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National Strategies for Renewables: Energy Efficiency, Building Renovation and Self-Consumption

Workshop proceedings

Policy Department for Economic, Scientific and Quality of Life Policies
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National Strategies for Renewables: Energy Efficiency, Building Renovation and Self-Consumption

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Abstract

This report summarises the presentations and discussions of the workshop on "National Strategies for Renewables: Energy Efficiency, Building Renovation and Self-Consumption", which was held on 22nd February 2018. National strategies for the development of renewable energy were discussed in relation to energy efficiency targets and other policies, including building renovation and self-generation of electricity. The current situation and its likely evolution were presented and evaluated, with possible policy initiatives identified to effectively address the challenges. The workshop concluded that ambitious targets for renewable energy and energy efficiency are feasible and pointed to important synergies between both policies, in particular in the building and transport sectors.

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LIST OF ABBREVIATIONS

BIM	Building Information Modelling
EP	European Parliament
EPBD	Energy Performance of Buildings Directive
EU	European Union
GHG	Greenhouse Gases
HVC	Heat, Ventilation and Air-conditioning Technologies
IRENA	International Renewable Energy Agency
ITRE	Committee on Industry, Research and Energy
PV	Photo Voltaic solar panels
RES	Renewable Energy Sources

EXECUTIVE SUMMARY

On Thursday 22nd February, the Committee on Industry, Research and Energy (ITRE) of the European Parliament hosted a workshop on *'National strategies for renewables: energy efficiency, building renovation and self-consumption'*.

This workshop, chaired by Mr. Hans-Olaf Henkel, was organised in connection with the ongoing discussions on the Clean Energy for All Europeans package and the 2030 policies and targets. The aim was to discuss national strategies for renewable energy in relation to energy efficiency targets and other policies, including building renovation and self-generation of electricity. During this workshop, the current situation and its likely evolution was presented and evaluated, with possible policy initiatives identified to effectively address the challenges. The workshop consisted of five presentations by high level speakers, followed by a question and answer session.

The first speaker, Mr. Dolf Gielen, Director Innovation and Technology at the International Renewable Energy Agency (IRENA), highlighted the potential of synergies and interactions between energy efficiency and renewable energy policies, in particular in the building and transport sectors. Development of renewable energy allows the efficiency of the energy system to be increased, while energy efficiency measures facilitate reaching a high(er) renewable energy share. Specific technologies which contribute to reaching both targets are electromobility, heat pumps, photovoltaic installations and wind turbines. Half of the GHG emission reduction by 2050 could be reached by renewables, while another 45% could come from energy efficiency and electrification. In order to reach the goal of limiting the maximum global temperature rise to 2°C, the share of renewable energy sources in final energy demand should increase from 15% today to about 65% by 2050. To do so, the average annual growth should increase from 0.2% today to 1.4%. According to a recent IRENA study, an energy efficiency target of 30% would lead to an "optimal" renewable energy share of 34% in 2030, while with a higher energy efficiency share of 35%, a more ambitious renewable energy share of 37% would be feasible. One of the main findings of this study is indeed that higher energy efficiency gains facilitate higher renewable energy shares in the final energy mix and vice versa.

The second speaker, Ms. Christiane Egger, Deputy Manager of the Upper Austria Energy Agency and Manager of the Cleantech-Cluster Energy, focused on national energy efficiency strategies. She highlighted the progress in the energy transition in Upper Austria, where renewable energy sources already supply 60% of the energy needs for space heating. This development has allowed a reduction in GHG emissions from buildings of 43% in 10 years. Adequate regulation, financial support and awareness campaigns are the main instruments that have contributed to realising this transition. She then focused on the progress made by EU Member States from 2012 to 2015, highlighting that fluctuations are mainly due to political changes. To avoid such "ups and downs", a "positive narrative" for energy efficiency is necessary. Energy efficiency requirements for new and renovated buildings on one hand and energy labelling and certification for products and buildings on the other hand are considered the most effective policy instruments. The survey result confirms that long term EU policies are an adequate basis for national policy instruments. Countries which have a dedicated market, making energy efficiency a core business opportunity, are more successful in addressing energy efficiency challenges than other Member States. With ambitious targets and strong policies and regulation, Europe should be able to become the global leader in sustainable energy markets and technologies.

The third speaker, Mr. James Drinkwater, Director at the World Green Building Council, highlighted how national and regional strategies can be an efficient tool for the modernisation of the existing EU building stock. He stressed the important role of the Energy Performance

of Buildings Directive in supporting renovation strategies on a European level. According to a study carried out by the World Green Building Council, more prominent community building should be promoted, and a bolder move towards coordinated and structured impact reporting would be beneficial. Member States are deploying national renovation initiatives, but their results and effectiveness are at present difficult to measure. An adequate impact framework should be developed and implemented. He finally referred to some possible concrete measures, such as energy efficiency mortgages and to the positive impact of energy management on people's health and wellbeing.

The fourth speaker, Mr. Peter Wouters, Director at the Belgian Building Research Institute, focused on the contribution of research and innovation in the construction sector to energy efficiency and integration of renewable energy in buildings. His first message was that policy makers and the related implementation processes should pay specific attention to the correct assessment of innovative building and control technologies in regulatory approaches. He then highlighted that the new approach called "Construction 4.0" based on Building Information Modelling (BIM), allows the collection of all kinds of interactive data for a given building, and can substantially contribute to smart implementation of building related energy policies, but this requires adequate preparation. He finally emphasised that renovation policies should not only be based on the typical solutions available today but should try to incorporate innovative cutting-edge solutions like BIM in order to optimally and cost-efficiently reduce the carbon footprint of buildings. As a short-term objective Mr Wouters highlighted the need to better insulate the existing building stock whilst working on smarter building design which allows the better integration of renewable energy technologies.

The fifth speaker, Mr. Cosme Segador Vegas, Director of the Spanish Extremadura Energy Agency, focused on lessons learned from different approaches across Europe in facilitating self-generation and consumption of electricity. He highlighted the current situation in Spain as well as in other EU Member States regarding the implementation of photovoltaic (PV) systems for self-consumption. In several Member States PV already supplies between 5 and 10% of the national electricity demand, and is currently mainly supported by net metering, feed-in tariffs and certificate schemes. Mr Vegas stressed the high potential contribution of self-generation and consumption of electricity to reducing GHG emissions in the medium term. He concluded that, although self-consumption of electricity has become economically feasible without subsidies in several Member States, an enabling and stable regulatory framework regarding grid connection conditions, tariffs and metering is necessary. Collective initiatives for self-generation and consumption, e.g. in apartment blocks and industrial parks, could offer substantial benefits and should be allowed and encouraged in all Member States.

Mr. Henkel concluded the session and highlighted the relevance of ambitious renewable energy and energy efficiency targets, as well as the important role of adequate long term national strategies for renovation of the existing building stock. During the question/answer session, members of ITRE raised questions and made comments regarding measures and policies to enhance renovation of existing buildings, target setting (EU versus national) for energy efficiency and renewable energy, renovation of public buildings, and the appropriate regulation level (EU versus national) for self-consumption of electricity.

1. WORKSHOP PROCEEDINGS

1.1. Opening Remarks

The workshop was chaired by Mr. Hans-Olaf Henkel, Vice-Chair of ITRE, who apologised for the absence of the ITRE Chair, Mr. Buzek, and welcomed the participants and speakers. He highlighted the ambitious positions taken by the ITRE Committee in the target setting for renewable energy and energy efficiency (ITRE was in favour of a 40% target for both domains). He also recalled that the European Parliament has subsequently supported in its plenary session a 35% target for both renewable energy and energy efficiency. Mr. Henkel also stressed the important role of the Energy Performance for Buildings Directive (EPBD) to foster energy efficiency improvements in Member States to decarbonise their national buildings stocks.

He highlighted that the Workshop was aimed at identifying synergies between energy efficiency and building renovation strategies.

1.2. Best practices in Member States to reach the renewable energy and energy efficiency targets

Dolf Gielen / Director Innovation and Technology / International Renewable Energy Agency IRENA

Mr. Gielen pointed to the large potential synergies between renewable energy and energy efficiency, particularly in the building and transport sectors. Implementing renewable energy sources, in particular solar and wind energy, allows the energy efficiency of the entire energy system to improve. He also stressed that, with higher energy efficiency (and hence lower overall energy demand), renewable energy sources can supply a larger share of the final energy needs. Electromobility, heat pumps and various renewable power options, such as solar PV and wind can play a key role in achieving these synergies. Mr. Gielen referred to some policy areas such as promoting electromobility in general or enabling recharging infrastructure for smart charging of electric vehicles, as an example. He also mentioned that building renovation is another important domain where investing in heat pumps can contribute to both the development of renewable energy and the reduction of energy demand.

Mr. Gielen further stated, that according to data gathered and analysed by IRENA, on a global scale 90% of the total GHG emission reduction by 2050 can be reached by renewable energy development and energy efficiency actions. To reach the 90% GHG emission reduction target the share of renewables in primary energy consumption would have to increase from 15% today to 65% by 2050, which means that the annual growth rate of renewable energy would have to grow from 0.2% today to around 1.4%. Moreover, an annual improvement of about 2.5% is needed in terms of energy efficiency, while the current improvement rate is only 0.8% per year. Mr. Gielen stressed that further information and figures are available in the IRENA study on the potential of renewable energy deployment in Europe. This study confirmed that a renewable energy target of 34% in 2030 can be cost-effectively reached, if, in parallel, adequate policies to substantially improve energy efficiency are implemented. The result of this study is hence close to the target endorsed by the European Parliament.

IRENA has studied the correlation between different levels of energy efficiency and renewable energy. The study has for instance considered a scenario of a 30% improvement in energy efficiency by 2030, which is the level suggested by the European Commission. Based on the

above-mentioned synergies, this target would lead to an "optimal" renewable energy target of 34%. If energy efficiency improvements are set at 35%, then the EU could reach around 37% of RES. The correlation between both targets results from synergies between energy efficiency and renewable energy policies and measures

Mr Gielen then referred to an analysis done by IRENA in 2017 for some large economies, including Germany, USA, China, Japan and India. The results suggest a similar level of positive synergy effects between energy efficiency and RES share. While energy efficiency helps in reaching ambitious RES targets, renewable energy contributes to energy efficiency improvement. On a global scale around one quarter of the energy efficiency improvement potential lies in the accelerated deployment of RES, in particular in the transport (electrification) and building sectors. Mr. Gielen gave some practical examples of energy efficiency and renewable energy synergies, and stressed that wind, hydro and solar energy installations have a particularly high positive impact on energy efficiency as they are assumed to have an efficiency rate of 100%.

