Efficiency First means Consumers First: the crucial role of energy advisory services in realising the EU's energy ambitions

Discussion Paper

Prepared by Members of the
Energy Advice Exchange

Catrin Maby
Louise Sunderland
Rod Janssen

27th September 2016

Table of Contents

Preface

The starting point for this paper is a concern that the role of energy advisory services in supporting consumers to undertake deep energy renovations is being overlooked, or that provision is assumed rather than ensured. This is highlighted by the lack of documented detail of such services, or evidence of their effectiveness (revealed to the authors in previous work including a world-wide review of energy advice services and 'one-stop-shops', and a review of energy advice provision in Europe undertaken under an Intelligent Energy Europe project completed in 2007).

There is much more that we need to understand. While practitioners and many policy makers recognise that there is an important – if not crucial – communications role, its unique and essential contribution is not fully recognised. Comprehensive communication strategies increase overall consumer awareness of the importance of undertaking energy renovations, as well as explaining programme and financial support, increasing understanding of technical aspects of energy efficiency, and building capacity within the energy efficiency service industry (suppliers, installers, etc.).

Throughout the execution of our work, an important policy gap was identified. Simply put, the consumer is not being given adequate and timely information and support to enable them to make important decisions about whether and how to have an ambitious building energy renovation. These energy renovations are of course needed, in very large numbers, by the European Union to meet our climate and energy objectives. Essentially, there is a disconnect. Government policies need consumers – owner/occupiers, landlords and tenants – to take action to meet long-term objectives. But the consumer is not given adequate signals – including the provision of appropriate advice in order to make the decision to renovate.

This Discussion Paper is designed to build the momentum that will lead to the appropriate changes to EU energy efficiency policies. While it provides many answers, it also leaves other questions that need further development. That is the role of a discussion paper.

The authors hope to facilitate a discussion – through the Energy Advice Exchange – and to build a body of evidence, experience and knowledge on energy advisory services. We are therefore welcoming comment on any aspect of the Discussion Paper. We also hope to facilitate the sharing of information or evidence on programme design and delivery experience and policy development and implementation. We hope to form a community of interest and a body of evidence to support this work.

Catrin, Louise and Rod
Energy Advice Exchange
September 2016

Acknowledgements

The preparation of this report was made possible by the financial contribution of the European Climate Foundation. We would like to thank Patty Fong, Yamina Saheb, Sophie Shnapp and Joanne Wade who contributed valuable comments to earlier drafts of this report.

About the Authors

Catrin Maby is a sustainable energy consultant based in Wales. The first energy advice service she set up was in London in 1984. Catrin set up the non-profit company Severn Wye Energy Agency in 1999, and as CEO built it to a 45 strong organisation, leaving in 2015 to focus on research and policy. She chaired the UK Energy Advice Providers Group for the cross-sectorial Energy Efficiency Partnership for Homes. Catrin has led European-funded projects on energy advice (SErENADE: Sharing Expertise in Energy Advice Across Europe), retrofit of social housing (SHARE: Social Housing Action to Reduce Energy Consumption), and amongst other projects, community-scale delivery of retrofit (Countdown to Low Carbon Homes). Catrin has a degree in Engineering Science from Oxford University and an MSc in Energy Resources Management from South Bank Polytechnic. She received an OBE in 2012 for services to the environment and social equity.

Louise Sunderland has worked in energy and sustainability for 9 years in research, lobbying and advisory capacities. Previously she worked in international development and community development in the UK. Louise's work has ranged from hands on evaluation of carbon reduction programmes to multi-country policy evaluation and advising built environment companies on sustainability best practice. Louise has a strong policy and industry experience having worked with both the Association for the Conservation of Energy and the UK Green Building Council. She also Chaired the Existing Homes Alliance for England and Wales. Louise has an MA and an MSc in Environmental Technologies from Imperial College London (Distinction) and was the recipient of the BP Prize for Strategic Thinking.

Rod Janssen is an expert in sustainable energy policies and gives special focus to how to communicate sustainable energy issues to a wide variety of audiences. He has worked in this field in various capacities since the 1970s first for the Canadian federal government and then at the International Energy Agency (IEA) in the 1980s. In 2012, Rod created the web service, *Energy in Demand*, to reach wider audiences globally through the use the web and social media. It is now one of the most popular blogs on sustainable energy in Europe. Rod is President of the not-for-profit association, Energy Efficiency in Industrial Processes and is a former board member of the European Council for an Energy Efficient Economy (eceee).

Conclusions and Recommendations

The European Union has set climate and energy targets for 2020 and 2030 that include an indicative target for energy savings. Following the global agreement at the Paris climate conference in December 2015, these EU targets are expected to become more ambitious as sustainable energy is expected to play a greater role in meeting our climate obligations.

While one of the pillars of the EU's Energy Union is 'Efficiency First'[1], this must be complemented with placing the 'Consumers First'.

In moving from a model in which reliance is placed energy supply to one that gives priority to energy demand and is delivered by a far greater number of decentralised energy saving actions, the consumer is at the centre of the market.

The reliance in this new decentralised model on large numbers of individual actions by consumers creates a huge need for consumer information, advice and support. However, the provision of energy advice to consumers is the weak link within energy renovation strategies and the energy efficiency policy framework as a whole.

The emphasis must be to give a priority to ensuring consumers have the right tools and information to make appropriate decisions on energy renovations. Significantly increasing the rate and depth of renovations will not happen, even if the big question of financing has been addressed, unless the consumer is enabled to identify and access the appropriate technologies for their situation, and understand how they interact in the building as a system. This includes taking up opportunities to integrate renewable energy technologies (such as roof-top photovoltaic panels) and 'smart' technologies (which enable greater control of the building's functions and interaction with the energy network) to achieve a more complete energy renovation[2].

Consumer advisory services can deliver against some of the headline priorities of the Efficiency First policy model. Advisory services create consumer awareness that leads to increased demand for ambitious energy renovations, can overcome market barriers and distortions from a malfunctioning market, secure actual delivered energy and carbon savings, and address social inclusion and fairness.

The paper reflects on important questions as Europe plans to revise part of its energy efficiency policy framework:

- Is the EU giving sufficient priority to the empowerment of consumers as it sets the policies to encourage greater energy renovation of its existing buildings?
- What are the right information support systems that will help the consumer make that commitment to undertake a deep renovation?
- Do the current provisions for consumer advice – for example, the Energy Performance Certificate mandated under the Energy Performance of Buildings Directive (EPBD) - motivate sufficiently? Do they provide an enabling framework?
- Who is best placed to provide trustworthy, credible advice to consumers?

---

[1] The Efficiency First principle, according to OpenEXP, "aims to ensure that *energy savings compete on equal terms with generation capacity*." OpenEXP, *Energy Transition of the EU Building Stock, Unleashing the 4th Industrial Revolution in Europe*, Paris, France, 2016, p. 61.

[2] While the expressions "deep renovation" and "nearly zero energy renovations" have gained currency, with the introduction of renewables, there will probably be a move to using the more appropriate expression "net zero energy" buildings.

The European Commission will soon recommend specific changes to two of the main energy in buildings directives, the Energy Performance of Buildings Directive (EPBD) and Energy Efficiency Directive (EED). These changes come in the form of an energy efficiency package that aims to improve implementation and ramp up the level of ambition. This new energy efficiency package provides a key opportunity to address the issue of consumer advice for renovation head on.

This paper has been prepared in support of a briefing that makes specific recommendations for the new energy efficiency package. The paper first explains what is meant by energy advisory services and delves into the state-of-the-art in order for readers to better understand what is needed and what is missing. It then focuses on the main issues related to the impact of advisory services on energy renovation strategies, and on how this can be enhanced by good programme design and delivery. As a litmus test the paper reviews the priority for energy advisory services in a survey of member states' national renovation strategies. This analysis is performed to determine whether consumer information and advice have been given sufficient attention to reflect their importance in our energy performance of buildings policy framework.

Main Conclusions

This report covers a wide spectrum of topics, focusing on: what an advisory service can, and ideally should, look like; how Member States describe their energy in buildings information services; and how the current EU policy framework supports energy advisory services. Undoubtedly, more work on understanding and delivering energy advice from the consumer perspective is needed.

Notwithstanding the need for further evidence, it is clear that the needs of the consumer – the central figure in any renovation strategy – are not adequately addressed. With mounting pressure to have an ambitious renovation strategy that will contribute to Europe's 2030 and 2050 objectives, as well as in meeting Europe's new obligations under the Paris climate agreement, the consumer must come first in an Efficiency First world.

Conclusions on advice delivery and design

- Current information services are broadly inadequate to directly address the needs of consumers, to help them make important, and often difficult, decisions whether to invest in a deep energy renovation. This may include a combination of energy efficiency, sustainable energy and smart technology measures, and is technically much more complex than installing a single technology;

- While there are some good examples in Europe and elsewhere, there is insufficient evidence about what an adequate advice service should look like and how effective it is;

- To achieve deep energy renovations, what is missing is a long term and sustained approach to advice delivery, offering full geographical and sectoral coverage, for all types and tenures of buildings, and supporting consumers through the full renovation process;

- An effective advisory service needs to be expert, independent of commercial bias towards any particular technologies, tailored to the needs of the individual consumer and building, and delivered in a manner that ensures accessibility for all;

- Effective advice delivery crosses the technology 'silos' of buildings energy efficiency, renewable heat and power, appliances and smart technologies. It also crosses the

knowledge and skills silos of technical, financial, social, and communications, and the action silos of installing measures and changing behaviour;

- Where advisory services have been terminated there is a risk that valuable experience of delivering these programmes is being lost; and there is a lack of evaluation evidence on the impact of advisory programmes, linking impact to programme design.

- Too often, from the review of national renovation strategies and other related literature, public communications by member states are dominated by, or restricted to, general awareness and information campaigns. They play an important role, but typically they are just a starting point for renovation;

- Energy audits and Energy Performance Certificates are specific tools, which have relevance within the renovation process, but on their own do not constitute an energy advisory service. They also need to be communicated effectively to consumers, and followed through with support and encouragement to take action on the information provided. Developed as a tool to compare the energy performance of different buildings, EPCs are typically based on relatively limited data sets, and do not provide the level of detail needed for deep energy renovation;

Conclusions on policy

There are several conclusions that relate directly to EU and national energy performance of buildings policy with respect to energy renovations:

- There is a lack of clarity in EU policy documents on what constitutes information and advisory services. In particular, the spectrum from broad awareness-raising to full bespoke advisory support is poorly defined. An indication of the level of assistance needed to support deep renovations is absent;

- The effectiveness of the EPBD and EED to promote the delivery of appropriate advisory services is severely impacted by the lack of a clear definition. Furthermore, the limitation of advisory services to '*information provision'* in the definition provided of a '*policy measure'* in EED, Article 2 is unhelpful;

- The information and advice elements in the two Directives are not conceived from a consumer's perspective. Provisions are piecemeal, overlapping and non-specific;

- The information and advice elements in the EPBD and EED limit their reach to the early stages of the customer journey and fail to promote assistance to consumers in the important action stages of the process, where arguably most help is needed to negotiate the complex technical, staging, financing and behavioural questions;

- The EPC, which can be considered to be the main or at least most concrete information provision tool across the Directives, has limited potential as a stand-alone measure to support a consumer to achieve a deep energy renovation;

- National Renovation Strategies overall (with a few notable exceptions) fail to reflect the necessary role of improved advisory services in delivering the scale and depth of renovations needed in the medium to long term;

- The renovation strategies will not achieve the potential impact to deliver the expected energy savings from building renovation without adequate information and advice provision; and

- The Commission's Guidance on Renovation Strategies is severely limited in its conceptualisation of, and requirements for, information and advisory policies and measures.

