The Economist Intelligence Unit

A report from the Economist Intelligence Unit

Investing in energy efficiency in Europe's buildings

A view from the construction and real estate sectors

Commissioned by GBPN Global Buildings Performance Network

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in collaboration with its European Hub, the
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The Global Buildings Performance Network (GBPN) is a globally organised and regionally focused non-profit network advancing building energy performance best practice policies to help decision-makers develop and implement policy packages that can deliver a Deep Path of energy consumption reductions and associated CO_2 emissions mitigation from buildings. It operates a Global Centre in Paris and is officially represented by Hubs in China, Europe, India and the United States. www.gbpn.org

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About this report

Investing in energy efficiency in Europe's buildings: a view from the construction and real estate sectors is an Economist Intelligence Unit (EIU) report commissioned by the Global Buildings Performance Network (GBPN) in collaboration with its European hub, the Building Performance Institute Europe (BPIE), and in partnership with the World Business Council for Sustainable Develoment (WBCSD). The report explores how companies in the EU building sector approach energy-efficiency investments, how they perceive the latest EU regulations and how innovative financing could help them ramp up retrofits to achieve ambitious emission reduction targets. The EIU bears sole responsibility for the content of this report. The findings do not necessarily reflect those of the sponsor. The paper was written by Dr Elie Chachoua and edited by Janie Hulse.

This report is based on three principal sources:

- Desk research building on the latest data, documents and reports on the subject.
- A previous survey of 96 EU executives in the EU building sector. Of the respondents, 44% were C-level, 46% reported company earnings of above $500m (EUR 390m), 69% were in the real estate segment (commercial, residential and industrial) and 31% came from the building construction industry.
- In-depth interviews with experts and C-level executives from leading companies involved in energy efficiency in the EU buildings sector.

The EIU would like to thank the following individuals for sharing their time and insights:

- Dr. Thomas Beyerle, managing director, IVG Immobilien
- Jean-Edouard Carbonnelle, chief executive officer, Cofinimmo
- Frank Hovorka, director of real estate sustainability policy, Caisse des Dépôts
- David Myers, president of building efficiency, Johnson Controls

Executive summary

Tackling building retrofits is crucial if the EU is to meet its ambitious 2020 energy and climate goals: improving energy efficiency by 20% and achieving a 20% reduction of greenhouse gas emissions from 1990 levels. Buildings now account for 40% of total primary energy consumption and 36% of greenhouse gas emissions in the region.

Approximately 40% of Europe's building stock predates the 1960s and is in dire need of renovation. Unlike emerging economies such as China and India that are experiencing an explosion of new building, new construction in Europe represents only about 1% of building stock.

EU energy efficiency laws for buildings are some of the world's most progressive, but implementation is patchy and varies by country. Full execution of existing regulation is needed to promote both energy-efficient new builds and retrofits, the latter being where most gains can be achieved. Indeed, most buildings present today in the EU will still be standing in 2050. Yet, renovation rates across the EU are low, standing at approximately 1% of the building stock. Only a minority of upgrades are substantial or what experts refer to as "deep retrofits". Encouraging deep renovations through clear legislation and innovative financing mechanisms would help achieve scale and help meet the 2020 targets.

The key findings of the report include:

- **The financial crisis, which has caused downward pressure on real estate valuations across much of the EU, has highlighted the need for renovation of existing building stock.** This will be needed to maintain and even increase the value of portfolios; deep retrofits will be crucial to achieving lasting value.

- **EU companies are relatively active in retrofitting buildings compared with their counterparts in other regions, but efforts need to double to meet EU energy efficiency goals by 2020.** Our 2012 survey revealed that 43% of EU respondents in the building sector focus on retrofits—more than in the US (37%) and in China (23%), for example. The majority (57%), however, still focus on new builds, with energy-efficient retrofits still accounting for only a meager 1% of existing stock.

- **The EU has taken some positive steps to improve regulation, but ambiguity regarding definitions of what constitutes a "deep retrofit" and a "nearly zero-energy building" affects implementation at national levels.** Indeed, 29% of the EU survey respondents

identified regulatory uncertainty as a barrier to pursuing energy efficiency investments. Furthermore, implementation of energy efficiency-related directives varies by country, which limits the ability of property owners to achieve economies of scale across the region.

