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Beyond Savings: The Social Impact of Energy Efficiency Investments in Europe

Exploring how energy efficiency drives essential social, economic, and health benefits across Europe.

ABSTRACT

From warmer homes to stronger economies, energy efficiency is rewriting the rules of sustainable investing. In this white paper, we explore the wide range of social, economic, and environmental benefits of energy efficiency in Europe. Beyond clear environmental gains from reduced energy use and lower emissions, these measures deliver improvements in public health, reduce energy poverty, and strengthen economic resilience. Enhanced building efficiency lowers healthcare costs, boosts local employment, and protects households and businesses from volatile energy prices. Drawing on EU policy initiatives, market data, and a case study from PAUL Tech and Solas Capital, the paper demonstrates how energy efficiency can be a cornerstone of sustainable investment strategies with high impact potential.

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Introduction

Energy efficiency brings wide social, economic, and health gains while boosting EU energy resilience.

Across the European Union (EU), energy efficiency is moving up the agenda. What was once seen primarily as a technical measure or a way to reduce utility bills, has now taken a new meaning in today's landscape. According to the International Energy Agency (IEA) and leading European think tanks, well-designed energy efficiency policies can change lives, making homes healthier, communities stronger, and opportunities more accessible for people across different backgrounds.[1] [2]

Recent increases in energy costs have revealed strong inequalities, with millions living in homes that are too cold in winter and overheated in summer, often at substantial cost to their health and finances.[3] Yet, evidence shows a clear path forward. Countries that have focused on improving the efficiency of buildings and infrastructure have seen benefits extending well beyond energy savings. Investments in upgrading housing and supporting energy-poor households have led to measurable reductions in household expenses, eased pressure on health services, and increased participation in the workforce.

As policymakers and investors search for solutions with wider social impact, understanding and recognizing these additional social, economic, and health benefits has become essential. Recent EU initiatives like the Social Climate Fund[4] or REPowerEU,[5] which work on reducing the EU's dependence on imported fossil fuels,[6] reflect this growing focus. This white paper reviews the latest research on the multiple benefits of energy efficiency and argues that these broader outcomes should be central to European investment strategies and policies in the years ahead.

The Multiple Benefits Framework

The Multiple Benefits Framework highlights the broader impact of energy efficiency.

The International Energy Agency's Multiple Benefits Framework broadens the way we understand the importance of energy efficiency. Traditionally, efficiency was evaluated by reductions in energy use, lowered emissions, and cost savings, metrics that remain at the core of most national strategies.

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[1] Buildings Performance Institute Europe (BPIE), *From cost savings to societal gains: rethinking the cost-optimal methodology*, accessed August 5, 2025, From cost savings to societal gains: rethinking the cost-optimal methodology > BPIE - Buildings Performance Institute Europe

[2] International Energy Agency (IEA), "Multiple Benefits of Energy Efficiency – Analysis," accessed August 5, 2025, Multiple Benefits of Energy Efficiency – Analysis - IEA

[3] Heinrich Boll Stiftung European Union, "What is the status of energy poverty in the European Union?," published November 20, 2024, accessed August 6, 2025, What is the status of energy poverty in the European Union? | Heinrich Böll Stiftung | Brussels office - European Union

[4] European Commission, "Social Climate Fund," accessed August 5, 2025, Social Climate Fund - European Commission

[5] European Commission, "REPowerEU," accessed August 5, 2025, REPowerEU, REPowerEU

[6] European Commission, "In focus: Reducing the EU's dependence on imported fossil fuels," published April 20, 2022, accessed August 5, 2025, In focus: Reducing the EU's dependence on imported fossil fuels - European Commission

But the IEA's analysis now show that the impact of energy efficiency runs much deeper. Investments in energy efficiency deliver a wide array of co-benefits, such as improved air quality and public health, reduced pressure on healthcare systems, increased economic resilience and local job creation (See Figure 1). By embracing this broader view, governments as well as investors, can unlock returns not only on utility bills and emissions, but also in the form of healthier communities and more resilient economies.

