Centre for Net Zero
Powered by Octopus Energy

The Smart Building Rating

A digital tool to scale demand flexibility

October 2023

CATAPULT
Energy Systems

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ABOUT CNZ

Centre for Net Zero (CNZ) is part of the world-leading group of organisations that comprise Octopus Energy. We leverage the global Octopus Energy customer dataset for modelling and research purposes. We are an autonomous, impact-driven research unit that delivers pioneering research to make the future energy system a reality.

Our access to tens of billions of customer data points gives us an unparalleled insight into the behaviours of people and businesses around the world. CNZ analyses this dataset in depth, runs field trials and experimentation, and builds cutting-edge AI models and tools to generate novel data and insights about the active participation of people in the future energy system.

We use our research to influence the key decisions of governments, policy-makers and grid operators, promoting the acceleration of the energy transition at low cost. We take a whole-systems view, considering demand as well as supply, and helping design an increasingly automated energy system with intelligent demand at its centre.

Find out more at **centrefornetzero.org**

FOREWORD

Lucy Yu

CEO, Centre for Net Zero

Flexibility is not optional; it is essential to a net zero energy system. Whilst it comes in many forms, consumer flexibility is the lowest-cost way of keeping supply and demand in balance. This is paramount as we power ourselves with an increasing share of renewables.

The UK has recently demonstrated global leadership in this area. National Grid ESO's Demand Flexibility Service (DFS) was one of the biggest innovations the grid has seen in years, and demonstrated what we can do as an industry at speed when required. During last winter's energy crisis, over one million households earned payment for shifting the times at which they used energy, protecting the grid during times of strain.

But there's an uphill mountain to climb. The current landscape is not conducive to rapidly scaling consumer flexibility. We cannot rely on early adopters or highly engaged consumers alone; we need tens of millions of people participating in flexibility year-round -made easy through automated, smart technologies. However, the UK's housing and energy policy is lagging behind existing market innovations and technology.

The *Smart Building Rating* is designed to ensure that flexibility is adequately valued and incentivised at a household level, readying UK buildings for smart electrification. As the Government reviews building standards and energy performance certificates, including breaking from EU-derived regulations, we must take a whole-systems approach to creating a built environment that is fit for the net zero energy system.

This policy tool is essential to ensuring we can effectively harness the growing amount of renewable generation, support our energy security and bring down energy bills. This trifecta must be actively pursued - for both people and the planet.

Guy Newey

CEO, Energy Systems Catapult

A smart and flexible energy system is essential if the UK is to achieve Net Zero carbon emissions. As we move to greater reliance on intermittent renewable energy sources and shift to electricity for heat and transport, flexibility enabled by digitalisation will be crucial in balancing the grid, cutting costs and helping to avoid network constraints and blackouts.

To get to Net Zero, we need to better understand the way energy is used in the almost 30 million homes across the UK. At present, the information we have about the buildings we will live in is disparate and not aligned to the outcomes we want to achieve.

The *Smart Building Rating* would enable businesses, Government and other stakeholders to better target and incentivise uptake of the technologies needed to achieve flexibility from homes. It would also help to stimulate innovation, boosting the market for new flexible products and services, where the UK has some of the most exciting and high growth-potential companies.

At Energy Systems Catapult, we look forward to working with Centre for Net Zero and others to develop this proposal further, so we can build an energy system that is inclusive, affordable and clean.

The Rt Hon Chris Skidmore MP OBE
Chair of Independent Net Zero Review

Decarbonising homes is at the heart of the UK's journey to net zero. As the recent Mission Retrofit report made clear, existing buildings account for over 30% of total UK emissions. It is therefore critical that we make them more efficient and low carbon, whilst also requiring new buildings to be net zero in manufacture and design.

The Net Zero Review highlighted that the current EPC measure does not work for net zero and called for a more holistic 'Net Zero Performance Certificate' that better reflects the benefits of low-carbon heating systems, such as heat pumps. I believe the development of a new metric can help us to go further and faster to decarbonise our homes.

The *Smart Building Rating*, alongside a reformed EPC, can drive us towards an efficient and smart building stock. The future energy system will need buildings to be both energy efficient and able to provide energy flexibility. This combination will allow households to use less energy overall and shift their use to times when it is abundant, cutting energy bills and reducing system costs for everyone. In placing a value on a building's capacity for energy flexibility, the *Smart Building Rating* can help us to achieve this.

Transitioning to a flexible, low carbon energy system requires the roll out of key technologies and innovations in our homes and buildings over the next decade. The replacement of gas boilers with heat pumps and the adoption of solar panels, for example, will affect ordinary people and their lives. For this to succeed, the incentives for the public must be made easy, concrete and compelling.

As the Net Zero Review made clear, net zero targets mean nothing without a clear, coherent and stable plan. We need a roadmap that works backwards, not just from 2050 but from 2035. The *Smart Building Rating* is a prime example of forward-thinking policy-making that aligns with a data-driven, digital future energy system.

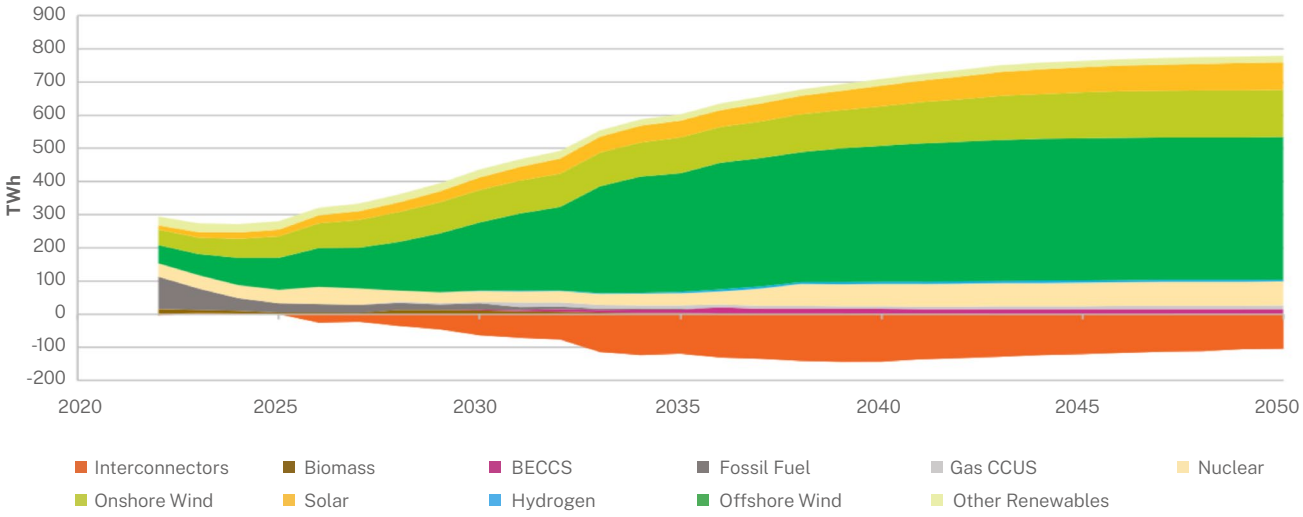
Easy to implement and complementary to existing market mechanisms, it has the potential to prepare our housing stock for smart electrification, cheaper energy bills and a cleaner energy system.

INTRODUCTION

We are on the cusp of the most profound disruption of the energy sector in over a century. Solar and wind are driving the growth of a new global energy economy; this year, the world is set to add a record-breaking amount of renewables to electricity systems.[1] At the same time, electricity demand is due to increase by two or three fold,[2] as we transform the way we travel, and heat and cool our homes.

In the UK, renewables reached a record 47.8% of electricity generation in the first quarter of this year,[3] which is set to increase to around three-quarters of generation by 2035.[4] At the same time, electricity demand will nearly double by 2035.[5] Volatile fossil fuel prices mean the case for homegrown renewables has never been stronger - tackling climate change and bolstering our energy security. There is no doubt that net zero will rely on rapid deployment of renewables and maximising their use in the energy system.

National Grid ESO's Future Energy Scenarios show growing electricity demand met by increasing share of intermittent renewables in the UK[6]



However, this complicates our ability to keep supply and demand in balance; we are not able to fire up intermittent renewable generation in the way we have historically used fossil fuel plants to meet increases in energy demand. To successfully harness the power of the wind and the sun, we need a far more flexible system.

