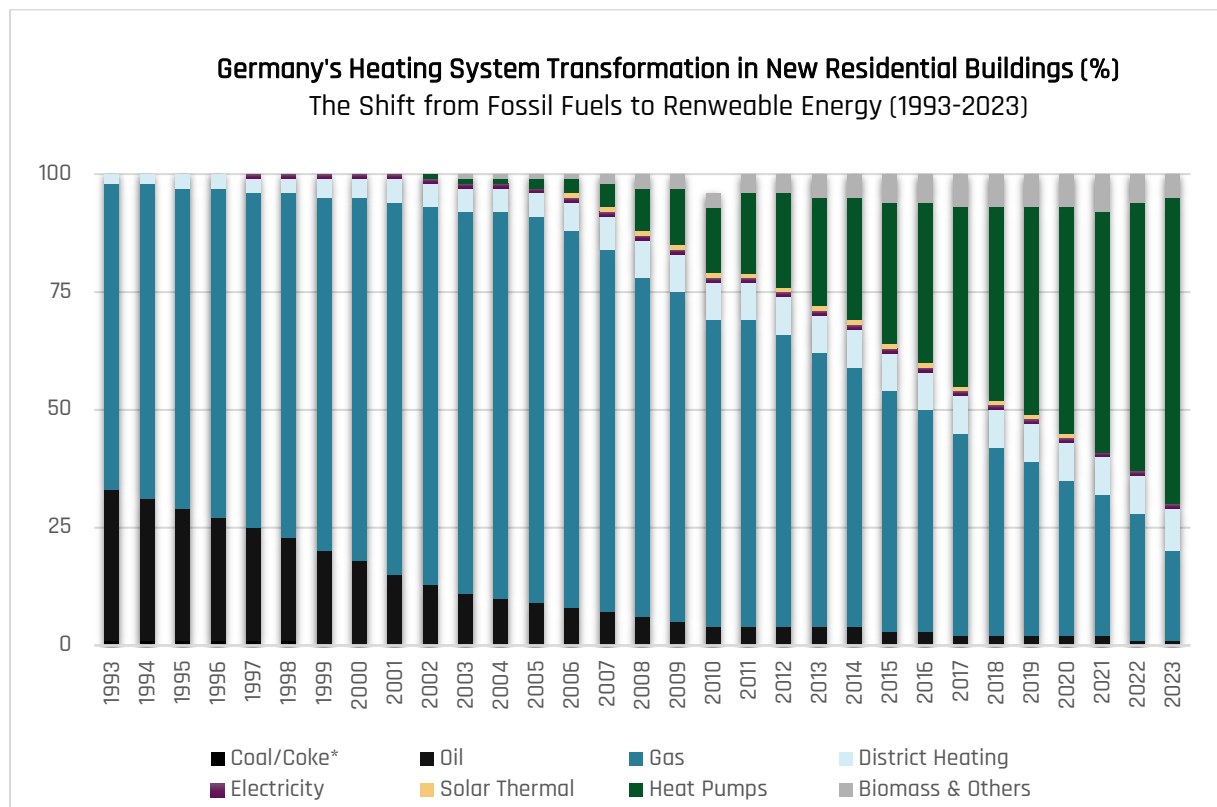
²¹ Federal Ministry for Housing, Urban Development and Building (BMWSB), Statement on EPBD Implementation, March 2024

²² Deno Gebäudereport 2025

12%), and Hamburg (9-13%).²³ Meanwhile, the vast majority of existing buildings still rely on fossil fuels - with approximately 75% of Germany's residential building stock still heated by oil or gas systems.²⁴

Properties failing standards face financing restrictions as the European Central Bank identifies energy-inefficient buildings as stranded assets requiring additional capital reserves from lenders.²⁵

According to the German Energy Agency (dena), the modernization need is immense: approximately 65% of residential buildings require significant energy retrofits to achieve EPC class B or better. Comprehensive retrofits typically cost €200-500 per square meter, depending on the building's current condition and target efficiency level.²⁶ This creates both massive modernization pressure and unprecedented investment opportunities for early movers who can navigate the complex regulatory and financing landscape. With Germany's residential building stock comprising approximately 19 million buildings and 3.8 billion square meters of living space, the total investment requirement reaches €400-600 billion - creating both massive modernization pressure and unprecedented investment opportunities for early movers who can navigate the complex regulatory and financing landscape.²⁷



While 65% of new buildings already use renewable heating, 75% of Germany's existing 19 million buildings still rely on fossil fuels - representing a €400-600 billion modernization opportunity.