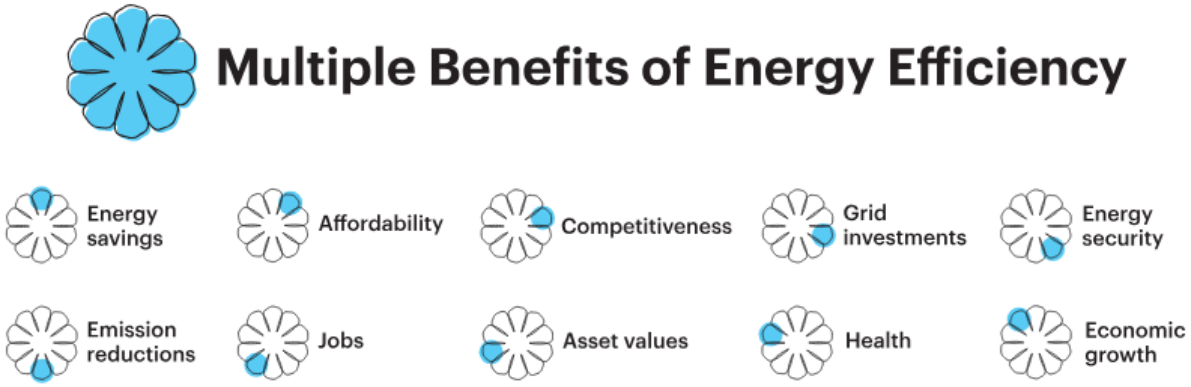

Figure 1 – Multiple Benefits of Energy Efficiency (Source: IEA)

Breaking Down the Multiple Benefits of Energy Efficiency

What are some of the social, economic and health benefits of energy efficiency?

Health and Wellbeing

Energy efficiency upgrades, especially in buildings deliver measurable health improvements across Europe. Poorly insulated homes are linked to respiratory and cardiovascular illnesses,[7] mental health stress,[8] increased winter mortality,[9] and higher healthcare costs.[10] According to the IEA and findings from the Buildings Performance Institute Europe (BPIE)[11] retrofitting buildings with insulation, modern

[7] World Health Organization, "Low indoor temperatures and insulation," in WHO Housing and Health Guidelines, NCBI Bookshelf, accessed August 5, 2025, Low indoor temperatures and insulation - WHO Housing and Health Guidelines - NCBI Bookshelf

[8] Amelia Simpson, Luis Filipe, Valerio Benedetto, and James Hill, "The impacts of housing conditions on physical and mental health: a critical mini-review informed by rapid conversion of evidence from Alidoust and Huang (2021)," Fontiers in Environmental Health, published February 20, 2024, accessed August 5, 2025, Frontiers | The impacts of housing conditions on physical and mental health: a critical mini-review informed by a rapid conversion of evidence from Alidoust and Huang (2021)

[9] Annabel Ferriman, "Excess winter deaths linked to temperatures in cold homes," BMJ, accessed August 5, 2025, Excess winter deaths linked to temperatures in cold homes - PMC

[10] Eileen O'Connor et al., "The correlation between energy efficiency and health," CA EED Expert Study Group, published March 8, 2024, accessed August 5, 2025 ca-eed.eu/ia-document/energy-renovation-energy-poverty-and-health/

[11] Ivan Jankovic, Carolina Koronen, and Volodymyr Vladyka, *From cost savings to societal gains: rethinking the cost-optimal methodology* (BPIE – Buildings Performance Institute Europe, October 2024), accessed August 5, 2025, From-cost-savings-to-societal-gains_final-1.pdf

heating and air ventilation reduces hospital admissions and lessens the burden of chronic illnesses on the healthcare system.