Alongside other forms of flexibility, including interconnectors and long duration storage, consumers themselves will play a crucial role in keeping the grid in balance. This involves households and businesses flexing their demand to match variable supply, also known as 'intelligent demand'. This will maximise the use of renewables, avoid grid congestion and save the system between £9.6 to 16.7 billion in 2050,[7] with savings for individual households of up to 52% on wholesale electricity costs in 2040.[8]

1. "Renewable Energy Market Update June 2023", International Energy Agency, 2023 | **2.** "Net Zero by 2050: Roadmap for Global Energy Sector", International Energy Agency, 2021 | **3.** Department for Energy Security and Net Zero, Energy Trends (2023) | **4.** National Grid ESO's Future Energy Scenarios (2023) - net zero consistent scenarios vary from 69%-82% renewables in 2030. | **5.** Across all ESO's future energy scenarios. (2023) | **6.** National Grid ESO's Future Energy Scenarios (2023). Graph shows 'Leading the Way' scenario. | **7.** "Flexibility in Great Britain", Carbon Trust, May 2021 | **8.** The Power of Flex: Rewarding Smarter Energy Usage, Cornwall Insight, 2023

As we transition to a distributed, tech-enabled energy system, consumers can provide flexibility through household assets capable of automating the consumption of energy when it is cheapest and cleanest. As more consumers adopt low carbon technologies (LCTs) - such as EV chargers, heat pumps, batteries and solar panels - the practice of optimising demand and selling energy back to the grid, in response to market signals, will become commonplace. Such services can be seamless, provided in the background by energy suppliers and aggregators, without consumers even having to think about it.

However, we are far from realising the benefits of this future system. To unlock its full value, most households and businesses need to be incentivised to adopt these technologies in the first place - and to use them intelligently, in a way that supports the grid. Yet there is no policy mechanism to drive the significant transformation required. Demand flexibility is still in its infancy - and it will not scale until it is sufficiently valued in the energy and building sectors, and households can see its benefits. In the UK, we face a considerable challenge of increasing demand-side flexibility from around 6 GW today to potentially over 100 GW by 2050.[9]

In the UK, we need demand flexibility to increase from around

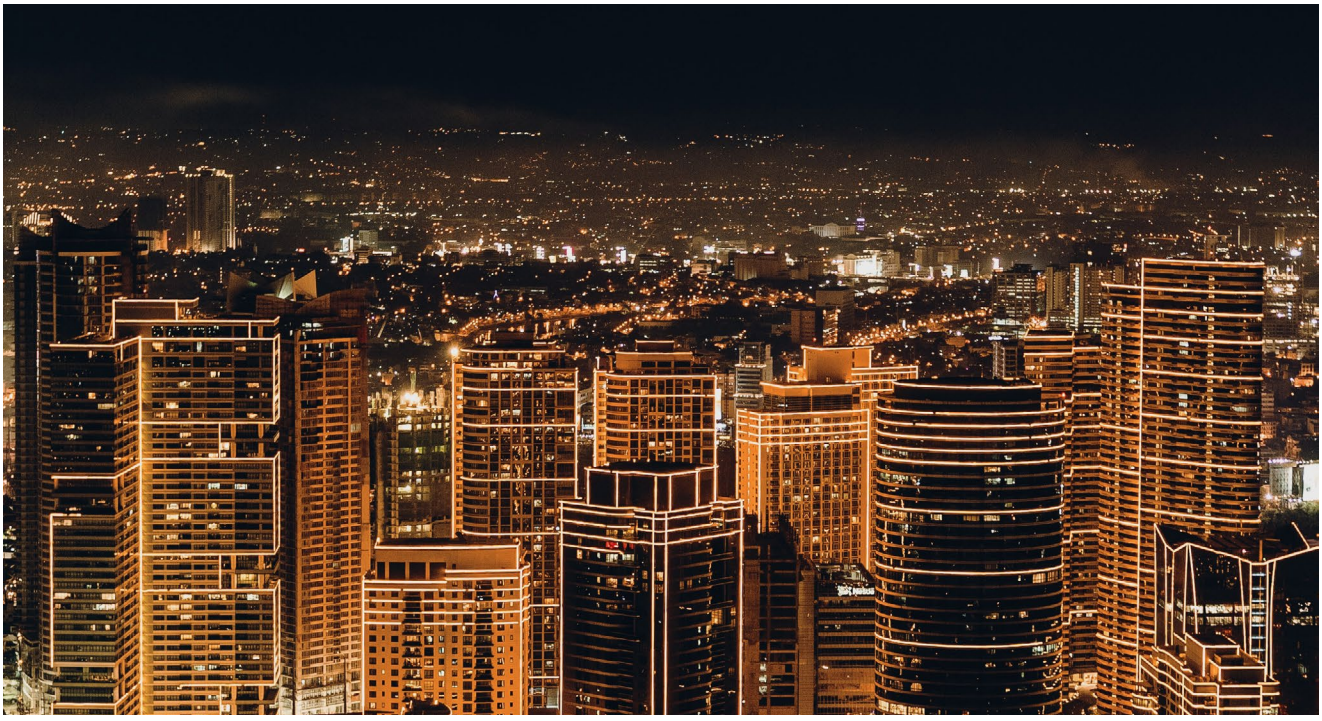
6 GW today

to potentially over

100 GW by 2050

If we are to ready our housing stock for smart electrification and unlock the benefits of a flexible energy system - from lower costs to greater energy security - the Government must look to the horizon and consider new consumer-centred policy for demand flexibility. This can be implemented in a way that complements existing policy plans, from improved energy performance certificates (EPCs) to new affordable housing.

The *Smart Building Rating* (SBR) is a digital tool that can be rolled out now and grow in future to unlock demand flexibility at scale. By placing a clear value on a building's capacity for flexibility, we can create a market and landscape that incentivises consumers to equip their homes and businesses for the future energy system.



9. Future Energy Scenarios 2022, National Grid ESO, July 2022

SMART BUILDING RATING: A GAP IN THE SYSTEM

EPC AND ENERGY EFFICIENCY

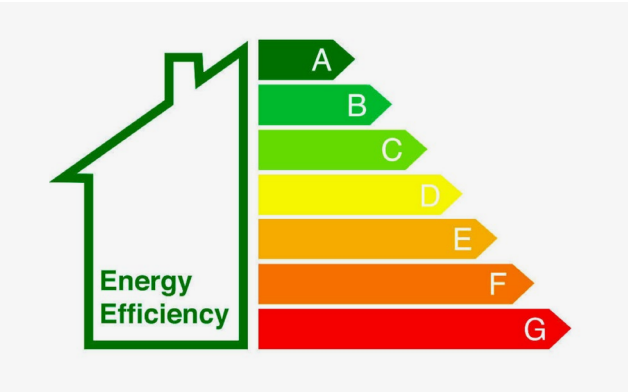
Calls for the reform of EPCs have grown louder in the UK in recent years. Whilst EPCs can be a critical tool in our pursuit of net zero homes and businesses, they are not able to address this significant challenge in isolation - nor were they created to do so.

EPCs are used to measure and improve the energy efficiency of buildings. They are issued by a qualified Domestic Energy Assessor and use the Standard Assessment Procedure (SAP, for new builds) or reduced version (RdSAP, for existing homes) to arrive at a rating from A (best) to G (worst). Rental properties in England and Wales are required to be rated EPC-E or above as part of the domestic Minimum Energy Efficiency Standard (MEES),[10] and the Government has an aspiration that all homes, where feasible, are EPC-C by 2035.[11]

EPCs are poorly designed to incentivise households to reduce their carbon emissions. For example, replacing a gas boiler with a heat pump can see your EPC rating worsen rather than improve. This is because the headline EPC rating is based on the assumed running costs of a building, and currently the unit cost of electricity is three to four times more expensive than gas. The EPC includes an Environmental Impact Rating, but this is rarely used by policy makers.

The methodology underlying EPCs is currently being updated to align with the Future Homes Standard, which is expected to be implemented in 2025 and lead to a significant reduction in the carbon intensity of new build homes. We support calls from the Climate Change Committee[12] and others to go beyond the planned update to SAP and reimagine the EPC metrics, methodology, and uses to better align with Net Zero goals. EPCs should inform and encourage decision-making on domestic building design, construction and retrofit that delivers the comfort and cost-efficiency that residents want.

The SBR is designed to complement a reformed EPC. We believe there is scope for a range of metrics, or suite of ratings, that can achieve building decarbonisation. These ratings can be applied differently in policy and regulation to deliver complementary but distinct outcomes - energy efficiency, flexibility and decarbonisation.



