



EeMAP

Energy efficient
Mortgages
Action Plan



CREATING AN ENERGY EFFICIENT MORTGAGE FOR EUROPE

BUILDING ASSESSMENT BRIEFING: IRELAND

ABOUT THE IRISH GREEN BUILDING COUNCIL

The Irish Green Building Council (IGBC) is the leading authority on sustainable building in Ireland. With a network of over 100 member organisations, the IGBC is working to transform the Irish construction and property sector into a global leader in quality and sustainability.

To do so, the IGBC has developed several sustainable building tools, including the Home Performance Index – Ireland’s first national certification system for quality and sustainable residential development – and an Environmental Product Declaration Platform. The IGBC has also developed an extensive green building education programme, which includes BREEAM, LEED and LCA training courses.

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www.energyefficientmortgages.eu

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PLATINUM MEMBERS



GOLD MEMBERS



SILVER MEMBERS



INTRODUCTION

Signals of climate change impacts are evident in Ireland. These include changes to key meteorological parameters such as average temperature, rainfall intensity and patterns, as well as ecosystem changes⁰¹. With buildings responsible for 36% of CO₂ emissions in the European Union, having more energy efficient buildings is a top priority.

The EU's investment need in energy efficiency in buildings is approx. \$62 billion per year between 2014-2035 to limit the temperature increase to 2°C as required under the Paris Climate Agreement⁰². Although most new dwellings built in Ireland today are highly energy efficient reaching an A3 (or higher) BER energy rating* ⁰³, as many as one million Irish homes are considered significantly energy inefficient and require upgrade work between now and 2050⁰⁴.

In this context, the aim of this report is to provide an overview of the building energy performance assessment "state of play" in Ireland, and as such to set the scene for the potential introduction of energy efficient mortgages. It highlights the opportunities and barriers these may present.

This document is intended to be used by non-building experts who may be interested in better understanding indicators currently available in Ireland to assess buildings energy and environmental performances.

The introduction provides an overview of Ireland's dwelling stock and existing policy initiatives to support energy efficiency. Section 2, 3, 4 and 5 present methods currently used in Ireland for assessing buildings' energy and environmental performances and how they may be used for financial assessment when a mortgage is issued.

IRELAND'S DWELLING STOCK

Out of the 1.7 million occupied permanent dwellings, 63.6% are in urban areas and 36.4% in rural areas⁰⁵. By 2030, it is likely that levels of urbanisation in Ireland will be comparable to the current average in the EU (i.e. around 74%).

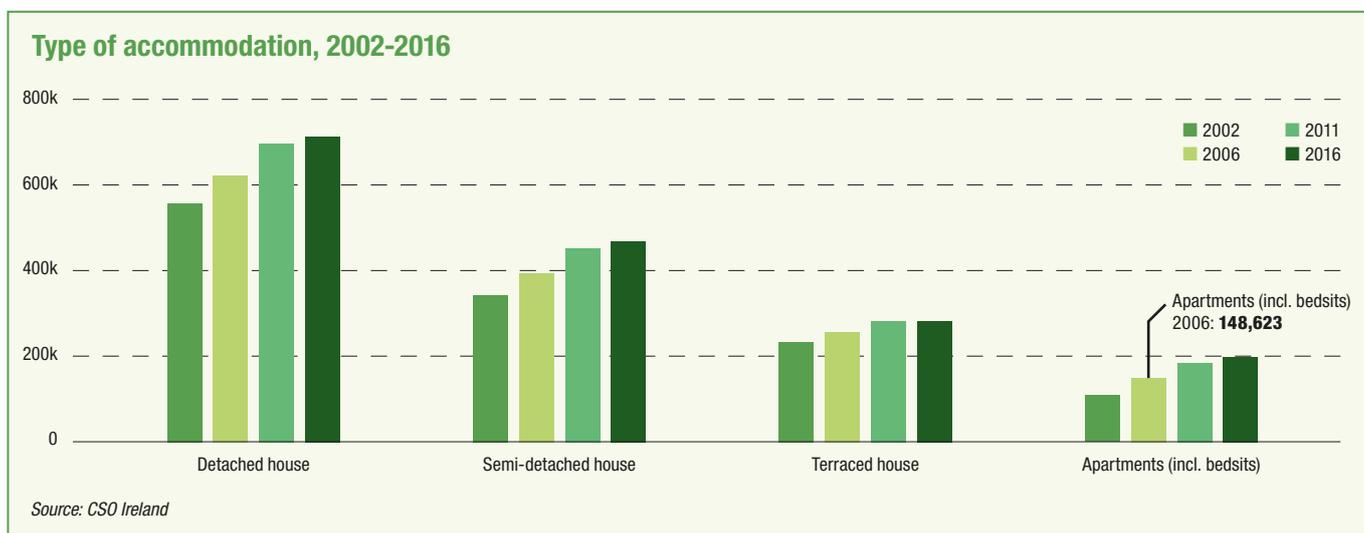
The average number of persons in private households was 2.75 in 2016. This number has steadily declined since 1961. A trend that is likely to continue in the next 15 years.

