The role of Public, Cooperative and Social Housing Providers in the Fair Energy Transition

THE POWER HOUSE NEARLY ZERO ENERGY CHALLENGE!

HOUSING EUROPE

POWER HOUSE NEARLY ZERO ENERGY CHALLENGE

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

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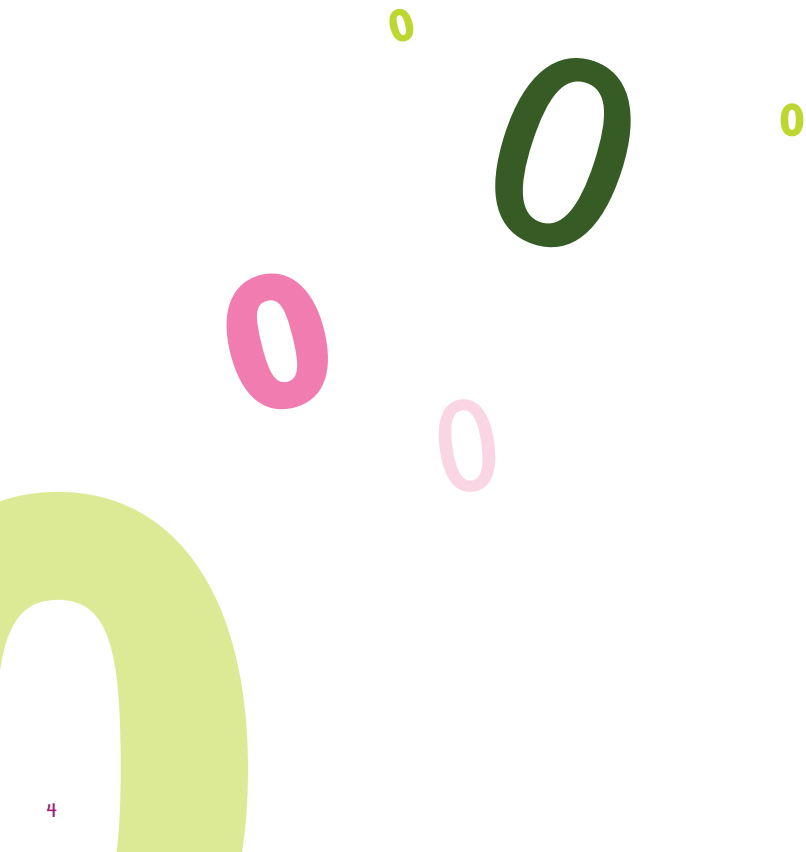
INDEX



1 FOREWORD

2015 *might be a key year for the success or failure of EU climate and energy policies.*

The initiatives proposed within the framework of the Energy Union and the UN Climate Conference in Paris will decide the direction the EU will take regarding climate and the environment. The findings of the 'POWER HOUSE nearly-Zero Energy Challenge' project could not be more timely.

This initiative, run by Housing Europe in partnership with 13 housing federations across the EU, has come to an end and produced solid, policy-relevant findings. It aimed to boost the number of nearly-Zero Energy homes across the continent by sharing ideas and expertise between Public, Cooperative and Social Housing professionals and has provided a great opportunity for housing providers to share learnings, gather accurate performance data and make progress on energy efficiency throughout Europe.

If I had to summarise in two sentences the essence of what partners have found out throughout the project, I would say the following: yes, a green building revolution is under way in the European Union thanks to the professionalism of the Public, Cooperative and Social Housing sector, the involvement of all relevant stakeholders including tenants and residents and driven by already ambitious legislation on nearly-Zero Energy Buildings; but no, this revolution cannot take place everywhere at the same speed and the EU must continue to support a pragmatic and differentiated approach to a fair energy transition in the housing sector.

I hope this report will give you a good sense of the activities carried out throughout the project and that the findings will be relevant to the activities of many stakeholders in the EU.

Housing Europe will continue its work to promote more affordable and more efficient energy investments in the housing sector.

Marc Calon

President of Housing Europe

2 THE POLICY CONTEXT

Housing and the EU Energy Union

The Energy Union is a strategy proposed by the European Commission and endorsed by Member States which aims to make energy policies more coherent in the EU and for them to contribute to the fight against climate change. It 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: energy security, solidarity and trust; the internal energy market; energy efficiency as a contribution to the moderation of energy demand; decarbonisation of the economy; and research, innovation and competitiveness.

The obstacles

For public, cooperative and social housing, the Energy Union is important since it sets out a strategy to move towards a fair energy transition and could help to address some of the main barriers to the successful renovation of housing.

A first obstacle is the gap between predicted and actual energy performance and low renovation quality. To overcome this, we need builders to guarantee the energy performance of renovated and newly built homes over extended periods – some practitioners expect this to be a period of up to 30 years. We also need to explore the possible use of industrialised and pre-fabrication methods to bring down costs and ensure consistent quality of any refurbishment. Overall, solutions need to integrate renewable energy production, insulation, ventilation and the reduction of energy consumption of appliances.