Recommendations

Provisions in the new energy efficiency package need to be developed with the customer and the customer journey at the centre. Information and advisory services need to be available throughout the customer journey from awareness to action (and repeated action), in order that lack of support does not result in lost renovations due to customers dropping out of the process. The following recommendations are to all the institutions of the European Union:

- Article 2 of the EED should be revised to include a definition of advisory services and 'one-stop-shops'. 'One-stop-shop' is a loosely defined term used to describe provision of several services from one point, so that the consumer only has to make one contact. In relation to energy advisory services, this could, for example, mean a single provider offering advice on technologies, finance and installers, and potentially actually managing installations and related works;

- The overlapping information requirements of the EPBD and EED (in particular the generic information requirements in EED Articles 12, 17 and EPBD Article 20) should be consolidated to provide a clear understanding;

- A requirement should be created within the EED for a robust strategy for information and advice to consumers on technical, legal, financial and behavioural issues; and clear requirements for relevant stakeholders in the market (at a minimum, energy auditors, contractors, installers, financial institutions) to provide information to consumers;

- The new requirement in the EED should emphasise advisory services that assist consumers through the 'action' stages of a renovation. These services must include information/advice on not just technical but also on legal, financial and behavioural elements, and encourage future stages of renovation. This may be delivered through a 'one-stop-shop' approach;

- The new requirements should be worded in specific and measureable ways with a requirement that advice services be evaluated on a regular basis and evaluation reports published;

- For clarity, in EED Article 7 (9(f)) 'training and education' and 'energy advisory programmes' should be listed as separate policy measures as alternatives to the Energy Efficiency Obligation Scheme. Training and education are vastly different measures to advisory programmes; they address different barriers, have different audiences and serve different goals.

- The value of the energy audit and EPC as consumer information tools should be increased by requiring a long-term renovation plan for the building, which can be updated over time in EPBD Article 11 (2). The quantitative assessment of the building would be used as the basis for developing a long-term renovation plan for the building, which can be updated as

changes are made and handed on at change of ownership and occupancy. This takes into account the reality that most building renovation happens incrementally over time, and that energy improvements may be less disruptive and more cost-effective if incorporated into other repair, maintenance and improvement works;

- A consolidation of existing Articles in the EPBD (in particular Articles 7 [renovation] and 14-16 [systems inspections]) should require identification of the key 'trigger points' for energy renovation and mechanisms in place to ensure referral to adequate and appropriate advisory services.

- Specific changes should be made to improve the presentation and conceptualisation of information and advisory services in the National Renovations Strategies:
    - Changes to EED Article 4 should be made to increase the focus placed on the broader policy framework beyond stock data/technical potential and finance provision. A revised Article 4 would provide for a better elaboration of a robust policy framework (c) and a future looking perspective (d) that guides not only investment decisions but also builds confidence through an adequate supporting framework.
    - To support investment by consumers, Article 4 should include a requirement for mechanisms to provide advisory services to facilitate deep, staged renovations and the transition to 'smart', integrated buildings.
    - Annex B of the Commission SWD Guidance for NEEAPs[3], which provides guidance on the National Renovation Roadmaps, should be revised to provide for a more comprehensive elaboration on "policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations" (EED Article 4(c)). In particular, point 3((a)iii) which currently defines the need for an appraisal of "Information campaigns" should be changed to read "*Information and Advice services for consumers"* in order to better indicate the appropriate type of programme.

- A resource for member states designing advisory programmes that collates published experiences and evaluations, identifies best practice and shares case studies should be created. A first step would be to set up a working group under the three relevant Concerted Actions (EPBD, EED and RES) to explore options.

[3] https://ec.europa.eu/energy/sites/ener/files/documents/20131106_swd_guidance_neeaps.pdf

1. Introduction

The European Union has set climate and energy targets for 2020 and 2030 that includes an indicative target for energy savings. Following the global agreement at the Paris climate conference in December 2015, these EU targets are expected to become more ambitious as sustainable energy is expected to play a greater role in meeting our climate obligations. Within this context, and the wider context of Europe's transition to a low carbon, secure and competitive economy, the EU has created the Energy Union.[4] Energy efficiency, and 'Efficiency First'[5], according to Commission Vice-President for Energy Union Maroš Šefčovič, is one of the five pillars of the Energy Union:

The Energy Union is based on the three long-established objectives of EU energy policy: security of supply, sustainability and competitiveness. To reach these objectives, the Energy Union focuses on five mutually supportive dimensions (the pillars): 1) energy security; 2) the internal energy market; 3) energy efficiency; 4) decarbonisation of the economy; and 5) research, innovation and competitiveness.

Perhaps the most significant opportunity to deliver energy savings in Europe is in its building stock, as the sector currently account for 41% of total energy consumption in the EU and 40% of total CO_2 emissions.[6] This potential has already been acknowledged in several framework Directives that place focus on energy use and renewable energy potential in buildings, but in light of the scale of the challenge, there are many arguing for a more ambitious approach to renovating our building stock.[7]

To achieve the transition to an Efficiency First model that delivers considerable efficiency savings from our building stock, significant and well-recognised barriers must be overcome. One of those barriers relates to adequate information provided to motivate the consumer.[8]

In moving from a model in which reliance is placed on centralised energy supply to one in which our 'First Fuel'[9] is delivered by a far greater number of decentralised energy saving actions, carried out by an even greater number of diverse stakeholders, the consumer is at the centre of the market. The new Efficiency First approach must therefore be delivered hand in hand with a 'Consumer First' approach.

The reliance in this new decentralised model on large numbers of individual actions by consumers creates a huge need for consumer information, advice and support. However, the provision of energy advice to consumers is the weak link within energy renovation strategies and the energy efficiency policy framework as a whole.

---

[4] http://ec.europa.eu/priorities/energy-union-and-climate_en

[5] The Efficiency First principle, according to OpenEXP, "aims to ensure that *energy savings compete on equal terms with generation capacity*." OpenEXP, *Energy Transition of the EU Building Stock, Unleashing the 4th Industrial Revolution in Europe*, Paris, France, 2016, p. 61.

[6] According to JRC report, "The PRIMES model used for the impact assessment [SWD (2014) 255 final of 23.7.14] puts potential savings from building renovation at 21.8% in 2020, 40.7% in 2030 and 42.7% in 2050." JRC, op.cit., p. 57.

[7] Some good examples are available in these reports: Joint Research Centre, *Energy renovation: The Trump Card for the New Start for Europe*, 2015; OpenEXP op.cit.; and Buildings Performance Institute Europe, *Europe's buildings under the microscope*, Brussels, Belgium, October 2011.

[8] For the purposes of this paper the term consumer is taken to refer to a building resident, owner or manager.

[9] EC and UNEP Financial Initiative working group Energy Efficiency Financial Institutions Group named energy efficiency as Europe's First Fuel because it is 'competitive, cost effective to produce and widely available' (EEFIG, 2014 Energy Efficiency – the First Fuel of the European Economy).

Notwithstanding some exemplary programmes, energy advisory services in general across the EU are not sufficient to support the scale of ambitious renovations that need to be delivered. Without the consumer having a better understanding of the building as a system instead of individual technologies and better access to information on the support that is available, significantly increasing the rate and depth of renovations will not happen, even if the big question of financing has been addressed. And, as consumers notice the options for including renewable energy technologies (such as roof-top photovoltaic panels) and smart technologies (which enable greater control of the building's functions and interaction with the energy network), there is a need for the consumer to better understand how such technologies can be optimally integrated into a more complete renovation[10].

Consumer advisory services can deliver against some of the headline priorities of the Efficiency First policy model. Advisory services create consumer awareness that leads to increased demand for ambitious energy renovations, can overcome market barriers and distortions from a malfunctioning market, secure actual delivered energy and carbon savings, and address social inclusion and fairness.

In the October 2016, the European Commission will be recommending specific changes to two of the main energy efficiency directives, in the form of an energy efficiency package that aims to improve implementation and ramp up the level of ambition. This new energy efficiency package provides a key opportunity to address the issue of consumer information for renovation head on.

Looking at the existing policy framework, there is reference to advice and information services in the main energy efficiency directives and policy communications of recent years. The 2010 EU Energy Performance of Buildings Directive has two recitals and three articles relating in generalised terms to 'information' but not to requiring energy advice services other than having advice to complement the Energy Performance Certificate. The 2012 EU Energy Efficiency Directive provides important references, yet is unstructured in its promotion of adequate advisory services. The Commission's 2014 Energy Security Strategy makes no direct reference to advice but there are several references to the need to accelerate the renovation rate of buildings.

The Commission's 2016 Heating and Cooling Communication makes the significant statement that owners often lack advice on technical possibilities. The strategy also encourages member states to work with stakeholders to raise consumer awareness of household energy efficiency aspects as well as to establish one-stop-shops for low-carbon investments. Yet, as shown in this paper, advice has been inadequately addressed in the overall EU approach to promoting energy efficiency. There are, however, ample opportunities to firmly embed advisory services in our energy efficiency policy framework.

This Discussion Paper is designed to give the reader a better appreciation of the importance of energy advisory services in our energy in buildings strategies. It has been prepared in support of a briefing that makes specific recommendations for the new energy efficiency package.

The Discussion Paper restricts itself to the residential sector and, where appropriate, SMEs, as the two stakeholder groups share many of the same energy performance concerns and both sectors are characterised by a plethora of small, disconnected and diverse consumers. In the residential sector

[10] While the expressions "deep renovation" and "nearly zero energy renovations" have gained currency, with the introduction of renewables, there will probably be a move to using the more appropriate expression "net zero energy" buildings.

consumers may be landlords, owner-occupiers or tenants[11], and for multi-family dwellings and shared buildings we have also included other intermediaries such as facilities/building managers and agents in our definition of consumers.

The paper first explains what is meant by energy advisory services and delves into the state-of-the-art in order for readers to better understand what is needed and what is missing. It then focuses on the main issues related to advisory services' impact on energy renovation strategies, and on how good programme design and delivery improve impact. As a litmus test the paper reviews the priority for energy advisory services in a survey of member states' national renovation strategies. This analysis is performed to determine whether consumer information and advice have been given sufficient attention to reflect their importance in our energy performance of buildings policy framework.

In its recommendations, the paper shows how the Energy Performance of Buildings Directive and the Energy Efficiency Directive[12] can be revised to refocus on the Consumer First and describes what the next steps might be to strengthen the provision of energy advice and to properly embed it within an energy renovation strategy.

Importantly, this paper is designed to contribute to a wide discussion by the full range of stakeholders in Europe. For a robust and sustainable buildings renovation strategy, this is essential.

Why energy advice is key to an effective energy renovation strategy

EU Sustainable Energy Week 2016 in Brussels focused on "Consumers at the Heart of the European Union." Who owns our buildings? Who has to decide when to renovate? Who decides what level of ambition of renovation? Yes, consumers. It is essential that the European Commission realises the key role that consumers play.

Is Europe undertaking enough energy renovations? No. The current market rate is about 1 % of building stock and many believe it needs to get to 3%.[13] Why? For one thing, the current energy efficiency policy framework does not contain the right measures to drive comprehensive renovation of existing buildings. The Energy Performance of Buildings Directive does little for existing buildings, and the Energy Efficiency Directive requires member states to prepare national renovation strategies on a regular basis, but does not require those strategies to be implemented. More is undoubtedly required to increase the rate of renovation.

The major challenges for buildings renovations are:

- To drastically reduce the energy use of the existing stock, ambitious energy renovations must be delivered, and on a large scale. This is what an EU renovation strategy needs to facilitate.[14]
- That means we need a much more holistic approach addressing the building envelope, the heating/cooling system, lighting and fixed appliances, opportunities for renewable heat and power and integrating smart appliances, systems and controls. Europe's renovation strategy needs to go beyond "cherry picking" and going just with measures offering a quick return

[11] In 2012, more than 70% of the population was owner-occupiers. Joint Research Centre, *Energy renovation: The Trump Card for the New Start for Europe*, 2015, p. 38

[12] It is appreciated that there are more directives that directly or indirectly impact on renovation strategies, but this paper restricts the discussion to the two primarily energy efficiency directives in question.

[13] OpenEXP, *op.cit*., p. 35.

[14] BPIE, *op.cit*., JRC, *op.cit*. and OpenEXP *op.cit*. Also, the OpenEXP report shows that the different EU directives do not have a common definition of a deep renovation, p. 33-34.

on investment. Technically this can be difficult to grasp and there may be multiple options to consider. The measures for deep renovation have to be seen as a package, and an integrated whole, both in terms of design and investment.

- This adds a level of complexity that needs to be better explained to consumers if they are to make the decision to undertake a deep renovation. For a consumer – and in particular, the building owner – this is a major step change and a significant investment.

As the EU moves towards a more demanding renovation schedule and more complex technical interactions with the building that need to be planned and staged over time, the consumer at the centre of each renovation has a greater need for support. If the consumer is confused, not convinced about the recommended actions or does not know where to go for programme support (e.g. financial subsidies that may be available), they will most likely do nothing. If we are convinced that we must ambitiously renovate a fair share of Europe's buildings in order to meet our long-term objectives, we cannot leave the consumer stranded. We must instead empower the consumer through a combination of high quality off-the-shelf information and bespoke advisory support.

There are questions that need answering

The following sections show the role that energy advisory services play, how they can be developed and how our policies can be adapted in order to correctly integrate them into our policies to significantly improve the energy performance of our building stock.

