

Green, healthy buildings as economic stimulus

EU policy recommendations on starting a paradigm shift

Summary

We welcome the EU's intention to 'Rebuild Europe' by accelerating green building renovation¹ to support economic recovery, to support our health², to reduce carbon emissions and improve energy security.

A recent survey³ of hundreds of central bank and national finance department officials found that retrofitting buildings was one of the top ways to stimulate growth and cut carbon emissions. A review⁴ of thirty five building retrofit programs found an average of 19 jobs created per €1m investment.

Pre-pandemic, an estimated 7.5 million jobs were involved in the renovation of buildings. A tripling of building renovation rates could create an additional 2 – 4 million jobs in the construction sector with additional jobs created amongst product manufacturers⁵.

However, energy efficiency investment in buildings and industry has stagnated and is certainly not growing at levels required to reach the Paris Agreement goals⁶.

For the last six years, DWS has been advising the EU as a founding member of the Energy Efficiency Financial Institutions Group. [EEFIG](#) is convened by the EU Commission and the UN Environment Finance Initiative (UNEP FI), bringing together ~200 finance and efficiency experts. DWS (this author), is leading the Steering Committee's focus on the covid-19 recovery package with EEFIG's rapporteur Peter Sweatman.

We commend the proposed EU Building Renovation facility⁷ as developed by Mr. Sweatman (in a personal capacity). DWS's proposals will increase the probability of a successful 'Rebuild Europe' strategy.

Public investment of €90bn/year could support deep retrofits of €243bn/year⁸. We recommend:

- 1. Healthy buildings: Help doctors 'prescribe' retrofits to enable our buildings to be healthier for everyone;** Support the creation of new business models for healthy buildings 'as a service'.
- 2. Start to create mandatory building performance standards,** drawing on the [CRREM](#) project⁹.
- 3. A digital agenda for energy efficiency:**
 - a) Member States should follow legislation to centrally disclose Energy Performance Certificates (EPCs)**
 - b) Align incentives between commercial building owners and tenants:** Member State guidance on sharing retrofit costs through building service charges plus tenants sharing smart meter data with building owners while respecting data privacy.
 - c) Measure energy efficiency like the planet, jobs and health depend on it: Ensure the time and location of energy and carbon savings is accurately measured** instead of 'deeming' savings. This is necessary to respond to the Court of Auditors call for stronger focus on cost effectiveness¹⁰.
 - d) Enable energy utilities to start writing procurement contracts for energy efficiency and healthy buildings,** creating revenue and stronger financial rigour for retrofit projects. EU stakeholders should work with an existing Horizon 2020 project on Pay for Performance¹¹.

¹ [EU Commission Dec 2019](#)

² [IEA March 2019](#)

³ [Hepburn et al 2020](#)

⁴ [EEIF 2012](#)

⁵ [EU Commission, IPSOS, Navigant; Feb 2019](#)

⁶ IEA 2019; EEFIG 2020

⁷ [RenovateEurope](#) leads communication on the proposal. Contact [Climate Strategy & Partners](#) for more detail on the proposal.

⁸ [BPIE](#) May 2020

⁹ [Carbon Risk Real Estate Monitor](#) emission reduction pathways

¹⁰ [European Court of Auditors, April 2020](#)

¹¹ <https://senseih2020.eu/>

We suggest it is in the interest of energy utility companies and energy market regulators (such as through the Agency for the Cooperation of Energy Regulators-ACER) to support implementation of our recommendations, particularly regarding measuring and contracting for energy efficiency.

Introduction to DWS Group

DWS Group is a major asset manager, listed on the Frankfurt Stock Exchange and majority owned by Deutsche Bank. DWS manages EUR 700bn in assets (as of March 2020) for institutional and retail clients.

DWS has a have a long track-record on climate and responsible investing. In the area of energy efficiency:

- DWS's real estate investment business¹² committed to 2050 net zero emissions and set a 2030 target to cut emissions from our European office buildings by 50% below 2017 levels. Targets for other property types are being developed.

- Working with the Institutional Investors Group on Climate Change (IIGCC), DWS is co-chairing a working group to define what Paris Alignment means for real estate investment.
- DWS manages a European energy efficiency strategy on behalf of the Commission, European Investment Bank (EIB) and Cassa Depositi e Prestiti (CDP), supporting retrofitting of public sector buildings¹³
- DWS has a strong track-records voting in favour of climate related shareholder resolutions¹⁴
- DWS is a major bond investor, including in green bonds. We expect that mass retrofitting buildings will need to involve the debt capital markets to a much larger extent.



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Investor actions to support energy efficiency in buildings

In December 2019, 631 institutional investors (including DWS) with EUR 37 trillion in assets, called on governments to strengthen climate policies¹⁵. DWS also signed a letter to EU Heads of State, calling for legislation for an EU net-zero emissions target, to be achieved by 2050 at the latest¹⁶.