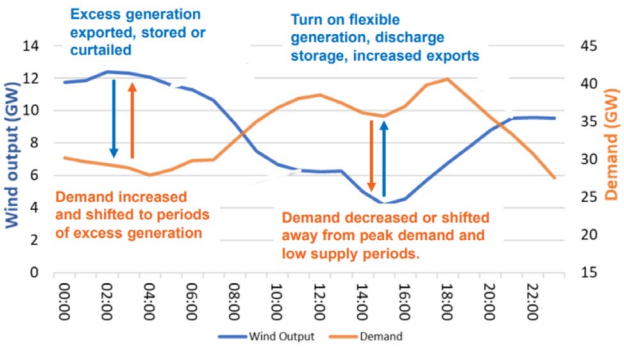
10. The Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015, HMG, 2015 | **11.** "Energy Performance Certificates For Buildings - Action Plan", BEIS & DLUHC, September 2020
12. "Letter: Reform of domestic EPC rating metrics Lee Rowley MP", The Climate Change Committee, February 2023

SBR AND FLEXIBILITY

In the UK, the SBR provides a targeted new measure of the flexibility capacity, or "energy smartness", of a building. A new, separate rating allows for an explicit focus on flexibility and avoids overloading the EPC with multiple different policy aims.

Reforms to UK building standards must not overlook the central importance of flexibility. The gap in our policy framework is clear - the EU, for example, has developed a rating of a building's capacity to accommodate smart-ready services.[13] Electrification, as we switch to heat pumps and EVs, will increase demands on the grid; this provides both a challenge and an opportunity. Using these technologies at the same time risks overloading the grid, but their intelligent use - optimising consumption to match supply and avoid peaks - can unlock a sustainable and flexible energy system.

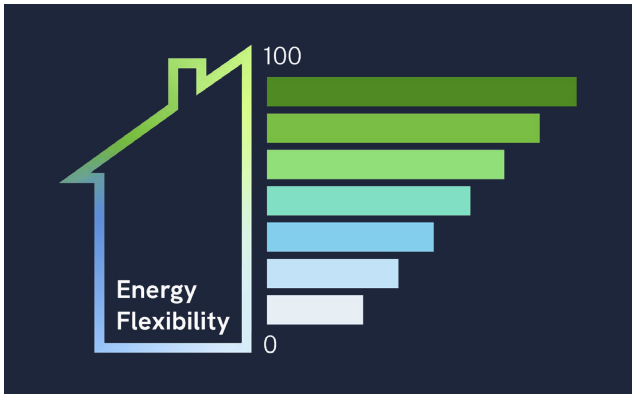
Example day of wind generation and demand, demonstrating the need for flexibility[14]



Consumers can provide flexibility through time-of-use tariffs, which reward consumers for using electricity when it is cheapest and cleanest, but only 12% of UK households report their use.[15] Households can also participate in flexibility events, through schemes such as National Grid ESO's DFS, which saw over a million participants paid to shift their energy use.[16] This delivered system-level impacts: around 3GWh of electricity was reduced during periods of peak demand, with over 680 tonnes of emission savings.[17] Flexibility can scale significantly as smart technologies grow. Centre for Net Zero's analysis suggests households are more likely to engage if they have a degree of automation, while price responsiveness is greater for consumers with LCTs.[18]

Despite recent progress, the pace of change is not sufficient if the UK is to meet the levels of flexibility needed for net zero. Consumer awareness of flexibility must increase; buildings must have technologies central to its provision; and the incentives must be clear, compelling and concrete. The SBR is designed to meet this challenge.

The SBR will measure the capacity of a property for demand flexibility, rather than observed behaviour within the property. For example, a property may have an EV charger, but the household does not actually use smart charging. While it is our ambition in the longer term to link the SBR to a measure that also rewards flexibility behaviours (see page 14), in the shorter term it is designed to upgrade UK buildings and accelerate their readiness for smart electrification. It will provide a measure of a building's current flexibility capacity, and its potential in future following upgrades - the potential will vary by building depending on the technology that can feasibly be installed (e.g. solar panels do not make sense for many flats, nor do EV chargers without space for a car).



The SBR can be a powerful disruptor as the UK undertakes reform to EPCs and building standards, moving beyond a narrow focus on energy efficiency to consider wider net zero aims. We recommend initially introducing the SBR as an optional rating for the residential sector, increasing demand for "smart homes" equipped for flexibility. As awareness improves and the methodology is proven over time, it should be extended to other sectors and eventually become mandatory.

13. Smart Readiness Indicator, European Commission (2022) | **14.** ESO Future Energy Scenarios, 2023 | **15.** "Public Attitudes Tracker Energy Bills & Tariffs 2022", BEIS, September 2022 | **16.** Demand Flexibility Service - National Grid ESO | **17.** "Insights from the UK's largest consumer energy flexibility service", Centre for Net Zero, May 2023 | **18.** Centre for Net Zero, Insights into DFS, 2023; Centre for Net Zero, Behaviour Insights on Energy Price Elasticity, 2022

INCENTIVISING DEMAND FLEXIBILITY

STIMULATING CONSUMER DEMAND FOR "SMART HOMES"

The SBR allows us to place a value on flexibility, and in turn introduce incentives for consumers through a range of policy levers: regulation, finance, behaviour change.

At first, as an optional rating, the SBR would start to put a premium on "smart homes". This can stimulate demand for the installation of smart technologies enabling flexibility (e.g. smart meters, EV chargers, heat pumps, solar panels, batteries) in two main ways:

1. Property value

Installing smart technologies increases the value of a property, due to the potential for bill savings, greater comfort and as a future-proofing measure. The SBR provides a simple proxy measure of this value, which estate agents and surveyors could use in valuations and when engaging buyers. As with EPCs, the SBR can form part of property listings, which estate agents and property developers use as one way of "greening" their portfolios and meeting their environmental, social and governance (ESG) goals. In future, regulation could mandate the use of SBRs in property listings.

2. Green finance

In the same way new financial products are emerging to support improvements in energy efficiency, the SBR provides a framework for financing "smart home" upgrades. It adds to the growing number of green mortgages or low-interest retrofit loans from lenders, which offer better interest rates or cashback for households looking to "green" their property. The SBR provides an additional way for finance providers to lend in this regard, linking finance products to an increased rating and pricing potential savings into payback periods. As with estate agents and property developers, lenders would have an interest in using the SBR as another way to "green" their investments, meet net zero commitments and broader ESG targets. It would increase the value of their mortgage book, and help future-proof against incoming regulatory requirements. The SBR's impact could increase in future with more stringent green finance policy, such as the UK's green taxonomy under development.[19]

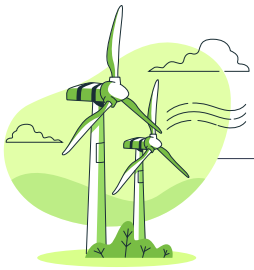
These factors will increase demand for smart technologies, their use in homes and the flexibility services on offer from energy suppliers and third parties. We can expect these mutually-reinforcing, positive feedback loops to accelerate as demand flexibility grows in future - with a thriving market for better, cheaper products that reward flexibility in a clean energy system in which it becomes increasingly important.

An optional SBR can also increase consumer awareness of demand flexibility - beyond only focusing on fabric-based energy efficiency measures - which energy suppliers, estate agents, property developers, banks and government can all use in their provision of energy savings advice. In turn, this too will bolster demand.

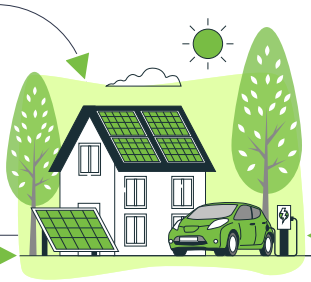
19. The UK Green Taxonomy is a framework to determine what activities or products are considered 'green' and criteria which specific economic activities must meet in order to be considered environmentally sustainable. See Mobilising Green Investment, 2023 Green Finance Strategy Finance Strategy (2023)

SBR CAN REINFORCE POSITIVE FEEDBACK LOOPS FOR DEMAND OF "SMART BUILDINGS"

denotes positive relationship



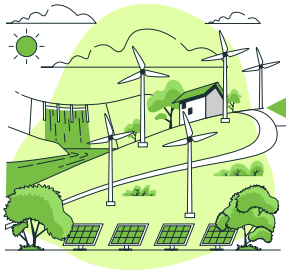
Cheap but intermittent renewable energy increases over time



Consumer demand for energy smart appliances and SBR home upgrade increases

SBR-linked green finance products increase

SBR increases property value



Energy smart appliances market grows and costs fall

SBR used as part of 'greening' property lending portfolios

SBR used in valuations and listings, 'greening' property portfolios

Energy suppliers and third parties offer more innovative flexibility tariffs and services for high SBR customers