The paper reflects on important questions:

- Is the EU giving sufficient priority to the empowerment of consumers (owners or tenants) as it sets the policies to encourage greater energy renovation of its existing buildings?
- What, indeed, does it mean to put consumers first? What does it take for the consumer to make that commitment to undertake a deep renovation?
- Importantly, what can roadblock a consumer from undertaking such an ambitious renovation?
- Do the current provisions for consumer advice – for example, the Energy Performance Certificate mandated under the EPBD - motivate sufficiently? Do they provide an enabling framework?
- Who is best placed to provide trustworthy, credible advice to consumers?

No doubt readers will have more questions throughout the discussions. This paper starts providing some of the answers.

The next section explains what the provision of energy advice actually means before we get into the policy aspects.

2. Overview of the state of the art

Most European countries have been providing some form of energy advice since the oil crises in the 1970s and hence there is a large body of experience available. Yet, there is little consolidated understanding of what energy advisory services are for, what they can achieve in practice, and how. It is important to review what energy advice is – and what it should be – before assessing the policy implications.

What is energy advice?

One noticeable feature of the debate around energy advisory services is the wide range of interpretations of what advisory services mean in practice. This lack of an agreed-upon definition leads to significant misunderstandings as to what is and is not being provided, what can be achieved by these services, and what resources are required to provide them.

This lack of clarity is reflected in the energy efficiency policy documents, which make reference to aspects of advisory services in various ways, using terms such as promotion, stimulation (to take action), awareness-raising, information, and advice. There is also a degree of confusion and potential overlap between advisory services, energy audits, and energy performance certificates. Furthermore, energy advisory services may also be conflated with technical consultancy and energy management services.

The most extensive review to date in Europe was the 2007 study of energy advice in Europe carried out by the SErENADE (Sharing Expertise in Energy Advice Across Europe) project, supported by the Intelligent Energy Europe programme of the European Commission[15]. The project developed working definitions as a basis for a review of energy advice in Europe. This has been adapted to create the following table:

Table 1: Working definitions of terms used in relation to energy advisory services

Activity	Working definition	Examples
Awareness-raising	Generating interest and imparting a generalised level of knowledge of the benefits of, and potential for, improved energy efficiency through behaviour change and practical measures.	Media campaigns, shows and events, competitions, direct mailing, advertisements, referrals by intermediaries and from other services.
Information	Explanation of problems with regard to energy use and energy efficiency, and relevant actions with general applicability to any situation and consumer.	Leaflets, websites, fact-sheets, guidebooks.
Advice	Guidance on actions to improve energy efficiency that can be taken in a specific situation and/or a specific consumer – tailored to consumer needs and requiring some level of interaction between advisor and consumer.	Dialogue between advisor and consumer by telephone, e-mail, interactive website, interview in advice centre or on site, advice stands in public places, written reports with

[15] Intelligent Energy Europe SERENADE project: https://ec.europa.eu/energy/intelligent/projects/en/projects/serenade

		specific, tailored recommendations.
Education	Raising level of knowledge of energy efficiency with a longer term perspective – not necessarily intended to stimulate immediate action.	Inclusion of sustainable energy in school or further education curricula, professional or vocational training, or community based adult education.

These definitions help to clarify what is being delivered in practice – and hence what may not be covered.

Levels of information or advisory service can also be illustrated on a spectrum from broad, generic messaging through to full support in both decision-making and implementation. This is discussed in more detail under 'delivery method' in the table below.

Awareness raising → (one-way, mass audience generic information)

Information provision → (one-way, mass audience – generic or individual - bespoke)

Advice→ (two-way)

Practical facilitation/assistance (implementation services)

How is energy advice delivered in practice?

In order to understand energy advisory services, a breakdown of the different elements of delivery has been developed below. Some aspects of the characteristics described here are developed further in the next section as issues affecting the delivery of energy advisory services.

Element	Description

Purpose	The key aims and objectives of the advice service directly impact the nature of delivery and the potential outcomes. These might for example be any or all of the following:
	• Reducing energy consumption (in the city/region/country)
	• Reducing carbon dioxide emissions and other environmental impacts
	• Improving indoor comfort and the health of the indoor environment
	• Achieving socio-economic benefits through:
	  ○ Reducing the costs of energy to consumers
	  ○ Alleviating and avoiding the risk of fuel poverty
	  ○ Creating /maintaining jobs in delivery of energy efficiency works and related services

Target Audience	One aspect of defining the target group is geographical. This may range from a local community through to a regional, national or even an international programme. The audience is also defined by sector, and possibly by segmentation of sectors (recommended by marketing specialists for maximum impact), for example: • **Households** ○ ***Tenure:*** owner occupied, private rented, social housing, residential: care homes and hostels, temporary accommodation

	○ ***Household characteristics:*** Number and ages of household members, economic: income and savings, permanence, health, occupations ○ ***Structure:*** single family home, two family home, apartments/ multi family home, house in multiple occupation (individual room rentals with shared facilities such as kitchen and bathroom) • **SMEs:** offices, manufacturing, retail outlets, services A further refinement of the target audience might be built form or technology, for example: • **Buildings**: ○ ***Built form:*** detached or semi-detached houses, terraced houses, apartments ○ ***Age of building*** • **Building systems:** heating, cooling and hot water provision, Micro-generation and/or cogeneration • **Electrical appliances**: lighting, refrigeration, cooking, ICT • **Business and industry**: specific energy consuming processes and services, ranging from manufacture to services such as hairdressing, or the refrigeration requirements of food wholesale and retail.
Delivery method	The actual method for delivery of advisory services may seem to be a detail, but in fact can have a major impact on what can be achieved – as well as the costs of delivery. In practice the balance between costs and effective delivery methods can be a difficult to achieve, but what is clear is that the approach will need to be adapted to the needs of the target audience, rather than the other way around. Examples of the range of approaches used include: • Written information sent out with energy bills; • Telephone helplines; • E-mail or web-based enquiry services; • Face-to-face advice in advice centres, stands in public spaces such as trade fairs, shopping malls or the public spaces within municipal buildings; • Home visit personalised advice; • Energy audits and surveys, involving site visit and quantification. This leads directly on to the question of the level and depth of advice delivered. This might range from a front-line service which, through answers to simple questions, simply 'signposts' on to more specialist support, to detailed technical surveys, support through the process of getting works done and medium to long term user behaviour change programmes. Another aspect of the level and depth of advice is the degree of knowledge of the consumer in question, and how the advice being given fits within the broader spectrum of support. In relation to buildings renovation, for example, there may be several 'key actors' involved including general and specialist building trades, technicians, designers and/or architects, surveyors, suppliers of materials, products and equipment, building inspectors, planning or buildings development control officials, as well as the building owner or manager. Another influencing factor will be the source of finance for the renovation, which may carry its own requirements and restrictions.

	A breakdown of possible levels of advisory provision is set out below, ranging from simple information through to detailed project and behaviour change support. **Level and depth of energy advisory services** **Level** **Examples** 1 Contact point only, signposting to other sources of advice 2 Simple information on standard actions, measures and subsidies 3 Tailored advice provided remotely in response to specific questions 4 Advice on actions and measures specific to client and building, including site visit and survey, and at least a basic level of quantification of costs and benefits 5 Multi stage project support including (4) plus help in sourcing installers/suppliers and finance 6 (5) plus longer term user behaviour support
Process, structure and links to other programmes and services	Linked to these levels of provision is the specifics of what is provided in practice– in particular whether the advice is: • A single contact or multi-stage • Based on a formulaic approach (such as a set questionnaire or survey process) or an interaction led by the client • Focussed on the installation of measures or behavioural – or both • A stand-alone service or part of something broader, for example: ○ Linked to a provider of finance for measures ○ Provided by a supplier of energy efficiency products or services ○ Part of a wider sustainability approach ○ Linked to housing provision ○ Part of a broader consumer or citizen advice programme ○ Part of a programme focussed on lower income and/or otherwise vulnerable consumers including welfare benefits, tariffs, supplier switching advice ○ Part of a one-stop-shop approach combining several of the above

Monitoring and evaluation

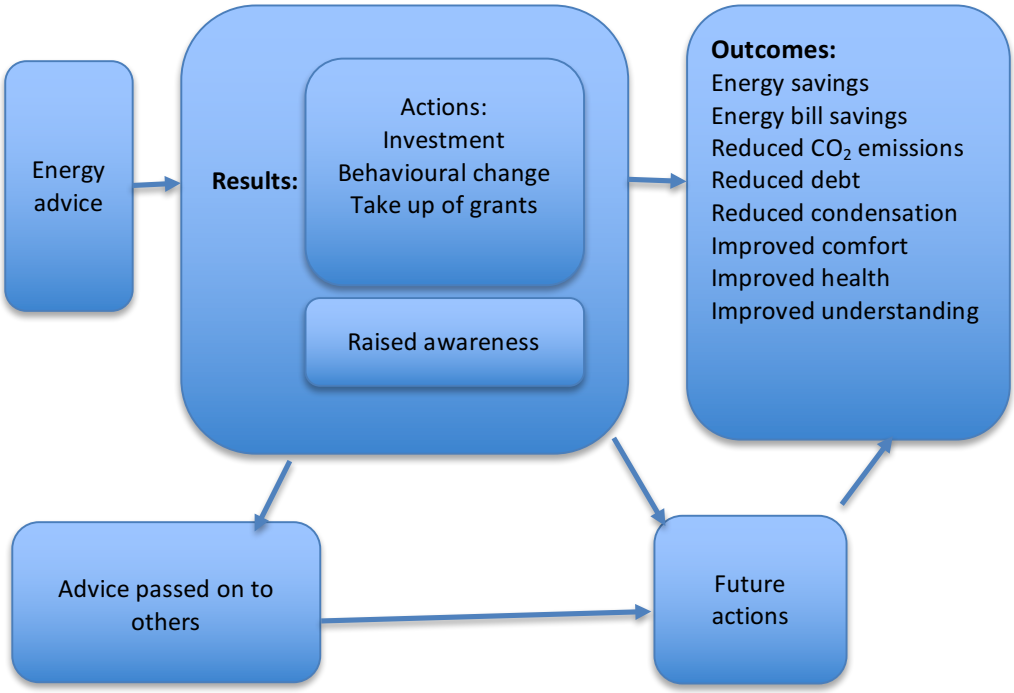
A crucial aspect to delivery of effective advisory services is monitoring and evaluation. The most basic form of monitoring is to keep a tally on numbers and nature of enquiries, customer satisfaction surveys, and the degree to which different outreach activities bring in users to the service, as well as service costs.[16]

Taking this a step further would be to assess the actions taken as a result of advice (results such as measures installed), and then the outcomes (such as energy savings and the associated reduction in carbon dioxide emissions) from these actions can be set against the aims of the service. Within this could be a more detailed analysis of whether all parts of the target audience is being effectively reached.

[16] The authors were part of a team that wrote a report on energy efficiency information centres and one-stop shops globally that describes the state of monitoring and evaluation - https://www.wec-policies.enerdata.eu/Documents/cases-studies/WEC-case-study-one-stop-shop.pdf

The diagram below offers a view of how results and outcomes of energy advisory services might be viewed within evaluation studies.

Figure 1: Energy advice: results and outcomes (Energy Advice in Europe, 2007)[17]



[17] IEE SERENADE project https://ec.europa.eu/energy/intelligent/projects/en/projects/serenade

3. Key issues in putting consumers first

Before analysing the policy implications, it is important to put some of the pieces together, to better understand the consumer and his or her needs. The following section raises key issues that arise when reflecting on the importance of advice and how it should be provided, in order to fully support consumers to achieve deep energy renovation of existing buildings.

There is considerable experience in Europe and globally. The findings and issues presented here represent result from projects such as SErENADE, referenced above, from a literature review and, by one of the authors having spent many years both delivering and managing energy advisory services, and training others to provide advice. The authors welcome thoughts and evidence from practitioners in particular on the issues in this section and further key issues not included here.

What advice do consumers need to achieve deep low carbon building renovation?

In defining the type and level of advice service needed by consumers, it is important to start with a clear understanding of what macro outcomes are desired. The starting point therefore is the step change we need to achieve in building renovation. This means that consumers need to take action on achieving the best possible level of energy improvement to every aspect of the building, it may also mean incorporating smart technologies and enabling interaction with the energy network, as well as adjusting to an optimum level of efficiency in user behaviour.

This means that cherry picking only the quick return measures is not enough. It could in fact be damaging, in that it leaves the most difficult stuff to do later – when it may be even more difficult and expensive.