Investor associations have called for a sustainable recovery from the pandemic¹⁷, which DWS also supports.

Many real estate investors are committed to retrofitting their commercial real estate. DWS and twenty four major real estate investors committed¹⁸ to net zero real estate investment portfolios by 2050. The commitment covers 11,000+ commercial buildings globally and 1.2 million+ tonnes of carbon emissions per year.

Each year, real estate investment funds are evaluated for sustainability by the Global Real Estate Sustainability Benchmark (GRESB). More than 1,000 property companies and real estates funds (including DWS) participated in GRESB in 2019, representing USD 4.1 trillion value of buildings¹⁹.

While these real estate investors are reducing their emissions, we believe that this is not happening fast enough. Through the Institutional Investors Group on Climate Change (IIGCC), investors are defining what 'Paris Alignment' means for key asset classes including real estate (DWS is co-chairing the real estate working group).

There are many more residential buildings that need retrofitting but institutional investors are not currently able to participate in financing retrofitting at scale, primarily because retrofitting activity is not yet occurring at scale. The decisions of millions of homeowners and occupiers does not yet favour deep retrofits, but this can change.

Strengthening carbon prices is a key policy in the economy but is likely an insufficient incentive for retrofitting buildings. The International Energy Agency (IEA)²⁰ found that building retrofit decisions are driven less by the price of energy and more by retrofit policies and building performance standards.

¹² [DWS](#) October 2019

¹³ www.eeef.eu

¹⁴ Ceres 2014-20; ShareAction 2020

¹⁵ [Investor Agenda](#) December 2019

¹⁶ [IIGCC](#) December 2019

¹⁷ [Investor Agenda](#) May 2020

¹⁸ [Better Buildings Partnership](#), 20 September 2019

¹⁹ [GRESB 2020](#)

²⁰ [IEA 2016. Energy Efficiency Market Report](#) p.81

1. Healthy buildings: Help doctors ‘prescribe’ building retrofits to enable our buildings to be healthier for everyone

We suggest that a core pillar of a Rebuilding Europe strategy should focus on ‘healthy homes for all Europeans’. We call on Health Ministries to work with national and regional medical associations and energy efficiency agencies to use common and simple communications to ‘prescribe’ patients drawing on building retrofit finance programs.

Retrofit ‘prescriptions’ could drive update of building renovation, improve patient well-being and reduce pressure on health systems.

The International Energy Agency²¹ highlights how “Measures to improve insulation, heating and ventilation systems can have positive impacts on air quality, reducing respiratory and cardiovascular diseases, and allergies. They also drive significant and consistent mental health improvements”.

We suggest learning from and scaling up initiatives such as Ireland’s ‘[Health and Wellbeing pilot](#)’, [Tipperary Energy Agency’s Healthy Homes initiative](#), the UK ‘[boilers on prescription](#)’, and other similar projects.

The UK initiative helped individuals suffering from respiratory diseases that are exacerbated by the cold. Individuals were ‘prescribed’ improvements such as new energy efficient boilers, double glazing and insulation totalling on average £5,000 per property. Patients participating in the initiative²², reported a 5% improvement in self-rated health, a 4% reduction in anxiety, reduced the number doctor visits by 60% and emergency department admissions reduced by 25%. A £20k saving to the UK National Health Service was created across 274 households over a six month period. The number of households in fuel poverty reduced by 37%.

One of the EEFIG Phase 3 working groups focuses on the ‘multiple benefits’ of energy efficiency. To ensure that this working group, is not just a research project or literature review, we call on Member States and the EU to work with medical and health system researchers to deploy updated, common research methods on the benefits of green, healthier buildings for people and the cost savings to operating health systems.

Pilot ‘Pay for Success’ financing

Part of the aim of an EU strategy for healthy buildings should be to support new, ‘Pay for Success’ financing beyond the time horizon of stimulus funding.

Under Pay for Success, government departments contract with a private sector provider and commit to repaying an investor (or investors) according to specific outcome targets monitored by an independent evaluator. By giving private investors the opportunity to profit from high-performing government programs, PFS monetizes the social value of policy initiatives, generating the potential for positive returns as well as positive societal outcomes²³.

Pay for Success was a major recommendation of the 2014 G8 Taskforce on Social Impact Investing²⁴.

The EU should draw on the Global Steering Group for Impact Investing and its EU Advisory Board, which is supported by the European Investment Bank, European Investment Fund and European Commission²⁵.

Support the creation of new business models for healthy buildings ‘as a service’

The Federation of European Heating, Ventilation and Air Conditioning Associations (REHVA)’s coronavirus guidance²⁶ advises that buildings should switch to 100% outdoor air recirculation.

²¹ [IEA March 2019](#)

²² [Gentoo March 2016](#)

²³ [Cornell Policy Review Sept 2017. What’s next in Pay for Success](#)

²⁴ [Social Impact Investment Taskforce 2014](#)

²⁵ [GSG 2020](#)

²⁶ [REHVA April 2020](#)

This will increase building energy use as buildings in colder climates have to heat the air more and buildings in warmer climates have to increase air conditioning.