The average number of rooms per household in 2016 was 5.2 (EU28: 3.8).

Due to a significant decrease in construction activities during the economic downturn and Ireland's projected population growth, Irish cities are currently experiencing a housing shortage. It is estimated that an average of 25,000 homes must be produced every year in the period to 2021⁰⁶. 9.15% of all dwellings enumerated in the 2016 census were vacant.

Categories of dwelling

Despite the increase in the number of newly constructed apartments in the last 2 decades, the detached house remains the most common dwelling, representing more than 42% of the total housing stock in 2016. Semi-detached and terraced dwellings accounted for 47% of the stock. Although the number of occupied apartments increased by 11.4% from 2011 to 2016, apartments only accounted for 12% of all dwelling types in 2016.



* Compare to an average BER for all Irish Dwellings of D1⁰⁷.

Detached houses are typically located in rural areas (72%) and are larger than the average European house, meaning that their energy use is higher.

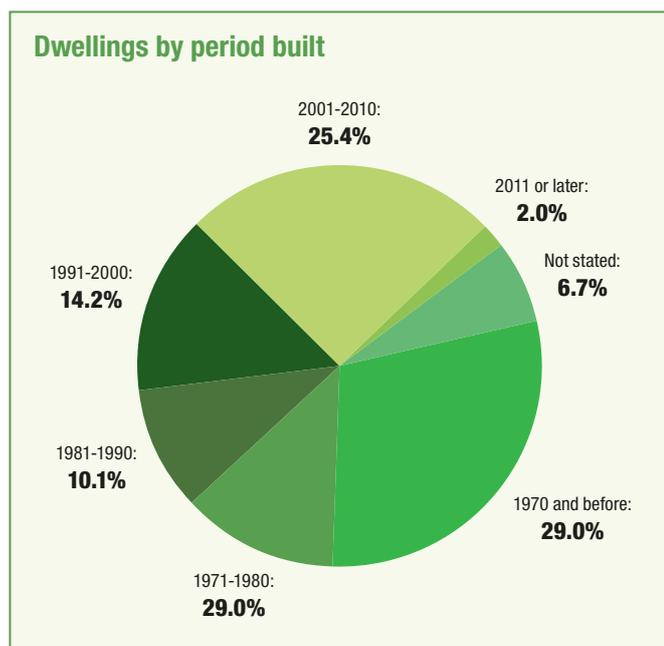
Apartments became the dominant dwelling type in Dublin City for the first time ever in 2016. In fact, Dublin City has the highest proportion of apartments as a household type at 34.3%, while Roscommon had the lowest with 2.4%.

Age band

The total housing stock grew by just 8,800 (0.4%) between 2011 and 2016, in sharp contrast to the growth of 225,232 dwellings recorded between 2006 and 2011.

Nearly 1/3 of the current housing stock was completed before 1970 and approximately a quarter dates from 2001 onwards. Dublin and Cork cities have the largest proportion of older dwellings (i.e. pre-1945 buildings).