- **Regulatory uncertainty should not be an excuse as waiting on the sidelines in anticipation of better laws exposes companies to the risk of asset depreciation**. Large property owners are starting to audit their portfolios to identify where they can achieve the most cost-effective energy efficiency measures. The deeper the retrofit, the lower the asset depreciation risk.
- **Attracting large institutional investors in retrofit finance will require energy efficiency project aggregators**. Aggregators can be public or private and can appear either as a result of regulation or client demand. To be effective, however, they require clear energy performance objectives, standardized contract structures that allocate responsibility for performance, and data collection and transparency about results. ■

1 Building on the past

"In the current economic downturn, we should embrace investments in efficiency as one of the key drivers to spur new and sustainable economic growth in the EU," said David Myers, president of building efficiency at Johnson Controls, a global provider of energy technologies and services.

Approximately 40% of the residential buildings in Europe predate the 1960s, yet, until recently, the overvalued housing market (notably in France, Britain, Spain and Netherlands) buffered owners from having to undertake renovations. "Prior to the crisis, the constant increase in the real estate prices had hidden the depreciating value of the existing building stock. The challenge companies are faced with today is how to maintain the value of the existing stock in the short term while increasing the long-term value of the portfolio," observes Frank Hovorka, director of real estate sustainable policy at Caisse des Dépôts, France's public long-term investor.

Large private companies with real estate portfolios in the EU building sector have already begun tackling retrofits. Indeed, 43% of respondents in the EU to our 2012 survey said they focus their energy efficiency efforts on retrofits of existing buildings—more than the US (37%), China (23%) or India (14%). Yet, the balance of investment in energy efficiency still tips toward new builds in Europe. "The EU has a challenge with the existing stock, not only with new builds," notes Mr Hovorka. To reach EU 2020 efficiency targets, retrofits will need to double from about 1% of existing stock today to 2-3%. This will require a combination of regulatory push (see Part 2) and market pull (see Part 3). ■

2 Regulating retrofits

"The big problem is that we can't spread out [retrofit] activities throughout our entire portfolio because we are facing different types of national standards," said Dr Thomas Beyerle, managing director at IVG Immobilien, one of the largest real estate companies in Europe.

Over the last two years, the EU has made good progress in trying to coordinate regulation across the region. In 2010, it updated the 2002 Energy Performance Building Directive (EPBD), the first EU effort to regulate energy efficiency in buildings. In October 2012, the Energy Efficiency Directive (EED) was adopted, with the aim of helping the EU achieve its 2020 energy efficiency goal.

The challenge, however, as with most EU regulation, lies less in the design and more in the implementation at the national level. "Even if we have the best Directive, it will only be as effective as the rules the member states enact. The history of the EU is littered with poorly implemented and ineffective Directives," warns David Myers of Johnson Controls. Such was the case of energy performance certificates for buildings in the early version of the EPBD, which attempted to compare performance across buildings. It was thwarted by vague definitions and spotty implementation at the national level.

It is still too early to tell if the updated EPBD or the new EED will face a similar fate. What is already evident is that the regulations, though ambitious, are riddled with ambiguity. For example, while the EED requires national strategies for building renovations and promotes a focus on deep retrofits, it does not specify a time horizon or define what "deep" retrofit means. Similarly, in the updated EPBD, more explanation of what is meant by a "nearly zero-energy building" is needed. Some flexibility in terms and requirements is necessary given the vast array of national circumstances in terms of geography, demographics, markets and ownership structures.

"We need to stop hiding behind vague concepts. It is fundamental for the market to get clear on common rules for nearly zero-energy buildings and on what constitutes a deep retrofit," argues Mr Hovorka of Caisse des Dépôts. While varied implementation across member states is not necessarily a problem for national property owners, it reduces international companies' capacity to leverage economies of scale.

Companies that respond to regulatory uncertainty by delaying retrofits will only expose themselves to asset depreciation risk. "Depreciation is the next big Damocles sword for the industry," says Mr Beyerle from IVG Immobilien. The risk of asset depreciation is compounded by a lack of data on companies' energy consumption and their carbon footprint. "Most investors have no idea what the energy efficiency or carbon footprint performance of their portfolio is," notes Mr Beyerle. Indeed, only one-half of the EU companies included in our survey audit their energy use—though this is much better than figures in the US (30%), in India (28%) and in China (15%).