- Studies attribute between 30% and 50% of excess winter deaths to poor housing conditions, highlighting the significant health risks associated with cold and inefficient homes.[12]
- Research shows that fuel poverty conditions like cold and damp homes increase risks of mental health problems, including anxiety and depression, highlighting the need for healthier housing.[13]

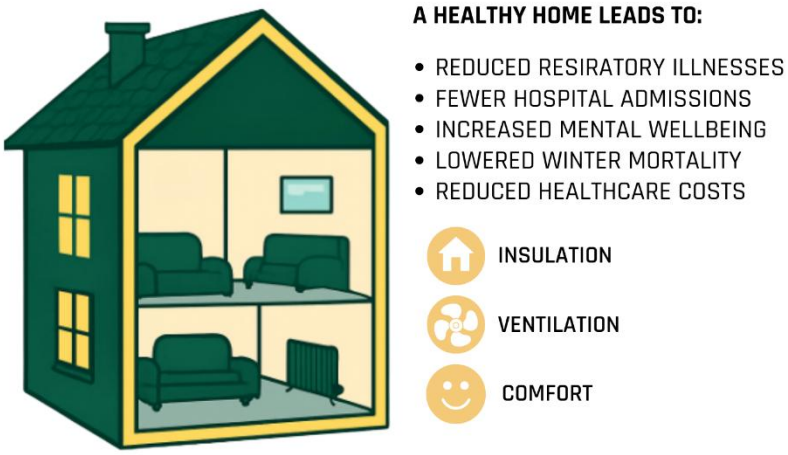

Figure 2 – Health Benefits of an Energy Efficient Home

Coal fired power plants are a major contributor to air pollution, releasing harmful substances such as fine particulate matter (PM2.5), sulfur dioxide (SO2), and nitrogen oxides (Nox) into the atmosphere. These pollutants not only degrade air quality but also significantly increase the risk of respiratory and cardiovascular diseases, leading to thousands of premature deaths annually across Europe. The emissions from coal plants travel long distances, impacting communities far from the source and creating a wide-reaching public health challenge. Addressing pollution from coal-fired power is therefore an essential to improving air quality, reducing health burdens, and supporting a healthier, more sustainable environment.

According to a report from the Health and Environmental Alliance (HEAL), emissions from coal power plants in Europe amount to more than 18,200 premature deaths, about 8,500 cases of chronic bronchitis, and over 4 million lost working days each year. The economic costs of these health impacts are estimated at up to €42.8 billion per year. Coal power plants in Poland, Romania and Germany are

[12] Renovate Europe, "Briefing 1/2017 on Energy Poverty – Nobody should have to choose between heating and eating," accessed August 5, 2025, Briefing 1/2017 on Energy Poverty - Nobody shouThld have to choose between heating and eating - Renovate Europe

[13] M.K. Varga, H. Moshammer, and O. Atanyazova, "Childhood asthma and mould in homes—A meta-analysis," Springer Medizin, accessed August 5, 2025, Childhood asthma and mould in homes–A meta-analysis | springermedizin.at

responsible for more than half of the total health impacts. Figure 3 below presents data from an expert assessment by HEAL on the health impacts of coal power plant emissions.[14]