Since the first mandatory Building Regulations that explicitly addressed conservation of fuel and energy in buildings were issued in 1992 and some 57% of residential dwellings date from before this time, there is likely to be potential in the residential sector for major energy renovation works.



Ownership types

Although the overall home ownership rate dropped slightly between 2011 and 2016, the Irish residential sector is characterised by a high degree of home ownership (67.6%). Furthermore, a significant number of householders (36.4%) own their own home outright, without any mortgage or loan.

However, there are considerable regional discrepancies: Houses owned with a mortgage are concentrated around Dublin, while homes owned outright are concentrated on the west coast.

When examined by age the results show that renting is more common than owning before the age of 35. Beyond this, more householders own rather than rent their home. The equivalent age in previous censuses was 32 years in 2011, 28 years in 2006, 27 years 2002 and 26 years in 1991.

These are important considerations for any energy efficient financial schemes as consumers with different tenures are likely to require different products – e.g. top-up mortgages, buy-to-let loans.

Mortgage market

According to the Irish Brokers' Association €7bn in new mortgages should be sold in Ireland in 2017, a number which should grow in the coming years as more houses are built. At €449m, the Central Bank said residential mortgage loans posted the largest net increase in the final quarter in 2016 since the depth of the financial crisis in March 2011⁰⁸.

The Irish mortgage market has undergone unprecedented changes in the past 15 years. A boom-bust cycle has resulted in many dysfunctional market characteristics.

The market is characterised by a high concentration of a small number of lenders, limited competition between these lenders and low levels of entry by new players. Unique characteristics of the Irish mortgage market include significant government involvement, market distortions caused by the large scale of tracker mortgages, negative equity and non-performing loans⁰⁹. In fact, while household debt as a proportion of income has fallen more than any other EU country in recent years, Irish household indebtedness remains high by cross European comparison*¹⁰.

Under Irish regulations, the Central Bank set limits on the size of housing loans made by the commercial lenders that it regulates¹¹. Equity release and top-up on an existing mortgage are both within the scope of the limits, but they do not apply to switcher mortgages, or to the restructuring of mortgages in arrears or pre-arrears. There are 2 types of limit: One based on the ratio of the loan to the price of the house and the other based on the ratio of the loan to the income(s) of the borrower(s). Both limits must be met for the mortgage to meet the Central Bank's requirements. However, the Regulations allow lenders to be flexible in some cases.

In 2016, the Irish government introduced the Help to Buy (HTB) incentive scheme. Under this scheme, first-time buyers buying or building a new property costing less than €500,000 qualify for a refund of up to €20,000¹².

The current characteristics of the Irish mortgage markets will need to be taken into account when developing energy efficient mortgages in Ireland.

EXISTING POLICY INITIATIVES

Public funding available to reduce CO2 emissions from the built environment was increased by €35m under the 2018 budget¹³, bringing the annual budget for energy efficiency to over €100m.

* The ratio of Irish household debt to disposable income is 140.9%.

Energy efficiency financial support for existing buildings is mainly available through grants and tax incentives.

The Sustainable Energy Authority of Ireland (SEAI) provides grants through schemes such as [Better Energy Homes](#)^{*}, [Better Energy Communities](#)^{**} and [SEAI's Deep Retrofit programme](#)^{***}. Financing models are also trialled and piloted through the Better Energy Finance (BEF) Initiative run by SEAI. Householders and private organisations who invest in energy efficiency may also be eligible for tax rebates under schemes such as the [Home Renovation Incentive](#) (HRI) and the [Accelerated Capital Allowances for Energy Efficient Equipment](#) (ACA).

As part of BEF, some local energy agencies help participants in their schemes to find financing solutions (e.g. [Superhomes programme](#) run by Tipperary Energy Agency). SEAI has run trials with credit unions and various counterparties to test innovative financing solutions for home retrofit. The BEF scheme has also partnered with many employers to trial a salary incentive scheme, whereby the employer provides loans to their employees to upgrade the energy efficiency of their homes. In all of these cases an end to end offering was made to participants, including advice, works, quality assurance and grant drawdown from SEAI, in addition to the financing mechanism provided.