Large European property owners like Caisse des Dépôts, IVG Immobilien and Cofinimmo have recently begun proactive evaluations of their existing stock. Four lessons have emerged from their audits thus far. First, the deeper the retrofit, the lower the risk of asset depreciation. Second, taking a portfolio approach to the management of the building stock helps large property owners increase the cost effectiveness of their energy efficiency efforts. Nearly one-half (48%) of the EU respondents to our survey said they already take a portfolio approach to energy efficiency investments. This is more than in the US (31.5%) and in India (45%) but less than in China (51%). Third, the approach to retrofitting should be strategic and nuanced by, for example, tackling deep renovations of the older, most inefficient buildings first and working towards replacing the others over time. Fourth, the scale of the investment determines the overall speed with which the stock is retrofitted—the higher the investment, the larger the percentage of stock upgraded.

But even the best project management will prove futile if required government permits are not granted on time. Many companies' plans have been stifled by bureaucratic delays. Cofinimmo, which manages 1.8m square meters of properties across Belgium, France and the Netherlands, for example, has been waiting for over a year for a permit to undertake a retrofit project for which it has received a price for the best energy performance building by the government of the Brussels-Capital Region. As Jean-Edouard Carbonnelle, CEO of Cofinimmo explains, "Getting faster permitting for deep retrofits would help those who try to go beyond the existing standards. It would also help increase the focus on the existing stock and make them more competitive with new builds." ■

3 Aggregating for scale

"Project aggregators won't appear by themselves. You need to activate multiple levers simultaneously to create trust all over the supply chain. This requires technical people to find the projects and secure performance, legal people to create the contracts and finance people to secure investors' interest. In other words, there is an investment cost to setting up aggregators and you need to be ready to invest it upfront if you want the aggregator to work," explains Mr Hovorka from Caisse des Dépôts.

The EU has more than one hundred public financing mechanisms to promote energy efficiency in the building sector. Most of them rightly focus on existing stock. The financing, however, largely comes through grants and subsidies which, in a context of cash-strapped governments still dealing with a public debt crisis, are not the most effective use of limited public funds. Instead, public money should be used to leverage more private finance.

Toward this end, different financing models have been explored at the national level. A well-known example includes Germany's use of its national development bank, KfW, to leverage private money on capital markets and provide subsidized loans for energy efficiency (via local banks) with a leverage ratio of 1:10 (ie, 10 euros of private money for every one euro invested by the government). More recently, the UK implemented an on-bill energy finance scheme known as the "Green Deal".

Companies can also help attract large investors by aggregating projects. Large property investors could establish green building funds, for example. Demand for these funds can be strong. Such was the case for IVG's Premium Green Fund—a EUR 500m fund for new energy-efficient buildings in Germany which closed in one day. "It was a way to respond to our investors' demand for responsible investments," notes Mr Beyerle from IVG Immobilien.

Governments could also impose energy-efficiency standards on utility companies. These would then promote energy efficiency among customers—effectively making the utility company a project aggregator. To this point, Mr Myers of Johnson Controls commented, "We are pleased to see a number of measures [in the EED Directive] such as the annual renovation requirements for central government buildings and energy saving obligations for utilities. These measures will aid the development of Energy Performance Contracting [EPC], an innovative financing technique that repays the cost of energy projects through the cost savings they produce."

Yet, both companies and member states will need more data on the performance of their energy efficiency investments if they want to attract large investors. "You must show bankers the value they'd get by investing in energy efficiency. Another important aspect will be to value the depreciation effect [of neglecting retrofits]," explains Mr Beyerle from IVG Immobilien. The first step, measuring the gains, will be crucial to attracting

large investors. The second, measuring the loss inherent in depreciation, will be important to motivate shareholders to invest in order to maintain value today and increase the long-term worth of their portfolios. Finally, both valuations should go beyond the simple energy dimension and try to put a monetary value on other co-benefits to energy efficiency such as increased comfort to occupants, lower maintenance costs, etc.