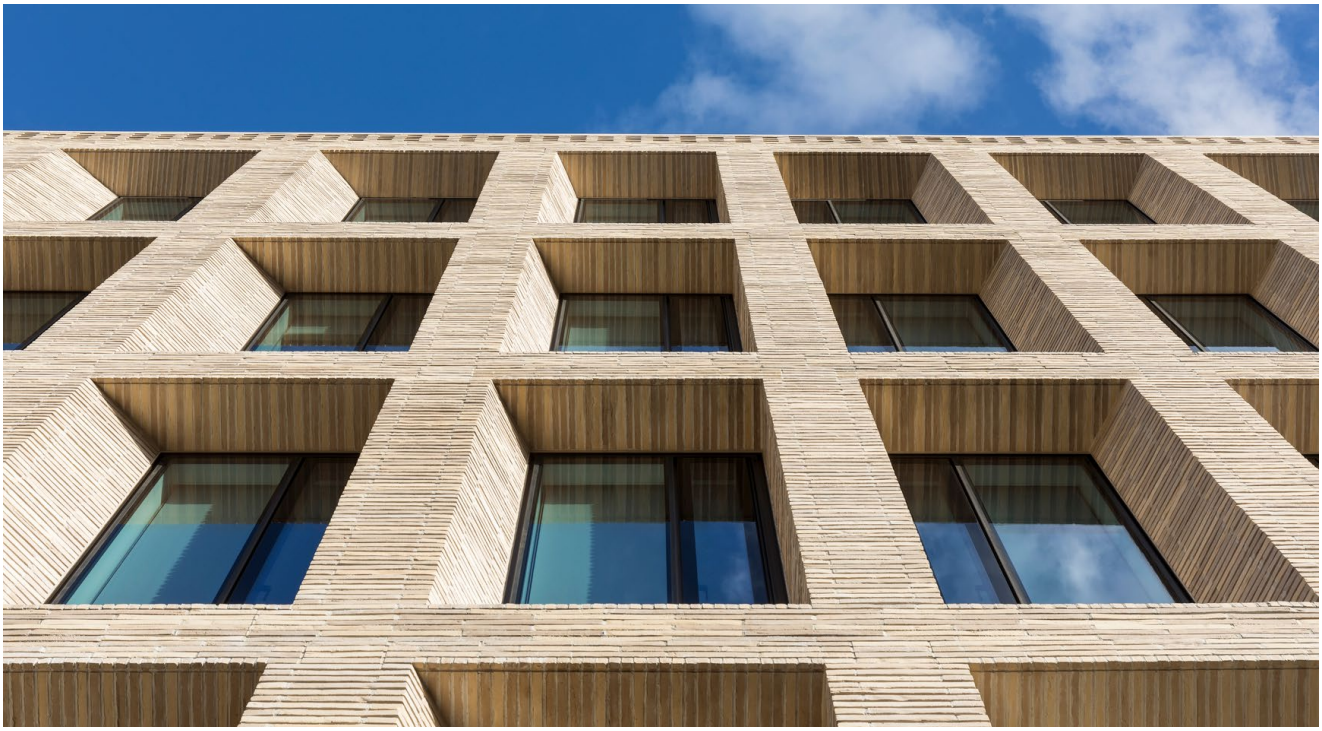
REGULATION

In future, a mandatory SBR will allow for its use in building regulations, analogous and complementary to energy efficiency standards. It would follow the same rules as the EPC, renewed at least as often, but as a data-driven product it would minimise administrative burdens and potentially be more dynamic (see page 18 for more details).

For new builds, the SBR, or principles of its methodology, can be used to set a high minimum standard for flexibility capacity in the Future Homes and Future Buildings Standards. This will ensure that future building stock is "net zero ready" for both reducing and flexing energy demand, which is lacking in current government plans.

For retrofitting existing buildings, the SBR can be used to set targets for different sectors, including industrial and commercial, private rentals and social housing - mandating minimum flexibility requirements over time. Unlike the current blanket targets for EPCs, we recommend setting SBR targets in relation to the potential of the individual property, which will vary depending on the technology that can feasibly be installed. For example, the government could set a target that all homes reach at least one grade below their maximum SBR potential by 2035, in line with its aim to decarbonise the power system. As well as supporting the future electricity grid, minimum standards will help to ensure certain households are not locked out of flexibility and the benefits it brings.

Ramping up minimum flexibility standards over time would allow for a graduated transition which goes with the grain of consumer choice and technology deployment. For example, landlords could start with a free smart meter installation, and initially choose between a heat pump or solar panel to meet the minimum required rating. Alongside a gradual approach, it is important to set clear long term targets which send a strong regulatory signal to markets and consumers. This would add an incentive to future-proof properties at the point of purchasing or replacing assets - for example, the decision to opt for a heat pump over a boiler.



FINANCIAL INCENTIVES AND SUBSIDIES

Incentives

Attaching financial incentives to the SBR would accelerate the transition to smart buildings in line with mandated standards and targets. Incentives would be based on a property's progress towards its individual maximum flexibility rating.

Building on existing policy proposals for EPCs, notably from the Energy Efficiency Infrastructure Group,[20] linking the SBR to stamp duty rebates could provide a powerful financial incentive. This would be a market-based measure that helps to avoid the "boom and bust" of grant funding, which scales with the value of a property and therefore with what different consumers can afford.

Stamp duty would be linked to a property's SBR score, putting a premium on "smarter" properties through reduced rates. If the owner improves their SBR within a set period, such as two years, a rebate would be paid equal to the difference between its new SBR and its rating at the point of purchase. The SBR incentive could be additional to, or combined with, one for EPCs. Either way, property owners would have more choice over the upgrades they make which earn a rebate (for example, installing flexible assets such as solar panels and home batteries). The incentive would be deliberately targeted at the point of purchase, to coincide with the moment when the SBR (and EPC) must be validated. It also ensures financing for home upgrades can form part of mortgage arrangements and negotiations when purchasing properties.

The incentive should be designed, as far as fiscal policy allows, to reward smart upgrades through tax rebates, rather than penalise others through increased rates. The Government can also mitigate exposure to the tax for lower-value properties or low-income buyers by capping or tapering rates, on top of existing stamp duty relief for certain properties and buyers.[21] A higher value rebate could also be paid to lower value properties, partially subsidising upgrades.

If we move to a process in which EPCs and SBRs are digital and updated more regularly (see pages 17-18), additional financial incentives could be considered to reach properties outside of the point of purchase. Council tax rebates, for example, is a potential option.

Support

As well as green financing options, such as loans, the SBR can be linked to more direct private or public financial support for building upgrades. In addition to targeting flexibility services at "high SBR" homes, energy suppliers, third party providers and smart technology manufacturers, can offer support for their "low SBR" customers. Subsidised installation of an EV charger or home battery, for example, could form part of an attractive sign on offer for use of their flexibility service or smart tariff.

Direct government subsidies for smart building upgrades can be linked to the SBR if, for example, it shows that lower-income households are being locked out of cost-cutting flexibility services. It could also provide a framework for existing public grants, as a measure to demonstrate the impact of specific technologies, such as heat pumps (alongside EPCs), solar panels, or EV chargers. It could form part of the success criteria or funding conditions of wider government schemes, such as widening the scope of the Energy Company Obligation, Public Sector Decarbonisation Scheme or Social Housing Decarbonisation Fund.

20. For example, the Energy Efficiency Infrastructure Group's Energy Saving Stamp Duty Incentive | **21.** Currently, buyers pay Stamp Duty on residential properties costing more than £250,000. Eligible first-time buyers also pay no Stamp Duty on properties costing up to £425,000, and a discounted rate on property purchases up to £625,000.

BEHAVIOUR CHANGE

The SBR is a measure of a building's capacity for demand flexibility, based solely on the technology installed. While it prepares the built environment for flexibility, and therefore makes it easier for people to take part, it does not measure or directly incentivise energy consumption behaviours within a building.

In future, however, the SBR could be coupled with a financial reward for households based on "smart" energy consumption. This could be calculated based on forecasting typical demand profiles and measuring changes in consumption from an agreed baseline (as is the case, for example, in National Grid ESO's DFS), or through a measure of the carbon-intensity of consumption (which will correlate with shifting demand to when supply is cleanest). It could be introduced by local leaders in the form of a council tax rebate, paid annually based on the load-shifting the household has achieved across the year. Such a scheme would be more feasible for local authorities if backed by central government funding.

For such a behavioural measure, the SBR provides a way to factor in different property types when calculating the flexibility of a household. This ensures the measure of a household's observed load-shifting is proportional to the maximum flexibility capacity of the individual property they live in (see page 23 for detail of the methodology). It makes for a fairer measure that does not penalise households for whom it would not make sense, for example, to install an EV charger. The SBR-linked incentive would be a relative measure of flexibility behaviour, standardised for property type, additional to the reward consumers get from flexibility services based on an absolute £/kWh measure.