As a conclusion, Mr Gielen stated that the most important opportunities lie in developing higher shares of electricity based on renewable energy. If this supply option is combined with high efficiency electricity end use (by using heat pumps, electric vehicles, etc.), then substantial overall efficiency gains can be realised.

1.3. Benchmarking Member States' national energy efficiency strategies

Christiane Egger / Deputy Manager of the O.Ö. Energiesparverband / Manager of the Ökoenergie Cluster

Ms. Egger started by presenting the progress made in her own region of Upper Austria as an example of a success story of implementing integrated solutions for energy efficiency and renewable energy. Thanks to this ambitious policy, renewable energy represents about 1/3 of the total power supply in the heavily industrialised Upper Austria region. Renewable energy already provides 61% of the space heating and 75% of the electricity for buildings. About half of this RES is clean biomass, with hydropower, solar PV and wind representing the other half of the electricity generation segment. Between 2005 and 2015 the Upper-Austrian region has decreased its greenhouse gas emissions from buildings by 43%, thanks to a rigorous combination of energy efficiency and RES development. Ms. Egger stressed that this combined policy is the only way RES can become an economically viable source for power generation. Furthermore, if the concept of decarbonisation is taken to its absolute terms of 100%, then these policies become highly cost-effective.

Ms. Egger continued by presenting the results of the Energy Watch project, funded by the European Union. In this project, O.Ö. Energiesparverband analysed the progress of energy efficiency policies in EU Member States. A large part of this project consisted of an expert survey, which invited 1100 experts from all 28 Member States to evaluate the real-life progress in their country in recent years. In this respect the project did not comprise a meta-analysis but was rather reflecting the opinions of experts about the effective impact of national implementation of policies initiated by the European institutions.

Ms. Egger pointed to large variations in the opinions for the different Member States, observed in the study between 2012 and 2015. Most of them can be explained by changes in national (or regional) governments which have led to reviewed ambition levels and consequently changes in policies. Ms. Egger expressed her concerns regarding these fluctuations and how a lack of stable long-term policies can set back any progress in the field. She also stated that the results indicate that countries with "stable" and sustained RES policies notwithstanding political coalition changes, generally have a convincing answer as to

why these policies make sense for them. By convincing local communities that energy policies and measures can effectively offer benefits at local level and are not merely adopted to comply with obligations from Brussels, the level of acceptance by the local government and population increases. These positive narratives also vary between Member States. In some countries, security of energy supply is an important factor to deploy energy efficiency actions, while in other countries energy independence, innovation, industrial competitiveness, climate change and other factors shape the debate and push public opinion in favour. A good narrative is in most cases based on strong numbers and politicians should also use that in their approaches.

Based on the results of the survey, Ms. Egger further highlighted that there are certain policies that work well in all Member States and could be further promoted at the EU level. These policies are energy efficiency requirements for new and renovated buildings as well as energy labelling and certification of buildings. It is important to note that all of these highly ranked instruments are based on strong EU regulations and long-term policies, while the other policies (with lower ranking) are more dependent on the local government's willingness to implement strong measures or not. The survey clearly concluded that national policies emanating from concrete European Directives were ranked the highest by the experts.

Another important element, which has resulted from the research is the need of including private businesses in policies and actions on energy efficiency. The results suggest that in countries where there is an enabling legal and economic framework that allows SMEs to make energy efficiency their main business, energy efficiency policies are more effective as the private sector systematically hunts for new opportunities in the field and constantly improves energy efficiency. This also allows for these SMEs to introduce new and innovative solutions and further develop the market.

Ms. Egger illustrated her findings by presenting the approach used in her home region of Upper Austria to promote sustainable energy policies. Local policy makers use the *carrots, sticks and tambourines* approach, where financial support, regulation and information and training are the most important factors to further push and pull end-users and service providers in the right direction. She also stressed the importance of public awareness campaigns and presented the information campaign carried out by the O.Ö. Energiesparverband, where 10 000 face-to-face advice sessions were conducted in the Upper Austrian region in order to promote the benefits of sustainable energy consumption.

In conclusion Ms. Egger stressed that the survey suggests that experts in the field recommend ambitious targets, reliable policy packages and good narratives in order to make Europe the leader in sustainable energy.

1.4. How national and regional strategies can be an efficient tool for the modernisation of the existing EU building stock

James Drinkwater / Director of the World Green Building Council's Europe Regional Network

Mr. Drinkwater started by presenting the BUILD UPON project which was coordinated by the World Green Building Council during the last two years. It focused on co-designing and implementing strong renovation strategies in the building sector. A series of over 100 events have been held in 14 different Member States, in particular in major cities across Europe. Mr Drinkwater referred in particular to the Energy Performance for Buildings Directive (EPBD), which offers a useful basis for national renovation strategies.

One of the most important outcomes of this project has been the acknowledgment that renovation of the existing building stock is a complex social challenge, with people at the

heart of the process. He used the metaphor of throwing a rock and a bird in a straight line to illustrate the challenges faced by decision-makers. If thrown in a certain direction, the rock will fly in a straight line and reach the set goal. If, however, a living thing, like a bird, is thrown in a certain direction, it will most certainly not approach the destination in a straight line. One of the key lessons learned from this project is that, when we deal with complex living elements like human beings and society, we shouldn't expect to be able to reach the objective in a straight line.

According to Mr. Drinkwater, the new EPBD is on the right track to include a wide public consultation as a key component in designing renovation strategies. He stressed the need to move even further and to consider community building as well as consultation. Strong inter-sector platforms were built in each of the Member States where the BUILD UPON project has been active. This has allowed the quality of collaboration between diverse stakeholder groups to be measured. According to Mr. Drinkwater, the local energy efficiency and RES communities were not always properly consulted and involved in view of delivering common proposals and designing and implementing renovation strategies. This is however changing, and strategies are now not only focusing on building interventions, but also on sustainable urban planning and municipal-level issues. This is a crucial point for bringing the communities together as well as for implementing successfully the agreed strategies. A well-structured and committed approach based on inclusive public consultation, is needed; the success of this consultation process will define the success of the solutions and the speed with which the renovation objective will be reached. Prior to this project, banks, property managers, universities, green building experts and energy utilities have never been brought together. Now that they have been brought together, they are collaborating on new ideas and are for instance generating a pan-European mortgage scheme.

The second point Mr. Drinkwater made was the need to move from overviews of initiatives towards coordinated collective impact frameworks. The takeaways from the BUILD UPON project suggest that there are typically between 50 to 100 major initiatives across the public, private and third sector tackling market barriers for renovations. What was striking was that very few of them reported their effective progress. Outside the public institutions there was very limited data to calculate the actual impact. Communities of solution providers have recently started to set up clusters and have begun to measure their impacts and collective progress towards the set goals. They all have followed different paths but knowing where their common goal lies was key to learn the most effective solutions. These collective paths have to be further supported.

Mr. Drinkwater also discussed energy efficiency mortgages. For all assets across Europe there has to be a plan to make them CO_2 net-zero emitters in order to respect the 2° C scenario. Investors, like mortgage brokers, are also looking to make sure the assets they are investing in are sustainable and that there is a plan put in place to improve them over time. The building renovation passports, mentioned in the EPBD, are a key instrument for setting out a journey for each building that integrates the right approach towards energy efficiency and RES measures and conveys the information of how to make that asset resilient in terms of value and performance, so that investors can start to fund that renovation during the lifecycle of the building.

In his final point Mr. Drinkwater highlighted the fact that the key focus of renovation polices should be the people. The 90% rule can be referred to in this respect. In the example of an office, the energy bill only represents 1% of the total costs. Therefore, the cost level alone does not offer a proper incentive to push towards energy efficiency improvements. The staff costs however represent around 90% of the operating costs, and the link between building performance and people performance is hence important. In this context the EPBD rightly identifies the impact of building and energy performance on the health and productivity of

the personnel. Further investigations will have to be made at the project level in specific tools that clarify the links between the environmental and energy performance metrics and economic performance metrics, like staff turnover, productivity etc.

1.5. The contribution of research and innovation in the construction sector to energy efficiency and integration of renewable energy in buildings

Peter Wouters / Director at the Belgian Building Research Institute / Manager of the International Network for Information on Ventilation and Energy Performance

Mr. Wouters began by highlighting the three main messages of his presentation. First, national policy-makers in charge of the transposition of EU regulations should pay specific attention to facilitating a proper assessment of adequate building control technologies in the regulatory context. Second, construction 4.0 (digital construction) and Building Information Modelling (BIM) can successfully contribute to smart implementation of building related energy policies. Third, innovation policies and solutions should not only be based on the typical solutions of today.

The main challenge for the future is to take the right steps in the commitment to pursue energy neutral buildings. Citizens must have trust in energy performance certificates. Next to the focus on new build, the environmental impact of the existing building stock must be drastically reduced by 2050, which is obviously economically challenging. With respect to technology, it is clear that new building materials, RES and other innovative technologies are progressively making their way into the market in the last couple of years. The era of digital construction with building information modelling is also growing exponentially.

Mr. Wouters continued by delving into the new materials and systems currently being implemented in building construction. He stated that there are constant improvements which vary between small and radical or disruptive changes. Vacuum insulation and vacuum glazing, for example is on the verge of breakthrough. Heating, ventilation and air-conditioning (HVC) technologies are following similar trajectories, with heat pumps, geothermal systems etc. becoming increasingly important. He pointed to the important leap in the area of smart technologies where there is a lot of potential.

Mr. Wouters noted that all of these technologies have the potential to substantially reduce the energy demand of buildings. They also allow for better energy production and control (indoor climate and energy management). He further commented on the challenges Member States face in transposing the EPBD into national legislation. According to him robust frameworks should correctly take into account these innovative technologies in national calculation methods. If this is not the case, this might turn into a barrier for innovation, because people might not be inclined to adopt them.

Mr. Wouters continued by presenting the benefits and challenges of Construction 4.0 and the BIM method. He highlighted the use of drones at construction sites and in particular the use of building information modelling, where a given building is digitally modelled and all kinds of activities and functions like heating are controlled through that framework. He also focused on the increasing system complexity which is resulting from the policy to reach a carbon-neutral building stock. He noted that (the risk of) over-heating is becoming a critical issue which requires more attention and adequate assessment methods. One of the factors that makes BIM particularly interesting is the ability to go from a single house level to a wider area of collecting grouped building data for the assessment. This would allow for a substantial reduction in data collection efforts. If a building is using the BIM Model, all of the data is gathered and analysed at the same time in the same platform. This results in the simplification of the process which allows for a more detailed analysis and a robust framework

for compliance. The data collected using the BIM Model could also help to set up more robust standards for building renovations and construction.