Clear performance objectives are also important. "The risk of being lax on the definition of performance is that we're going to spend money in an inefficient way. And the reason for that is simple: if you give money but do not ask for performance in return, people will naturally take the money and do the minimum," says Mr Hovorka.

Achieving performance objectives will require standardized contracts that clearly define the responsibilities and liabilities of the different parties involved and help facilitate faster retrofits through faster processing. Independent, accountable energy auditors also play a critical role—they could leverage these contracts in their performance evaluations to determine financing needs and to select the most cost-effective measures.

4 Conclusion

The new and updated EU Directives indicate some urgency in tackling impediments to achieving the 2020 efficiency targets.

Their virtuous ambitions, however, could be obstructed by legislative ambiguities and patchwork implementation at the national level—a notorious downside of lots of well-intentioned EU Directives. Our survey revealed that the EU private sector is in favour of effective regulation and implementation that encourages deep renovation of the building stock. Any future EPBD revisions might provide clarity and strengthen the case for retrofits.

Companies cannot afford to wait for an ideal regulatory framework; their portfolios will only depreciate if they do. Some larger property owners with access to capital understand this and are taking action now and hoping for longer-term dividends. Achieving scale in retrofits, however, will require innovative finance and support from large institutional investors. Aggregating projects is critical to large-scale financing. So is proving the value-add of energy-efficient upgrades at the portfolio level. Clear performance objectives, good data collection, standardized contracts and regular independent audits should help.

Table 1: Overview of European legislation addressing energy efficiency in the building sector

EPBD (Energy Performance of Buildings Directive)	**RED** (Renewable Energy Directive)	**EED** (Energy Efficiency Directive)	**Ecodesign**	**Energy labelling**
Requires member states to develop and apply a methodological framework for calculating the energy performance of buildings. This calculation method shall consider thermal building characteristics as well as the technological equipment for the thermal supply.	Obliges member states to set up sector-specific targets for renewable heating and cooling.	Obliges member states to establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private.	Sets minimum efficiency standards for technologies used in the building sector (eg, boilers, hot water generators, pumps, ventilation, etc).	Obliges member states to establish efficiency labelling schemes for a number of technologies used in the building sector.
Obliges member states to take the necessary measures to ensure that minimum energy performance requirements for buildings or building units are set, applied and met with a view to achieving cost-optimal levels; this regulation applies to all new buildings and existing buildings that undergo major renovation.	Requires member states to adopt support policies for RES-H (project to help member states to examine heating and cooling in light of renewable energy sources) at least for new buildings and existing buildings that are subject to a major renovation.	Requires member states to ensure a refurbishment rate of 3% per year related to the total floor area of all heated and/or cooled buildings (> 500 m2) owned and occupied by their central governments (applying the standards set by the EPBD recast).		
Requires member states to take measures that aim at optimising the performance, installation, appropriate dimensioning, adjustment and control of the technical building systems which are installed in existing buildings.	Defines technology-specific restrictions (in view of target accounting) for heat pumps and bio-liquids.	Requires member states to establish energy efficiency obligation schemes (commonly known as White Certificate Schemes) or alternative measures with equivalent effect, aiming at providing efficiency measures that achieve energy savings of 1.5% per year on average.		
Obliges member states to ensure that all new buildings are nZEB (nearly zero-energy building) by the end of 2020 and that all new public buildings reach this standard two years earlier; in addition, member states shall draw up national plans reporting on their plans for increasing the number of nZEBs, the definition of nZEB, the policies/measures to stimulate the transformation of buildings that are refurbished into nZEBs, the interim steps towards nZEB and the implementation of Article 13(4).	Requires member states to ensure that new public buildings, and existing public buildings that are subject to major renovation, at national, regional and local levels fulfil an exemplary role in the context of the use of RES-H.	Obligates member states to promote the availability of independent high-quality energy audits to all final customers.		
Requires member states to ensure that all accessible parts of the heating and air-conditioning systems are regularly inspected and that heating installations older than 15 years are assessed with respect to their energy performance.				
Obliges member states to implement EPC schemes according to a number of minimum requirements (especially regarding content, display and disclosure, reliability, validity, quality) defined by the Directive.				

Source for table: Bürger, V. (2013). Overview and assessment of new and innovative integrated policy sets that aim at the nZEB standard.

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