Advice therefore needs to encourage and enable a holistic approach to the building and its use, with a long-term aim of transformation to a nearly zero energy, smart, building. This may well include technical advice, help with sourcing suppliers and installers, and in sourcing finance for measures. It may involve knowledge of local services, building codes and planning regulations.

Advice needs to cover all relevant technologies, and to be entirely commercially impartial to be credible. Distinctions between types of technology are typically of more relevance to the provider than to the customer – whereas advice needs to cater for all the energy needs of the home (heating, cooling, hot water, lighting, cooking, laundry, ICT, entertainment etc.) rather than be defined by industry silos such as energy efficiency versus renewables.

Any advice work must be bounded in some way – and customers reaching the boundaries of the service should not be left unsure of where to go next, but referred on appropriately. One of the boundaries to be aware of is where advice stops and design and specification start. One aspect of this is the need to look at the 'whole house' as an integrated system of building fabric, services and users, with different measures taken impacting on each other and the whole system. Given that humans live there, it cannot however ever be a perfectly controlled system – it is not a 'black box'. Beware the 'technical fix' that does not take account of the occupants.

Judson and Maller (2014)[18] argue that "*Current policies and programmes focused on technical interventions to improve energy efficiency will have limited reach and impact. Instead, it is*

[18] Ellis P. Judson & Cecily Maller (2014) Housing renovations and energy efficiency: insights from homeowners' practices, Building Research & Information, 42:4, 501-511, DOI: 10.1080/09613218.2014.894808

suggested, among other interventions, that policies to reduce the environmental impact of housing should be reframed around and positioned to address the mundane practices of everyday life."

What are the timing issues and trigger points for energy renovation?

Firstly, the advice that is needed is unlikely to be just a one-off event (such as a single call to a helpline, or even an audit visit to a site). A building owner has a journey to take to carry out a renovation, and advice and support may be needed at several stages through this journey, from an initial raising of awareness through identification of measures appropriate for the building in question, reviewing the costs and benefits of these, working out how and when to do them, and adjusting user behaviour to maximise the positive impact.

Supporting behaviour change is in itself not a one-off event, but needs to be built into policy and programmes for the on-going motivation and support for energy efficient user behaviour and maintaining it. Support for maintaining behaviours might include clear and understandable feedback on consumption and changes to consumption, benchmarking against similar consumers, motivational messaging and the opportunity for further advice and information.

Secondly, the prioritisation of, and order in which measures are taken is unlikely to be based only on the costs and benefits of the individual measures. Other factors include fitting around on-going use of the building and the ability of the occupants to adapt as works are done, the availability of finance, comfort priorities, what is being said about different technologies in the media and the neighbourhood, and what relevant works are planned for other reasons that energy improvements.

In practice, many of the most major energy improvements (such as wall insulation) are very disruptive and expensive unless carried out in conjunction with other relevant works – when these are needed or wanted for other reasons. This 'triggering' of energy improvements can have the benefit of rendering the cost of the energy improvement marginal to the cost of the more comprehensive renovation or improvement works being carried out.

The ideal scenario is that a deep energy renovation can be carried out as a single carefully designed and delivered event. This would appear to offer the best chance of effective integration of technologies to achieve a low carbon result without unintended negative consequences such as poor ventilation, damp or summer overheating. In practice this is unlikely to be the reality for many buildings, and the path to deep energy renovation may have to be a staged one. This means that the building owner needs a plan for how to move their building to a near zero energy one that has a long term perspective. This may even be a plan that extends beyond their own ownership or occupation of the building. This requires a very different perspective for the building owner, as well as some kind of handover of the 'building renovation plan over time' between owners.

This plan needs then to be one which can inform decisions every time that the building owner arranges for works to be undertaken, within the usual round of repair, maintenance and improvements. This 'RMI'[19] market is a critical trigger point for energy improvements.

Who provides the advice and how?

Advice needs to come from an organisation or an individual that the consumer will trust. Often, the "closer to home," the better.

[19] Repair, Maintenance and Improvement market

Locality

It is very unlikely that the advice needed for deep energy renovation can be provided effectively as a remote service, so it needs to be delivered at a local level. In addition to the benefits of local knowledge as indicated above, local provision is likely to be more effective because it enables advice to be relatively personalised. Home visits and surveys can be carried out by assessors linked directly to the advice hub, and the knowledge and data shared in full. The ideal scenario is that an allocated adviser to a particular consumer carries out the technical assessment and the follow on advice.

Another benefit is that installers can be part of a local network that ensures availability and the ability of the consumer to see examples of a tradesperson's work. It also enables knowledge exchange and referrals between installers, for mutual benefit. This makes it more viable for suppliers to offer support, even to the smaller companies that tend to make up the majority of the RMI market in many countries.

> **The Upper Austria Energy Agency** (ESV) is an example of an independent, expert and trusted local provider - offering energy advice to both households and businesses, covering energy efficiency and renewable energy, and linking building owners to suppliers and installers through their Sustainable Energy Cluster.[20]

Identifying and prioritising measures

While generalised information about the potential costs and savings of different measures can be a useful starting point, the specific advice for any building can only be provided by carrying out an actual site survey.

The 'Energy Performance Certificate' as mandated under the EPBD, involves such a survey, and provides an assessment of the energy performance of the building comparable to other buildings in the same country. However it has several limitations as an advice tool for deep renovation. Feedback from building tradespeople in the UK[21] endorsed the experience of energy advice providers, that, although people would benefit from estimates of the costs and savings resulting from major investments in energy saving for their own homes, the energy performance certificate, at least in its current form, is too basic a tool for this.

> **Energy Performance Certificates (EPCs)** are required by the EPBD (Article 7) and are proposed primarily as an energy performance comparison tool. Article 7 does also require that the EPC includes recommendations for cost-optimal or cost-effective improvements, an indication of where further information on the recommendations can be obtained, and information on the steps to be taken to implement them. Finally Article 11 proposes that the EPC may also provide other information on related topics such as energy audits or incentives of a financial or other nature.

[20] http://www.energiesparverband.at

[21] Maby, C and Owen, A: Installer Power: The key to unlocking low carbon retrofit in private housing, Severn Wye Energy Agency, 2015. http://ukace.org/wp-content/uploads/2015/12/Installer-Power-report-2015.pdf

In practice, little effective use has been made of the opportunities to use the EPC as a communication tool, as a trigger for renovation works or to signpost consumers to support or advisory services.

It appears that the need to keep the costs of delivery of the EPC as low as possible has superseded the need for it to be an effective communication tool. Where recommendations are provided these may be simplistic and limited. Recommendations are typically prioritised on the basis of cost-effectiveness as one-off measures, which is particularly unsuited to achieving deep renovation, and also unrelated to the real-life process of renovation over time in conjunction with other repair, maintenance and home improvement works. Added to this is the problem of over simplification of data collection, which can result in misleading results for more complex buildings – particularly for many older buildings which have traditional features and/or have been added to over time. When an EPC clearly has not taken into account building elements or characteristics that the building user knows are there, they quickly dismiss its relevance.

The EPC is also not generally undertaken for homeowners unless the building is for sale or rent. Long-term owners/residents would simply not have an EPC, which illustrates another 'fatal flaw' to the efficacy of the EPC as the 'silver bullet' information tool.

The new concept of a 'Building Renovation Passport' (BRP) could help to fill the gap in provision. This is a tool, currently under development, which outlines a long-term (up to 15 or 20 years) step-by-step 'renovation roadmap' for a specific building, resulting from an on-site energy audit fulfilling specific quality criteria and indicators established during the design phase and in dialogue with building owners. The renovation roadmap is envisaged as a plan with a horizon of 15-20 years that, by looking at the building as a whole, suggests the installation of selected measures in a certain order to avoid that at any stage of renovation the future installation of additional measures is precluded. It can also usefully be combined with a repository of building-related information (logbook). The BRP would be complementary with an EPC, but not the same instrument, since an EPC has to be developed before selling a building, and the BRP takes into account the preferences of the future homeowner, not the past.[22]

Action research in 'Countdown to Low Carbon Homes'[23] indicated that even a well-delivered EPC needs explanation and 'interpretation' to the homeowner.

Accessibility, relevance and level – differentiating consumers

Another important issue is accessibility of advice services for the consumer. This applies both to the physical access and the type of communication language that is used. Imparting technical information to a non-technical audience is a particular skill, which often requires an even better technical understanding on the part of the adviser than it does to deliver a dry technical report. Technical literacy amongst consumers varies enormously – as does even basic numeracy and literacy levels. Another variation is that some consumers are articulate and/or numerate verbally but struggle with written materials – in which case energy bills (and some energy advice literature) can be challenging.

Consumers vary a great deal not only in their level of technical knowledge, but also the level of interest they have in it. Communication of advice needs to take into account the person on the other end, and adjust accordingly. Any good salesperson knows this – you need to be able to assess motivations and interests as well. Advice needs to cater for the full range of consumer

[22] The Buildings Performance Institute Europe will soon be publishing a report on the Building Renovation Passport.

[23] http://www.countdowntolowcarbonhomes.eu/index.php/gb/project-reports-and-case-studies/

characteristics, not just in terms of level of knowledge, but also consumer attitudes, for example to cost, comfort and environmental considerations. Haines and Mitchell (2014) point out that "*tailoring strategies to suit different personas will considerably enhance the diffusion of policy goals for low-energy retrofit and also allow business and technology developers to target an appropriate user*."

Different customers need have different access options open to them – so to maximise reach, advice needs to be available through different media (internet, phone, 'surgery', home visit).

> **The Guichets Energie in Wallonie, Belgium**[24] are a good example, with 16 centres across the region, providing advice through telephone, e-mail, public promotional events and home visits where needed. Advice covers measures, user behaviour, relevant regulations and further help where needed such as subsidies for low income households and solar energy installations. To give an idea of the scale of activity, the number of direct contacts per year rose from 28,000 in 2000 to more than 64,000 in 2013.

An approach which can help to engage people's interest and illustrate what is possible for homes similar to their own is the 'Open Homes' idea. This is where homeowners who have carried out renovations open their homes to visitors, typically as part of a neighbourhood event over a weekend. Visitors can learn about the improvements that have been made, and hear about the process from the occupants themselves. It also offers local suppliers and installers the opportunity to showcase their work, and consumers the chance to ask them questions.

Advisory services also need to be able to cater for the most vulnerable consumers, for example where there may be particular health or social needs, such as for heating, cooling, hot water or lighting. This requires sensitivity to these needs, and knowledge of local services, and of protocols designed to protect vulnerable consumers. A quality advisory service will typically have considered and agreed policies for such provision, and have well developed relationships and cross-referral arrangements with other support services such as health and social care.

> **The Energy Efficiency Advice Centres Network in the UK** (discontinued in 2012) consisted of local centres across the country, with a uniform core advice delivery process funded by government through the Energy Saving Trust[25]. As these centres developed, many of them formed extensive working relationships and referral networks with housing, health and social care bodies at local level. Some took an active role in the formation of fuel poverty or 'affordable warmth' strategies and partnerships. UK fuel poverty charity, National Energy Action (NEA)[26], supports and informs local activity of this kind, and forms an important link with government policy.

Impartiality and trust and who pays?

An effective adviser must be not only credible due to their expertise and ability to communicate, but trustworthy and seen as such by the consumer. A major question here is that of impartiality.

[24] http://energie.wallonie.be/fr/guichets-energie-wallonie.html?IDC=6946
[25] http://www.energysavingtrust.org.uk
[26] www.nea.org.uk

This is a problematic question. Technological impartiality of the advice giver would require an equal treatment of all technologies in the advice given. Commercial impartiality would require the adviser to have no financial benefit from the consumer taking action – or what action is taken. In this case, how is the advice to be paid for? This is a question that arises in other sectors of advice as well, such as in financial services. One way to ensure commercial impartiality is to provide public funding for the advice service, and another is to charge a fee for advice to the consumer. There are examples of a mixture of these approaches, in which an initial level of advice provided for free, with charges for the next level (such as an energy survey and written report). A variation on this model is to partially publicly fund the advice, and charge the consumer a reduced fee but for low-income consumers to subsidise advice more fully.

Who else needs access to advice apart from building owners?

One feature of building renovation projects is the wide variation in the way these projects are organised in practice. There will always be a building owner involved – but the level of their engagement can range from 'hands-off' commissioning through to designing and project managing the work themselves, or even carrying out the work as a 'Do-It –Yourself' project.