Early action provides substantial competitive advantages in German markets. First movers avoid Handwerker (craftsman) shortages and material cost inflation as demand intensifies approaching deadlines. Properties achieving compliance early capture green rental premiums before efficiency

²³ BNP Paribas Real Estate, Green Building Investments continue strong performance (2024)

²⁴ Dena Gebäudereport 2025

²⁵ ECB Guidelines on Climate Risk (2024)

²⁶ Deutsche Energie-Agentur (dena), "Gebäudereport 2024", p. 47

²⁷ Dena Gebäudereport 2025

standards become baseline market requirements. Access to KfW funding programs and green financing remains most favourable for early adopters, with subsidy programs potentially becoming oversubscribed as 2030 deadlines approach.

National Perspectives: EPBD Implementation Strategies in Europe

How do Europe's largest markets tailor the EPBD to local realities and challenges?

Germany is implementing the EPBD through its updated Building Energy Act (GEG), which requires that all new heating systems use at least 65% renewable energy. The Act also prioritizes renovations of public buildings, focusing on achieving collective efficiency targets rather than imposing individual mandates. The country offers Federal Funding for Efficient Buildings (BEG) covering up to 30% of costs for comprehensive renovations, with a speed bonus of 20% for heat pump installations completed before December 31, 2028.²⁸ Municipal heating planning varies by city size, with transitional periods until 2026 for cities over 100,000 inhabitants and 2028 for smaller municipalities.

While Germany adopts its neighborhood approach, other EU member states are developing distinct implementation strategies worth examining:

France continuously evolves its DPE (Diagnostic de Performance Énergétique) system, implementing new calculation methodologies for small properties under 40m² as of July 2024. The country enforces progressive rental restrictions for F and G-rated properties while focusing strongly on social housing improvements and energy poverty reduction. Market-driven approaches for the private sector combine with regulatory backstops, ensuring compliance while maintaining affordability for vulnerable households.

Spain faces constitutional constraints limiting mandatory private building improvements, requiring legislative amendments before full EPBD implementation. The country demonstrates exemplary transparency through workshop-based stakeholder engagement and public response matrices. Integration of seismic resilience with energy efficiency through the GreenRenov8 project addresses Spain's specific geographical challenges while developing sustainable financing models aligned with National Recovery and Resilience Plan funding.

FRANCE

- Continuously evolves its Diagnostic de Performance Énergétique system, implementing new calculation methodologies for small properties under 40m².
- Enforces progressive rental restrictions for F and G-rated properties.

ITALY

- Phases down its Superbonus from 70% in 2024 to 65% in 2025, shifting toward targeted support for vulnerable households.
- Sismabonus integrates seismic improvements for earthquake-prone zones 1-3.

SPAIN

- Demonstrates exemplary transparency through workshop-based stakeholder engagement.
- Integration of seismic resilience with energy efficiency through the GreenRenov8 project addresses Spain's specific geographical challenges.

NETHERLANDS

- Phases down its Superbonus from 70% in 2024 to 65% in 2025, shifting toward targeted support for vulnerable households.
- Sismabonus integrates seismic improvements for earthquake-prone zones 1-3.

²⁸ KfW Bank, BEG Funding Guidelines, Version January 2024, Section 4.2

Italy learns from its Superbonus experience, which saw cost overruns, despite achieving significant renovation volumes. The country phases down its Superbonus from 70% in 2024 to 65% in 2025, shifting toward targeted support for vulnerable households. Extensive heritage building protections accommodate Italy's numerous UNESCO sites, while the Sismabonus integrates seismic improvements for earthquake-prone zones 1-3, offering 50-85% incentives based on intervention type.