However, it also means that the return on investment for insulation and efficient ventilation systems will be higher.

Building owners, project developers, and public sector officials should use this to our collective advantage.

Energy efficiency agencies and technology developers/manufacturers could make local estimates of how the return on investment improves for insulation and efficient ventilation systems.

With growth in the number and sophistication of building sensors, sensor-based systems can help to serve as the first line of defense within the built environment, from creating contact-free systems to better screening of entrants and monitoring building health around key indicators. Sensors are one theme explored in a recent DWS report on the future of real estate investing in a post-covid-19 world²⁷

To facilitate the creation of new business models, organisations like Climate-KIC have been examining how healthy buildings as a service could be facilitated, drawing on the huge improvement in building sensors.

Fifteen European cities have been working with Climate-KIC²⁸ since 2019 in a process with some leading corporations. They are already seeing some exciting new models for driving building renovation at scale based on health outcomes, social benefits, inclusivity, and deep energy performance improvements.

We expect that some companies and individuals may be willing to pay for healthy retrofitted buildings, with sensor readings as ‘proof’. As well, landlords may be able to attract and retain tenants by maintaining and retrofitting buildings to be more energy efficient and healthier.

2. Align incentives between commercial building owners and tenants

A priority reform is to allow commercial building owners (which can include residential buildings like apartments) to share the cost of retrofit projects with tenants through service charges. **Figure 1** shows where landlords can or cannot easily share service charges with tenants. The status of countries not shown is uncertain.

FIGURE 1. WHERE LANDLORDS CAN OR CANNOT EASILY SHARE ENERGY RETROFIT COSTS WITH TENANTS THROUGH BUILDING SERVICE CHARGES

Service charge recoverable from tenants	Service charge NOT recoverable from tenants
France, Italy, Poland, Portugal, UK, Spain, Netherlands, Belgium	Austria, Finland, Germany, Sweden

Source: DWS analysis, 2020.

If an owner undertakes a retrofit project, they bear the costs while the tenant’s energy bills would fall. This split incentive significantly reduces building owners’ wiliness to retrofit their buildings.

Allowing costs to be shared through service charges would help address this barrier while higher service charges can be offset by lower energy use costs

Many tenants and landlords share energy data in order to collaborate in developing retrofit projects, but this is not always the case.

The EU could publish Member State guidance or requirements, that as part of the smart meter roll-out, Member States encourage or require tenants to share energy use data with their building owners. We believe data privacy issues can be appropriately addressed.

Appropriate data sharing will help building owners to develop retrofit projects that could save tenants and owners money, cut emissions, improve indoor air quality and create jobs for technology and installation companies.

²⁷ [DWS May 2020](#) “Real estate and ESG in a post-COVID world”

²⁸ Communication with Climate-KIC’s Brian Kilkelly, Development Lead – Urban Transitions

3. A digital agenda for energy efficiency is essential

a) Full disclosure of Energy Performance Certificate (EPCs) in central and useable databases

A digital agenda for energy efficiency should start with disclosure of EPCs to a central database (as required by the legislation via the Energy Performance in Buildings Directive). Only 11 Member States²⁹, **Figure 2**, upload their EPCs to a database. In far fewer countries are EPCs easily available to building owners, the renovation industry and to financial institutions (including banks) to assess real estate investing or lending portfolios.

FIGURE 2. DISCLOSURE OF ENERGY PERFORMANCE CERTIFICATES IN PUBLIC EPC REGISTERS

EPCs disclosed in a central database	No access to EPCs in a central database
Denmark, Estonia, Ireland, Lithuania, Netherlands, Portugal, Slovakia, Sweden, UK.	Bulgaria, Cyprus, Czech Republic, Germany, Finland, Greece, Croatia, Poland, Romania
Dependent on region: Italy, Spain Limited access: Austria, Belgium, France, Hungary, Slovenia	

Source: [EU Commission, 2020](#).

Europe’s buildings are well described in National Long-term Renovation Strategies³⁰, including information on the physical state and occupancy of buildings, age, ownership and fuel use.

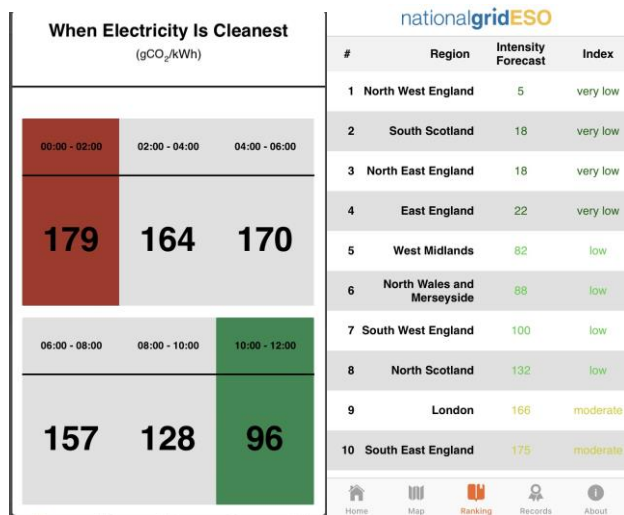
The bottleneck is how many of these building’s owners, or renovation decision makers, know this and whether or not their building needs a renovation, how much it will cost (rough numbers), whether they can get public support and how to do it.