VISIBILITY OF DEMAND FLEXIBILITY

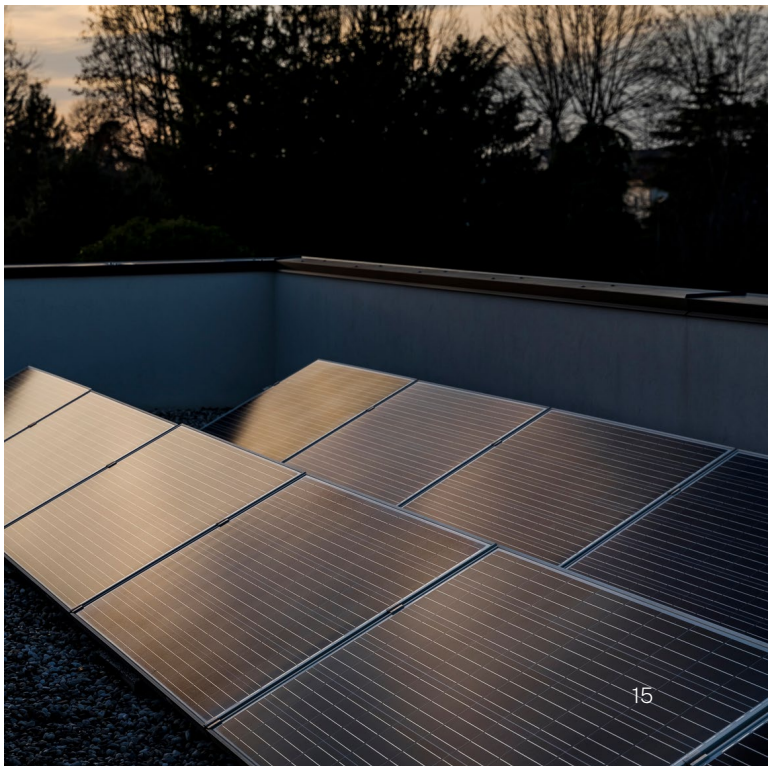
In addition to accelerating consumer flexibility at scale, the SBR can support a stronger bottom-up understanding of future electricity demand. The future grid will manage flows of energy from more varied sources - not only big wind and solar farms, but the millions of LCTs in our homes and businesses. We need to know where assets are to optimise demand and manage constraints, but visibility is currently poor.

The SBR aligns well with the Government's ongoing work to improve asset visibility and work towards a central asset register (see page 18). As part of better data in the future energy system, it can provide estimates of flexibility capacity from the built environment, which is crucial to managing constraints at local, regional and national level. For example, National Grid could use the SBR to integrate updated estimates of flexibility into energy system modelling. Distribution Network Operators (DNOs) would have improved spatial understanding of current and future flexibility as part of grid infrastructure planning.

Similarly, local leaders could use the SBR database as part of local area energy planning (LAEP). As well as forecasting flexibility, it could potentially feature in planning permission to incentivise smarter buildings, based on the flexibility they offer the local area, maximising local renewable generation and bringing energy costs down for all.

The SBR would form part of a suite of measures, including reformed EPCs, to understand the extent to which the built environment is 'net zero ready'. For example, the Heat Pump Federation and Scottish and Southern Electricity Networks are investigating whether a "low carbon technology (heat pumps and EV charging) readiness" indicator can be generated to improve visibility of future demand, so improving the potential for targeted network investment interventions. If a mechanism to combine and interrogate multiple existing databases can be identified, the solution would ideally be run out across all DNOs. Combining these potential initiatives with the SBR should give DNOs a better understanding on where future low-carbon assets are likely to be deployed and how much flexibility those buildings could contribute.

Finally, analysis using the SBR can develop our understanding of how equipped different consumer groups are to access flexibility. This could inform policy targeted at lower-income households (e.g. grants or subsidies), or properties with high "untapped" flexibility, such as solar panels without home batteries or thermal storage, or EV chargers without smart metering to optimise charging.



SYSTEM-WIDE BENEFITS, EXPANDING USE CASES

Ensuring that flexibility is sufficiently valued in the built environment benefits numerous groups and sectors, in both the short and long-term:

Households and landlords

- Cheaper energy bills
- Greener, more comfortable homes
- Increased property value

Government (national and local) and regulator

- Lower cost, more secure energy system
- Economic growth opportunities for smart systems
- Enhanced local energy area planning

System and network operators

- Lower system operating costs
- Balancing the grid and easing congestion
- Visibility and forecasting of consumer demand

Banks and estate agents

- Greening lending portfolios; supporting net zero ESG goals
- Increased value of mortgage books
- Future-proofing against regulation

Energy, cleantech and built environment sectors

- Supports investors and suppliers of renewables by maximusing use
- Increased consumer demand for flexibility providers, smart systems developers, manufacturers and installers of LCTs, and building upgrades
- Strengthening local supply chains & skilled workforces

TODAY'S SBR	FUTURE SBR
Optional product for consumers	**Part of building standards and retrofit targets**
Desirable to property owners; linked to increase in property value	Further financial incentives offer to property owners, such as stamp duty rebate and council tax rebates
Opportunity for lenders and estate agents to 'green' portfolios & future-proof against regulatory requirements	Mandated SBR targets and requirements for lenders & estate agents
Allows industry to target flexibility tariffs and services	Government can address distributional impacts of flexibility and target funding so all households can benefit
Improves the visibility of flexibility capacity for governments, regulators and operators	Comprehensive visibility of flexibility capacity
Increases consumer awareness of flexibility and the benefits it unlocks	Widespread household adoption; SBR model replicated in other markets

DIGITAL AND DATA-DRIVEN PRODUCT

A MANDATORY, INTEGRATED SBR IN FUTURE

The SBR will not seek to recreate existing building assessment processes for EPCs. It will be a digital product which draws on available data for buildings, deriving a measure based on flexibility estimates of its assets. This will benefit from anticipated improvements in data over time and we will need to ensure future data collection processes provide the information required.

Creating an SBR in future will be as automated as possible: every property would have a digital SBR linked to its EPC, which is updated automatically and available online. As the SBR would be created based on the same data processes as the EPC, it would not require any additional building survey and would be at least as up-to-date.

01 **New asset installed:** Homes and businesses have low carbon technologies installed - such as solar panels, battery storage and heat pumps - as well as other flexibility assets, including smart meters and EV chargers.

02 **Central asset register updated:** Small-scale assets typically require registration by an installer, but the current process is incomplete, inconsistent and complex. Work is underway to streamline and automate the process, while creating a single register.

03 **Property record updated, linked to EPC:** These assets would be included in information held about a property. Energy assessors, who provide the data for EPCs currently, would validate the data used for the SBR (i.e. an in-person visit checks the digital record of the property is correct).

04 **SBR updated:** The SBR methodology would pull data from the property record to generate, and automatically update, a property's current rating and recommendations. This would work in tandem with the EPC Standard Assessment Procedure methodology, using the same database.

05 **Open online database:** An open online database would allow users to search for properties based on postcode, building on the current EPC register. This would make clear whether the SBR has 'validated status' or not. It would also provide tailored efficiency and flexibility advice to consumers. Data at this stage would need to protect any personal information.

For both the SBR and EPC, improvements to asset visibility and data processes would allow for a more digital product, generated without the need for an in-person assessment and updated more dynamically. This would ensure that advice to property owners and our understanding of the UK building stock is up-to-date. However, Domestic Energy Assessors would still play a role in validating digital ratings through in-person assessments - for example, checking the assets recorded against the property are correct. This will be particularly valuable in assessing the maximum flexibility potential of a building, based on whether specific assets are considered viable for the property. 'Validated' SBR status (i.e. a rating that has been subject to an in-person assessment) could be required for 'higher stakes' use cases, such as the sale of a property, but would not delay a household receiving a SBR in the meantime.

The move to more dynamic EPCs and SBRs, which are not based only on assessments every 10 years or when a property goes to market, can improve their coverage of UK housing stock. Currently, more than a third of residential dwellings in England and Wales do not have an EPC.[22] This can also improve engagement with the recommendations for property owners, providing more up-to-date and relevant advice. To improve and simplify advice, the EPC and SBR can be integrated within a digital 'building passport', which would allow easier tracking of a property's progress towards being 'net zero ready'.

AN OPTIONAL, INDICATIVE SBR TODAY

Ahead of a system in which the SBR is integrated in improved data processes, indicative ratings can be provided to consumers today based on the information currently available. An interactive service can also allow users to provide any necessary missing information about their property to generate a rating. On this basis, advice can be provided to households on how to upgrade their homes to unlock demand flexibility. Centre for Net Zero and Energy Systems Catapult aim to launch a proof-of-concept of the SBR, allowing users to generate a rating for their property, to demonstrate its public policy value.