The Netherlands addresses past EPBD compliance issues while developing a new energy label classification system for 2030 implementation. Mandatory renewable energy or heating network connections combine with residential photovoltaic systems linked to heating requirements. The country resolves its 5th infringement procedure with the European Commission while integrating renewable energy incentives with broader energy transition strategies.

Overcoming Germany's Building Modernization Challenge

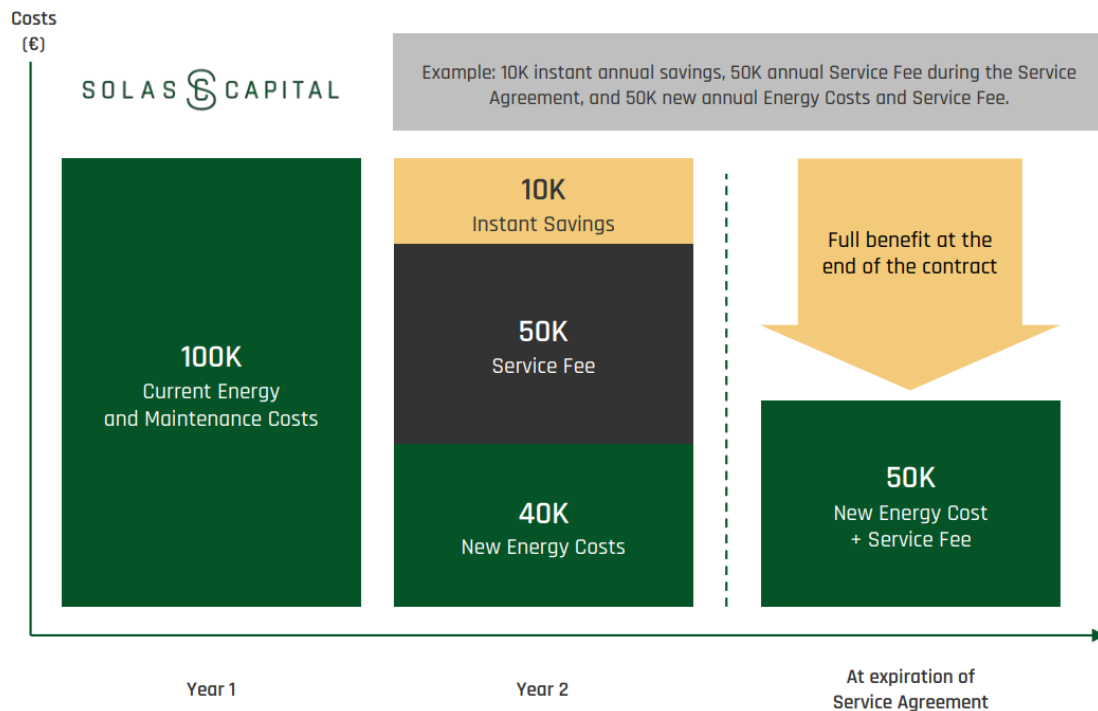
How can German property owners manage rising costs with innovative solutions?

Commercial and residential property owners in Germany confront significant financial challenges for EPBD compliance. Modernization costs vary substantially based on building age, current efficiency level, regional factors, and chosen technical solutions. Comprehensive retrofits from poor efficiency classes to EPBD-compliant standards typically require substantial investments that many property owners cannot finance through conventional means.

According to the Federal Ministry for Economic Affairs and Climate Action, achieving climate neutrality in Germany's building sector will require cumulative investments of approximately €500-600 billion through 2045, or roughly €20-25 billion annually.²⁹ These costs create challenges for multi-family residential buildings, which comprise most of the German rental stock and require coordination among multiple stakeholders.

However, proven technical solutions demonstrate clear pathways to compliance. Integrated approaches combining heat pumps, photovoltaic systems, and intelligent building controls can achieve the required efficiency improvements. Most significantly, innovative financing models like Energy-as-a-Service eliminate upfront investment barriers, enabling building owners to achieve EPBD compliance with positive cash flow from day one.

²⁹ BMWK, "Langfriststrategie Gebäude 2050", Updated 2024, p. 89



Case Study: Comprehensive Building Transformation Through Eaas

A replicable path to high-efficiency residential building upgrades.