The comparability of EPCs between countries is a separate issue. Over time, investors would like to see EPC

methodology harmonisation.

b) Ensuring the time and location of energy and carbon savings is accurately measured

FIGURE 3. THE TIME AND LOCATION OF ENERGY AND CARBON SAVINGS MATTERS



Source: National Grid, 2020.

To scale up investment, the first step is to standardise how energy efficiency is measured³¹.

The time and location of energy use and energy savings matters. Electricity carbon intensity changes within a day, between months and over years as generation capacity is built and retired. However, time and location of energy use is not accounted for in traditional project level, deemed carbon savings assumptions.

Current methods of estimating carbon emissions use annual averages. Stanford University³² research shows that **in California by 2025, using annual averages could overstate the carbon reductions of solar power by 50%+** when compared to hourly or marginal accounting.

Figure 3, shows part of the display for a regional carbon intensity forecast app developed by the UK’s National Grid Electricity System Operator, with Environmental Defence Fund Europe, WWF and Oxford University³³, which helps consumers and smart devices schedule energy use to minimise emissions.

²⁹ EC website cites BPIE report (2014) https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-performance-certificates_en

³⁰ EC long-term buildings renovation strategies, 2014, updated for 2017 and 2020: https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies_en

³¹ We are grateful to [EnergyPro Ltd](#) and [Recurve Analytics Inc.](#) for multiple discussions over the last several years regarding the opportunity of metering savings and payment for performance. DWS has no commercial relationship with these companies.

³² JA de Chalendar, SM Benson (2019). [Why 100% renewable energy is not enough](#). Joule.

³³ National Grid, www.carbonintensity.org.uk 2020.

We suggest all energy companies use this approach to tracking and reporting the actual carbon intensity of customer's electricity use, energy efficiency projects and green power contracts.

To ensure that the Retrofit Wave lives up to expectations, accurate carbon accounting is needed.

An energy saving is the absence of energy use compared to a baseline – how much the building 'would have used' if an energy efficiency initiative had not taken place. We can't measure this so-called 'counterfactual' directly, so current approaches duck the problem by simply estimating (or 'deeming') the overall saving from a particular measure, such as new insulation.

The deeming approach has some merits. It is relatively simple to administer and offers certainty for contractors and implementers of energy efficiency programmes. But there are many downsides to deeming in that it:

- Provides no information on the specific impact of a retrofit project on a particular household's energy bill
- Increases project performance risk as the desired output, (real energy and carbon savings), are not measured which reduces the incentives for the provider to develop and deliver high quality projects
- In any particular project, assumptions can be changed which alter estimates of energy savings
- Does not account for behavioural responses of building occupants
- Does not sufficiently value energy efficiency within our changing energy system

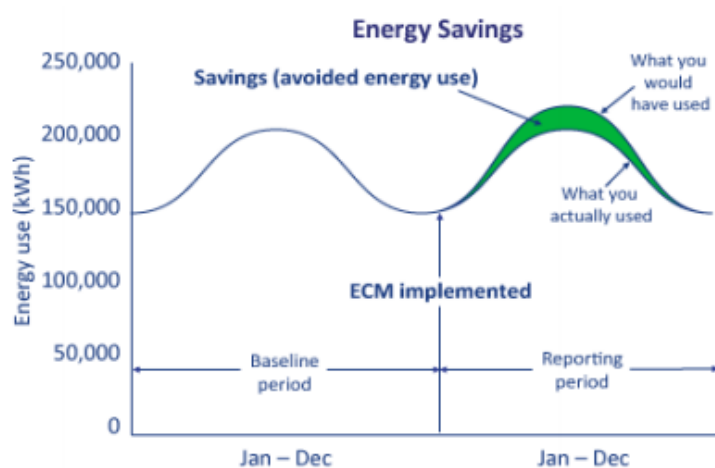
A solution to the problems with deemed savings – digital 'metered savings' plus smart meters

'Metered savings' means estimating baseline energy use in a standardised, transparent way using software-as-a-service (SaaS). Energy use, measured by a smart meter, is compared to a calculated building-specific baseline, forming a virtual meter that gives everyone involved in the project (programme manager, energy network, contractor, householder) the same view of performance.

The approach can be used for retrofit projects and any other behind-the-meter change, including flexibility (demand shifting), and electrification.