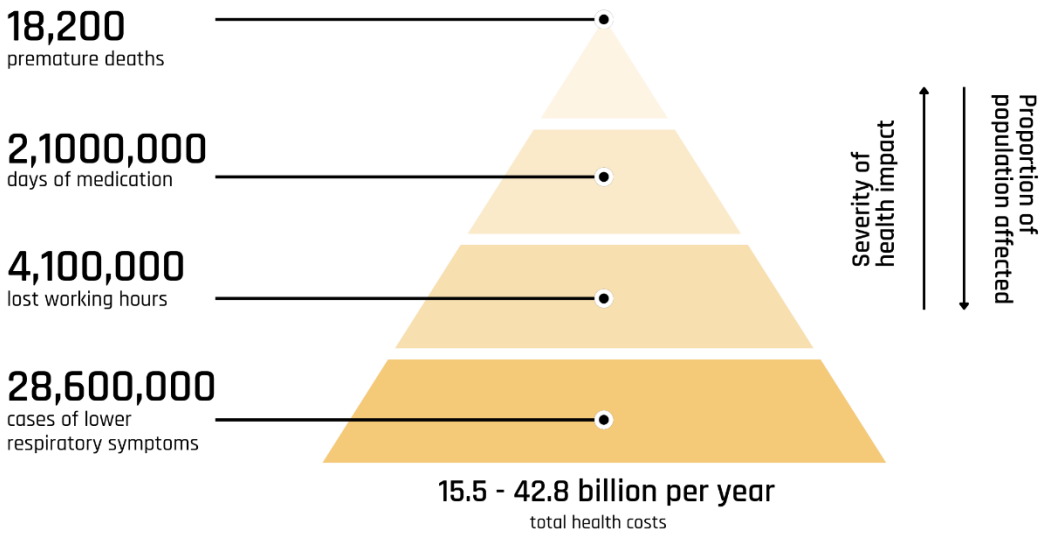

Figure 3 – Average Annual Health Impacts Caused by Coal Powered Plants in the EU (Source: HEAL)

Economic Resilience and Competitiveness

Energy efficiency is widely recognised by many European authorities as a foundational driver of economic resilience and competitiveness. By lowering energy demand, households and businesses are less exposed to volatility of global energy prices and supply shocks, a critical advantage highlighted during recent disruptions in European markets. [15] [16] [17]

Data demonstrates that improvements in energy efficiency not only reduce the total energy bill for households and companies but also save billions each year at the national level by curbing demand growth and importing less fuel. [18] During the 2022 energy crisis, efficiency measures across European countries collectively saved households and businesses an estimated $680 billion, about 15% of the total energy bill for that year.[16]

Efficiency investments also have a ripple effect through the wider economy:

[14] Health and Environmental Alliance. (2013). *The unpaid health bill: How coal power plants make us sick.* Brussels: HEAL. Retrieved from https://www.env-health.org/IMG/pdf/heal_report_the_unpaid_health_bill_-_how_coal_power_plants_make_us_sick_finalpdf.pdf

[15] International Energy Agency, *The many benefits of energy efficiency,* accessed August 6, 2025, https://build-up.ec.europa.eu/en/resources-and-tools/publications/many-benefits-energy-efficiency-report-IEA

[16] Molly Walton and Sam Kimmins, "Efficiency first: A decarbonization powerhouse hiding in plain sight," We Mean Business Coalition, accessed August 6, 2025, https://www.wemeanbusinesscoalition.org/blog/efficiency-first-a-decarbonization-powerhouse-hiding-in-plain-sight/

[17] European Commission, "New impetus for energy efficiency," accessed August 6, 2025, https://energy.ec.europa.eu/topics/energy-efficiency/new-impetus-energy-efficiency_en

[18] Directorate-General for Energy, "Energy Efficiency: A new impetus to reduce energy consumption," European Commission, published May 21, 2025, accessed August 5, 2025, https://energy.ec.europa.eu/news/energy-efficiency-new-impetus-reduce-energy-consumption-2025-05-21_en

- For businesses, lower operational costs and more stable input prices create a stronger basis for investment, growth, and international competitiveness. Studies show that firms, especially those in energy-intensive sectors, tend to become more productive and less vulnerable to profitability losses when they invest in energy efficiency in response to energy price shocks. [19] [20]
- At the macro level, the European Environmental Agency, emphasises that energy efficiency contributes to lower average energy prices, cuts import bills and reduces exposure to global price spikes. Without advances in efficiency over the past 20 years, the EU's energy consumption today would have been about 27% higher, meaning considerably higher energy costs and increased vulnerability to supply disruptions. [21]

The multiple benefits of energy efficiency extend beyond saving on utility bills. Large-scale efficiency upgrades reduce public sector expenditure on energy, support job growth, improve the business environment, and have a stabilising effect on the economy during both short-term shocks and long-term transitions.