While targeted and effective government incentives are part of the solution, the scale of the challenge means that private investment must be mobilised too.

In Ireland, private finance mainly targets the non-residential market. In 2014, the Irish Government facilitated the creation of a €70m Energy Efficiency Fund by committing €35 million to finance energy efficiency projects across Irish public and private sector buildings on a commercial basis. The Energy Efficiency Fund invests in projects that reduce energy consumption, recover useful energy from waste streams and distribute renewable energy generation. One of the main Irish banks, AIB also launched an Energy Efficiency Finance scheme to support SMEs that want to drive down their energy costs and increase competitiveness.

As part of Ireland's National Renovation Strategy consultation process, close to 200 key stakeholders said that banks and credit unions should play a role in supporting large scale energy renovation in Ireland. In particular they suggested the introduction of low interest loans for homeowners who undertake energy renovation – See Recommendation 3.12¹⁴.

Research from SEAI also shows that homeowners would be much more open to engaging in home retrofit if a low-cost finance product was available, and that the retrofits would be deeper in nature. Surveys by SEAI have shown that the interest rate, flexibility and ease of application are the main priorities of home owners in relation to securing finance.

For further information on these financial mechanisms please visit RenoWiki Ireland at <http://ie.buildupon.eu/financial-economic/>.



* Residential.

** Residential and non-residential.

*** Residential.

BUILDING ENERGY RATING

Under S.I. No. 243/2012 – European Union (Energy Performance of Buildings) Regulations 2012, every dwelling and non-domestic building offered for sale or rent to any prospective purchaser or tenant must have an Energy Performance Certificate (EPC) provided by a certified assessor. However, there are exemptions for protected structures and some other building types, such as places of worship or non-residential agricultural buildings with a low installed heating capacity.

In Ireland, EPCs are known as Building Energy Rating (BER) certificates. The scheme is managed exclusively by SEAI, including registration and quality assurance of assessors and publication of all BER certificates.

Over 745,000 BER certificates for dwellings had been issued in the country by April 2017¹⁵. In contrast, 47,000 had been issued for non-domestic buildings by June 2017¹⁶. The most common EPC rating of Irish residential houses is a D1 for which the asset-based energy usage calculation ranges from 200 to 225 kWh/m²/year⁰⁷.

ABOUT BERS

A BER certificate is an indication of the energy performance of a building. It is the calculated energy use for space and water heating, ventilation and lighting based on a standard pattern of occupancy.

A BER is based on the characteristics of major components of the dwelling (wall, roof and floor dimensions, window and door sizes and orientations) as well as the construction type and levels of insulation, ventilation and air tightness features, the systems for heat supply (including renewable energy), distribution and control, and the type of lighting. The Assessor will typically collect about 80 pieces of data which are subsequently input into the BER software tool (DEAP) to calculate the BER. DEAP is based on the European Standard IS EN 13790:2004 and draws heavily on the UK's Standard Assessment Procedure (SAP)¹⁷. The BER certificate and advisory report is published through SEAI's online platform.

A BER is valid for up to 10 years if there is no material change to the dwelling that could affect its energy performance.

The label has a 15 points scale from A1 to G. A-rated homes are the most energy efficient and will tend to have the lowest energy bills. However, a BER is only an indication of the energy performance of a dwelling. Actual energy usage will depend on how the occupants operate the dwelling.

ABOUT BER ASSESSORS

As of 9th October 2017, there were 563 certified BER assessors for dwellings and 163 certified assessors for non-domestic dwellings operating in Ireland (17).

BER assessors must satisfy the following requirements:

DOMESTIC BER ASSESSOR	NON-DOMESTIC BER ASSESSOR
Have a level 6 award under the National Qualifications Frameworks in construction studies or equivalent	Have a level 7 award under the National Qualifications Frameworks in a building construction related discipline
Have successfully completed a training course for BER Assessors	Hold membership of a professional organisation at the specified grade
Have passed the SEAI Domestic BER Examination	Have passed the SEAI non-domestic BER Examination
Have the required insurance policies	Have the required insurance policies
Have completed the registration form, accepted the Code of Practice, submitted the required certified ID and Tax Clearance Certificate	Have completed the registration form, accepted the Code of Practice, submitted the required certified ID and Tax Clearance Certificate
Have paid the registration fee	Have paid the registration fee

Domestic and non-domestic assessors can be identified through a live register available at <https://ndber.seai.ie/Pass/assessors/search.aspx>.