Government can also build interactive capabilities into its EPC Register, as part of introducing more digital formats for EPCs. This would allow users to update the assumptions used in the EPC assessment to match the actual conditions of their property, ensuring the advice they receive is relevant and up-to-date. As above, this could still be subject to external validation at the point of selling a property.

22. Office for National Statistics, Energy efficiency of housing in England and Wales 2022

METHODOLOGY

PRINCIPLES

The SBR methodology will evolve over time to reflect changes in evidence of flexibility, building performance and the technology itself. Accounting for the latest technology will ensure it encourages innovation and incentivises the adoption of assets with the highest impact. In particular, our understanding of automation will grow in future, based on changes in smart technologies and how consumers engage with them - an active area of research for Centre for Net Zero, which we will bring to bear in developing a proof-of-concept SBR.

In future, we envisage the methodology for the mandatory SBR to be overseen by a public or professional body, to be determined by Government. This would include ongoing review of the evidence, likely through meta analysis combining estimates of flexibility from different research into a single estimate for assets. Where a product is able to demonstrate a higher flexibility capacity, this could be input to override the estimate for the product type. Taking a data-driven approach means that updates to the methodology and data inputs will dynamically apply to SBR scores, which will need to be balanced against stability for existing ratings.

The methodology below outlines Centre for Net Zero's initial approach to demonstrate the policy concept; it will be subject to further development in the coming months, with Energy Systems Catapult. This will also include working with the Building Research Establishment to ensure we develop the SBR in a way that leverages and aligns with the existing SAP methodology for EPCs, which it develops on the government's behalf.

THE DEVELOPMENT OF THE SBR METHODOLOGY WILL FOLLOW THESE PRINCIPLES

Evidence-based, led by empirical data from buildings and energy research, while reflecting the latest technology;

Data-driven, drawing on available data and minimising the need for additional building surveys;

Integrated with existing processes and standards for building performance, as well as energy advice services;

Simple, providing households and businesses with digestible advice and clear recommendations to improve a building's flexibility;

Versatile, whereby users can also drill down into greater detail about their property, including estimates for potential bill savings and property value;

Transparent, with an openly available methodology, information about inputs and assumptions and how these are used.

SCOPE

The SBR methodology is an estimate of a building's capacity for flexibility, rather than observed energy consumption. It focuses on capacity to shift or spread energy demand.

✅ In scope	❌ Out of scope
Flexibility **capacity** of a building	The observed **flexibility behaviour** of inhabitants in a building
Load shifting capacity - using the same amount of energy at a different time	**Load destruction** capacity - using less energy
Load spreading capacity - using the same amount of energy over a longer period	

The measure is based solely on the technology within a building - starting with domestic settings - that enables flexibility. Moreover, it only captures technologies "attached" to the building or premises, not assets that may move with its occupants. While this requires some generalisations, the below list captures assets with the highest impact. Smart "white goods" such as dishwashers, fridges and washing machines, have not been included explicitly, although will be implicit in the flexibility attached to smart metering, as this enables consumers to make savings from using such appliances flexibly. The assets in scope, and categories of assets, will be subject to ongoing review.

Assets included in the Smart Building Rating (subject to further development)

Asset		Flexibility provided	Categories
Heating	**Heat pump**	Controllable load through smart thermal storage and pre-heating	Air, ground, water source; hybrid; heat network
	Storage heater	Controllable load by shifting consumption overnight and through storage	Varies by size
	Direct electric	Controllable load possible through smart thermostats and meters; this will be captured in 'heating control' and 'metering'	Electric boiler
	Boiler	None	Fossil fuel, biomass, H2
Heating control		Enabler to shift consumption from heating, hot water or household electricity appliances. Increases in combination with other assets but enables "manual flex" on its own	None; room thermostats; mechanical/smart TRVs; mechanical/smart thermostat
Heat storage capacity		Load-shifting through thermal storage (e.g. water tank) and pre-heating; increases with size of store.	None (not electric); small, medium, or large storex
EV charger		Smart or V2G charging in response to price or carbon signals. Controllable load depends on car battery size (we assume average), but power of charger increases speed and therefore flexibility	None; smart-ready chargers varying by power; bidirectional
Solar PV		Load-shifting potential by drawing on on-site generation instead of grid	None; panels varying by power
Home battery		Load-shifting potential by drawing on on-site storage instead of grid	None; batteries varying by size and power
Metering		Enabler for smart tariffs and flexibility events. Increases in combination with other assets but provides "manual flex" alone, captured here	Analogue, smart

CALCULATION

The methodology calculates an estimate of flexibility potential for each of the assets in scope. This relies on two types of data:

1. **Property data**
   a) assets installed in the property, to calculate its current flexibility potential
   b) assets that could feasibly be installed in the property, to calculate its individual maximum flexibility capacity, which will vary by property
   c) features of the property affecting assets' current and maximum flexibility - for the initial indicative measure in this paper, we only factor in the impact of insulation on heat flexibility.

2. **Flexibility data**
   The load-shifting potential of different types of assets, based on its characteristics affecting flexibility (e.g. periods of the day it can be used and how far in time it can shift demand) and analysis of how consumers use these to shift consumption today. This evidence will be subject to ongoing review.

Our initial approach to the calculation, used as an indicative measure for the archetypes on pages 24-28, is to estimate the load-shifting potential from assets based on their technical specifications (e.g. the size of battery). We then make two adjustments based on "flexibility characteristics": the theoretical maximum amount of time that the asset can shift energy throughout the day (including to account for changes in weather conditions through the year), and the insulation of the property for heat flexibility. The estimates are not accurate values of absolute consumption, but act as a proxy for the relative flexibility provided by each asset to create a weighted score.

This calculation, shown on page 22 below, is subject to further development and optimisation as we develop the proof-of-concept SBR.

CALCULATION

1. We create a weighted asset score by taking a load-shifting estimate for each asset (kWh/year), making adjustments, then converted into a score out of 100.

Asset	Load shifting estimate	Flexibility characteristics		Current asset weighting	Max asset weighting
		Flexibility hours a day	Installation multiplier		
Heating	kWh/yr	✅	✅	X	Y
Heating control	kWh/yr	✅	❌	X	Y
Heat storage	kWh/yr	✅	❌	X	Y
EV charger	kWh/yr	✅	❌	X	Y
Solar	kWh/yr	✅	❌	X	Y
Battery	kWh/yr	✅	❌	X	Y
Metering	kWh/yr	✅	❌	X	Y

Current asset score

$$\frac{X*100}{X_{max}}$$

Max asset score

$$\frac{Y*100}{Y_{max}}$$

Flexibility characteristics apply multipliers to account for:

- hours of the day the asset can provide flexibility, accounting for changes in conditions over the year
- the property's insulation, which affects heat flexibility

X = current flex capacity of the asset in the property, in reference to the maximum potential in that asset category

Y = max flex capacity of the asset for *specific property*, in reference to the maximum potential in that asset category

2. This is summed to a building score out of 100.

Current building score

$$\frac{Sum(X)*100}{Sum\ X_{max}}$$

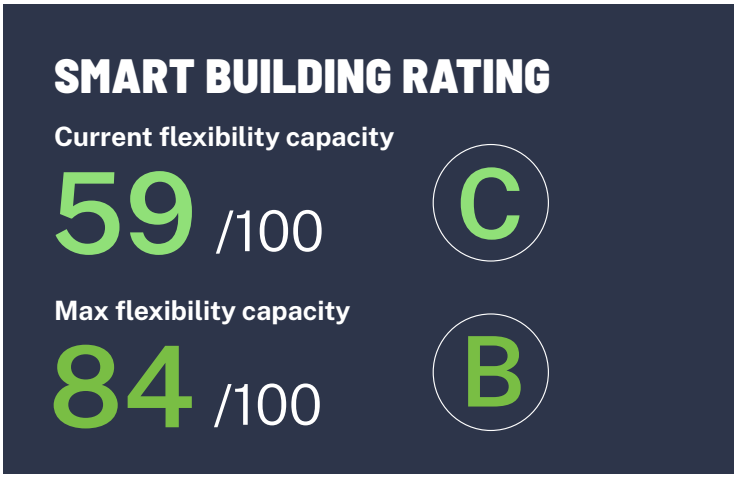
Max building score

$$\frac{Sum(Y)*100}{Sum\ Y_{max}}$$

Current building score indicates the building's flexibility capacity.

Max building score indicates the maximum the *specific property* can achieve, based on the assets that can feasibly be installed.

3. Each building has a score out of 100 for its current flexibility capacity, and maximum flexibility capacity for that building



Score out of 100 gives users an overall rating for the building. Final design is subject to user testing.