Employment and Skills

Targeted energy efficiency investments generate significant employment, often more than any other energy-related intervention. Investment in energy efficiency can generate a net gain in employment rates both directly and indirectly. Reduced unemployment provides a variety of social benefits, in addition to monetary ones, such as improved household incomes and reduced budgetary outlays for unemployment payments. Estimates have ranged as high as 27 job years created for every EUR 1 million spent on energy efficiency measures in the residential sector. [22] New roles often are found in construction, manufacturing, design, and quality assurance and provide upskilling opportunities, supporting a just economic transition. [23]

- Jobs in energy efficiency tend to be local, stable, and difficult to offshore, ensuring benefits remain within communities.
- The push for deep retrofits and smart energy management is also raising demand for digital engineering, and management skills, supporting long-term career resilience.

[19] David Amaglobeli et al., *Firms' Resilience to Energy Shocks and Response to Fiscal Incentives: Assessing the Impact of 2022 Energy Crisis,* IMF Working Paper 24/27, February 2024, accessed August 6, 2025, https://www.elibrary.imf.org/view/journals/001/2024/027/article-A001-en.xml

[20] Vasily Astrov, Doris Hanzl-Weiss, Sandra M. Leitner, Olga Pindyuk, Johannes Poschl, and Robert Stehrer, *Energy Efficiency and EU Industrial Competitiveness: Energy Costs and their Impact on Manufacturing Activity,* wiiw Research Report 405, August 2015, accessed August 6, 2025

[21] European Environment Agency, "Energy efficiency," accessed August 5, 2025, https://www.eea.europa.eu/en/topics/in-depth/energy-efficiency

[22] International Energy Agency, *Capturing the Multiple Benefits of Energy Efficiency* (OECD, 2014), accessed August 5, 2025, https://www.oecd.org/content/dam/oecd/en/publications/reports/2014/09/capturing-the-multiple-benefits-of-energy-efficiency_g1g476b1/9789264220720-en.pdf

[23] Paul McCormack, Serena Pagliula, and Nathalie Richet, *White Paper on Energy-efficient buildings as job-creation motor,* IWG5-CSA, published January 30, 2025, accessed August 5, 2025, https://www.iwg5-buildings.eu/wp-content/uploads/2025/02/IWG5_Skills_white-paper_v1.pdf