Mr. Wouters finally focused on the long-term perspective for technologies in general, and RES in particular. He noted that, in order to provide solutions for the future we often use the technology of today, which is of course not a good method. He gave the example of better insulating the housing stock in Brussels as well as deploying more efficient heating systems. In his view, consumers have to be prepared for the long-term changes.

1.6. Lessons learned from different approaches across Europe in facilitating self-consumption of electricity

Cosme Segador Vegas / Director of the Extremadura Energy Agency

Mr. Vegas first highlighted that in the South-Western part of Spain, renewable energy sources provide 100% of the electrical energy needs; 78% is generated through PV and the rest by hydro power. Over the last 10 years the number of installed PV installations has increased by around 85%. Efficiency has improved considerably, and the management side is rather simple. A further massive deployment and usage of PV for self-consumption could offer a huge potential for reducing GHG emissions.

According to the latest analysis around 80% of European households could become self-producers of electricity. Regulation and rules for self-generation and connection to the grid have an important impact on the development of PV for self-consumption. Mr. Vegas pointed in this context to the uncertainty emanating from the legislative framework. The EU regulation in this domain is rather limited. In the context of Spain and its' autonomous regions, there is a specific legislative framework put in place at regional level, which determines the possibilities for supporting self-consumption of electricity. 97% of self-consumption registered in the south and middle parts of Spain has been supported by local initiatives.

Mr. Vegas further presented the three main options European countries have implemented to support PV for self-consumption. The first group of countries (including Spain, Ireland and Iceland) support self-consumption of electricity via net metering. The second group is improving the economic and financial business case for consumers through dedicated feed-in tariffs; these are implemented in countries such as Greece, Cyprus, Hungary, Slovenia, Germany, France, Czech Republic etc. The last group of countries implement a dedicated compensation or remuneration mechanism, like Italy for example. Mr. Vegas concluded this section by stating that national legislative frameworks have a large impact on national approaches and developments.

Mr. Vegas continued by presenting the business cases for PV installations for self-consumption in several countries. In the Italian example, the PV installation covers 75% of the overall electricity needs, and its pay-back time is 11 years thanks to savings on the electricity bill. In the Spanish case, the pay- back time is 12 years. In several member states cooperatives are set up to develop PV; consumers can jointly invest in PV solar panels and/or they can via the cooperative benefit of lower electricity prices for their consumption. Collective electricity self-generation and consumption offers an interesting potential but is not yet legally allowed in all MS.

The central role that self-consumption can play in contributing to the overall objective of reducing the greenhouse gas emissions was in particular highlighted by Mr. Vegas. In some Member States; e.g. in Spain, further legislative changes are necessary in order to facilitate the deployment of PV for local consumption. The importance of avoiding legislative changes at Member State level that could have a detrimental effect was also emphasised.

In conclusion, Mr. Vegas highlighted the importance of supporting PV for self-consumption in order to cost-effectively reach the RES target and empower consumers. In several Member States PV for local consumption has become economically feasible without subsidies, but further steps are needed to reduce administrative barriers for grid access of self-generators of electricity. A stable and enabling legislative framework in order to promote this type of approach is considered necessary. Smart metering was also recommended, and finally, Mr. Vegas suggested considering the possibility of facilitating financing of PV installations by specific EU guarantees.

2. QUESTIONS & ANSWERS

Mr. Henkel, Chair of the workshop, thanked the speakers and opened the floor for comments and questions.

Mr. Turmes pointed to the need to focus on the refurbishment of the existing building stock in the EU. The construction of new buildings that are highly energy efficient is relatively easy, however the challenge is modernising the existing building stock. Almost all of the actors in the building sector employ less than 10 people, which represents a major challenge in terms of skills. According to Mr. Turmes a genuine industrial revolution is needed in the building industry, and predesigned renovation should be introduced. He also raised the question on how the EP can contribute to implement the renovation passports together with the BIM model. Also, what could the EP do to speed up this process? Mr. Turmes continued by stressing that we are entering an age of cheap oil and gas, as a consequence of electrification (lower demand) and cheap shale oil and gas (higher supply), which could result in an oil price of $40-60 per barrel. With that price level there would be no business case for deep renovation. Member States should support renovation and could consider the possibility of linking the financial aspects of a building renovation not to the owner, but to the users.

Mr. Kelly referred to the public awareness aspect in the debate. The public and industry are aware of the need to decarbonise and the question of the carbon footprint is increasingly addressed by end-users. This increase in public awareness must be capitalised on. In the constituency of the MEP, most old houses have still an oil boiler; renovation is highly needed and new buildings should be equipped with HP, RES, etc. Most consumers are not yet aware of the potential of self-generation of electricity for local consumption. There are opportunities in this respect and the message is not getting out. How can we help to transfer this potential into reality?

Mr. Henkel addressed several questions to the speakers. His first question raised to Mr. Gielen was about RES targets: should we opt for an EU target only or are individual national targets also necessary? He then asked Ms. Egger whether the study she presented had taken into account the industrial growth in the examined countries. He also wanted to know whether a country that deindustrialises and moves towards a financial or service economy can better and quicker decarbonise its economy. His question towards Mr. Drinkwater was focused on the government owned building stock. The Chair was interested to know whether imposing strong renovation regulations on government owned buildings could be a valuable idea and how the energy performance of government buildings relates compared to private ones. From Mr. Wouters the Chair wanted to know whether there is a large difference between the actual insulation level of public versus private buildings. Finally, he asked Mr. Vegas whether the rules regarding self-consumption of electricity should preferably be decided by the Member States themselves or would a common framework at EU level be more appropriate.

Mr. Gielen stated that according to the research done by IRENA the determination of national RES targets for 2020 has in practice delivered significant progress and good results. He expressed his regret that this approach would not be continued for 2030, and emphasised that national targets would be favourable, in order to create certainty for investors. Mr. Gielen also stressed that the GHG emission reduction framework seems to become a (more) important instrument in this particular case. He concluded that energy efficiency and renewable energy policies support each other and that EU policies are a stabilising component for national strategies.

Ms. Egger stated that the initial goal of the policies implemented in her region, was to ban oil in new buildings. However, as the regulatory risk was too large, the authorities had to drop this objective. She added that decarbonisation is enabling industrial competitiveness and an encouragement from the EU to all Member States to ban oil in new buildings, would

represent a great improvement and would push the sector in the right way. In her opinion, EU targets act as a business plan and give stability to the market and this is precisely one of the main reasons why they are needed, alongside dedicated national and regional targets. Regarding PV installations for self-consumption, she noted that this technology empowers people to choose a more sustainable power source. Energy communities can play an important role to accelerate this development.

Mr. Drinkwater highlighted that investing in people and new skills is a key issue. Innovation should lead to ready-made packages for renovation which allow the supply chain to industrialise. In this context he pointed out that the *Supply Chain Sustainability School*, aimed at promoting and training sustainable supply chain management has gained traction in Australia, the United Kingdom and is now more and more popular on the continent. He also highlighted that financial risk is something that mortgage issuers and banks have to better understand and define in the context of energy efficiency renovation strategies. The building renovation passport can become a useful instrument in financing; in some countries mortgage systems are already based on this aspect. Concerning government-owned buildings, he noted that the public sector has a catalyst/exemplary role but not all government buildings can be renovated at once. The main priority and focus should be on the most economically beneficial building renovations which can bring the biggest added value to the market.

Mr. Wouters stressed that the building sector needs better skilled personnel, both for the design and the construction phase. Policies should strive to create a more efficient construction sector through collective renovation and building teams. In his opinion, *Construction 4.0* could contribute to further cost reductions and the implementation of new technology. He further added that BIM can have a positive impact on the construction of new buildings by allowing for data integration and management, and that there is a growing need to focus on reducing building inefficiencies, not only by technologies like heat pumps but also by focusing on better management of the indoor climate. With regard to the presumed difference in insulation level between private and public buildings, Mr. Wouters argued that insulation is only one characteristic, but that a more holistic approach is necessary which includes e.g. ventilation and risk for overheating.

Mr. Vegas confirmed that, in order to optimally stimulate self-consumption of electricity, more harmonised rules at EU level are indeed appropriate, but the implementation should be take into account the local potential. Improving the quality of buildings and installations is key; in this context he referred to a specific concept which would allow guarantees of 20 or 30 years to be offered. Funding of RES for buildings could be facilitated by low interest loans. This development could also be stimulated by providing information to architects and building companies.

A second round of questions and comments was then launched.

Ms. Ernst referred to the ongoing discussions regarding target setting and to the interaction between renewable energy and energy efficiency. She asked the speakers to comment on the biggest challenges for Member States and wondered whether the EU should set directly binding targets. She also raised a question regarding the possible interaction between energy efficiency and energy poverty and wondered what principle should be applied in poorer countries in order to avoid a situation of RES mainly becoming a solution for richer countries.

A second intervention by Mr. Turmes focused on the skills in the building sector; he wondered in particular whether EU or national programs could trigger better economic activities at local level and improve the skillset of workers. Mr. Turmes also referred to the negative impact of the housing owners' lobby, which is strongly opposed to energy efficiency and RES targets

due to their impact on housing rents. This attitude was compared to the lobby against electromobility and the question was raised on how to counter this opposition.

Ms. Egger pointed to the fact that some Member States deliberately block some parts of EU legislation. She also noted that the most important factor for adopting energy efficiency and RES strategies is climate change, but local authorities and communities are increasingly becoming aware of their beneficial economic impacts at local or regional level, for instance on the value of the properties. In Austria the change of government has resulted in more focus on the industry because the new coalition is prioritising that sector. She also highlighted that in her region the construction industry has a rather local character. The implementation of technology is on one hand pulled by consumers (e.g. they request PV and more energy efficient materials and construction techniques) and on the other hand pushed by regulation.

Mr. Wouters confirmed that the building sector does indeed have a local character, but the role of the EU level is still very important, particularly to accelerate the implementation of high energy efficiency solutions in new and existing buildings.

Mr. Gielen stated that the cost of RES has fallen dramatically but not everyone is yet fully aware of it. He also pointed to a lack of awareness about the macroeconomic impacts; it is clear that the development of RES creates jobs and is positive for the trade balance. He expressed the opinion that it would be beneficial to have a high CO_2 price at EU level. He concluded that comfort is also an important argument to trigger building renovation and referred to the Netherlands which has launched an ambitious renovation program.