Project Overview: This project involved the comprehensive modernization of two residential complexes built between the 1950s and 1970s, comprising a total of 75 housing units. Initially classified with an Energy Performance Class E, the retrofitting efforts successfully raised both buildings to a class A rating, meeting stringent energy efficiency standards.

Technical Solutions:

Several integrated technical measures were employed to achieve these results. Gas boilers were replaced with modern heat pump systems, and solar photovoltaic (PV) systems were installed, with capacities ranging from 33 kWp to 99 kWp. An AI-driven control system connected to IoT sensors was deployed and hydraulic balancing was performed. Additionally, weather-predictive heating management further enhanced system performance.

Key Results:

- Over 70% primary energy reduction achieved
- Near-complete elimination of direct CO2 emissions
- Supply temperature reduced from 61°C to 52°C
- Implementation in 4 weeks without tenant displacement

Energy-as-a-Service Model: The project was financed through an Energy-as-a-Service model, which eliminated the need for any upfront investment from the building owners. Service contracts lasting 10 to 15 years ensured stable operations and maintenance. Owners benefited from immediate positive cash flow, fixed energy costs were guaranteed for tenants, and full maintenance and system

optimization were included. The contractual structure transferred all performance risks to the service provider, aligning incentives for continued efficiency gains.

Scalability: This approach is highly replicable across Germany's estimated 11+ million residential buildings constructed in the 1950s to 1970s. The model demonstrates a viable, capital-barrier-free pathway for mass EPBD compliance in legacy building stock, enabling accelerated modernization at scale.

Success Factors:

- Comprehensive technical solution
- Rapid, non-disruptive installation
- Innovative financing eliminating capital needs
- Guaranteed performance with continuous optimization

German commercial real estate increasingly reflects this performance differentiation. JLL research indicates green-certified buildings command 12-18% rent premiums in major German markets, while properties failing efficiency standards face 15-25% discounts in prime locations. Munich's commercial market shows the starkest differentiation, with Class A energy certificates yielding 22% higher returns than Class F-G properties, while Hamburg demonstrates 16% premiums for certified buildings.

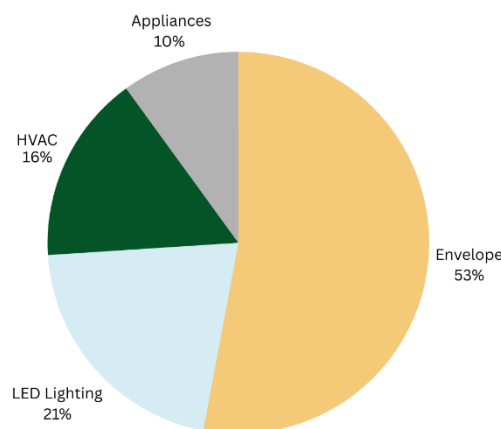
Investment Opportunities in Germany's Retrofit Market

Exploring the €60 billion annual market driven by EPBD compliance.

Germany's building retrofit market represents one of Europe's largest investment opportunities, with substantial growth expected through 2030 as EPBD compliance drives modernization demand. The European Commission's Impact Assessment for the EPBD revision estimates that achieving the EU's 2030 building targets requires approximately €275 billion in annual investments across all member states.³⁰ Germany's share, based on its 22% proportion of EU building stock, translates to €60-65 billion annually through 2030.³¹ While German government estimates suggest lower figures for achieving climate neutrality in the building sector, the scale of investment required under EPBD compliance represents a significant financing gap that innovative funding mechanisms must address.

³⁰ European Commission, SWD(2021) 453 final, Impact Assessment EPBD Revision, Part 1/3, p. 67

³¹ EU Building Stock Observatory, Country Factsheet Germany 2024

Germany Retrofit Investment Market by Segment in 2022 (%)

Source: Germany Energy Retrofit Systems Market Size & Outlook 2022, Grandviewresearch

Building envelope improvements - including insulation, windows, and facades - account for the largest share of retrofit investments, though they also offer the most substantial long-term energy savings. These measures provide stable, predictable returns despite requiring significant upfront capital.