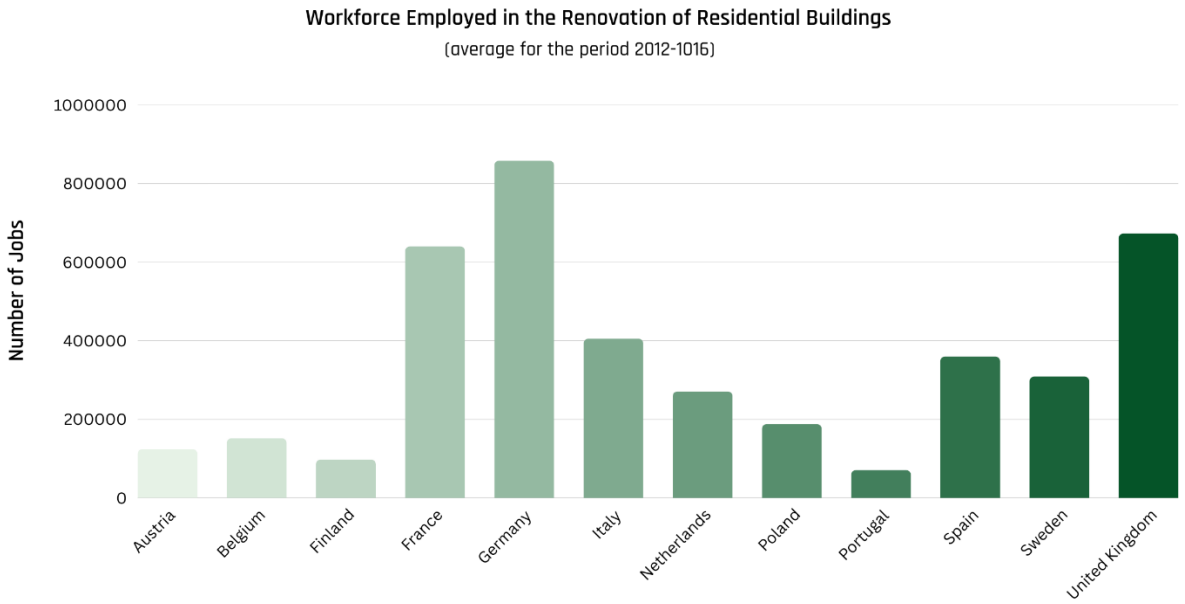

Figure 4 – Workforce Employed in the Renovation of Residential Buildings (Source: Navigant, Ipsos Belgium 2019)

Reduction of Energy Poverty

Reducing energy poverty is one of energy efficiency's most direct social benefits. In 2024, 30% of the populations of Portugal, Bulgaria, Greece and Lithuania could not adequately heat their homes.[24] Energy poverty ranged from 10% in the Netherlands and Hungary to over 20% in Sweden, Malta and Latvia. In 2022, 16% of people across Europe reported being in arrears with their utility bills (Figure 5) [25]. Strategic energy efficiency policies, such as those supported by the EU's Social Climate Fund and national renovation strategies, have measurably decreased the number of households at risk.

- Studies from Ireland, the UK, and broader EU retrofit schemes report that energy efficiency upgrades in social housing consistently result in substantial energy bill reduction and improve comfort and housing quality for tenants. [26] [27] [28]

[24] Morgiane Noel, "Energy poverty in the EU," The Loop Political Science Europe, accessed August 6, 2025, https://theloop.ecpr.eu/energy-poverty-in-the-eu/

[25] European Foundation for the Improvement of Living and Working Conditions, "Energy poverty looms as cost of living increases: Data behind the difficulties," published June 30, 2022, accessed August 6, 2025, https://www.eurofound.europa.eu/en/blog/2022/energy-poverty-looms-cost-living-increases-data-behind-difficulties

[26] Bryan Coyne, Sean Lyons, and Daire McCoy, *The effects of home energy efficiency upgrades on social housing tenants: evidence from Ireland,* Working Paper 279, Grantham Research Institute on Climate Change and the Environment. London School of Economics, September 2017, accessed August 5, 2025, https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2017/09/Working-Paper-279-Coyne-et-al-1.pdf

[27] UK100, *End the wait. Insulate*, 2024, accessed August 6, 2025, https://www.uk100.org/sites/default/files/publications/UK100_End%20the%20wait.%20Insulate_v4.pdf

[28] European Commission, "LIFE reduces energy poverty for Europe's vulnerable communities," published December 12, 2023, accessed August 6, 2025, https://cinea.ec.europa.eu/news-events/news/life-reduces-energy-poverty-europes-vulnerable-communities-2023-12-12_en

- Targeted efficiency support closes the comfort gap between high- and low-income populations, especially in Central and Eastern Europe, and rural areas. [29]