The Chair of the workshop, Mr. Henkel thanked the speakers and concluded that the workshop has provided useful input for the further activities of ITRE.

ANNEX 1 AGENDA

Workshop on

NATIONAL STRATEGIES FOR RENEWABLES: ENERGY EFFICIENCY, BUILDING RENOVATION AND SELF-CONSUMPTION

European Parliament Committee on Industry, Research and Energy (ITRE)
Thursday, February 22, 2018
09:00 - 10:30am
European Parliament, JAN4Q2, Brussels.

Programme

Introduction by Hans-Olaf HENKEL, ITRE Vice-Chair

Best practices in Member States to reach the renewable energy and energy efficiency targets
Dolf Gielen, Director Innovation and Technology, International Renewable Energy Agency IRENA

Benchmarking Member States' national energy efficiency strategies
Christiane Egger, Deputy Manager of the O.Ö. Energiesparverband and Manager of the Ökoenergie Cluster

How national and regional strategies can be an efficient tool for the modernisation of the existing EU building stock
James Drinkwater, Director of the World Green Building Council's Europe Regional Network

The contribution of research and innovation in the construction sector to energy efficiency and integration of renewable energy in buildings
Peter Wouters, Director at the Belgian Building Research Institute and Manager of the International Network for Information on Ventilation and Energy Performance

Lessons learned from different approaches across Europe in facilitating self-consumption of electricity
Cosme Segador Vegas, Director of the Extremadura Energy Agency

Question and Answer Session

Concluding remarks by Hans-Olaf HENKEL, ITRE Vice-Chair

ANNEX 2 SHORT BIOGRAPHIES OF THE SPEAKERS

Dolf GIELEN (Director Innovation and Technology, International Renewable Energy Agency IRENA)

As director of the IRENA Innovation and Technology Centre in Bonn since 2011, Mr. Gielen oversees the agency's work on advising member countries in technology status and roadmaps, energy planning, costs and markets and innovation policy frameworks.

Before joining IRENA, Mr. Gielen was Chief of the Energy Efficiency and Policy Unit at the United Nations Industrial Development Organisation (UNIDO). Previously, he was a Senior Energy Technology Policy Analyst at the International Energy Agency, and from 2000 to 2002, he was on a Fellowship with NIES Tsukuba Japan.

Christiane EGGER (Deputy Manager of the O.Ö. Energiesparverband and Manager of the Ökoenergie Cluster)

Ms. Egger is Deputy Manager of the OÖ Energiesparverband, the energy agency of Upper Austria, and Manager of the Cleantech-Cluster Energy, a business network of 140 companies active in renewable energy and energy efficiency. Ms Egger is also Vice-President of FEDARENE, the European network of regional energy and environment agencies, as well as conference director of the World Sustainable Energy Days, one of the largest annual conferences in Europe on energy efficiency and renewable energy sources.

Ms. Egger is an expert in energy efficiency in buildings, in renewable heating as well as market and policy development in the field of sustainable energy production and use. She has developed and implemented a large number of scientific and dissemination European projects.

Ms. Egger holds a law degree and a post-graduate degree in environmental engineering.

James DRINKWATER (Director of the World Green Building Council's Europe Regional Network)

Mr. Drinkwater is advising on and coordinating global and European political processes in the sustainable buildings arena, recently including UNEP's 10 Year Framework Programme on Sustainable Consumption and Production, UNFCCC Technical Experts Meetings and the European Commission's 'Resource Efficient Buildings' project. He co-leads the Europe Regional Network's flagship Horizon 2020 project 'BUILD UPON'; a multi-stakeholder dialogue involving 2,000 key stakeholders across 13 European countries to design and implement ambitious national renovation strategies. He also coordinates the energy efficiency workstream within the Horizon 2020 'EeMAP' project; which aims to establish a pan-EU 'energy efficiency mortgage' product.

Mr. Drinkwater has a Master's from the University of Cambridge, and a background in corporate and finance law. Previously an associate with the Environment and Climate Change practice of global law firm Linklaters LLP, he specialised in advising global corporations on UK and EU sustainable real estate law and policy, renewable energy projects and chemicals regulation. He also previously worked for the Royal Institute of British Architects, focusing on sustainable building policy and EU public procurement policy.

Peter WOUTERS (Director at the Belgian Building Research Institute and Manager of the International Network for Information on Ventilation and Energy Performance)

Mr. Wouters holds a Civil Engineering degree in Architecture (University of Leuven) and a PhD in Engineering (Université de Louvain-La-Neuve).

He is Director of development and valorisation at the Belgian Building Research Institute and Manager of INIVE EEIG, International Network for Information on Ventilation and Energy Performance.

Mr. Wouters currently holds several coordinating or advising positions at EU and international level, amongst others Belgian representative in IEA Executive Committee 'Energy in Buildings', Operating Agent of Air Infiltration and Ventilation Centre, the IEA's information centre on ventilation, Coordinator European airtightness platform TightVent Europe, Coordinator European venticool platform, Director Belgian Union for Technical Approval in Construction, Director technical approval at Belgian Construction Certification Association, Chairman of net society "Building physics, building technology and architecture", Chairman of NBN Belgian standardisation Committee on Ventilation.

Mr. Wouters has been active as coordinator of EPBD Buildings Platforms (BUILD UP) and involved in the international and external communication EPBD for Concerted Action. He also coordinated several European research projects, such as PASLINK, COMPASS, PV-HYBRID-PAS, ENPER, ASIEPI and QUALICHECK.

Cosme SEGADOR VEGAS (Director of the Extremadura Energy Agency)

Mr. Vegas holds a MSc degree in Industrial Engineering and a MSs degree in Renewable Energy Sources. He also holds a PhD in Industrial Engineering, specialised in the field of energy. He is a Professor at the University of Extremadura, in the Department of Thermal Motors and Engines of the Industrial Engineering School. He is also Extremadura President of the Spanish Professional Association of Heating and Cooling, ATECYR.

Mr. Vegas has 15-years of experience in the private energy sector, both in companies and as an independent Engineer, especially in the field of renewable energies, where he ensures the design and on-field coordination of PV, solar thermal and biomass projects. He also has a large knowledge of the HVAC and electrical sector, where he has developed projects in heating, cooling and electricity. In 2012 he received the Spanish National Award of Eneragen granted for a project of a bioclimatic pool 100% heated by integration of biomass heaters, solar thermal panels and PV for self-consumption.

As researcher and university Professor, he is coordinating studies in the field of renewable energy integration in public buildings, energy management impact in municipalities and smart rural mobility. He also teaches courses in several Spanish universities, such as Extremadura, Huelva, Madrid, Zaragoza y Barcelona. Since 2010, he has worked for the Extremadura Energy Agency, where he is currently Director, leading more than 45 technicians active in energy efficiency, renewable energy and strategic energy planning.

ANNEX 3 PRESENTATIONS

Presentation by Dolf GIELEN

IRENA
International Renewable Energy Agency

Best practices in Member States to reach the renewable energy and energy efficiency targets

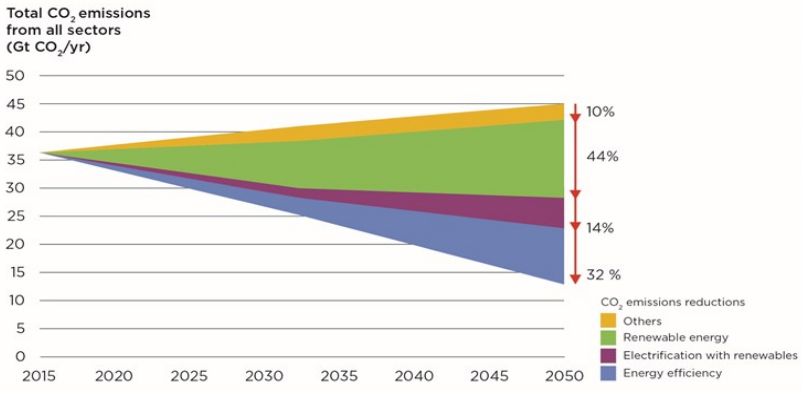
Dolf Gielen
Director, Innovation and Technology
ITRE workshop Brussels 22 February

REmap
A Renewable Energy Roadmap

IRENA
International Renewable Energy Agency

#REmap

RE & EE Synergies – the cornerstones of energy transition



Source: IRENA, 2017

- Renewables would account for half of total emission reductions in 2050, with another 45% coming from increased energy efficiency and electrification with renewables.

2

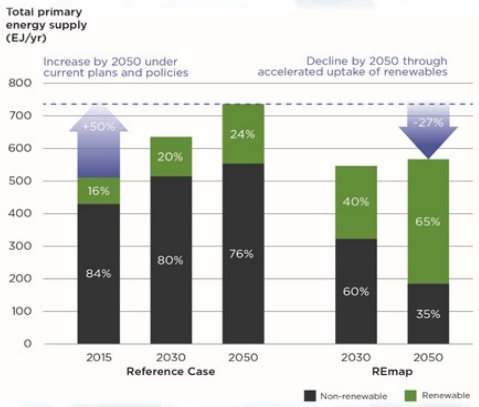
REmap
A Renewable Energy Roadmap

IRENA
International Renewable Energy Agency

#REmap

RE & EE – A need for global action

- Renewable energy would make up two-thirds of the energy mix by 2050 in REmap case, up from just one-quarter in Reference Case
- This requires an increase in the renewables' share of 1.4% per year, a seven-fold acceleration
- TPES would decrease from over 700 EJ to around today's level the result of both energy efficiency and RE power/electrification
- GDP nearly triples and energy use is flat – intensity improvement 2.6%/yr – a doubling



Source: IRENA, 2017

3

REmap
A Renewable Energy Roadmap

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International Renewable Energy Agency