In the domestic sector, clearly owner-occupiers are a key target group. In addition, other key groups are landlords, tenants and the general building trades who deliver services to homeowners – active mainly at a very local level and in direct contact with homeowners commissioning works on a daily basis. This is essential to realise trigger point opportunities, rather than to rely on demand for energy improvements as a singular market distinct from the other building works.

The building trades and installers get their products and materials from somewhere – typically either an online trade catalogue, a local builder's merchant, or direct from a specialist supplier. In order to cover all bases and ensure consistency of advice and information, these sources should also be linked in to any regional or national information strategy. In moving towards near zero carbon building, the specialist support of suppliers is crucial to enabling installers and building trades to achieve the required quality – and avoid new problems. Some of the issues that can arise ad need to be managed are air-tightness and ventilation, moisture movement and condensation risk, damage to historic features and unacceptable visual impact.

Larger projects may also involve architects and/or structural engineers. There may be contact with building inspectors and planning control. These are also places where advice may be made available or endorsed. Certainly it is important that these sources do not conflict in the information they provide.

Reliable sources of information and advice are needed therefore (and need to be consistent) for all 'key actors' who are in a position to decide or to influence decisions.

Integrated/holistic approach – the 'one-stop-shop'

In designing practical delivery of energy advice, it is necessary to take into account certain critical ingredients: technical and social expertise, practical experience, social awareness, communication skills and commercial independence.

Another issue to take into consideration is to ensure that the customer is not passed on from one service provider to another, risking losing them along the way – hence the concept of the one-stop-shop, where they can be supported through the whole 'journey' to installation and post installation user behaviour (change). From this perspective it is also necessary for the data collected in assessment to be available to advisers, installers and the customer themselves – and for it to be easily updated as changes are made. There is potential for this to be integrated with other practical

needs for a store of readily accessible information about a home, such as the details of electrical circuitry, water supply and where to turn it off, gas supply, drainage, damp-proofing….perhaps ultimately a cloud-based log book? Or even an official log kept with official property or land registries or the local authority?

> **The PRIS network in France** is an interesting example of a one-stop-shop approach, providing end-to-end advice on home renovation and behavioural change. The network has been formed by merging the "Espaces Info Energie", which have been delivering energy advice since 2001, supported by the national energy agency ADEME and local authorities, with the local information centres run by the National Agency for Housing (ANAH) and the Local Agency for Information on Housing (ADIL).[27]

The idea of the one-stop-shop for building renovation might include a multi stage advisory service, offering awareness raising, generic information, detailed energy audits as well as the basic energy performance certificate, assistance in sourcing installers and suppliers and in identifying finance for measures, and support through the process. This support is particularly crucial where the renovation is a complex one, as is typical in aiming for deep energy savings, involving the thermal quality of all building elements, upgrading of heating, cooling and hot water equipment, air-tightness and ventilation, and micro-generation – as well as user behaviour adjustments.

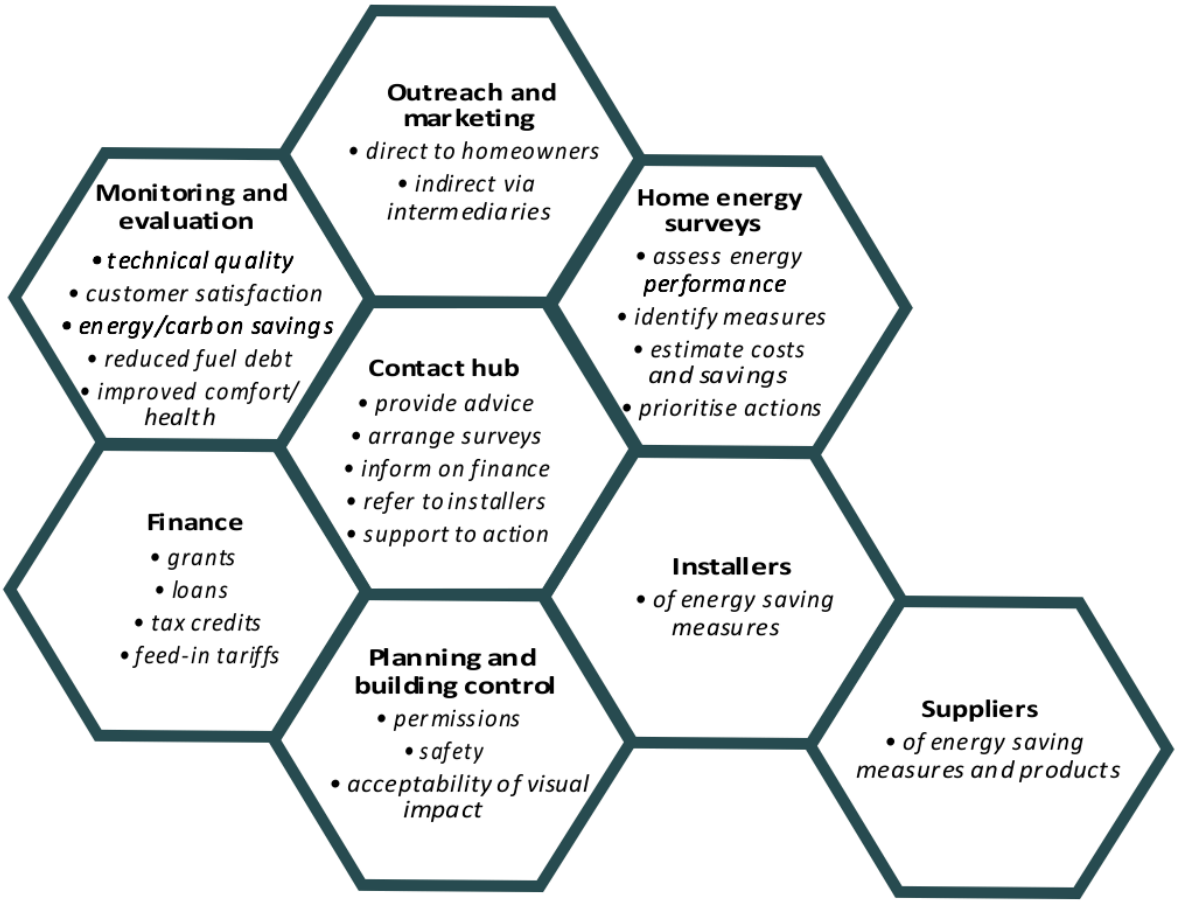
The 'Countdown to Low Carbon Homes' project (Maby et al, Severn Wye Energy Agency, 2014)[28] used an action research approach to develop a model for supporting home energy improvements, based around an advisory service at a local or sub-regional level – the scale envisaged being one which would enable a personalised service to home owners and a network of known installers and suppliers, who in turn are available locally and familiar with the building stock. The model developed consisted of several elements, all closely linked:

- A contact hub, with several options for contact including telephone and website (or drop in if this is feasible);
- A proactive outreach programme;
- An initial contact and simple advice service;
- A network of energy assessors able to carry out detailed home energy audits;
- Links to suppliers and retail outlets;
- Links to local building and planning control bodies;
- Information on and referrals for (or direct provision of) finance for measures, and assistance in applying for these, and in blending different sources where necessary;
- Links to other support services for vulnerable consumers ;
- Appropriate monitoring and evaluation processes

Crucial to this approach is that the contact hub acts as a glue to keep everything together and supports and encourages the customer through the whole process. It is essential to review the approach from the perspective of the 'customer journey' through the process of renovation, looking at where intervention is needed and where support might be of benefit, and at which points the consumer could be confused or discouraged and drop out.

[27] http://www.renovation-info-service.gouv.fr
[28] http://www.countdowntolowcarbonhomes.eu/index.php/gb/project-reports-and-case-studies/

Figure 2: The Countdown to Low Carbon Homes model for local delivery of a home energy improvement programme



How important is monitoring and evaluation of energy advisory services?

Monitoring and evaluation of energy advisory services are essential, not only to check quality of delivery and maintain relevance of approach, but also to inform improvements and developments. Evaluation is also needed to provide evidence of the value of energy advice, and justify investment. However there are difficulties and barriers, which may account in part for the lack of evaluation studies to date.

A thorough evaluation would involve monitoring of actual outcomes, for example in terms of energy (and associated carbon emission) or fuel bill savings, improved comfort conditions or health of occupants. A robust approach would also involve before and after monitoring for several years – but this tends to be both impractical for most advisory service, and too costly.

As a result, a typical approach is to try to record actions taken as a result of advice, and to use 'deemed' outcomes for these actions. For example, an insulated roof of a house has a 'typical' saving. This approach is more accurate if adjusted for an actual house of measured dimensions rather than a standardised average, but even so will be very approximate. Inaccuracies include variations on material and quality of installation, and details of each building type, such as 'cold – bridges' formed by structural elements or services.

Another factor to take into consideration is the likelihood and degree of any 'rebound' effect, where the user behaviour alters to use more energy in other ways in response to improved energy efficiency.

It is also important to avoid double-counting. Advisory services do not operate in isolation – and are often most successful when supporting other policy measures, such as financial incentives. Savings resulting from these different policy tools need to be seen in this context and allocated accordingly. These barriers are an indication of the need for careful, expert and robust evaluation of energy advisory services, and not a reason to avoid doing this at all. There is a strong argument for large scale analysis of energy advisory services to better understand what works and why.

Developing a blueprint for energy advice for deep renovation

How does all of this apply to building renovation strategies? And what kind of advisory services are needed to enable these to achieve the desired results? The answer is all of the above! This may seem very expensive, as all direct contact time with individuals can be costly – but how does this cost compare to new supply capacity, particularly in a fossil-free future and one in which the polluter pays principle is applied? As the 'glue' that can bring together financial, technical and other elements of support, the value of advisory services can easily be overlooked but without the navigation offered by these services other measures put in place, like finance or technical standards, may themselves be ineffective in achieving desired results.

Taking into account the issues raised in this section, a possible blueprint is set out below for an effective energy advice service to support deep renovation.

Key features of the blueprint
A 'one-stop-shop' approach to delivering support to consumers in moving towards deep (energy) renovation of buildings, this requires consistent funding over an extended period of time, and clear recognition in policy as a significant enabling mechanism.

Local/regional advisory hubs providing the full advisory service, offering full geographical coverage, supported by a national resource centre providing technical support and joint services where appropriate.

Experience has shown that it may work better if the national resource centre is seen as an equal partner to the network of local/regional hubs, providing different services, rather than 'higher' in the hierarchy, as there can otherwise be a less than transparent competition for resources.

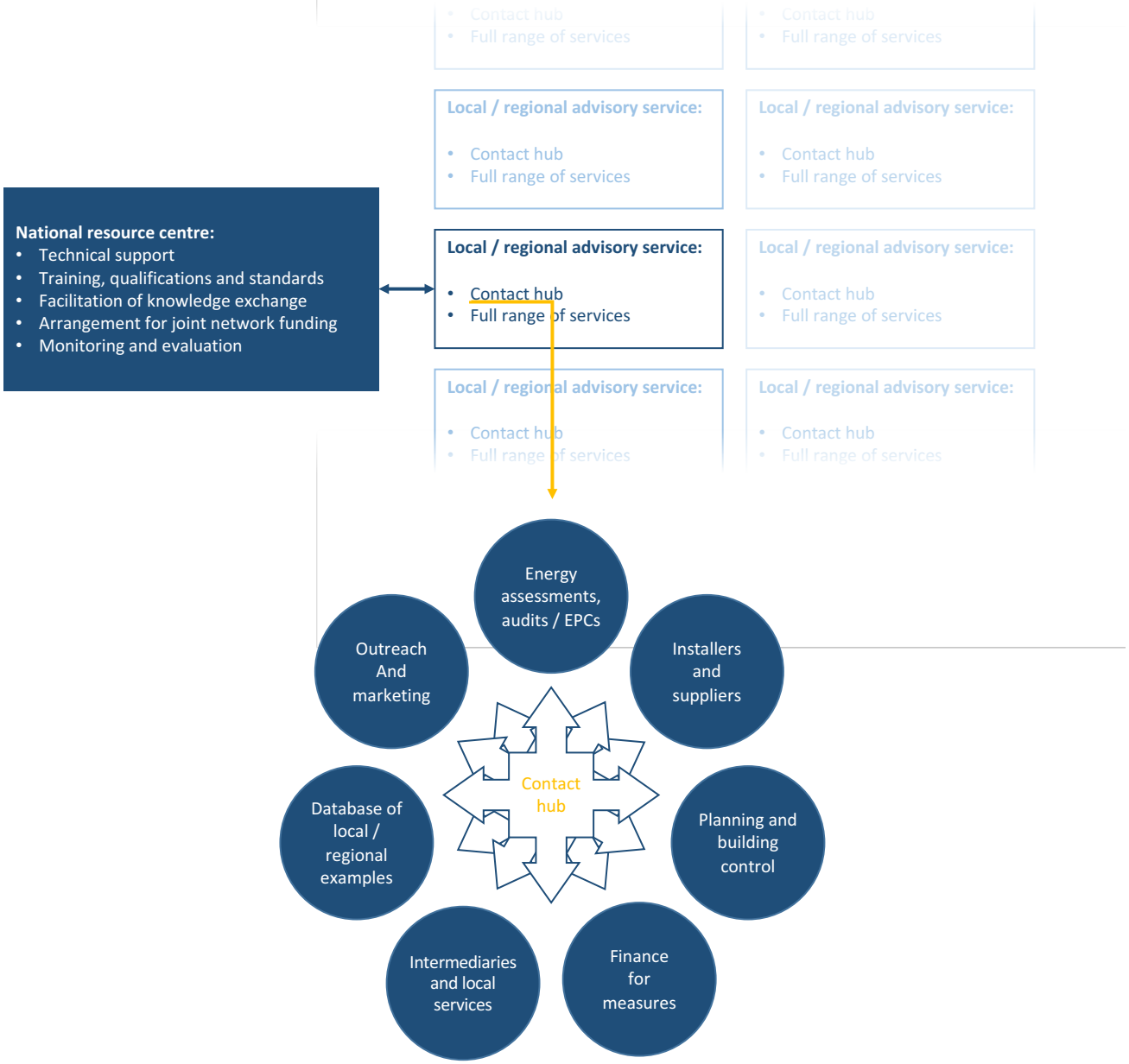
Each local/regional advisory hub to provide:

- A range of media/contact options, to ensure maximum accessibility, including:
    - Free telephone service (not just office hours)
    - Website
    - E-mail
    - Face to face in publicly accessible location
    - Face to face on site
    - Written reports (e.g. energy audit/long term building energy renovation action plan);
- Multi stage advice – supporting consumer throughout the 'renovation journey';
- Ranging from answers to simple questions through to full technical audits and communication and interpretation of these ;

- Covering the full range of needs including:
    - raising general awareness of benefits and opportunities
    - identification of specific measures appropriate to each building and consumer
    - quantification of costs and benefits
    - development of long term renovation plan for building to reach near zero energy
    - assistance in prioritisation of next steps
    - assistance in identifying and obtaining finance
    - guidance in identifying suppliers and installers
    - help through potential building control and planning barriers
    - guidance on user behaviour and methods for long term maintenance of energy efficient behaviour;
- Knowledge of/advice on local specificities in terms of services, building vernacular, planning and building code restrictions;
- Supported by effective marketing and outreach programme – both planned and opportunistic, including segmentation to ensure reach and coverage;
- Effective referral network making full use of range of possible intermediaries;
- Targeted support services for households potentially vulnerable to fuel poverty;
- Affordable – and at least the core provision needs to be free to the user (contact hub support). Elements can be paid for such as energy assessments/audits with written reports, but may still need to be subsidised. Crucial that costs of quality assessments are on the one hand controlled and on the other hand adequately covered (and transparently so), to avoid pushing down quality to lowest common denominator OR gaining poor reputation for overcharging. A set system of pricing, with agreed variations for size and complexity of buildings could be the solution.
- Advisors to be specifically trained and qualified to deliver energy advice;
- Advice delivery standards to be set and adhered to including qualifications, customer service, equalities, confidentiality, environment, data protection;
- Supported network of local/regional suppliers and installers – with capacity building ethos, rather than exclusivity/closed –shop approach;
- Provision of a linked expert advisory service for building trades involved in repair, maintenance and home improvements, to enable them to integrate energy efficiency improvements into delivery in a manner consistent with policy and the advice being given to consumers;
- Development of local/regional database of examples of deep renovation – with outreach activity such as ‘open days’;
- Effective links to regional investment advisory platforms as envisaged by the European Investment Bank;
- Regular, consistent and transparent monitoring and evaluation, including customer satisfaction, levels of activity, results and outcomes.

It should be noted that this is a one-stop-shop approach, but does not preclude further integration, for example with a wider building renovation support service (not just energy) – as in the PRIS service in France.

Figure 3: The Hub Approach



4. Key issues in embedding energy advice into buildings policy

How can we ensure energy advice is properly integrated in our EU national renovation strategies?

There is no clear policy definition for information or advisory services, which is perhaps in part to blame for the lack of priority and inconsistent delivery of these essential services. This section explores in more detail the areas within the most relevant European policies that have the potential to promote advisory services, in particular the National Renovation Strategies required under the 2012 EU Energy Efficiency Directive.

How well does the policy framework support information and advisory services?

The two EU Directives that hold the main responsibility for promoting energy saving in buildings and building renovation are the 2010 Energy Performance of Buildings Directive and the 2012 Energy Efficiency Directive. A review of the provisions within these Directives that have the potential to require or enable the provision of information or advice to household and SME consumers has been carried out.[29]

This review reveals that there are a relatively large number of provisions that promote information provision across the two Directives. However, looking at the provisions together as a guiding framework for effective delivery of awareness raising, information and advice they are severely lacking. The provisions are piecemeal and contain unhelpful crossover and duplication. Essentially, the provisions are unclear and non-specific.

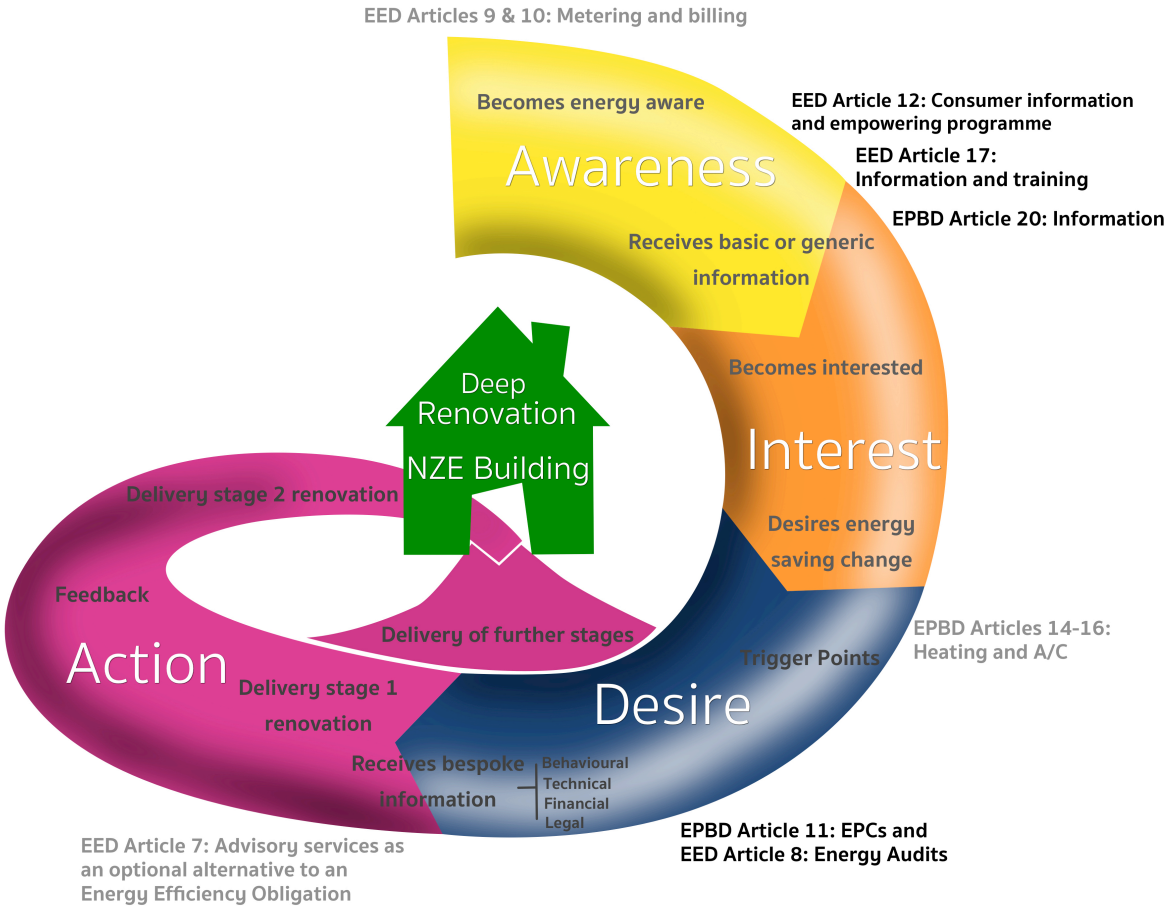
Most notably, if mapped against the customer journey to deep, staged renovations or nearly zero energy existing buildings, as shown below, significant stages in the journey are almost entirely ignored by the existing provisions, leaving customers unassisted and opportunities for renovations lost. Most significantly, the provisions impact disproportionately at the awareness raising and information stages, with less support for consumers as they travel through the AIDA (Awareness, Interest, Desire, Action) journey.

Three Articles across the two directives promote generic information provision or awareness raising. Yet, bespoke information is limited to the provision of technical information though EPCs and audits. This paper has firmly stated that EPCs or energy audits on their own do not constitute an adequate deep renovation advisory service and should not be seen as a stand-alone consumer support measure. EPCs and audits are generally too limited in scope, and need not only to be communicated effectively to consumers, but also followed through with support and encouragement to take action.

Beyond bespoke technical information, the wider package of financial, behavioural and legal advice is missing from the framework. Furthermore, no provisions across the two Directives require policy and programme support for consumers at the essential 'Action' stages of the customer journey to help them manage complex, staged renovations and to motivate them to stay within the renovation cycle after the first works. The only provision that may result in an adequate energy advisory service is included, with very little detail, as a subset of one policy measure in a list of optional alternatives to an Energy Efficiency Obligation Scheme.

[29] See Annex 1: Relevant articles of EED and EPBD for full description.

Figure 4: Articles of EPBD and EED that promote awareness, information or advice mapped onto the customer journey to deep renovation



Furthermore, opportunities to link up the information or advice provision elements to other facilitative measures in the same Directives are being missed, these include the National Energy Efficiency Fund (EED, Article 20) and financial incentives (EPBD Article 10), or the requirement for policies and measures to transform an increasing number of refurbished buildings into NZEBs (EPBD Article 9), or link to trigger points like energy efficiency upgrades required when major renovation or systems replacement is carried out (EPBD Articles 7 and 8) or heating and air-conditioning system inspections (EPBD Articles 14 and 15).

The next section of this paper reviews the role that information and advisory services play in Member States' National Renovation Strategies under the EED.

What role do information and advisory services play in National Renovation Strategies?

The national renovation strategies that are required under the EED offer the appropriate opportunity for Member States to express the priority they give to providing energy advice to consumers. It is important to look more closely at these strategies.

What should National Renovation Strategies be for?

> "*Member States shall establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private."* EED, Art 4.
>
> "*The Coalition for Energy Savings believes that the aim of the comprehensive national renovation roadmaps should be to provide a well-planned, realistic yet ambitious approach, to increase, with immediate effect, the historically low renovation rates, and ultimately reduce significantly the energy consumption of the building stock by 2050…. The national renovation strategies must be robust and designed to put all actors on the right track towards reaching an 80% reduction of the energy demand of the EU's buildings by 2050*".[30]

As laid out in EED Article 4 the role of the National Renovation Strategy is to indicate how investment in the renovation of the national building stock can be mobilised. Article 4 points to two further important intentions for the strategies.

First, it makes clear that the strategy should contain policies and *measures to stimulate cost-effective **deep renovation** of buildings, including **staged deep renovations*** (c). This clearly sets the development of the strategies in the context of the need to drastically increase the rate (annual rate of renovation and depth of building renovations to achieve long-term energy savings objectives.[31] Furthermore, the strategy should be set in the context of the ambition, read across from the EPBD, to stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings. This establishes the expected ambition of the long-term strategy and the acknowledgement that deep renovations (to nearly zero energy levels), staged over time, are essential to achieve this.

Second, the Article points to the multiple stakeholders including energy end users who will be required to make investments and deliver the strategy, requiring that strategies are sufficient *to guide investment decisions of individuals, the construction industry, finance institutions* (d).

Information and advice is one of the key policy tools to both address the still largely unconquered challenge of achieving deep and staged renovations on a large scale and to engage, motivate and assist the key 'individuals' stakeholder group to deliver these renovations.