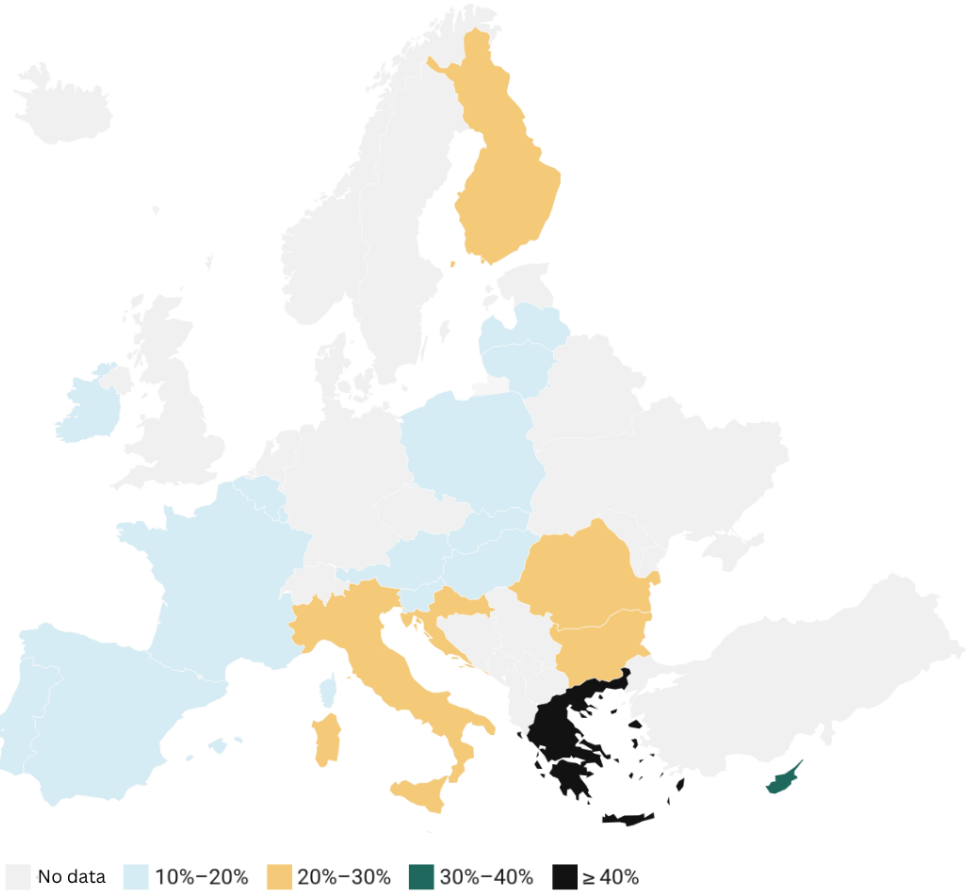

Figure 5 – Percentage of Households Behind on Utility Bill Payments in Europe in 2022 (Source: Eurofound)[30]

Community and Social Cohesion

Efficiency projects at the community level create important social dividend. Community-led renovation initiatives, district-wide retrofitting, and citizen energy programs build social ties, improve civic engagement, and foster inclusion. Research by Institute Delors and BPIE finds that where efficiency

[29] Metropolitan Research Institute, Habitat for Humanity International, Habitat for Humanity Hungary, and FEANTSA, *Energy prices and energy poverty in Eastern Europe*, July 2022, accessed August 6, 2025

[30] Daphne Ahrendt, Michele Consolini, Massimiliano Mascherini, and Eszter Sandor, *Fifth round of the Living, working and COVID-19 e-survey: Living in a new era of uncertainty,* European Foundation for the Improvement of Living and Working Conditions, May 2022, accessed August 6, 2025, https://www.eurofound.europa.eu/en/publications/2022/fifth-round-living-working-and-covid-19-e-survey-living-new-era-uncertainty

programs involve participatory decision-making and outreach, they help bridge divides, empower marginalised groups and leave a lasting community benefit. [31] [32]

Energy Security

Energy efficiency plays a crucial role in boosting Europe's energy security by reducing overall energy demand, decreasing reliance on volatile fossil fuel imports, and protecting consumers and economies from sudden energy price shocks. By using less energy to achieve the same comfort and productivity, countries can lower their exposure to external supply risks, including geopolitical disruptions and market fluctuations.

For instance, the Institute Jacques Delors policy brief emphasizes that, in response to disruption like the Russian gas supply crisis, accelerating energy efficiency in buildings and industry could save up to 25 billion cubic meters of fossil gas by 2025, equivalent to 15% of the imports needed to replace Russian supply. [31] Such savings are not only a buffer against price spikes but directly reinforce national and European goals to achieve greater self-sufficiency and resilience.