The Energy Service Company (ESCO) market in Germany continues to expand as building owners seek turnkey solutions without capital requirements. Energy-as-a-Service models eliminate upfront investment barriers through long-term performance contracts, typically spanning 8-15 years. These structures guarantee immediate cost savings while transferring technical and performance risks to specialized operators, making them particularly attractive for building owners lacking renovation expertise or capital.

KfW's Federal Funding for Efficient Buildings (BEG) program remains the cornerstone of Germany's building modernization strategy. The program offers substantial loan support and grants for efficiency improvements, with enhanced conditions for comprehensive renovations achieving high efficiency standards. According to KfW's current guidelines, support can cover a majority of project costs under optimal conditions, significantly improving investment economics and reducing payback periods.

Regional programs complement federal funding, with various German states offering additional grants, zero-interest loans, and technical support for building modernization. These stacked incentives can substantially reduce the net investment required from building owners, though specific terms vary by region and change periodically.

The combination of regulatory pressure, available subsidies, and innovative financing models creates favorable conditions for building modernization investments. Early movers can benefit from current subsidy availability, lower construction costs before market saturation, and the opportunity to capture green building premiums before efficiency becomes the market standard.³²

³² KfW Development Bank, "BEG Funding Guidelines 2024"

Proven Technical Solutions for Reliable Performance

How do heat pumps, solar PV, and smart controls combine for optimal energy performance?



Heat pump installations remain essential for German EPBD compliance, with the market recovering after recent volatility. According to the German Heat Pump Association (BWP), Germany maintains one of Europe's largest heat pump markets, with installations demonstrating coefficients of performance (COP) of 3-4 in typical German climate conditions, delivering 300-400% efficiency compared to direct electric heating. The Federal Ministry for Economic Affairs reports that current heat pump stock reduces gas imports by approximately 8.4 billion cubic meters annually.³³

Heat pumps demonstrate significantly higher efficiency than conventional systems in German climate conditions. According to field monitoring by Fraunhofer ISE of 300 heat pump installations (2022-2024), air-source heat pumps achieve average seasonal performance factors (SPF) of 3.1, while ground-source systems reach 4.5 SPF in German climate conditions.³⁴ Installation costs vary widely based on system type and building characteristics, with KfW subsidies potentially reducing payback periods substantially.



Germany's photovoltaic sector offers expanding opportunities under the Renewable Energy Act (EEG 2023). The Federal Network Agency (Bundesnetzagentur) reports current installed capacity of 82 GW as of early 2024, progressing toward the government's 215 GW target by 2030.³⁵ Fraunhofer ISE analysis indicates German rooftop potential of approximately 200 GW, with current utilization below 40%, suggesting substantial expansion opportunities.³⁶



Intelligent building control systems deliver significant efficiency gains with minimal structural interventions. TÜV-certified systems using IoT sensors and machine learning algorithms can achieve 15-30% energy savings through optimization of existing heating systems, according to studies by the German Energy Agency (dena). These systems enable hydraulic balancing, weather-predictive control, and demand-based temperature adjustment without replacing core infrastructure.³⁷

Combined implementation strategies achieve the greatest impact. The Federal Environment Agency (UBA) reports that integrated approaches combining heat pumps, solar systems, and intelligent controls can reduce building energy consumption by 50-75% while maintaining or improving comfort levels. Such comprehensive solutions address multiple EPBD requirements simultaneously while providing grid flexibility services increasingly valued in Germany's energy transition.

³³ Bundesverband Wärmepumpe (BWP) - Market statistics 2024

³⁴ Fraunhofer ISE, "Wärmepumpen in Bestandsgebäuden", Field Study Results 2024, p. 34

³⁵ Bundesnetzagentur - Solar installation statistics

³⁶ Fraunhofer ISE - Solar potential studies

³⁷ Deutsche Energie-Agentur (dena) - Building efficiency studies

German Financing Drivers for EPBD Compliance

How do Energy-as-a-Service and green mortgages drive retrofit investments?

Germany's building modernization challenge requires diverse financing approaches to bridge the substantial investment gap. While traditional bank financing remains important, innovative models like Energy-as-a-Service (EaaS) are proving essential for achieving EPBD compliance at scale.