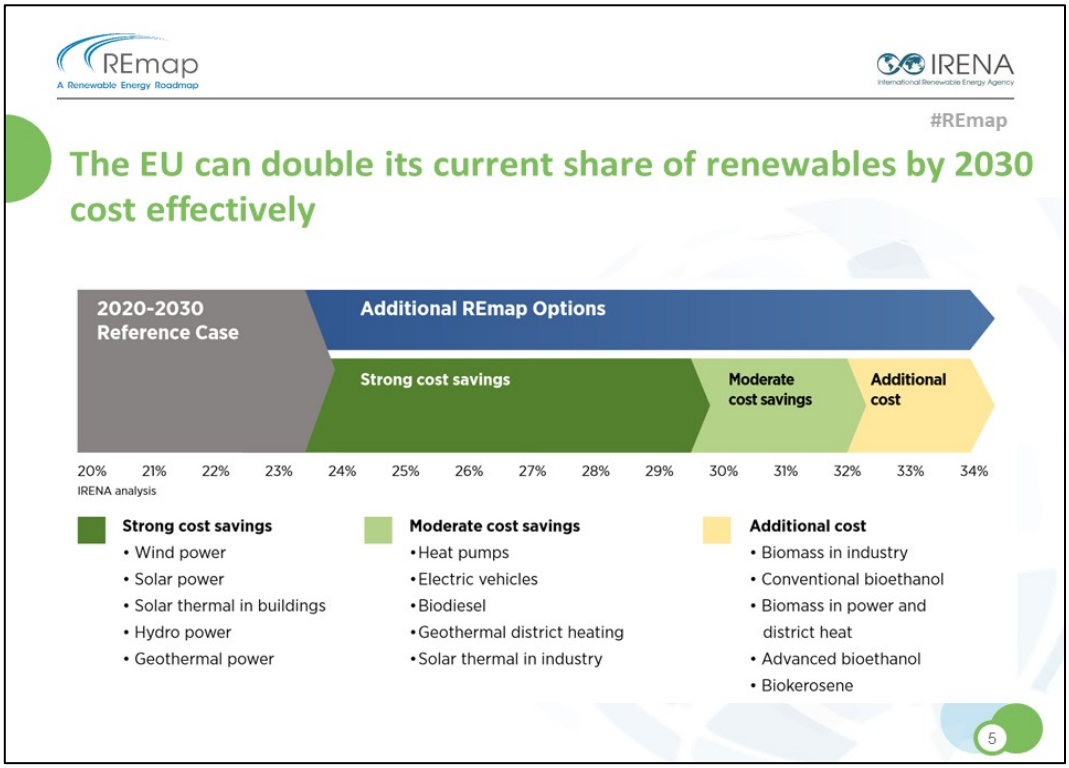
#REmap

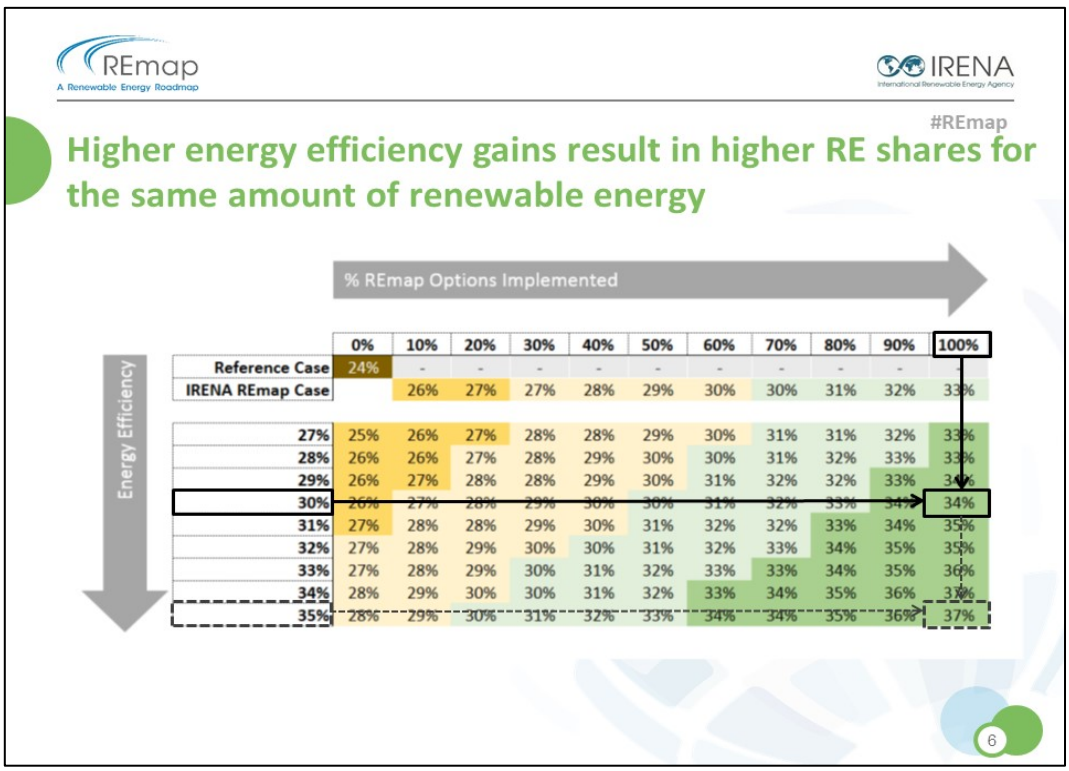
Renewable Energy Prospects for the European Union

February 2018

- Aim:
  - Identify options to meet and potentially exceed the proposed 27% renewables target for 2030
  - Assess the aggregated impact of national renewable energy plans
  - Assess the role of renewables in long-term decarbonisation
- Insights
  - Doubling the RE share is feasible between now and 2030 to 34% RE share
  - This is cost neutral
  - RE technology improvements in recent years are the driver for greater potential
  - Accelerating renewable deployment will be key for Europe to be in line with Paris Agreement
  - Substantial economic and social benefits

4


REmap
A Renewable Energy Roadmap
IRENA
#REmap
The EU can double its current share of renewables by 2030 cost effectively
2020-2030 Reference Case
Additional REmap Options
Strong cost savings
Moderate cost savings
Additional cost
20% 21% 22% 23% 24% 25% 26% 27% 28% 29% 30% 31% 32% 33% 34%
IRENA analysis
Strong cost savings
• Wind power
• Solar power
• Solar thermal in buildings
• Hydro power
• Geothermal power
Moderate cost savings
• Heat pumps
• Electric vehicles
• Biodiesel
• Geothermal district heating
• Solar thermal in industry
Additional cost
• Biomass in industry
• Conventional bioethanol
• Biomass in power and district heat
• Advanced bioethanol
• Biokerosene
5


REmap
A Renewable Energy Roadmap
IRENA
#REmap
Higher energy efficiency gains result in higher RE shares for the same amount of renewable energy
% REmap Options Implemented
Energy Efficiency
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Reference Case 24%
IRENA REmap Case 26% 27% 27% 28% 29% 30% 30% 31% 32% 33%
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6

REmap
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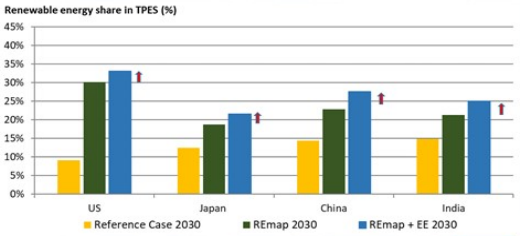
Energy Efficiency gains result in higher RE shares

#REmap

Example Germany

	Base year 2010	Reference Case 2030	EE 2030	REmap 2030	REmap +EE 2030	TECH 2030
Renewable energy share (% of TFEC)	10.4	25.9	27.7	35.6	38.4	43.7
Annual rate of energy intensity improvement 2010–30 (%/yr)	1.8 (1990–10)[a]	2.6	3.0	2.8	3.2	3.4

- Germany:
  - RE results in increase in annual EI improvement from 2.8% to 3.2%
  - EE results in increase in RE share from around 35.6% to 38.4%
- Similar effects seen in China, India, Japan and USA with on average a 10-15% increase in RE share resulting from increased EE



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REmap
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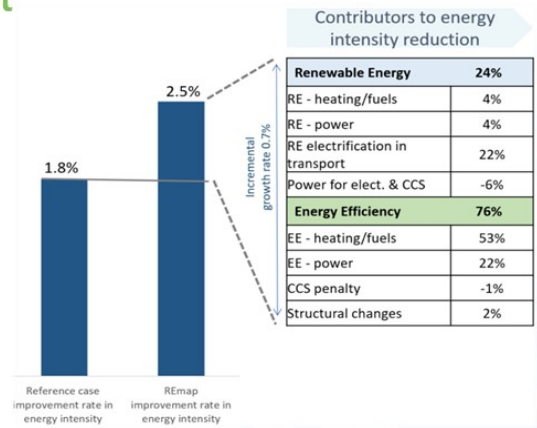
Renewable Energy contributes to Energy Efficiency improvement

#REmap



Renewable Energy	24%
RE - heating/fuels	4%
RE - power	4%
RE electrification in transport	22%
Power for elect. & CCS	-6%
Energy Efficiency	**76%**
EE - heating/fuels	53%
EE - power	22%
CCS penalty	-1%
Structural changes	2%

- Energy intensity improvements need to increase to 2.5% per year by 2030 and continue around this level until 2050.
- One-quarter of EI improvement is the result of RE technologies

8

REmap
A Renewable Energy Roadmap

IRENA
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#REmap

Practical examples of EE and RE synergies

- Solar, wind, hydropower, marine – efficiency gain factor 1.5-3 compared to conventional fossil and nuclear power generation
- Sector coupling offers efficiency opportunities
  - Electromobility and renewable power – efficiency gain factor 2-3 compared to gasoline/diesel ICE
  - Heat pumps and renewable power – efficiency gain factor 2-4 compared to condensing gas boiler
- Not all renewables result in efficiency gains, statistical definitions play an important role and don't make a difference in real life

9

REmap
A Renewable Energy Roadmap

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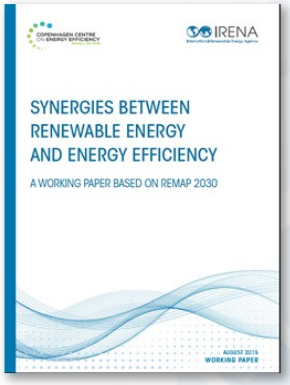
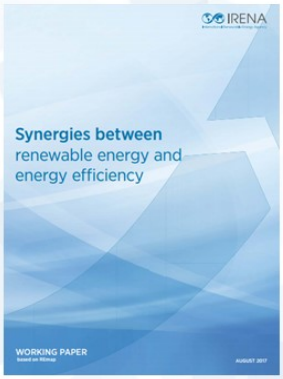
#REmap