QUALITY ASSURANCE

The Irish BER quality assurance system, operated by SEAI, has been identified as one of the most robust in Europe¹⁸.

To serve the interests of clients for BER services and of all reputable BER Assessors, SEAI has put in place a robust quality assurance system for BER Assessors, and a related disciplinary procedure. This includes both targeted and random audits of BER Assessor and BER assessments to ensure compliance with the relevant EPC technical methodology and the Code of Practice for BER Assessors.

BER DATABASE

Ireland has one central BER database maintained and operated by SEAI.

End-users can easily access information on BER legal requirements and BER assessors, as well as access their certificate using its unique number, or the electricity meter point reference number (MPRN) through an online platform. BER assessors can log into the platform and upload certificates.

Since 2012, SEAI has operated a national BER research tool – for domestic BER certificates. The database is updated daily, so up-to-date anonymised energy statistics on residential BERs is widely available. Details available include dwelling type, year of construction, floor area and fabric U-values. Six filtering tools (county, dwelling type, energy rating, rating types, year of construction and total floor area) are available to narrow down the results. The whole dataset can be downloaded in an excel format at <https://ndber.seai.ie/BERResearchTool/Register/Register.aspx>.

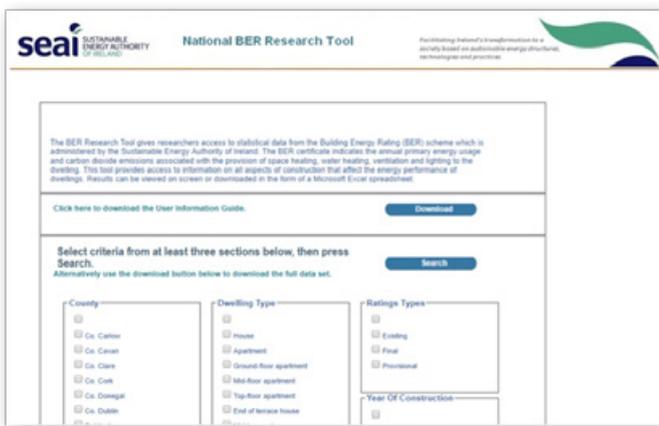


Fig. 1: SEAI's National Research Tool – Screenshot – October 2017

The national BER database is essential for collecting statistical insights in to energy performance of the existing building stock. The database is used to inform renovation strategies and to enable stakeholders in the supply chain to better understand the market for their products.

The Central Statistics Office (CSO) is Ireland's official statistics office. The CSO combine BER data with other data sources including the national census. The CSO publish comprehensive quarterly update of the BER data. The latest version of same is available [here](#).

IMPACTS OF BER RATINGS

BER ratings and energy savings

Across Europe, energy performance models generally over-estimate the energy required for existing dwellings and under-estimate energy consumption in newly built dwellings¹⁹.

No large-scale studies have looked at the correlation between BER rating and actual energy consumption in Ireland. However, small-scale research suggests that BER ratings are not always a good indication of actual energy use. In 2012, an Irish study on the oil consumption of 142 houses pre-retrofit found that BERs were poor predictors of the households' oil consumption. In fact, this study found the houses on average to use 41% less energy compared to the theoretical usage estimated by the buildings' DEAP²⁰. A similar study conducted in 2016 showed that the DEAP assessed as standard for a sample set of urban social housing in Dublin on average underestimated the gas usage of the houses by 41% compared to actual gas consumption⁰⁷. As the tenants were living in poor thermal conditions prior to retrofit, they probably experienced a benefit of improved thermal conditions rather than energy reductions. This phenomenon is well-known as the rebound effect.