Grade (A-G) provides users with an easily digestible indication 'at a glance', analogous to the EPC.

Alongside this, users would see **individual assets scores** and how the property can reach its full flex potential. They would also see which assets have the biggest capacity for flexibility and contribute most to the overall score.

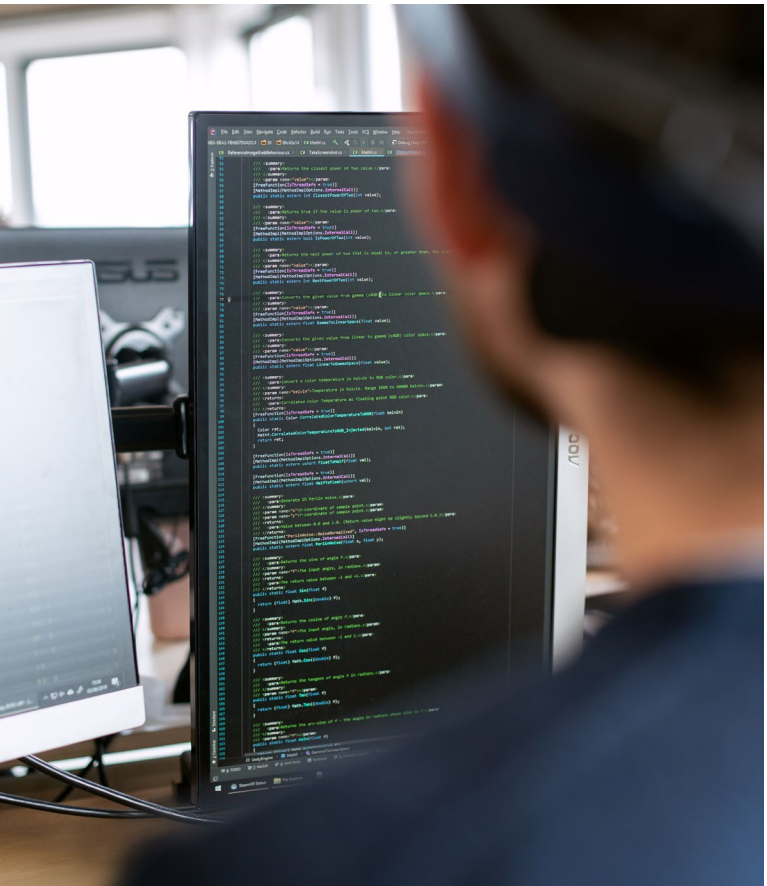
Property owners would also get further information, such as **estimates of annual cost savings** for each asset and property grade, and practical advice about home upgrades.

AREAS FOR FUTURE DEVELOPMENT

Centre for Net Zero and Energy Systems Catapult will develop the methodology further in the coming months. We aim to launch a proof-of-concept for the SBR, allowing users to generate a score for their property and demonstrating its public policy value.

Potential areas to explore for the methodology include:

- **Reviewing the assets in scope,** in consultation with industry specialists. This would include further consideration of different types of assets - for example, how we account for heat networks and tracker solar panels.
- **Improving asset estimates** with further data analysis, especially to accurately isolate the impact of individual technologies.
- **Refine and expand 'flexibility characteristics' in the calculation,** including to better account for "how far" load can be shifted, more granular adjustments for the impact of insulation, and further adjustments for greater accuracy.



- **Accounting for the impact of the combinations of assets,** which could provide greater flexibility than the sum of their parts. For example, EV chargers and home batteries, or solar thermal through solar panels and smart heating.
- **Assess the "performance gap"** between modelled SBR ratings and real-world, providing high confidence ahead of incorporating the SBR in regulation or green finance.
- **Consider how we future-proof the methodology** so it responds to changes in technology while providing stability for ratings, especially for the maximum score in each asset category.
- **Explore potential geographic factors that affect flexibility.** We could consider accounting for weather conditions, where flexibility potential from solar or heat will be reduced in cloudier and colder climates. We could also consider an optional feature for a locational adjustment, which reflects the value of a specific building's flexibility based on spatial grid constraints.
- **Explore potential for more holistic outcomes,** such as health, comfort and wellbeing. This can consider the approach taken to the EU's smart readiness indicator, which includes outcomes wider than flexibility.

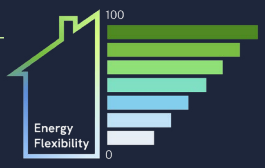
The SBR methodology will also adapt over time in response to the policy landscape. For example, we recognise that this approach does not explicitly consider the carbon savings realised from flexibility. We consider looking only at load-shifting to be the right approach in the short-term, working alongside the direction of travel of existing government policies and EPCs. In future, if policy is reoriented towards carbon savings, then the SBR could consider how to incorporate carbon-intensity of electricity into its methodology.

SMART BUILDING RATING EXAMPLES

We have created five archetypal properties to show the range of flexibility the SBR would measure and the nature of potential reports for consumers. **These examples are purely illustrative; the scores used are based on informed assumptions of asset flexibility to create indicative estimates.**

SBR ARCHETYPE 1: THE NO FLEXER

Currently, only a small hot water tank has capacity for some load-shifting, based on setting analogue timers to heat overnight. Without a smart meter, the property cannot respond to price signals to participate in fle xibility. Its maximum score is limited by no feasible access to a private EV charger, nor can it increase the size of its heat storage capacity. As a ground floor garden flat, it has a small amount of space for some solar and battery installation, while flexibility through an air-source heat pump is possible provided it improves currently poor insulation.



SMART BUILDING RATING REPORT

SMART BUILDING RATING

Current flexibility capacity

2 /100 G

Max flexibility capacity

23 /100 F

This shows the overall flexibility **capacity** of your property. The flexibility (and savings) ultimately rely on how you consume energy, such as pairing smart technology with smart tariffs.

The higher the rating the greater the potential for lower energy bills by shifting demand.

The average current rating for this property type is __

See below how to improve the property to its maximum potential to consume energy when its cheapest and cleanest.

ASSETS IN YOUR PROPERTY

Type	Asset	Current score	Max score	% of building score
Heating*	Gas boiler	0	100	37%
Heating control	Analogue	19	100	6%
Heat storage	Small tank (analogue)	19	19	8%
EV charger	None	0	0	0%
Solar	None	0	17	11%
Battery	None	0	20	32%
Metering	Analogue	0	100	6%

* Current asset score is uplifted based on insulation in property's EPC

Upgrading to this property's max flexibility capacity could save:

▲ £__ each year*

*Based on average household. This will change over time with electricity prices and flexibility services. Figures unavailable currently.

TOP ACTIONS YOU CAN TAKE

Get a smart meter at no cost
Contact your energy supplier for a free installment.

Consider a heat pump
An air source heat pump is possible if space, or a shared ground source heat pump is an option for blocks of flats. Government grants and financing advice is available here.

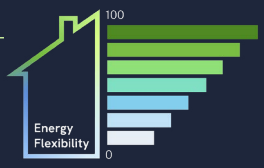
Insulation
Further improvements to cavity wall insulation, as shown in property's EPC, will reduce heat loss and allow for greater flexibility as well as reduced demand.

Solar and battery
These assets improve the property's energy self-sufficiency and flexibility, even to export electricity to the grid. Further information is available here.

Illustrative

SBR ARCHETYPE 2: THE LOW-TECH FLEXER

Currently, the property has limited capabilities for flexibility, but smart metering enables the property to participate in “manual flexibility” by changing consumption in response to price signals. Its maximum score is limited by, as a high rise flat with limited space, no feasible access to a private EV charger or solar panels. An air source (on the balcony) or shared ground source heat pump is possible, with both flexibility capacity and efficiency increasing if insulation is upgraded further.



SMART BUILDING RATING REPORT

SMART BUILDING RATING

Current flexibility capacity

11/100 G

Max flexibility capacity

28/100 F

This shows the overall flexibility **capacity** of your property. The flexibility (and savings) ultimately rely on how you consume energy, such as pairing smart technology with smart tariffs.

The higher the rating the greater the potential for lower energy bills by shifting demand.

The average current rating for this property type is __

See below how to improve the property to its maximum potential to consume energy when its cheapest and cleanest.

ASSETS IN YOUR PROPERTY

Type	Asset	Current score	Max score	% of building score
Heating	Gas boiler	0	100	30%
Heating control	Analogue	19	100	5%
Heat storage	Large tank (smart)	100	100	35%
EV charger	None	0	0	0%
Solar	None	0	0	0%
Battery	None	0	20	25%
Metering	Smart (SMETS1)	100	100	5%

* Current asset score is uplifted based on insulation in property’s EPC

Upgrading to this property’s max flexibility capacity could save:

▲ £__ each year*

*Based on average household. This will change over time with electricity prices and flexibility services. Figures unavailable currently.