THANK YOU

www.irena.org





10

Presentation by Christiane EGGER

Benchmarking Member States' energy efficiency strategies

Christiane Egger

OÖ Energiesparverband
Regional Energy Agency of Upper Austria

christiane.egger@esv.or.at, www.esv-en.at

www.energy-efficiency-watch.org

LAND OBERÖSTERREICH

ENERGY EFFICIENCY WATCH

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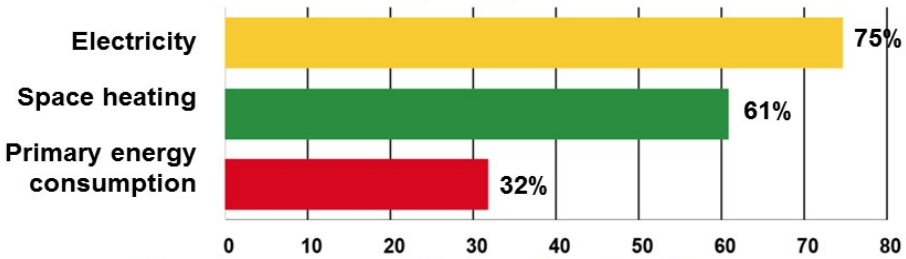
OÖENERGIESPARVERBAND

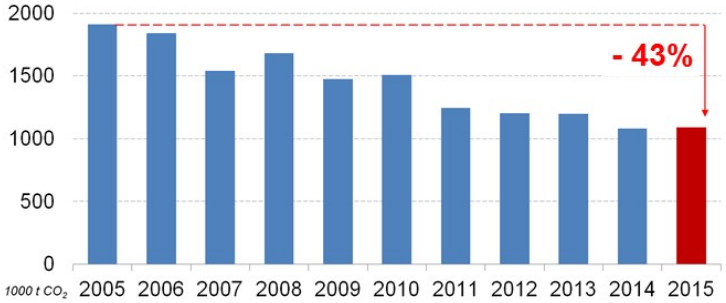
Clean energy transition in Upper Austria

energy efficiency & renewables as a "winning team"

Renewable energy in Upper Austria



Greenhouse gas emissions from buildings



The Energy Efficiency Watch Project

Progress of energy efficiency policies the EU Member States

- **Expert Survey**:
  More than 1100 energy experts from all 28 MS consulted
  → how they see the actual, "real-life" progress in energy efficiency policies in their respective country
  → similar survey carried out in 2012
- **28 Country Reports**
- **10 Case Studies**
- **Business Stakeholder Consultation**
- **Extensive communication and networking**

ENERGY EFFICIENCY WATCH

Key issue: how can we speed up energy efficiency in Europe?

ENERGY EFFICIENCY WATCH

Co-funded by the Intelligent Energy Europe Programme of the European Union

Progress indicators 2015 and 2012
"Real life progress by country experts"

Austria	5	13	↗	Italy	13	27	↑
Belgium	13	18	↗	Latvia	15	12	
Bulgaria	23	16	↘	Lithuania	9	18	↗
Croatia	10			Lux	10	3	↘
Cyprus	5	22	↑	Malta	25	3	↓
Czech Rep.	15	25	↑	NL	19	24	↗
Denmark	**1**	**2**		Poland	22	21	
Estonia	**3**	**3**		Portugal	21	6	↓
Finland	**2**	**1**		Romania	20	23	
France	12	10		Slovak Rep.	15	26	↑
Germany	5	6		Slovenia	5	7	
Greece	24	16	↘	Spain	28	15	↓
Hungary	26	20	↘	Sweden	4	9	↗
Ireland	15	11	↘	UK	27	13	↓

ENERGY EFFICIENCY WATCH

Co-funded by the Intelligent Energy Europe Programme of the European Union

Against "ups and downs": a "positive narrative" for energy efficiency

- Energy efficiency policies work over a longer period and despite political changes, because a consensus has been reached on **why it is a reasonable thing to do**
- They have found convincing answers to the question: ***"Why should we want energy efficiency?" (positive narrative)*** And not: "***We must because Brussels tells us so"***
- Narratives differ significantly between Member States/regions/cities: energy indepence and security, innovation, social and health benefits, industrial competitiveness, climate change etc.
- A good narrative is based on strong numbers!
- And: political decision makers can support the development and spreading of narratives!

ENERGY EFFICIENCY WATCH

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OEENERGIESPARVERBAND

Policy instruments: what works and what does not?

How effective are the following policy instruments in your country? No. of countries

	Over 70 % see them as **effective**	Over 30 % see them as **not effective**
EE requirements for new buildings	26	1
Energy labelling of products	26	0
EE requirements for renovated buildings	22	1
Energy certification of buildings	15	6
Programmes for local energy planning	12	10
Financial incentives for private households	11	9
Financial incentives for SMEs	6	11
Energy audits for companies	6	12
Targeted advice for households	6	13
Inspection heating/air-conditioning	3	16
Smart metering	2	17

ENERGY EFFICIENCY WATCH

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OEENERGIESPARVERBAND

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Smart metering	2	17

strong, EU regulatory, longer-term policies

ENERGY EFFICIENCY WATCH

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OEENERGIESPARVERBAND

Making energy efficiency your business

- Without the right framework, it is hard to make **energy efficiency the main business** of a company (rather than an additional "sales argument" for a product or service)
- This resulted in markets where energy efficiency potentials were **not systematically addressed** by specialised **energy efficiency companies**
- Examples show that the right policy framework resulted in innovative business models with many new market entrants, many of them SMEs. **Their main business is energy efficiency.**
- By identifying economic potentials, they create business for companies with efficient products and solutions

ENERGY EFFICIENCY WATCH

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Carrots, sticks and tambourines

Policy packages
Example: Sustainable Energy Action Plan Upper Austria

"sticks"	"carrots"	"tambourines"
Regulatory measures	**Financial measures**	**Information & training**
• Emission & efficiency standards • Fuel requirements • Renewable heating obligations • Minimum requirements heating & cooling	• Investment grant programs • Renewable heating as a program requirement • Contracting program • Regional R & D program, pilot projects	• Energy advice • Training programs • Publications, campaigns & competitions • Local energy action plans • CTC - clean energy business network

stimulate demand

Policy Packages

support supply

EU energy efficiency policies - what the experts want

- ambitious **targets** and **strong** EU energy efficiency and renewable energy **policy and regulation**
- **policy packages** that combine regulatory, financial and information/training measures to speed up market developments
- more important than the type of the policy is its **reliability** (long term, transparent, at reasonable transaction cost)
- market frameworks that allow SMEs to make energy efficiency their **main business**
- good European, national, regional and local **narratives** for energy efficiency bring stability to sustainable energy policies - less dependent on political fluctuation and an inherent part of energy and industry policies

Yes, we can make Europe the global leader in sustainable energy efficiency markets and technologies"!

ENERGY EFFICIENCY WATCH

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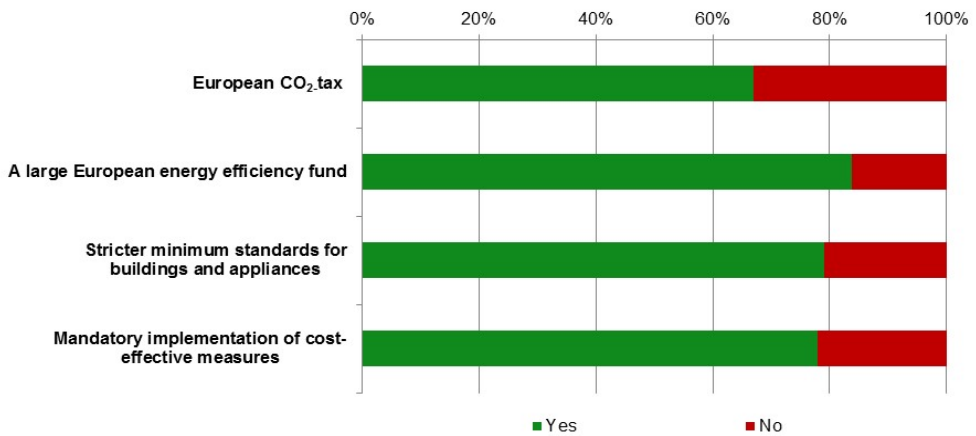
OEENERGIESPARVERBAND

EU 28: measures which should be introduced on EU level



ENERGY EFFICIENCY WATCH

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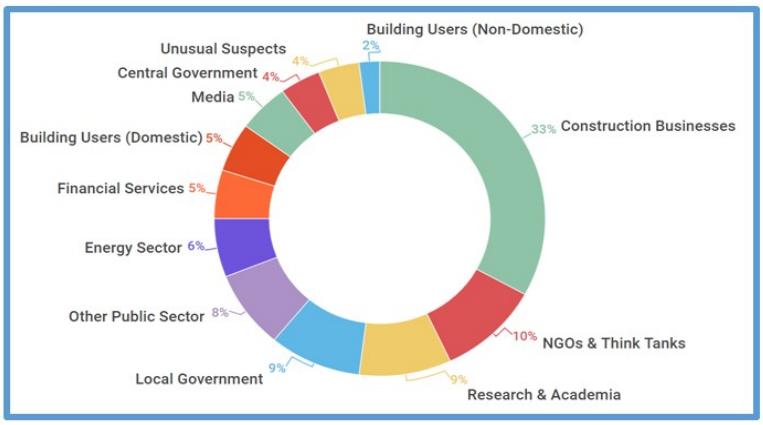
OEENERGIESPARVERBAND

Presentation by James DRINKWATER

"Consultation" to "Community Building"