How are information and advisory services presented in the National Renovation Strategies?

The project team reviewed the first iteration of the National Renovation Strategies drawn up in 2014 (25 of 28 strategies were reviewed, strategies from Luxembourg, Portugal and Romania were not included due to lack of translation).[32]

It should be noted that in delivering their first iterations of the National Renovation Strategies, Member States approached the exercise in drastically different ways. Some countries have embraced the exercise as an opportunity to engage and consult widely with stakeholders whereas others appear to have undertaken a much more bureaucratic exercise with the resulting report providing largely technical information only. Some strategies describe policies and measures in detail while others make only passing reference. Furthermore, a number of strategies make assessments of the need for future policies and measures but do not make it clear whether these interventions are planned as part of the future policy framework.

---

[30] http://eedguidebook.energycoalition.eu/national-renovation.html

[31] See Chapter 2 of OpenEXP op.cit., for a full discussion on stimulating deep renovations.

[32] See Annex 2: Analysis of Member State Renovation Strategies for information and advice provision for summary analysis.

Due to the broad variety in approaches to, and quality of, the strategies the summary below is based on a generous assessment in which any reference to an awareness, information or advice measure is counted whether it appears to be a concrete measure in the existing or proposed policy framework or not, and even when description of the measure is brief or generic.

It should also be remembered that this review is of the treatment of information and advisory services in the renovation strategies and should not be taken to be an assessment of actual delivery in the country in question. The authors are aware of a number of programmes that are not mentioned in the relevant country strategy and, conversely, are aware of programmes that are in the national strategy but no longer exist.

The need for information and advice was well recognised in the strategies. In all but one of the national strategies that addressed barriers to renovation (half of the strategies reviewed) information/knowledge of the building user was recognised as a barrier.

When looking at the presence of relevant policies and measures to provide awareness raising, information or advice to end users, seven strategies did not contain reference to any programme of relevance. Unsurprisingly, many of the strategies did contain reference to energy audits and EPCs but their role as a technical tool is the focus, without further expansion on or link to supporting advice/information. Where this is the case audits/EPCs have not been recognised as a relevant measures in this analysis.

Of the 18 strategies that did make mention of an existing or future awareness, information or advice measure, four described measures entirely limited to awareness raising, generic information provision or education (Croatia, Finland, Hungary, Slovakia), i.e. programmes that influence the very early stages of the AIDA process (national awareness campaigns, media campaigns, leaflet provision, awareness events).

The remaining 14 strategies contained reference to some sort of advisory support but the detail provided on these services and the comprehensiveness varies hugely. Only a small number of examples describe programmes of consumer support that are in line with the blueprint set out in this paper for a national, independent and end to end advisory service suitable to facilitate deep renovations (e.g. France, Germany). On the regional or municipality level there are a number of further good examples (e.g. Upper Austria, Brussels, Riga in Latvia etc.).

In summary, the strategies on the whole (with a few notable exceptions) fail to adequately recognise the role of, and need for, advisory services to deliver the ambition of widespread, deep renovations.

Are the guidelines for National Renovation Strategies sufficient?

The overall poor reflection of the importance of advice provision can in part[33] be traced to the wording of Article 4 and to the Commission Guidance on renovation strategies.

The wording of Article 4 and the associated Commission Guidance focuses heavily on modelling of technical potential, and cost-effective technical potential, and on the identification of investment and sources of funding and finance for renovation. Clearly, technical potential is an essential evidence base for the creation of a strategy, and as a signifier of the size of the market it provides an important signal to investors. The focus on funding and finance is also essential, but is only one

[33] The poor reflection of advice programmes can also be potentially traced in some National Strategies to a more general poor description of existing and future policy measures.

element of a policy framework that needs to be comprehensive to drive the scale of renovation necessary.

In expanding on this wider framework of 'policies and measures', the Commission Guidance[34] divides policies into the following categories:

- *Regulatory (EU, national, regional and local*
- *Fiscal (tax incentives, grants, subsidies, loans, etc.)*
- ***Information campaigns***
- *Labelling (e.g. EPCs etc.)*
- *Voluntary agreements*
- *Other*

The category of policy in which awareness, information and advice measures are included is limited to the title 'Information campaigns'. The use of 'information' limits its ambition for Member State measures to awareness raising or information activities rather than encouraging bespoke advice and facilitation that is in keeping with the level of renovation complexity foreseen. Furthermore, the definition of measures as 'campaigns' implies time-based (short-term) initiatives rather than the sort of sustained provision that this paper illustrates is necessary to facilitate high levels of deep renovation.

[34] https://ec.europa.eu/energy/sites/ener/files/documents/20131106_swd_guidance_neeaps.pdf

5. Next steps

This Discussion Paper is the beginning of a process to ensure that energy advisory services are properly integrated into the EU's energy renovation strategies. There is further work that needs to be undertaken.

The next step is to encourage a full discussion of this paper in the context of the negotiations following the publishing of the Commission's energy efficiency package.

Undoubtedly, there is a need for a better sharing of best practice – or even understanding what best practice is. Some of this work might, for example, occur within the Concerted Actions, and be complemented by a forum for exchange of practice between advice providers.

A new study to assess the depth of delivery of energy advisory services in Europe would give a better picture of current practice and where there are gaps. Because of the dearth of evaluations in this area, there is a need to better understand the lessons learned from experience in the EU and elsewhere. This would include returning to existing (and terminated) programmes to analytically develop a better understanding of the effectiveness, the costs and the benefits.

It would also be beneficial to do a series of short consumer surveys to better understand the needs of both owners (in general) and owner-occupiers.

A linked piece of work is to research models of funding for impartial end-to-end advisory services. This paper touches upon some of the models of financing but sustainable, long-term funding is an issue that demands greater investigation.

It is fundamental that there be more analysis and understanding of how energy advisory services can play an increasingly important role in improving the impact of future renovation strategies. This might be supported by organisations such as the European Council for an Energy Efficient Economy encouraging peer-reviewed papers on energy advice at its summer studies.

Other useful developments could be a resource for policy makers and programme designers to develop energy advisory programmes, and a "how to" guide for Member States and relevant civil society organisations on implementing advice provision in the context of the EPBD and EED.

Annex 1: Relevant articles of EED and EPBD

Articles of the EED and EPBD relevant to the provision of awareness raising, information and advice to households and SMEs on building energy efficiency renovation.

Direct (Articles requiring information direct to the end user)	**Indirect** (Articles requiring information/training to 3rd parties and from 3rd parties to consumers)	**Facilitative** (Articles creating potential trigger points for renovations and other facilitative mechanisms)	**Contextual** (Articles that provide the context for renovation of the stock)
EED Articles 9 and 10: **Metering and Billing** In summary these Articles require that energy end users are provided with accurate energy metering and billing information reflecting their actual consumption. EPBD Article 11: **Energy Performance Certificates.** *Member States shall lay down the necessary measures to establish a system of certification of the energy performance of buildings…The energy performance certificate shall include recommendations for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit.* EED Article 8: **Energy Audits and energy management systems** *Member States shall promote the availability to all final customers of high*	EED Article 16: **Availability of qualification, accreditation and certification schemes** *Where a Member State considers that the national level of technical competence, objectivity and reliability is insufficient, it shall ensure that…certification and/or accreditation schemes and/or equivalent qualification schemes, including, where necessary, suitable training programmes, become or are available for providers of energy services, energy audits, energy managers and installers of energy-related building elements.* *Member States shall take appropriate measures to make consumers aware of the availability of qualification and/or certification schemes in accordance with Article* EED Article 17: **Information and training**	EPBD Article 10: **Financial incentives and market barriers** *Member States shall draw up . . . a list of existing and, if appropriate, proposed measures and instruments including those of a financial nature, other than those required by this Directive, which promote the objectives of this Directive.* EED Article 19: **Other measures to promote energy efficiency** *Member States shall evaluate and if necessary take appropriate measures to remove regulatory and non-regulatory barriers to energy efficiency, without prejudice to the basic principles of the property and tenancy law of the Member States.* *…The measures may be combined with the provision of education, training and specific information and technical assistance on energy efficiency.*	EED Article 3: **Energy Efficiency Targets.** *Each Member State shall set an indicative national energy efficiency target, based on either primary or final energy consumption, primary or final energy savings, or energy intensity.* EED Article 4: **Building Renovation (Renovation Strategy)** *Member States shall establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private.* EPBD Article 9: **Nearly zero energy buildings** *Member States shall draw up national plans for increasing the number of nearly zero-energy buildings…* [and] develop policies and take measures such as the setting of targets in order to stimulate the transformation of

quality energy audits which are cost-effective…Member States shall develop programmes to encourage SMEs to undergo energy audits and the subsequent implementation of the recommendations from these audits. Member States shall also develop programmes to raise awareness among households about the benefits of such audits through appropriate advice services. EPBD Articles 14, 15, 16: **Inspection of heating and a-c systems and subsequent reports.** Requires periodic inspections of systems. *The inspection report shall … include recommendations for the cost-effective improvement of the energy performance of the inspected system.* EED Article 7: **Energy Efficiency Obligation Schemes** (9) As an alternative to setting up an energy efficiency obligation scheme, Member States may opt to take other policy measures to achieve energy savings. These options may include (f) *training and education, including energy advisory programmes, that lead to the application of energy- efficient technology or techniques and have the effect of reducing end-use energy consumption.*	*Member States shall ensure that information on available energy efficiency mechanisms and financial and legal frameworks is transparent and widely disseminated to all relevant market actors, such as consumers, builders, architects, engineers, environmental and energy auditors, and installers of building elements.* *Of particular relevance to 3rd parties: Member States shall encourage the provision of information to **banks and other financial institutions** on possibilities of participating, including through the creation of public/private partner ships, in the financing of energy efficiency improvement measures* *Member States shall establish appropriate conditions for **market operators** to provide adequate and targeted information and advice to energy consumers on energy efficiency*	EED Article 20: **Energy Efficiency National Fund, financing and technical support** *Member States shall facilitate the establishment of financing facilities, or use of existing ones, for energy efficiency improvement measures to maximise the benefits of multiple streams of financing.* *Member States may set up an Energy Efficiency National Fund. The purpose of this fund shall be to support national energy efficiency initiatives.* **Trigger points:** EPBD Article 7: **Existing Buildings** *when buildings undergo major renovation, the energy performance of the building or the renovated part thereof is upgraded in order to meet minimum energy performance requirements set in accordance with Article 4 in so far as this is technically, functionally and economically feasible.* EPBD Article 8: **Technical building systems** *Member States shall…set system requirements in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the technical building systems which are installed in existing buildings.*	buildings that are refurbished into nearly zero-energy buildings,

EED Article 12: **Consumer information and empowerment programme** *Member States shall take appropriate measures to promote and facilitate an efficient use of energy by small energy customers, including domestic customers. These measures may be part of a national strategy.* Member states shall include one or more of the listed policy options around behavioural change (which includes information provision as an option) or ways to engage consumers and consumer organisations through the smart meter roll out through communication of ways to save energy or info on energy efficiency measures. EED Article 17: **Information and training** *Member States shall ensure that information on available energy efficiency mechanisms and financial and legal frameworks is transparent and widely disseminated to all relevant market actors.* *Member States shall, with the participation of stakeholders, including local and regional authorities, promote suitable information, awareness-raising and training initiatives to inform citizens of the benefits and practicalities of taking energy efficiency improvement measures.* **EPBD Article 20: Information**		EPBD Articles 14, 15, 16: **Inspection of heating and a-c systems and subsequent reports.** Requires periodic inspections of systems. *The inspection report shall … include recommendations for the cost-effective improvement of the energy performance of the inspected system.*	

Member States shall take the necessary measures to inform the owners or tenants of buildings or building units of the different methods and practices that serve to enhance energy performance. *Member States shall in particular provide information to the owners or tenants of buildings on energy performance certificates and inspection reports, their purpose and objectives, on cost-effective ways to improve the energy performance of the building and, where appropriate, on financial instruments available to improve the energy performance of the building*			

Annex 2: Analysis of Member State Renovation Strategies for information and advice provision