Large industrial/commercial energy efficiency projects have a long track-record in using counterfactual calculations to estimate energy and carbon savings as shown in **Figure 3**. However, calculations are typically carried out by an engineer based on global industry standards, and usually involves long evaluation reports that are finalized months or years after a project is implemented and may rely on 'black box' methods with substantial subjectivity in calculations. This can lead to over- or under-estimating true savings.

FIGURE 3. MEASURING & VERIFYING ENERGY SAVINGS
(ECM: ENERGY CONSERVATION MEASURE)



Source: EEVS based on IPMVP 2017

Metered savings takes the principles of Measurement and Verification and embeds them in an automated software platform.

The software takes meter readings, other inputs such as the local temperature conditions and uses a fixed, transparent, open source methodology to calculate savings. If the meter readings are live, such as half-hourly smart meter readings, the savings calculations are live.

California has led the way in developing a standardised metered savings approach through the industry-wide adoption of the CalTRACK (<https://www.caltrack.org>) standard methodology for calculating baseline energy consumption.

CalTRACK is an important enabler of residential retrofit markets in California and other U.S. states. CalTRACK is a set of empirically tested methods to standardise the way normalised meter-based changes in energy consumption are measured and reported. Nearly 100 experts from utilities, regulators, energy efficiency advocates, implementors, evaluators and academics participated in CalTRACK development.

In January 2019, the the California Public Utilities Commission (CPUC) published an updated rulebook for utilities using metered savings approaches³⁴ in their energy efficiency programs. When the CalTrack approach is taken across a portfolio of home retrofit projects, it gives a reliable quantification of the true, weather-normalised savings achieved by an energy efficiency programme. In any portfolio, some projects will exceed expected performance while others will under-perform, but in a properly targeted programme these effects balance out.

A Horizon 2020 funded project called SENSEI³⁵ has started to created an EU equivalent to CalTrack.

We recommend the EU, Member States and all relevant stakeholders, use a re-invigorated partnership with California and other jurisdictions like Australia to learn about time and location accounting of energy efficiency.

The EU should convene relevant stakeholders including energy regulators through the Association for the Cooperation of Energy Regulators (ACER) , to build stakeholders' knowledge and create a foundation for action.

c). Start efforts that lead to utilities starting to write energy efficiency procurement contracts

Today, energy efficiency investments are often initially funded by individuals, and/or via government-led subsidy schemes. This means the efficiency industry is supported largely by a combination of consumer credit and government subsidy, unlike virtually any other part of the energy system.

Electricity supply companies currently cannot invest in or contract for the reduction in electricity use in the same way that they currently invest in or contract for renewable energy (or fossil fuels).

Heating supply companies are not able to contract for deep thermal retrofits as an alternative to contracting for imported natural gas.

Energy networks are not able to view energy efficiency as an alternative to expanding network infrastructure.

In contrast, energy companies and network operators are able to understand the probability that a particular wind farm will generate a particular amount of electricity at a particular time of day and time of year. But companies and network operators are not able to make such a calculation for energy efficiency.

Despite some European utility companies working to promote energy efficiency (often due to regulatory requirements like the Energy Efficiency Obligation), part of the reason for the collapse in European power companies' share prices between 2008-2013 has been improving energy efficiency – which equates to lower electricity and natural gas sales for utility companies³⁶. This can mean that utility companies are somewhat hesitant about promoting energy efficiency too much.

However, the relationship between utilities and energy efficiency is beginning to change.

Utility companies in California and several U.S. states as shown in **Figure 4** are changing this paradigm by understanding and financially valuing how energy efficiency contributes to their energy security requirements.

³⁴ CPUC January 2019 <https://www.recurve.com/blog/cpuc-releases-version-2-0-of-the-meter-based-nmec-rulebook>

³⁵ <https://senseih2020.eu/>

³⁶ Carbon Tracker June 2015

FIGURE 4. EXAMPLES OF US UTILITIES PROCURING ENERGY EFFICIENCY: PAY FOR PERFORMANCE

Seattle City Light	California PG&E	New York State Utilities
<ul style="list-style-type: none"> • Energy efficiency power purchase agreement: ~8 cents/kWh for 20 years • Launched an Energy Efficiency as a Service (EEaS) pilot program and invited interested building owners and developers to submit proposals • City Light customer is billed for electricity delivered plus the electricity savings. • Electricity savings are noted on the bill as a service fee, based on the electricity rates of the current billing period. • The customer pays for electricity costs as if no improvement had occurred, and remains bill-neutral. 	<ul style="list-style-type: none"> • Completed several residential pay for performance pilots • Homeowners buy a USD170 smart thermostat and receive USD2,000 of energy saving products at no cost with free professional installation • PG&E started to measure the change in electricity load shape from energy efficiency, rather than just assumed electricity monthly savings and modeled demand impacts • Enabling energy efficiency resource curves to solve time and location specific grid problems 	<ul style="list-style-type: none"> • New York State Energy Research and Development Authority (NYSERDA), issued a request for proposals inviting energy efficiency aggregators to bid on a new Business Energy pay-for-performance initiative • USD10m budget for at least 5 percent average whole-building savings for less than USD12/MMBtu of levelized cost (gas and electric lifetime savings).