Breakdown of 2,000+ orgs participating in WorldGBC's Build Upon Project

1. Intersector stakeholder platforms are needed

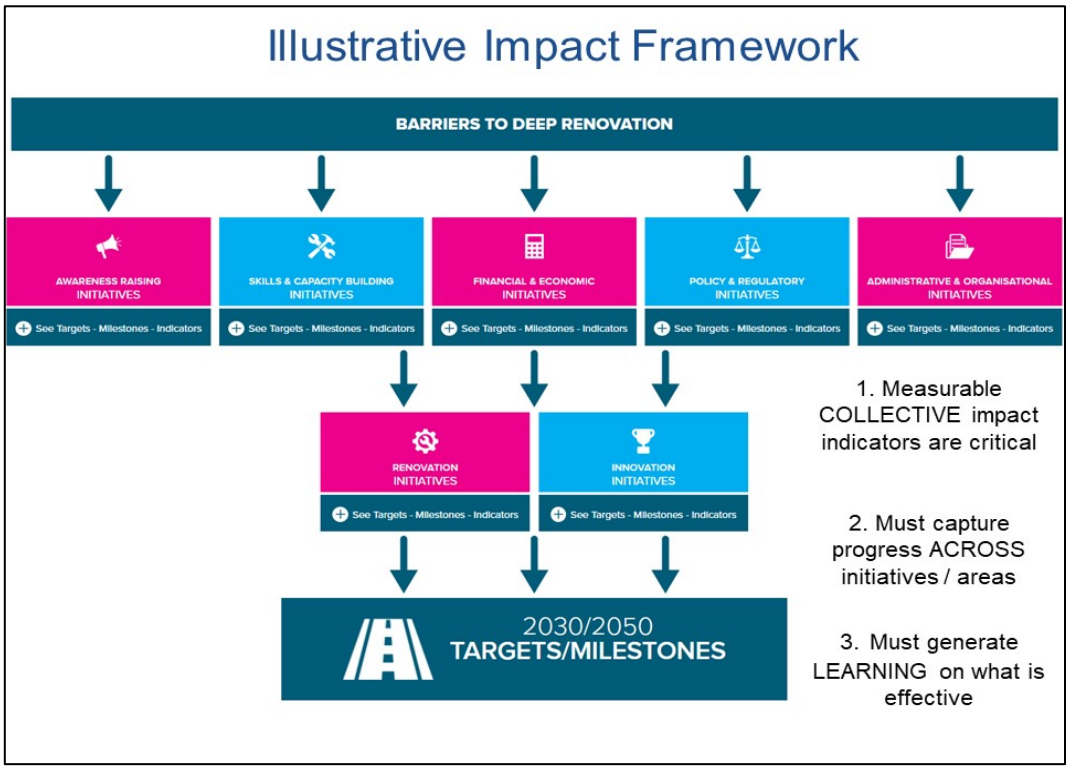
2. Process and quality of community building impacts solutions

3. Local – Regional – National – EU level governance structure

"Overviews" to "Impact Frameworks" –

renowiki

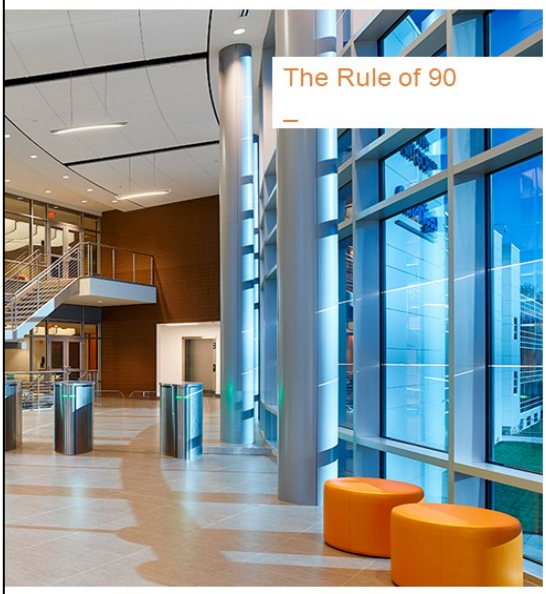
- **Would you employ 100 staff that didn't report or coordinate with one another?**
- 50-100 major initiatives tackling market barriers per country
- Less that 5% reporting progress / impact
- No strategy to coordinate and scale all this resource

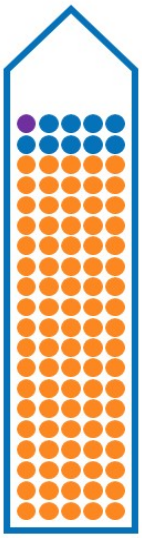

Illustrative Impact Framework
BARRIERS TO DEEP RENOVATION
AWARENESS RAISING INITIATIVES
SKILLS & CAPACITY BUILDING INITIATIVES
FINANCIAL & ECONOMIC INITIATIVES
POLICY & REGULATORY INITIATIVES
ADMINISTRATIVE & ORGANISATIONAL INITIATIVES
See Targets - Milestones - Indicators
RENOVATION INITIATIVES
INNOVATION INITIATIVES
2030/2050 TARGETS/MILESTONES
1. Measurable COLLECTIVE impact indicators are critical
2. Must capture progress ACROSS initiatives / areas
3. Must generate LEARNING on what is effective


Energy Efficiency Mortgages
Preparing pan-EU framework for EEMs. Public consultation until 12 March
Building Renovation Passports will be crucial to market development
Use of public funds to remove barriers to leverage private investment
www.energyefficientmortgages.eu/
EeMAP
Energy efficient Mortgages Action Plan
CREATING AN ENERGY EFFICIENT MORTGAGE FOR EUROPE
A Review of Building Performance Indicators that Impact Mortgage Credit Risk
EUROPE REGIONAL NETWORK

Creating Better Places for People

BETTER PLACES FOR PEOPLE
PUT WELLBEING AT THE HEART OF YOUR BUILDING





1% Energy Costs

9% Rental Costs

90% Staff costs in salaries and benefits

Creating Better Places for People

BETTER PLACES FOR PEOPLE

IMPACT FLOWS THIS WAY

ENVIRONMENTAL	EXPERIENTIAL	ECONOMIC
1. Lighting 2. Indoor air quality 3. Thermal comfort 4. Acoustics 5. Interior layout 6. Look & feel 7. Active/Inclusive design 8. Integration of nature 9. Amenities	Perception of the working environment, as measured by a staff survey	1. Absenteeism 2. Staff turnover/retention 3. Revenue breakdown 4. Medical costs 5. Medical complaints 6. Physical complaints
Refers to the ***physical*** characteristics of the office setting believed to have an impact on employees.	Refers to occupant ***perception*** of their space, which is as important as objective measures of the space itself.	This category covers the organisational outcomes, that may be influenced by environment and experience. Typically these have a ***financial*** implication.

Macro-level health and wellbeing impact analysis is important, but practical project level tools are key to creating better places for people.

www.worldgbc.org jdrinkwater@worldgbc.org

www.buildupon.eu/renovationrevolution

WORLD GREEN BUILDING COUNCIL

Presentation by Peter WOUTERS

The contribution of research and innovation in the construction sector to energy efficiency and integration of renewable energy in buildings

Peter Wouters

Manager INIVE EEIG &
Director Development and Valorisation at the Belgian Building Research Institute

INIVE

bbri.be
Researches • Develops • Informs

Conclusions (for discussions)

1. Policy makers and the related implementation process should pay specific attention to facilitating a correct assessment of innovative building and control technologies in regulatory EPBD related approaches

2. Construction 4.0 (with BIM) can substantially contribute to smarter implementation of building related energy policies but it requires preparation

3. Renovation policies and solutions should not only think with the typical solutions of today and may require specific actions

Overall context

Energy policy

- NZEB requirements (and beyond) are **challenging**
- **Reliability** of EPC and compliance is important
- Environmental impact of the existing building stock must drastically reduce by 2050, which is economic challenging

Technology context

- Interesting developments in building products and systems and in control
- Construction 4.0 and BIM
- Renewables will cover by 2050 a major part of energy production

1. Development of new materials and systems

- **Building envelope**: insulation, windows, solar control, airtightness, ...
  - Sometimes small improvements, sometimes disruptive changes
  - Examples: vacuum insulation, vacuum glazing, ...
- **HVAC technologies**
  - Heating and cooling: heat pumps, geothermal systems, ...
  - Ventilation: demand controlled systems
- **Smart technologies**
  - Indoor climate control, optimal system use
  - Good indoor climate (avoidance overheating, good IAQ), ...

Important developments

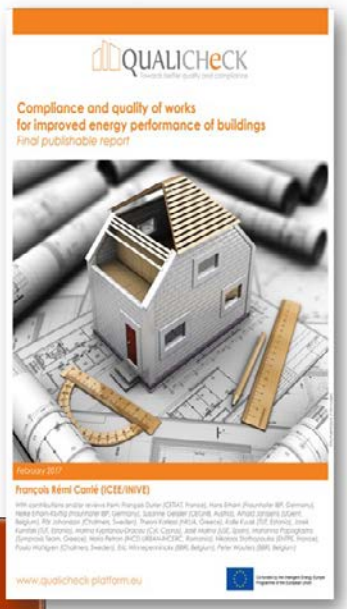
1. Development of new materials and systems

- Possibilities for substantial reduction in energy **demand**
  - Less need for energy supply to the building (heating, cooling, lighting, domestic hot water)
- Possibilities for substantial increase in efficiency of energy **production**
  - Lower environmental impact of energy production
- Possibilities for substantial improvements in **control** (indoor climate and power management)
  - Better living conditions
  - Better match between demand and supply

Practical impact

1. Development of new materials and systems

- EPBD related assessment frameworks must allow to correctly integrate these new systems and innovations
- The QUALICHeCK project indicates that this is in many countries not really the case
- If not, EPBD legislation can be a major barrier for innovation



Considerations regarding energy policy

CONSTRUCTION 4.0

2. Construction 4.0 – BIM

- **Use of present EPB methods towards NZEB: various concerns**
  - Move towards NZEB and beyond means often an increased complexity
  - EPBD methodology is sometimes a barrier for innovation
  - It is challenging to correctly assess issues as e.g. overheating
  - Often limited compliance checks and/or enforcement
  - Each country has its own methodology (quite similar but not the same)
  - It is challenging to have a smart assessment of 'smart'
  - Growing need for a more global assessment (from building to communities)

Important developments

2. Construction 4.0 – potential of BIM

Smart implementation of BIM …

- Very substantial reduction in required efforts for data collection
- Possible to simplify and at the same time to have a more refined analysis
- Potential of much more robust framework for compliance
- More suitable for dealing with innovation
- More chances for a really European EPBD method
- EPBD assessment can become part of design process
- Potential contribution to a better quality of the works
- Same approach possible for e.g. environmental assessment

Potential impact of BIM

2. Construction 4.0 – BIM

- **Regulatory environment:**
  - (National) authorities should consider/evaluate the possibilities for stimulating/allowing BIM for EPBD assessment
- **Standardisation:**
  - BIM use for EPBD assessment might allow more refined assessment methods AND require more and/or different CEN standards

Considerations regarding energy policy

We often optimise by using present technologies for providing answers in 2050...

Very well insulated and airtight building envelope

Condensing boiler

3. Renovation policies and solutions should not only think with the typical solutions of today

- Today:
  - Condensing boiler can be a good choice
- In …20… years
  - Probably necessary to replace the boiler - Probably less evident to use then gas or fuel
  - Possible alternatives:
    - Heat pumps - District heating and cooling - …
  - Important that possibilities for such switch are optimally prepared
- In terms of EPC:

Condensing boiler

	Building with condensing boiler	Building with heat pump
Today	100	100

In case of existing buildings

Very well insulated and airtight building envelope?