Member State	Does national renovation strategy identify information/ knowledge/awareness of the consumer as a barrier in the national context?	Does the strategy describe a current or future programme that provides information/advice?	Summary description
Austria	N (barriers not specifically addressed)	Y	Detail is by region - and 6 of the 9 regions specifically mention advice and/or information, several also highlighting that it is free, comprehensive and multi sector. Examples of regional measures include the federal state of Burgenland has instructed the Burgenland Energy Agency to offer construction and subsidy advice free of charge in association with a non-refundable grant for EE and RE; the federal state of Lower Austria organises and finances advisory programmes including the Lower Austria Energy Advice provides free advice to households and the EcoManagement consultancy service provides subsidised advice to companies; the federal state of Upper Austria provides a range of subsidies and comprehensive, product-independent energy advice on the construction and renovation of buildings for private individuals, enterprises and public bodies
Belgium (Brussels and Wallonia only – Flanders not reviewed)	Y (Wallonia)	Y	In Wallonie a number of information measures are reported in the strategy along with best practice promotion. In Brussels a number of measures are noted including: a network of 6 La Maison de l'Energie-Energie Huis (MEH) centres which provide free advice, technical, administrative and financial support and help with finding contractors; Advice and support is also available from the Brussels Energy Agency and the Habitat network; and an awareness campaign on resident behaviour change is also supported.
Bulgaria	N (barriers not specifically addressed)	N	
Croatia	Y	Y (broadly relevant measures are included in a list of proposed solutions)	A list of proposed solutions includes reference to a number of measures including user education conducted by energy agencies, preparation of training and education materials, a national database of good practice projects, and promotional and education activities emphasising the benefits for renovation.
Cyprus	Y	Y	Current awareness raising activities by the Ministry of Energy around the EPC. The roles of Energy Auditors and Specialist Experts in providing advice are explained. An example of the Municipality of Nicosia, is given where “the Municipality subsidises 50% of the ‘energy

			wastage control' costs, as it calls it, for Controls are performed by the Cyprus Energy Agency, usually do not last more than an hour and consist mainly of a discussion on the habits of owners with regard to energy use. At the end, owners are able to identify the areas where there is wastage of energy and ways to address it." Energy Savings Officers in the public sector.
Czech Rep	N (barriers not specifically addressed)	N	No mention of information or advice in the Strategy
Denmark	Y	Y	A number of initiatives and measures are prioritised including provision of information and the support for municipal efforts including the establishment of partnerships to run information activities; web-based resources to support the EPC to provide specific information and guidance on renovations; a digital energy renovation platform for the social housing sector and the introduction of the 'BedreBolig' scheme which accredits tradespeople to provide advice and assistance to householders on technical solutions, access to finance and managing the project
Estonia	N (barriers not specifically addressed)	N	No mention of information or advice in the strategy
Finland	N (barriers not specifically addressed but the need for information is repeatedly recognised)	Y (described in very general terms)	The Finnish strategy contains some good analysis of the needs but is descriptive in a very broad manner with little specific detail on existing or planned policies. It largely describes the need for awareness raising and information rather than advice or assistance but does prioritise the strategy of linking ee renovation to other renovation works.
France	N (barriers not specifically addressed)	Y	France has in place a national network providing independent, free technical and administrative advice to householders on renovation. See box on PRIS
Germany	Y	Y	Range of provision with national awareness campaign to promote renovation, provision of in-home audits and advice (including to low income households that are provided with free energy consultations (funded by the Federal Government) in 650 consumer advice bureau or municipal offices or via in-home checks.); and the KfW renovation funding scheme is underpinned by energy consultation and planning support.
Greece	Y	N	The strategy does recognise the need for information
Hungary	N (barriers not specifically addressed)	Y	Strategy recognises need and proposes in broad terms: 1) Developing the system and content of public awareness raising and information campaigns in the field of responsible energy use, establishing information and knowledge centres. 2) knowledge sharing for SMEs and others.

			Strategy also recognises that a monitoring system should also be put in place to follow up on the efficiency of the campaigns.
Ireland	Y	Y	A range of relevant measures including a network of demonstration homes, 'The Power of One' campaign which was a national energy efficiency campaign that was launched by the Government national energy efficiency promotion and behavioural change programme; and advice and support for SMEs by SEAI offering free energy management advice, mentoring, training and other support services.
Italy	Y	N	No mention of relevant measures/policies
Latvia	Y	Y	Policies include the 'Let's live warmer' awareness campaign, awareness raising projects and regional advice centres including: the Energy Efficiency Centre of JSC "Latvenergo" which is an advice and demonstration centre on electricity use; the Energy Efficiency Information Centre of the Riga Energy Agency (REA) which provides free consultations, advisory services and audits; and the Society "Zemgale Regional Energy Agency" which also provides advice.
Lithuania	Y	N	A short mention in the chapter on Sources of Financing recognising as future (2015-2020) need for investment in information for building owners on the possibilities and benefits of renovation.
Luxembourg	(no available translation)		
Malta	N (barriers not specifically addressed)	Y	Strategy describes a national education campaign which involves amongst other things: an advertising campaign; the creation of a centre for the built environment which will showcase successful projects to the public as well as provide information on grants, regulations, insulation installation techniques and material data; a one-stop-shop to centralise and streamlining the application processes for support schemes, information resources and support.
Netherlands	N (barriers not specifically addressed, but lack of awareness by homeowners is identified and 'informing and raising awareness' is one of 3 pillars for the government strategy)	Y	The Energy Centre for Small and Medium-Sized Enterprises currently provides objective information about energy-efficiency and implementation in practice and energy information centres are listed as a future measure- € 15 million available in the period 2014-2016 for a support structure for and in municipalities and at a regional level (for example in the form of an energy information centre)
Poland	N (barriers are addressed)	N	No relevant polices or measures in the strategy
Portugal	(no available translation)		
Romania	(no available translation)		

Slovakia	Y	Y	In relation to funding for ultra-low carbon renovation the strategy contains a small number of broad references: this incentive scheme for ultra-low carbon renovation should be complemented by training and awareness activities; and the expansion of the information campaign to include information on the construction of nearly zero-energy buildings and information on the building renovation strategy.
Slovenia	Y	Y	Existing measures in the strategy include an energy advice network for citizens, an aid scheme for renovation for vulnerable groups which includes advice, and '*coordinated awareness-raising, information and promotion in the area of EE, the use of RES and energy services'.* These are supported by future measures: demonstration projects and further energy advice as part of a fuel poverty programme.
Spain	N (barriers not specifically addressed)	Y	The strategy states that 'Generating a culture and awareness in favour of maintenance, urban renovation, regeneration and renewal' is a key strength of the strategy but detail on actual measures is missing. In order to achieve the scenarios set out, there is acknowledgement of the need to raise awareness however it is not clear whether the subsequent list of measures are being undertaken or are examples of measures that could be undertaken: measures include awareness, training, guides websites, best practice examples, university and vocational training; and it notes the role of local agencies or municipalities' which could include management and information through so-called 'one-stop shops'.
Sweden	N (barriers not specifically addressed)	Y	Existing measures include energy and climate advice, bot general and specific which has been provided since 1977 and a common online portal (www.energiaktiv.se) on improving energy efficiency aimed at homeowners, other property owners and managers, and provides support for improving energy efficiency in relation to both buildings and the organisation's transport. The support covers the whole chain from planning to follow-up of the measures. In addition an information centre for energy-efficient renovations is proposed with the aim of having a coordinated grasp of the gathering and dissemination of information to promote development and raise awareness.
United Kingdom	Y	Y	Energy Saving Advice Service features in the policy landscape diagram in the UK strategy but no information is given on what functions it performs. The Green Deal aims to overcome many of the barriers to energy efficient renovation. It provides access to capital and a trustworthy source of advice, assurance and accreditation for the consumer about the energy efficiency supply chain. Further, devolved nation, programmes are also mentioned (NEST in Wales, a fuel poverty programme that provides energy efficiency advice and income maximisation advice, alongside installation of 'whole house' measures, for qualifying properties; and the Energy Saving Advice Service providing advice in Ireland)

References:

Buildings Performance Institute Europe (BPIE), *Europe's Buildings under the Microscope*, Brussels, Belgium, October 2011 http://bpie.eu/publication/europes-buildings-under-the-microscope/

BPIE, *A Guide to Developing Strategies for Building Energy Renovation*, Brussels, February 2013 http://www.bpie.eu/documents/BPIE/Developing_Building_Renovation_Strategies.pdf

BPIE 2014 – *Renovation Strategies of Selected EU Countries*, Brussels, 2014 http://bpie.eu/wp-content/uploads/2015/10/Renovation-Strategies-EU-BPIE-2014.pdf

The Coalition for Energy Savings, *EU Energy Efficiency Directive (2012/27/EU), Guidebook for Strong Implementation,* Brussels, 2013 http://eedguidebook.energycoalition.eu/national-renovation.html

European Commission Staff Working Document, Guidance for National Energy Efficiency Action Plans, SWD(2013) 180 final, Brussels, 22.5.2013 https://ec.europa.eu/energy/sites/ener/files/documents/20131106_swd_guidance_neeaps.pdf

eceee, *Final Report: Case study on evaluation of energy efficiency information centres and one - stop shops," For WEC/ADEME preparations for WEC Congress, Istanbul, October 2016*, Stockholm, April 5, 2016 - https://www.wec-policies.enerdata.eu/Documents/cases-studies/WEC-case-study-one-stop-shop.pdf

eceee, *Steering through the Maze #1 - The recast of the EPBD*, (updated 9 March 2010), http://www.eceee.org/policy-areas/Buildings/docs/copy_of_100309_steering1.pdf

eceee, *Steering through the Maze #6, Understanding the Energy Efficiency Directive*, http://www.eceee.org/policy-areas/EE-directive/maze-6

Energy Saving Trust, *Trigger points: A convenient truth*, 2011, retrieved from http://www.energysavingtrust.org.uk/ Publications2/Corporate/Research-and-insights/TriggerPoints-a-convenient-truth

Tina Fawcett and Ruth Mayne, *Exploring an 'over time' model of eco-renovation*. Retrofit 2012. Salford, Manchester, 24–26 January 2012.

Victoria Haines & Val Mitchell, *A persona-based approach to domestic energy retrofit,* 2014, Building Research & Information, 42:4, 462-476, DOI: 10.1080/09613218.2014.893161

Joint Working Group of CA EED, CA EPBD and CA RES, *Assistance Documents for EU Member States in developing long term strategies for mobilising investment in building energy renovation*, November 2013 http://www.epbd-ca.org/Medias/Pdf/EED-Article4-composite-document-final.pdf

Ellis P. Judson & Cecily Maller, *Housing renovations and energy efficiency: insights from homeowners' practices*, 2014, Building Research & Information, 42:4, 501-511, DOI: 10.1080/09613218.2014.894808

Catrin Maby et al, *Countdown to Low Carbon Homes: delivering community scale retrofit of home energy improvements*, research report and guide, 2014, Severn Wye Energy Agency, http://www.countdowntolowcarbonhomes.eu/index.php/gb/project-reports-and-case-studies

Catrin Maby and Owen, A., *Installer Power: The key to unlocking low carbon retrofit in private housing*, 2015, Severn Wye Energy Agency, http://ukace.org/wp-content/uploads/2015/12/Installer-Power-report-2015.pdf.

Catrin Maby et al, *Energy Advice in Europe,* 2007, IEE SErENADE project, https://ec.europa.eu/energy/intelligent/projects/en/projects/serenade

Eliane Métreau and Kenya Tillerson, *Local energy advice centres in France: quite active but how effective? An evaluation of local energy actions in France*, International Consulting on Energy (I.C.E.) France, ECEEE 2007 SUMMER STUDY

OpenEXP, Energy Transition of the EU Building Stock, Unleashing the 4th Industrial Revolution in Europe, Paris, France, 2016

Regulatory Assistance Project, *Residential efficiency retrofits – a roadmap for the future*, May 2011 http://www.raponline.org/wp-content/uploads/2016/05/rap-neme-residentialefficiencyretrofits-2011-05.pdf

Global Buildings Performance Network (GBPN), What is a Deep Renovation Definition?, Paris, 2013 http://www.gbpn.org/reports/what-deep-renovation-definition

Joint Research Centre, *Energy Renovation: The Trump Card for the New Start for Europe*, 2015 http://publications.jrc.ec.europa.eu/repository/bitstream/JRC92284/eur26888_buildingreport_online_2015-03-25.pdf

The Policy Partners, *Renovation Roadmaps for Buildings*, for Eurima, Brussels, 2013 http://www.eurima.org/uploads/ModuleXtender/Publications/96/Renovation_Roadmaps_for_Buildings_PP_FINAL_Report_20_02_2013.pdf

Yamina Saheb, OpenEXP, *Energy Transition of the EU Building Stock, Unleashing the 4th Industrial Revolution in Europe*, Paris, France, 2016 http://openexp.eu/publications/energy-transition-eu-building-stock-unleashing-4th-industrial-revolution-europe