BER ratings and property values

In 2013, the Economic and Social Research Institute (ESRI) analysed the impact of the BER rating on the sale or rent of 36,000 properties listed on the Irish property website daft.ie between Jan 2008 to Mar 2012. The study showed that there is a price premium associated with energy-efficient properties in both the sale and rental markets³⁴.

According to this report, a house with a good energy efficiency rating (A) can fetch almost 10% more than a comparable property with a low BER (D). If the BER is measured as a 15-point scale from A1 to G, each rating decline along the BER scale is associated with a reduction in price of 1.3%.

While the magnitude of the effect is weaker in the rental market, a positive relationship still holds between energy ratings and rental prices. Relative to D-rated properties, A-rated properties receive a rental price premium of just under 2%. If the BER is measured as a 15-point scale from A1 to G, each rating decline along the BER scale is associated with a reduction in rental price of 0.5%.

However, the study showed that the effect of the energy rating is generally stronger where selling conditions are worse. For instance, the price discount associated with each decline along the energy efficiency scale was 1.2% in urban areas, whereas in rural areas the discount was almost double this at 2.3%. Each improvement along the BER scale was associated with a 2% increase in the sales price compared to a 1.5% increase when market conditions were not as bad.

BER ratings and carbon emissions

Although BER documents provide information on carbon emissions, this does not impact a building rating. In fact, BER rating is based on energy efficiency rather than carbon emissions. It is currently possible to reach a high BER rating but to have an inefficient system in terms of carbon emissions.

PREDICTING ENERGY PERFORMANCE

During Ireland's national renovation strategy consultation process – Build Upon – there was a call for quality energy upgrades to be made more convenient and accessible. A need was identified to introduce simple holistic energy assessment and/or building passports which would include a masterplan for retrofit and a record of work. Beyond the publication of impartial information and guidance, residential end-users would benefit from the development of a network of skilled, trusted local intermediaries who would support them at all stages of the process¹⁴.

As it currently stands, SEAI provides an indicative BER and estimated yearly energy cost of varying home types and ages²¹. However, it does not require a BER to be carried out prior to energy renovation when applying for SEAI funding under the Better Energy Homes Scheme*. As BER Certificates come with an advisory report recommending the best energy saving improvements for a building, researchers have called for the introduction of energy audits that would include recommendations as to an optimal package of measures prior to any energy efficiency works²¹.

Some energy agencies provide some extra support to homeowners at a local level. For instance, the Tipperary Energy Agency assists homeowners with all aspects of the energy renovation process, from sorting the grant to selecting insulation and contractors with an initial home survey going beyond a simple BER assessment being mandatory – [Superhomes project](#). Other energy agencies, as well as some energy suppliers and their counterparties also provide home site visits to provide advice on home energy upgrades. In addition, they will arrange for contractor works, provide quality assurance and manage the SEAI grant process.

In Dublin, Codema with the support of SEAI, recently introduced the [Home Energy Saving Kit](#). The kit is available to borrow free of charge



from all Dublin City Council libraries and contains 6 practical tools (e.g. thermal leak detector and plug-in energy monitor) to help residential end-users save energy. The agency is now working on a new phase of the project, which will allow homeowners to move to the next steps after identifying the issues.

Private organisations such as [Energy Action](#) and [Renova](#) also help homeowners planning retrofit activities. The TABULA Irish Building Typology provides standard and advanced energy upgrade recommendations for 31 typical Irish dwelling types²².

* A BER is only required to be carried out and published once the grant related works are completed. However a full BER is required under all other SEAI funding schemes.

MEASURING ENERGY PERFORMANCE

Buildings accounted for 35% of total final energy consumption in Ireland in 2014, making it the second largest energy end-use sector behind transport. Ireland has an unusual residential fuel mix compared to many European countries. The single largest fuel source is oil, accounting for 34% of total residential fuel consumption in 2014. This is because a large share of dwellings are in rural areas, have no access to the gas grid and use oil fired boilers for space and water heating. Energy efficiency in the residential sector improved by 34.7% between 2000 and 2014. The gains in efficiency have mainly been brought about by the improvement in space heating and increased insulation levels. This is also linked to the increase in new buildings built to higher standards since 2000 and to uptake of retrofit schemes since 2005²³.