TOP ACTIONS YOU CAN TAKE

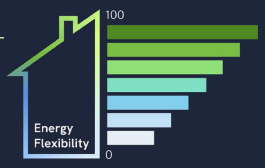
Consider a heat pump
An air source heat pump is possible if balcony space, or a shared ground source heat pump is an option for blocks of flats. Government grants and financing advice is available here. Combine this with smart heating controls and improved insulation to maximise flexibility further.

Battery
Even without solar, a small battery can draw power from the grid when prices are cheaper to improve the property’s load-shifting capabilities. Further information is available here.

Illustrative

SBR ARCHETYPE 3: THE UNTAPPED FLEXER

Currently, the property has some flexibility capacity through a heat pump, large hot water tank and EV charger -although no smart meter limits potential bill savings. Solar and battery would make a significant difference. Its maximum score is high, as a small semi-detached house with plenty of space for the installation of all smart low carbon technologies and few physical limitations to achieving far greater flexibility than its current score.



SMART BUILDING RATING REPORT

SMART BUILDING RATING

Current flexibility capacity

24 /100

F

Max flexibility capacity

70 /100

C

This shows the overall flexibility **capacity** of your property. The flexibility (and savings) ultimately rely on how you consume energy, such as pairing smart technology with smart tariffs.

The higher the rating the greater the potential for lower energy bills by shifting demand.

The average current rating for this property type is __

See below how to improve the property to its maximum potential to consume energy when its cheapest and cleanest.

ASSETS IN YOUR PROPERTY

Type	Asset	Current score	Max score	% of building score
Heating	Air source heat pump	51	100	12%
Heating control	Analogue	19	100	2%
Heat storage	Small tank (analogue)	19	100	14%
EV charger	7kW	64	100	38%
Solar	None	0	50	11%
Battery	None	0	40	21%
Metering	Analogue	0	100	2%

* Current asset score is uplifted based on insulation in property's EPC

Upgrading to this property's max flexibility capacity could save:

▲ £__ each year*

*Based on average household. This will change over time with electricity prices and flexibility services. Figures unavailable currently.

TOP ACTIONS YOU CAN TAKE

Get a smart meter at no cost
This will make use of dynamic pricing and automation from heat pump and EV. Contact your energy supplier for a free installment.

Consider a heat pump
Smart heating control is a small improvement to increase flexibility potential from property's heat pump.

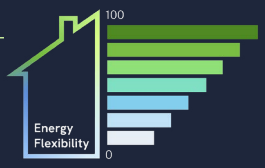
Insulation
Improvements to cavity wall and window insulation, as shown in property's EPC, will reduce heat loss and allow for greater flexibility as well as reduced demand.

Solar and battery
These assets improve the property's energy self-sufficiency and flexibility, even to export electricity to the grid. Further information is available here.

Illustrative

SBR ARCHETYPE 4: THE STRONG FLEXER

Currently, this property has high capacity for flexibility from heat, EV charging, solar and battery, if paired with smart tariffs. A key area for improvement is insulation to reduce heat loss and improve flexibility.This is a terraced house with sufficient space for all assets, albeit with some limits on the size of heat storage, battery and solar panels that can feasibly be installed.



SMART BUILDING RATING REPORT

SMART BUILDING RATING

Current flexibility capacity

52 /100 D

Max flexibility capacity

72 /100 B

This shows the overall flexibility **capacity** of your property. The flexibility (and savings) ultimately rely on how you consume energy, such as pairing smart technology with smart tariffs.

The higher the rating the greater the potential for lower energy bills by shifting demand.

The average current rating for this property type is __

See below how to improve the property to its maximum potential to consume energy when its cheapest and cleanest.

ASSETS IN YOUR PROPERTY

Type	Asset	Current score	Max score	% of building score
Heating	Air source heat pump	69	100	12%
Heating control	Analogue	100	100	2%
Heat storage	Small heat battery (smart)	38	38	5%
EV charger	7kW	100	100	38%
Solar	None	83	100	21%
Battery	None	0	40	20%
Metering	Smart (SMETS2)	100	100	2%

* Current asset score is uplifted based on insulation in property's EPC

Upgrading to this property's max flexibility capacity could save:

▲ £__ each year*

*Based on average household. This will change over time with electricity prices and flexibility services. Figures unavailable currently.

TOP ACTIONS YOU CAN TAKE

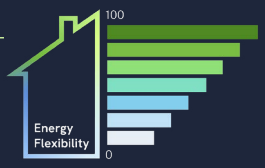
Insulation
Further improvements to cavity wall insulation, as shown in property's EPC, will reduce heat loss and allow for greater flexibility as well as reduced demand.

Solar and battery
These assets improve the property's energy self-sufficiency and flexibility, even to export electricity to the grid. Further information is available here.

Illustrative

SBR ARCHETYPE 5: THE GOLD STANDARD FLEXER

This property is fully kitted out with all assets for flexibility. Excellent insulation increases its heat flexibility capacity, while high powered EV charging solar, combined with battery storage, enables this property to significantly shift demand as well as export to the grid. It has the capacity to reduce energy costs to near-zero. A large, high-specification new build house with plenty of space, it has not limits to its flexibility potential.



SMART BUILDING RATING REPORT

SMART BUILDING RATING

Current flexibility capacity

93 /100 A

Max flexibility capacity

100 /100 A

This shows the overall flexibility **capacity** of your property. The flexibility (and savings) ultimately rely on how you consume energy, such as pairing smart technology with smart tariffs.

The higher the rating the greater the potential for lower energy bills by shifting demand.

The average current rating for this property type is __

See below how to improve the property to its maximum potential to consume energy when its cheapest and cleanest.

ASSETS IN YOUR PROPERTY

Type	Asset	Current score	Max score	% of building score
Heating	Ground-source heat pump	100	100	9%
Heating control	Smart	100	100	1%
Heat storage	Medium tank (smart)	100	100	10%
EV charger	11kW	100	100	27%
Solar	5-6kW	100	100	15%
Battery	8kWh	80	100	37%
Metering	Smart (SMETS2)	100	100	1%

* Current asset score is uplifted based on insulation in property's EPC

Upgrading to this property's max flexibility capacity could save:

▲ £__ each year*

*Based on average household. This will change over time with electricity prices and flexibility services. Figures unavailable currently.

TOP ACTIONS YOU CAN TAKE

Home battery size
This would increase storage capacity and flexibility potential further.

Illustrative

RECOMMENDATIONS TO POLICYMAKERS & FUTURE WORK

POLICY RECOMMENDATIONS FOR UK GOVERNMENT

Consult on the introduction of a new measure of demand flexibility, and work with industry on its effective implementation

Urgently reform EPCs to ensure that they accurately measure energy efficiency, drive decarbonisation, and are digitised, including potential interactive formats. Integrating the EPC and SBR within a digital building passport would allow easier tracking of a property's progress towards being 'net zero ready'.

Increase investment in its **Automatic Asset Registration programme and continue to develop a central asset register,** which would support the SBR

Require **Domestic Energy Assessors to collect relevant information** needed to improve visibility of flexibility and calculate the SBR (e.g. assets not captured consistently, such as batteries), and provide the relevant training

Launch a **'Help for Smart Home Scheme'** allowing banks to provide lending products to households to upgrade their properties to unlock flexibility

Develop a **holistic policy package designed to incentivise demand flexibility at scale,** covering public awareness, financial incentives and regulation. This should include bolstering the smart meter rollout programme to ensure it stays on track.

Signal a long-term direction of travel to the market, through the development of an overarching Government demand flexibility strategy, coordinating the work of Ofgem, ESO and industry. This should include GW capacity targets delivered by consumer flexibility in 2035 and 2050 respectively.

POTENTIAL NEXT STEPS FOR THE SBR CAMPAIGN

Develop proof-of-concept SBR as an optional user-generated service, which allows consumers to see how smart their home is, including user testing.

Centre for Net Zero and partners to develop the SBR methodology further, in line with next steps outlined on page 23.

Conduct analysis to investigate how the SBR compares with EPCs across the UK, and what it can tell us about the flexibility of UK housing stock.

A feasibility study with Domestic Energy Assessors to assess the ease of collecting more information about flexibility.

Extend and trial proof-of-concept SBR in the commercial sector in the medium-term.

A trial with a DNO to explore the potential for the SBR to improve visibility of flexibility from LCTs, alongside better understanding of future demand on the network using Centre for Zero's generative AI model, Faraday.

Demonstrator to explore use of SBR in local energy area planning, as part of optimising building flexibility, and potentially responding to locational price and carbon signals.

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