- **Non-insulated cavity wall**
  - Filling existing cavity with insulation is easy, not so expensive (…20 €/m²) and reasonable pay-back time, substantial comfort improvements
  - Modest investment – easy to implement
  - If one wants a high performance wall:
    - External (or internal) insulation
    - Expensive, pay-back time not evident
    - External insulation may substantially upgrade building look
  - Each € can only be invested one time…
- **Non-insulated floor on ground**
  - Very substantial and expensive works to insulate
  - Is it a must to insulate or can it be a valid alternative to focus in such case on improved energy production?

Conclusions (for discussions)

1. Policy makers and the related implementation process should pay specific attention to facilitating a correct assessment of innovative building and control technologies in regulatory EPBD related approaches

2. Construction 4.0 (with BIM) can substantially contribute to smarter implementation of building related energy policies but it requires preparation

3. Renovation policies and solutions should not only think with the typical solutions of today and may require specific actions

Presentation by Cosme SEGADOR VEGAS

Workshop "National strategies for renewables: energy efficiency, building renovation and self-consumption"

European Parliament Committee on Industry, Research and Energy (ITRE)

ENERSELVES
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European Union
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agencia extremeña de la energía

Lessons learned from different approaches across Europe in facilitating self-consumption of electricity

Dr. Eng. Cosme Segador Vegas, Director
AGENEX - Extremadura Energy Agency
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Brussels, February 22nd 2018

Workshop "National strategies for renewables: energy efficiency, building renovation and self-consumption"

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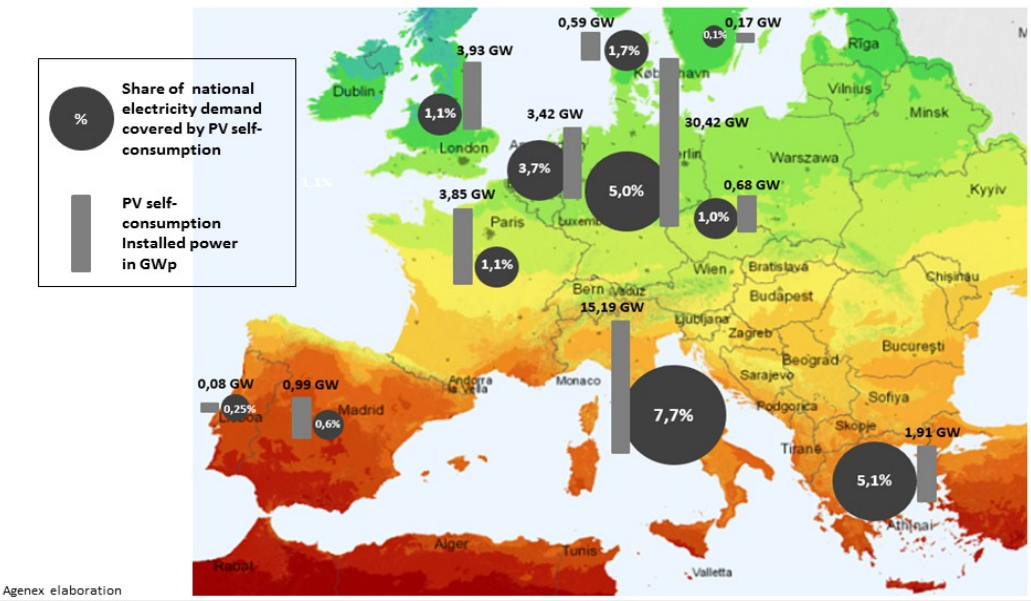
EUROPEAN SITUATION OF PV FOR SELF-CONSUMPTION



Agenex elaboration

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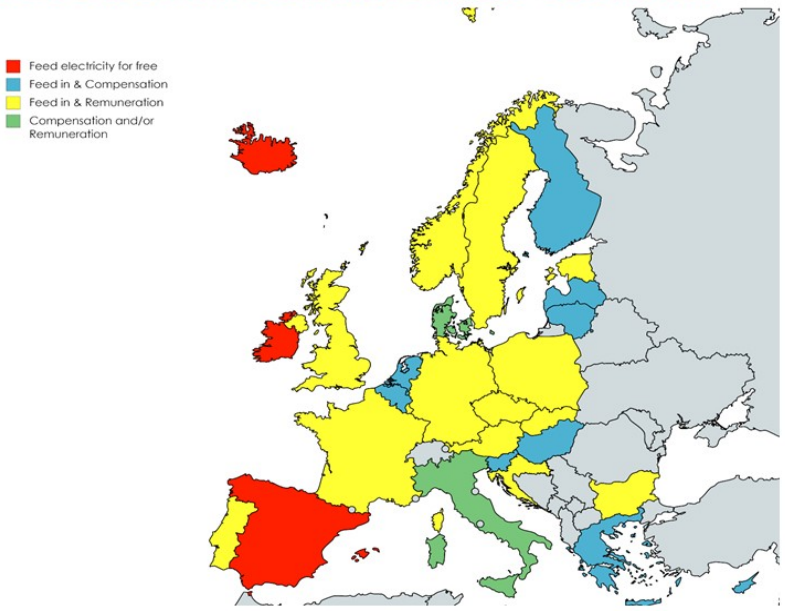
EUROPEAN SUPPORT MECHANISMS FOR PV SELF-CONSUMPTION



AGENEX elaboration

Source: Study on "Residencial Prosumers in the European Energy Union" JUST/2015/CONS/FW/C006/0127; European Commission

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ITALIAN LESSONS LEARNED

Legislative security	● ● ●
Administrative/grid burocracy	● ●
Economic support/penalties	●

MALTESE LESSONS LEARNED

Legislative security	● ●
Administrative/grid burocracy	● ●
Economic support/penalties	● ●

Case: residential building Sardinia Region

- PV power: 33 kW
- PV energy coverage: 75%
- Earnings: 8.523 €/year → Savings: 0,20 €/kWh; Surplus: 0,14 €/kWh; FIT: 0 €/kWh
- Simple Payback: 11 years

Case: Eco Gozo Ministry

- PV power: 108 kWp
- PV energy coverage: 45%
- Earnings: 20.000 €/year → Savings: 0,12 €/kWh; Surplus: 0 €/kWh; Grant: up to 50%
- Simple Payback: 13 years

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SWEDISH LESSONS LEARNED

Legislative security	●
Administrative/grid burocracy	● ●
Economic support/penalties	● ●

SPANISH LESSONS LEARNED

Legislative security	● ● ●
Administrative/grid burocracy	● ● ●
Economic support/penalties	● ●

Case: condominium association Blekinge

- PV power: 109 kWp
- PV energy coverage: 33%
- Earnings: 8.000 €/year → Savings: 0,12€/kWh; Surplus: 0,0605 €/kWh; Grant: 30%
- Simple Payback: 14 years

Case: residential building Extremadura

- PV power: 1,6 kWp
- PV energy coverage: 34%
- Earnings: 308 €/year → Savings: 0,14 €/kWh; Surplus: 0 €/kWh; Grant: None
- Simple Payback: 11 years

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GERMAN LESSONS LEARNED

Legislative security	● ● ●
Administrative/grid burocracy	● ●
Economic support/penalties	● ●

FRENCH LESSONS LEARNED

Legislative security	● ●
Administrative/grid burocracy	● ●
Economic support/penalties	● ●

Case: Heidelberger cooperative – Germany

- PV power: 445 kWp
- Tenant investment: 1.000 €
- Revenues: 3 % over 20 years
- Benefits: subsidized electricity 0.254 EUR/kWh

Case: *Dairy farm Alsace*

- PV power: 14kWp
- PV energy coverage: 22%
- Earning: 2.250€/year → Savings: 0,15 €/kWh; Surplus: 0,15?€/kWh; Grant: 10%
- Simple Payback: 10 years

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CLEAN ENERGY FOR ALL EUROPEANS

"The new proposal aims to further consolidate this trend, for example by removing obstacles to self-generation."

"It aims to empower consumers and enable them to be more in control of their choices when it comes to energy."

"The regulatory changes introduced by this package and the shift from centralised conventional generation to decentralised, smart and interconnected markets will also make it easier for consumers to generate their own energy, store it, share it, consume it or sell it back to the market – directly or via energy cooperatives."

"This also necessitates the removal of wholesale and retail price caps, while ensuring the full and appropriate protection of vulnerable household consumers."

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CONCLUSIONS I

- Self-generation of electricity for local consumption has, in most MS, become economically feasible without subsidies
- Unnecessary administrative barriers for self-generation of electricity should be removed and grid connection procedures should be simplified
- Policy uncertainty should be avoided and more standardized and stable legislation should be promoted
- General public awareness should be raised about technologies for self-generation and the economic benefits
- Collective energy self-generation and consumption should be allowed in all MS, and specially facilitated/promoted in apartment buildings and small industrial parks

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CONCLUSIONS II

- Smart metering is recommended to optimize the net metering system and to facilitate demand response and local storage
- Grid tariffs for self-generators should be reasonable and fair and based on effective cost (e.g. share in peak load) and benefits (e.g. lower grid losses)
- Remuneration for surplus or back-up electricity should be based on market prices to incentivize demand response and local storage
- Adequate grid tariff and price setting should allow to offer benefits for both self-consumers (lower electricity cost) and society (lower overall system cost)
- Possibility of an of-the-shelf financial instrument at EU level to support (through a guarantee fund) PV investments for self-consumption should be considered

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Thank you very much for your attention!!!

Lessons learned from different approaches across Europe in facilitating self-consumption of electricity

Dr. Eng. Cosme Segador Vegas, Director
AGENEX - Extremadura Energy Agency
csegador@agenex.org
Bussels, February 22nd 2018

NOTES

This report summarises the presentations and discussions of the workshop on "National Strategies for Renewables: Energy Efficiency, Building Renovation and Self-Consumption", which was held on 22nd February 2018. National strategies for the development of renewable energy were discussed in relation to energy efficiency targets and other policies, including building renovation and self-generation of electricity. The current situation and its likely evolution were presented and evaluated, with possible policy initiatives identified to effectively address the challenges. The workshop concluded that ambitious targets for renewable energy and energy efficiency are feasible and pointed to important synergies between both policies, in particular in the building and transport sectors.

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