For illustrative purposes only. Source: energysolutions.seattle.gov/energy-efficiency-as-a-service/ ; www.homeenergyoptimization.com ; www.recurve.com/blog/metered-resource-curve-time-and-locational-ee-arrives-in-california ; www.recurve.com/blog/nyserda-p4p-is-a-critical-opportunity-for-efficiency-implementers

These utility companies are creating the first ‘pay for performance’ contracts with aggregators of residential energy efficiency projects, with payments only occurring if energy is reduced at the desired time and location.

By creating contracts for portfolios of energy efficiency projects, a revenue source or cash flow is created.

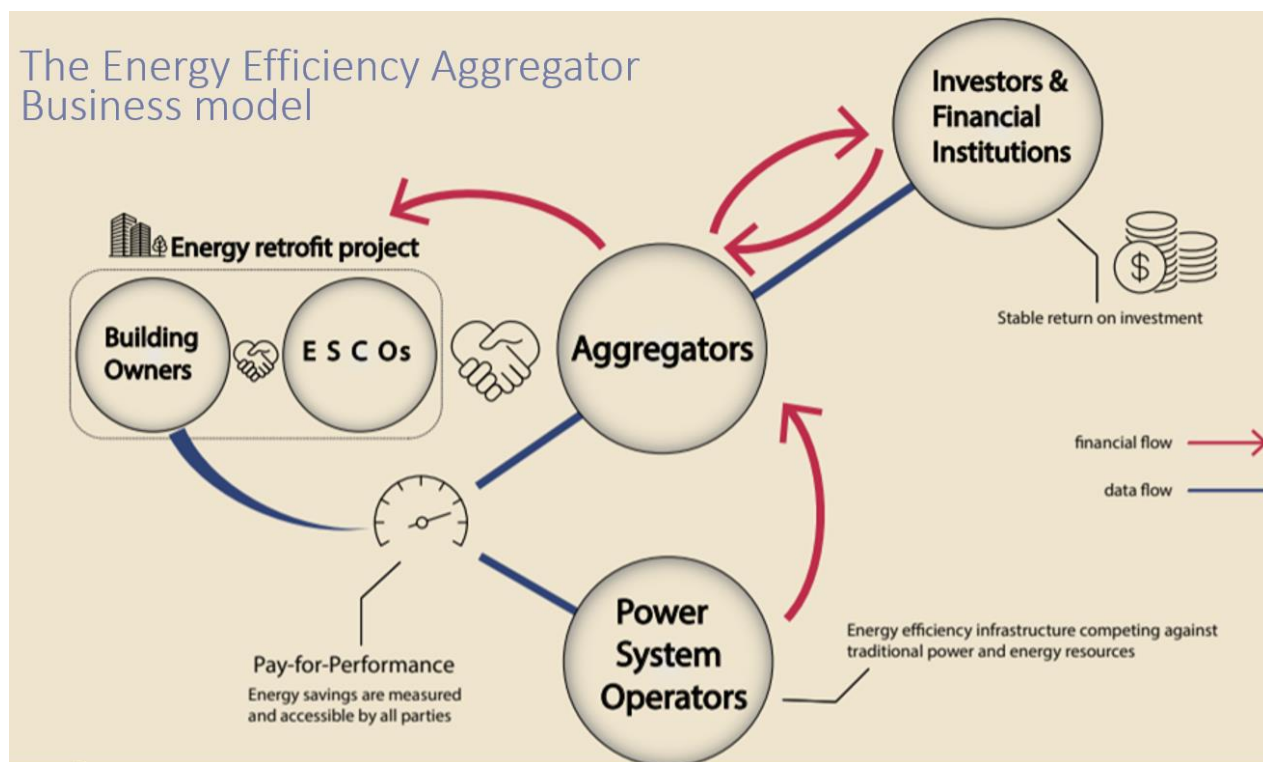
The EU’s Horizon 2020 is funding a multi-year program SENSEI³⁷ that aims to “enable energy efficiency to be rewarded as an energy resource and a new grid service while turning the energy efficiency retrofit project’s value into an investable asset for private financing”.

Figure 5 shows the business model for an aggregator under a Pay for Performance model.

We highlight that in the diagram, the payments to Aggregators from Power System Operators, could in theory also come from heating or natural gas companies or gas network companies if there was a link to thermal energy efficiency and avoiding natural gas use and imports.

³⁷ <https://senseih2020.eu/>

FIGURE 5. ENERGY EFFICIENCY AGGREGATOR BUSINESS MODEL FOR PAY FOR PERFORMANCE



Source: SENSEI April 2020 For illustrative purposes only. ESCOs: Energy Service Companies

We call on the EU, the Agency for the Cooperation of Energy Regulators (ACER), utility regulators, Member States, utility companies, project developers and interested financial institutions to engage with the SENSEI project to develop European, Pay for Performance aggregator business models. An essential foundation for this market is the ‘metered savings’ approach, described earlier.