Traditional Banking Solutions

German banks increasingly recognize energy-efficient buildings as lower-risk assets. Major financial institutions now offer green mortgages with preferential rates for energy-efficient properties, typically providing 0.1-0.3% interest rate reductions for buildings achieving high efficiency standards. The German Energy Efficient Mortgage Initiative, supported by leading banks, enables financing for comprehensive renovations with loan-to-value ratios adjusted based on achieved energy performance.

However, traditional financing faces limitations: building owners must manage construction risks, coordinate multiple contractors, and carry debt on their balance sheets. Many owners, particularly in the residential sector, lack either the creditworthiness or expertise to manage complex renovation projects.

Energy-as-a-Service: Transforming Building Modernization

Energy-as-a-Service ("EaaS") models fundamentally reimagine building efficiency as an operational service rather than a capital investment. This approach eliminates the primary barriers to EPBD compliance: upfront capital and technical complexity.

Under the EaaS structure, Energy Service Companies (ESCOs) handle complete project delivery—from design and financing through installation and long-term operation. Building owners sign service contracts spanning 8-15 years, paying only for delivered energy services while achieving immediate cost savings of typically 20-40%. All technical, performance, and maintenance risks transfer to the ESCO, ensuring guaranteed outcomes.

The EaaS financing ecosystem requires specialized investors who understand both building technology and project finance. Institutional investors providing capital to EaaS projects enable the deployment of integrated energy solutions without requiring upfront payments from building owners. When properly structured with performance guarantees and backed by creditworthy counterparties, EaaS contracts can achieve investment-grade risk profiles comparable to infrastructure investments.

The aggregation of multiple EaaS projects into portfolio structures achieves risk diversification while maintaining stable, long-term cash flows. This approach particularly suits institutional investors seeking exposure to the energy transition with predictable returns.

Portfolio Approach and Scalability

Portfolio aggregation of EaaS projects creates important economies of scale and risk diversification. By bundling multiple building modernization projects across different regions and building types, investors can achieve stable returns while addressing Germany's fragmented building stock. This approach particularly benefits smaller projects that might otherwise struggle to access financing, including the 57% of German housing comprising multi-family buildings requiring coordinated solutions.

The institutional investment case for EaaS portfolios rests on several factors: contracted cash flows from essential building services, diversification across hundreds of individual projects, and alignment with EU taxonomy requirements for sustainable finance. Solas Capital has demonstrated this model's viability through its strategic partnership with Paul Tech AG, successfully financing comprehensive Energy-as-a-Service solutions for German residential buildings. As investment advisory firm specializing in EU Taxonomy eligible energy efficiency investments, Solas Capital bridges the gap between institutional investors seeking sustainable infrastructure-like returns and ESCOs requiring patient capital for building modernization projects. The firm's expertise in structuring and managing EaaS portfolios, combined with deep technical due diligence capabilities, enables institutional investors to access this emerging asset class with appropriate risk mitigation.

Through its established relationships with ESCOs and comprehensive understanding of both German regulatory requirements and building technology, Solas Capital has developed a proven framework for evaluating, structuring, and monitoring EaaS investments. This specialized approach addresses the key challenge facing the German market: connecting the €60+ billion annual investment need with institutional capital seeking exposure to the energy transition through predictable, contracted cash flows.

For German building owners facing EPBD deadlines, the availability of both traditional bank financing and EaaS models provides complementary pathways to compliance. Owners with strong balance sheets and technical expertise may prefer conventional loans to maintain full asset control. Others, particularly those lacking capital or renovation experience, benefit from the turnkey, zero-investment nature of EaaS contracts. The German market will require both approaches operating at scale to achieve the necessary building transformation by 2030 and beyond.

Conclusion: Navigating Germany's Building Transformation

Navigating the shift to energy-efficient building in Germany

The EPBD marks a watershed moment for German real estate. It transforms buildings from passive assets into active participants in Europe's energy transition. This change fundamentally alters how properties are valued, financed, and operated. Early compliant properties secure premium valuations and favorable financing, while non-compliant buildings face mounting operational costs and restricted market access.