ACCESS TO PROPERTY ENERGY CONSUMPTION DATA

The government and members of the supply chain (e.g. utilities, insurance companies) collect significant amounts of data. However, in the Build Upon consultation process it was highlighted that these are not always captured in the most useful way. For instance, due to data protection legislation accessing quality data from energy providers is currently difficult. While acknowledging the need to protect consumers' privacy, Build Upon participants said that energy, education and health data, as well as national and local data, should be married and studied in a more comprehensive way¹⁴.

Since the National Open Data Initiative was instigated in 2014, substantial advances have been made, including the development of the National Open Data Portal data.gov.ie, which links to over 5,500 datasets from 100 Public Bodies. There are 100 Open Datasets available that are categorised as 'Energy' data*, from Local Authorities, SEAI and Department of Communications, Climate Action and Environment (DCCAE). However, very few of these datasets relate to property energy consumption data.

To develop more detailed local analysis and to better monitor local actions, the Carlow Kilkenny Energy Agency (CKEA) initiated a process to facilitate public authorities access to energy data. This was done through transferable, effective and structured collaboration agreements between 3 Irish counties (Carlow, Kilkenny and Wexford) and energy providers. Further information on this process can be found at www.energyhub.ie.

SMART METER ROLL-OUT

A total of 2.3 million smart meters are to be installed in Irish homes and businesses between 2019 and 2024. The National Smart Metering Programme involves a phased approach, commencing with an initial delivery of 250,000 meters in 2019-2020 and about 500,000 meters in each of the four subsequent years. The initial priority is to service "early adapters" (i.e. consumers who request a smart meter) and to replace older meters approaching end of life expectancy. Day-to-day rollout of the delivery plan will be the responsibility of ESB Networks and subjected to oversight by a steering group that will also include the Commission for Energy Regulation (CER) and DCCAE.

The cost to the consumer will be €5.50 a year, which will be added to their bill. The new meters will have a sim card and will send readings to the network 48 times a day.

SMART METERS AND DATA PRIVACY

As smart meters increase the frequency of communication between the consumer and other parties, the use of smart meters also increases the amount of consumer data that is generated. Smart meters collect a much larger amount of data and that data can be used for many more purposes than traditional meters. With the regular collection of personal data, the creation of individual profiles is facilitated²⁴. In fact, detailed electricity usage patterns and trends can be identified to help understand daily consumer habits and routines. In Ireland, the CER is responsible for ensuring consumer's data protection.

The roll-out of smart meters was confirmed on 21st September 2017. Except for a few letters to the editor of the main newspapers regarding use of personal data, media coverage of smart meters has been positive so far. However, it is worth noting that the data protection policy of Irish Water became a major source of contention a few years ago. Following widespread protests against the opacity of Irish Water's data protection notice and the reference to possible data transfers to third parties, Irish Water had to revise its Data Protection Notice²⁵.

* <https://data.gov.ie/data/search?theme-primary=Energy>

GOING BEYOND ENERGY

Consumers have different drivers for investment in energy efficiency. Research conducted by SEAI show that comfort gains, energy savings and impact on property values are the principal motivators for people who decide to get involved in energy renovation. In contrast, environmental benefits are a relatively weak motivator²⁶.

Although density in Ireland is relatively low, recent surveys have shown growing support for higher density and good public transport²⁷. Location, access to amenities and options for transportation are clear priorities for home owners. In that regard, recent flooding events mean that the risk of flooding at site is also likely to be a key consideration.

From a financial institution point of view, it might also make sense to go beyond the BER ratings and to look at carbon emissions efficiency. More specifically, with the Nearly Zero Energy Building (NZEB) standard coming into force from 2019 onwards, a growing interest in building embodied carbon can be expected. In fact, for buildings built to the NZEB standard embodied impacts can represent up to 50% of the total life cycle carbon²⁸.