Payments/cash flow for portfolios of energy efficiency projects is an important and necessary step-change in the world of energy efficiency.

Receiving revenue, not just cost savings is a paradigm shift that will make it easier to convince more families and businesses to retrofit their buildings, cut emissions, improve energy security and air quality and create jobs. Such a paradigm shift would build a market for energy efficiency, not just efficient technologies.

Standardising measurement allows utility companies to properly value energy efficiency to improve flexibility, avoid fossil fuel use and expensive distribution network upgrades. While this is a medium term measure, its development is essential as a way to partially reduce reliance on stimulus funds which may be created.

“Payable savings represent the total energy reduction associated with an energy efficiency project. Payable savings are calculated by first using consumption and weather data from the baseline period to establish what consumption during the reporting period would have been in the absence of an intervention.

The actual energy usage during the reporting period is then subtracted from this counterfactual (what consumption would have been) to yield payable savings. Payable savings can be used as the performance metric in pay-for-performance contracts and can also provide readily available feedback with respect to the savings yields of energy efficiency projects.”³⁸

A report in the *Electricity Journal*³⁹ reviews US progress in metered savings and payment for performance.

³⁸ www.recurve.com/open-source/how-it-works

³⁹ Golden, Matt; Adam Scheer, Carmen Best, 2019. “Decarbonization of electricity requires market-based demand flexibility” *Electricity Journal* www.recurve.com/blog/the-secret-plan-for-decarbonization-how-demand-flexibility-can-save-our-grid

We recommend that the EU, Member States, energy companies and retrofit project developers, and the financial sector partner with leading US states and companies to learn from, adapt and create a European ‘pay for performance’ energy efficiency market that uses smart meter data to financially value the time and location of projects’ energy and carbon savings.

Germany’s “Savings Meter” (Einsparzaehler) provides a good foundation for a pay for performance market.

To advance these recommendations, we suggest that the EU re-invigorate its partnership with California to learn from their experience. The Commission and the State Governor could convene an online conference that includes energy regulators, energy utilities and trade associations, energy efficiency experts and advocates, retrofit companies and financial institutions.

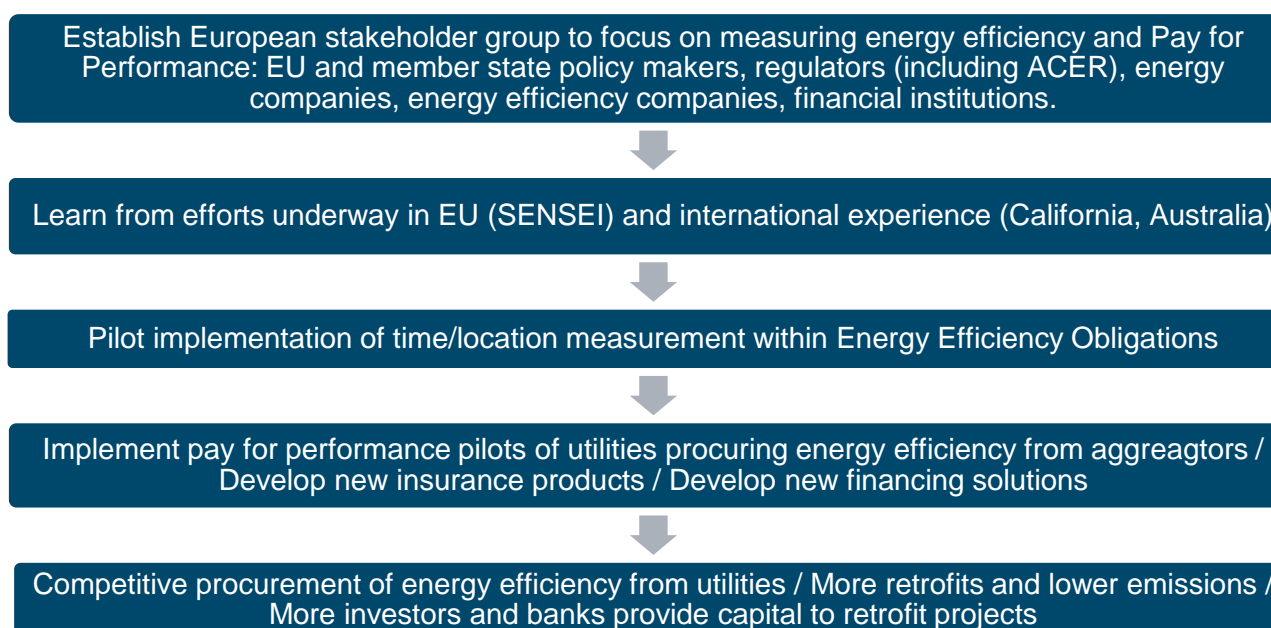
Such a conference could help kickstart workstreams necessary to realise our recommendations for metered savings and for involving utility companies in energy efficiency.