Comprehensive energy efficiency policies contribute to reducing the need for costly infrastructure investments by lowering overall energy demand and peak loads, thereby supporting a stable and resilient energy system. According to the Buildings Performance Institute Europe, improvements in building energy systems, help reduce energy losses, decrease grid capacity requirements, and facilitate the cost-effective integration of renewable energy sources into the electricity grid. [32]

Case Study: PAUL Tech and Solas Capital

PAUL Tech and Solas Capital work together to advance energy goals in Germany.

Tenants in German residential buildings frequently live with inefficient heating systems that increase energy costs and contribute to the country's carbon footprint. With PAUL Tech's Heating-as-a-Service offering, a solution is offered using advanced sensors and automated controls that can reduce energy consumption by as much as 40%. Financing such upgrades has traditionally been challenging for property owners due to substantial upfront costs. The Solas Sustainable Energy Fund, advised by Solas Capital, addressed this barrier by providing €30 million in funding to PAUL Tech, enabling the company to deliver its heating optimisation systems with no initial financial burden on building owners.

This financing model extends the benefits of energy efficiency beyond technical improvements. Through these upgrades, thousands of apartments have benefited from warmer and more comfortable environments, with tenants seeing meaningful reductions in energy bills. At the same time, these measures are directly supporting Germany's climate targets by lowering emissions from the building sector. As PAUL Tech's leadership emphasises, widespread building renovation is achievable when solutions are made accessible and practical for property owners and tenants alike. By overcoming

[31] Klervi Kerneis and Camille Defard, "The multiple benefits of energy efficiency," Institut Jacques Delors, July 2023, accessed August 5, 2025, https://institutdelors.eu/en/publications/the-multiple-benefits-of-energy-efficiency-2/

[32] European Commission, "From cost savings to societal gains: rethinking the cost-optimal methodology," BPIE, 2024, accessed August 5, 2025, https://www.bpie.eu/publication/from-cost-savings-to-societal-gains-rethinking-the-cost-optimal-methodology-2/

financial obstacles and applying intelligent technology, the partnership between Solas Capital and PAUL Tech is advancing energy goals while improving resident's quality of life.

Investing in energy efficiency represents one of the most impactful opportunities in sustainable finance. While inherently "green" through its direct reductions in energy use and emissions, it also delivers a host of social and economic benefits. As a strategy, it meets EU taxonomy criteria and complies with SFDR Article 9, reflecting its robust sustainability credentials. For institutional investors, energy efficiency offers a valuable complement to existing impact and renewable energy allocations, helping to achieve a stronger environmental outcome while enhancing portfolio resilience.

The Institutional Investment Opportunity

Energy efficiency project debt – A green fixed-income alternative.

For institutional investors seeking stable, long-term returns with meaningful climate impact, energy efficiency project debt represents a compelling opportunity. These investments offer several distinct advantages compared to traditional green investments:

- fixed and long-term cash flows through contractual off-take agreements that eliminate electricity price risk;
- extremely diversified counterparty exposure across hundreds of projects and multiple EU countries;
- limited correlation to traditional asset classes; and
- energy efficiency assets are typically essential for building operations, meaning payments continue even during economic downturns.

By investing in highly distributed portfolios of energy efficiency projects investors add significant diversification to their existing private markets strategy while achieving their climate investing targets.

Conclusion

Energy efficiency is more than just reduced emissions.

Energy efficiency in the EU delivers much more than just reduced energy use and emissions. It significantly improves public health, economic stability, and social wellbeing. Upgrading buildings lowers healthcare costs by addressing poor housing conditions, reduces energy bills to protect households from price volatility, and supports job creation in local communities. It also helps tackle energy poverty and strengthens social cohesion, while enhancing Europe's energy security by cutting demand and reliance on imports.

To unlock the full potential of energy efficiency, policies and investments must recognise these wide-range benefits, not only technical savings but also social, economic, and environmental gains.

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 prioritise 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 eligible 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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Disclaimer

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