Home Performance Index

The Home Performance Index (HPI) certification scheme allows potential owners and investors to go beyond energy efficiency and to access reliable information on wider sustainability aspects²⁹. Developed by the Irish Green Building Council with the support of EPA Ireland, HPI is the first national voluntary quality and sustainable assessment system, developed for the residential construction sector in Ireland.

The system is divided into three main categories based on the environmental, social and economic pillars of sustainability. Two additional categories, quality assurance and sustainable location, reflect the planning and procurement processes. Points are awarded for each indicator and sub-indicator. For most indicators there are several levels of achievement, which means that points are scored when there is an improvement over the baseline, normally set at the minimum requirement of Irish Building Regulations where there is a relevant standard.

The Environment category contains indicators that measure the ecological footprint of the development, including those for global warming potential, loss of biodiversity, water usage, quantity of land consumed, and embodied impact of materials used in construction. Certified HPI homes must at the very minimum have an A3 BER rating.



The Economic category contains indicators that relate to occupant running costs and the long-term value stability of the dwelling, such as its capacity to adapt to changing family circumstances.

The Quality Assurance category contains indicators to assess the process of design and construction of the dwelling, and a testing regime to ensure that the design intention is achieved.

Finally, the Sustainable Location category contains indicators that measure how well the dwelling relates to existing transport infrastructure and the accessibility of amenities. It also assesses the key risks on the site, such as flooding.

A copy of the HPI technical manual is available at <http://homeperformanceindex.ie>.

Organisations involved in certified developments to date have found the process useful and straightforward³⁰. Although designed initially for new housing only, the intention is that the HPI should be developed further for all housing, using the key indicators to benchmark all homes.

Warmth and wellbeing scheme

In 2016, DCCAE, in conjunction with the Department of Health and the Health Services Executive (HSE) launched the warmth and wellbeing scheme³¹. The initiative is operated by SEAI in association with the HSE.

The programme aims to make homes warmer and healthier to live in. It does this by providing extensive energy efficiency upgrades to those in energy poverty who are living with chronic respiratory conditions. To qualify for the scheme, one must be aged 55+ or 12 and under, be referred by a HSE official, live with a chronic respiratory disease, and be in receipt of, or living with someone who is in receipt of, fuel allowance or the one parent family payment. In addition, homes must be owner-occupied or rented from a local authority/approved housing association and be located in the area designated for the pilot scheme, namely Dublin 8, 10, 12, 22 or 24.

This is a pilot scheme established initially for a 3-year period. It runs in parallel with an extensive research programme aimed at assessing the impact of energy efficiency upgrades on people's health and wider living circumstances. Results of this research should be available in 2020.

CONCLUSIONS

- As Ireland's emissions across the transport and agriculture sectors are set to continue to increase over coming years, building-related emissions will play a critical role if we are to achieve the goal stated by the Paris agreement to remain between 1.5 and 2 degrees above the preindustrial global average temperature level.
- Although the amount of public funding for energy-efficiency increased over the last few years, public funds will not suffice to realise the full potential of energy efficiency.
- Research has shown that investments in building performance improvements can help to free-up disposable income for borrowers through lower utility bills and can enhance property value³². Yet, the number of energy-efficiency finance products currently available in Ireland is limited.
- To facilitate the integration of energy efficiency into credit risk assessments, financial institutions need simple, standardised and proportionate energy efficiency measurement parameters³³.
- Given the high number of BERs for dwellings issued to date, the quality and transparency of Ireland's BER database, and the quality assurance system in place, BERs could be a useful starting point for the assessment mechanism behind an energy efficient mortgage.
- Although the use of the asset rating approach to generate BERs means that it remains difficult to obtain actual measured energy data, the roll-out of smart-meters should improve the availability of actual energy data for individual properties. This may be particularly useful for monitoring and verification of performance over time.
- The dysfunctional nature of the Irish housing market and the relative low cost of energy in Ireland could have a negative impact on the successful development of energy efficient mortgages in this country.
- Other building performance aspects which are likely to have a strong influence on the value of a property over time (e.g. quality, adaptability and location) should hence be considered.

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