We suggest that the aim of such a partnership would be to standardize the digital/smart measurement of energy efficiency, drawing on experiences in California, aiming to establish new payment for performance contracts for energy efficiency, which will help unlock financing for many more energy efficiency projects. **Figure 6** shows a potential roadmap.

The EU could also aim to organise conferences and workstreams with other countries where there is a shared high-level political and business/financial ambition to step up action and investment in retrofitting buildings. It would be necessary to have very targeted policy and market reforms in mind, (either for policy exporting or importing) when developing partnerships with other countries.

Figure 6, shows a potential roadmap for developing a pay for performance energy efficiency market.

FIGURE 6. ROADMAP FOR TIME/LOCATION ACCOUNTING & PAY FOR PERFORMANCE CONTRACTING



Source: DWS May 2020 based on [Recurve 2019](#). “Policy Pathways to Meter-Based Pay-for-Performance“ For illustrative purposes only.

5. Start to create mandatory minimum carbon requirements for building performance

We also recommend that Europe lead efforts to develop a progressively tightening minimum carbon/energy performance standard for existing buildings, differentiated by building type and Member State.

Minimum building energy standard policies, that include financial penalties, have been developed for Dutch office buildings⁴⁰, all building types in the UK⁴¹ and also in New York City⁴². As well, several cities in California are banning natural gas use for new homes⁴³.

The Commission's 2016 Staff Working Document found that Minimum Energy Performance Standards are "*the strongest measure to increase the rate of renovations providing a clear signal to investors*"⁴⁴.

We believe that building standards can help activate the whole building supply chain to invest in retrofitting.

Just as governments have phased-out inefficient consumer goods products, minimum standards are needed to effectively phase-out inefficient buildings by requiring retrofitting.

To monitor progress, milestone targets every five to 10 years are needed. Clarity on a future path for tightening minimum standards gives building owners time to plan and make retrofits at an optimal and economically efficient time such as when buildings are being retrofitted for other reasons.

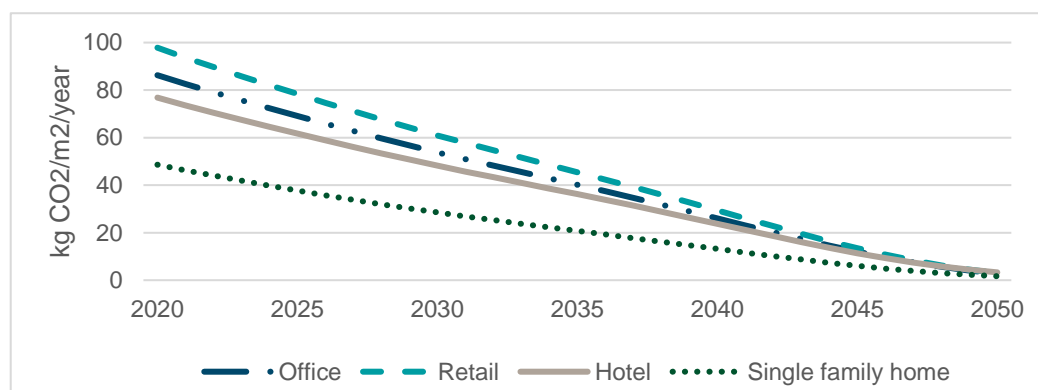
We recognise the significant effort that has gone into developing the EU Taxonomy. However, the Taxonomy criteria for retrofitting buildings is that the renovation achieves energy savings of at least 30% in comparison to the baseline performance of the building before the renovation. This is likely not aligned with the emission reductions required for the Paris Agreement goals.

To guide minimum standards, we recommend drawing on the emission reduction pathways created by the EU and investor funded CRREM⁴⁵ project (Carbon Risk Real Estate Monitor).

The EU funded and investor funded, CRREM project has developed a model for downscaling climate science to emission reduction pathways for different building types. The CRREM model will be a core component of IIGCC's framework document for Paris Alignment in real estate.

Figure 7 shows the emission reduction pathway required for select types of buildings in Germany.

FIGURE 7. 1.5°C DECARBONISATION PATHWAYS FOR SELECT GERMAN BUILDING TYPES



Source: © CRREM May 2020.

⁴⁰ Offices in the Netherlands need to have a minimum C energy label by 2023 or they cannot be let - [RVO](#) March 2019.

⁴¹ BEIS October 2017

⁴² [Code Green Solutions](#) 2019

⁴³ USA Today. 21 November 2019. "No more fire in the kitchen"

⁴⁴ EU Commission, Nov 2016. [Commission Staff Working Document Good Practice in Energy Efficiency](#).

⁴⁵ [www.crrem.org](#) May 2020

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