This differentiation is visible in major markets and will only intensify as deadlines approach. The current window offers unique advantages such as subsidy availability, manageable construction costs, and the ability to capture green premiums before efficiency becomes the market baseline.

Energy-as-a-Service has emerged as the catalyst for scalable transformation by eliminating capital barriers and transferring technical risks, enabling building owners to achieve compliance with positive cash flow. For investors, EaaS offers infrastructure-quality returns by essential building services, a rare combination of stability and impact.

Germany's response to the EPBD will set the template for European building decarbonization: success requires immediate action, innovative financing, and flawless execution. The framework exists, the solutions are proven, and the opportunity is clear.

About Sebastian Carneiro

Sebastian Carneiro is the Chief Executive Officer and Co-founder of Solas Capital AG, a specialised investment advisory firm that pioneers financing 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 Antonia Bader-Lang

Antonia Bader-Lang is Investment and Compliance Officer at Solas Capital. She brings more than 5 years of infrastructure portfolio management experience, specializing in illiquid assets debt. Her expertise in due diligence and fund setup supports the company's operational efficiency and strategic growth.

About Solas Capital

At Solas Capital we provide specialised financing solutions for demand-side energy projects, bridging the gap between institutional investors and high-impact energy efficiency projects. Unlike traditional renewable energy investments focusing on supply, we specialise in reducing energy demand at scale—an often-overlooked but equally important pillar to reach Net-Zero.

We focus on the building sector—responsible for 40% of Europe's energy consumption—and industrial efficiency, providing capital to project developers to offer zero upfront cost solutions. Our team of experts structures funding solutions for distributed energy transition projects across Europe, delivering cost savings while reducing fossil fuel dependence.

Our asset-backed private credit strategy offers investors fixed-income like returns from EU Taxonomy aligned assets while accelerating Europe's transition to a carbon-neutral economy. We firmly believe that the best energy is the energy we don't use.

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References

1. European Commission official EPBD site ([Energy Performance of Buildings Directive](#))
2. Bundesministerium für Wirtschaft und Energie, Übersicht zum Gesetz für Erneuerbares Heizen ([BMWE - Übersicht zum GEG: Umsteigen auf klimafreundliche Wärme](#))
3. European Comission ([European Energy Efficiency Financing Coalition](#))
4. European Union, Directive 2024/1275 ([Directive - EU - 2024/1275 - EN - EUR-Lex](#))
5. GEG 2024, 571 ([§ 71 GEG - Einzelnorm](#))
6. ECB Guide on climate-related and environmental risks (November 2020) ([Guide on climate-related and environmental risks](#))
7. ECB Climate and nature plan 2024-2025 at a glance ([Climate and nature plan 2024-2025 at a glance](#).)
8. European Commission, Impact Assessment Report 2021 ([swd-2021-0453-2-en.pdf](#))
9. Dena Gebäudereport 2025 ([dena Gebäudereport 2025](#))
10. BNP Paribas, Green Building Investment Market, Market Focus 2024 ([PowerPoint-Präsentation; Investment market Green Buildings 2024 | BNP Paribas Real Estate](#))
11. Deutsche Energie-Agentur (dena), "Gebäudereport 2024", p. 47 ([dena-GEBÄUDEREPORT 2024](#))
12. KfW Bank, BEG Funding Guidelines ([Bundesförderung für effiziente Gebäude \(BEG\) | KfW](#))
13. Germany Energy Retrofit Systems Market Size & Outlook 2022, Grandviewresearch ([Germany Energy Retrofit Systems Market Size & Outlook, 2030](#))
14. PF4EE instrument and EU blended finance guidance ([Private Finance for Energy Efficiency | European Cluster Collaboration Platform](#))
15. Bundesverband Wärmepumpe (BWP) - Market statistics 2024 ([BWP Branchenstudie 2024 WEB 650.pdf](#))
16. Fraunhofer ISE, "Wärmepumpen in Bestandsgebäuden", Field Study Results 2024, p. 34 ([WP-QS im Bestand - Entwicklung optimierter Versorgungskonzepte und nachhaltiger Qualitätssicherungsmaßnahmen für Wärmepumpen im EFH-Bestand - Fraunhofer ISE](#))

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