Another set of obstacles relates to the low demand for deep or comprehensive refurbishments due to perceived inconvenience, low value for money of works (including the lack of trust) and preference given to aesthetic improvements or renewed kitchens/bathrooms. To tackle these obstacles we need refurbishments which can be carried out over a shorter period of time and allow residents to stay at home. Community outreach before and after renovation helps to build trust among residents. Evidence also shows that good building aesthetics lead to high levels of interest in deep refurbishment among neighbourhoods where pilots have been completed.

One last obstacle is the long payback time on investment which can reduce the interest of private investors or energy service contractors and result in a tendency to implement only superficial measures offering short-term returns. What we need is a guarantee that energy savings will cover the up-front costs and energy production made over the lifetime of the project. Key to success will be the guarantee of affordability for residents.

Investing in energy efficient social housing has many proven positive effects on growth, social cohesion and quality of the environment. Beyond the direct effect on energy performance of dwellings, those measures help to save costs in other policy areas.

The opportunities

Thus for public, cooperative and social housing providers, some elements of the Energy Union (Communication on Strategic Framework from the European Commission of 25th February 2015)[1] are positive:

[1] Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee, The Committee Of The Regions And The European Investment Bank: A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM (2015). See http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:80:FIN

WHAT THE EUROPEAN COMMISSION SAYS

"Facilitating the participation of consumers in the energy transition through smart grids, smart home appliances, smart cities and home automation systems."

"The Commission will continue to push for standardisation and to support the national roll-out of smart meters and to promote the further development of smart appliances and smart grids, so that flexible energy use is rewarded."

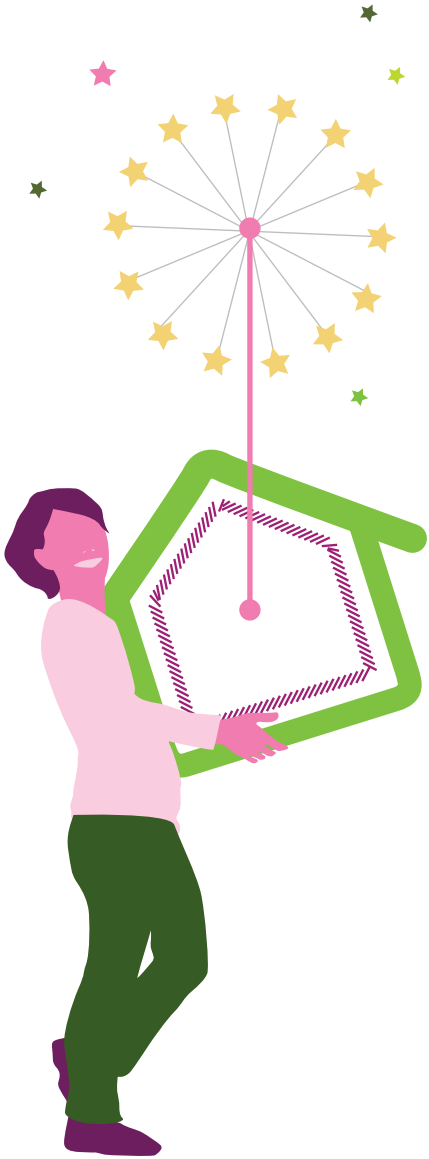
"Further enforcement of public service obligations for the protection of vulnerable energy consumers through energy schemes/tariffs or preferably general welfare systems."

The EC has not yet fully acknowledged the role of local communities (cities, neighbourhoods, tenants unions, etc.) in energy transition not only regarding behavioural change, but also for funding and training purposes.

Housing renovation to reduce energy consumption and bills is an integrated part of effective neighbourhood city or region-wide energy transition planning. This must be seen in the context of job creation, therefore reducing the social and economic costs related to unemployment, the burden of which is felt by the whole neighbourhood, city, region and country. Also, this links directly into reducing fuel poverty and its health impacts, the cost of which is transferred to health services, empowering citizens financially by increasing purchasing power and through increased comfort, which is often one of the most important demand-side considerations. This is also very closely linked to the cost of energy saving measures.

There are also limitations to the effect of smart devices on consumption reduction, which must be evaluated and taken into account.

Housing organisations are doing a lot to make energy use effective, but this is also based on the behaviour of the people living in the buildings. In order to lower energy consumption and make the future energy market possible, we need impartial information and training and involve the tenants in this process.



2 - FINANCING ENERGY EFFICIENCY

WHAT THE EUROPEAN COMMISSION SAYS

"The Commission will support ways to simplify access to existing financing and offer 'off-the-shelf' financing templates for financial instruments to the European Structural and Investment Funds managing authorities and interested stakeholders, promote new financing schemes based on risk and revenue sharing, develop new financing techniques and support in terms of technical assistance. Financial support needs to be combined with technical support to help aggregate small scale projects into larger programmes which can drive down transaction costs and attract the private sector at scale."

While there is huge potential for energy efficiency gains in the buildings, the measures needed are not always cost effective for housing providers, even over the long term. We need to ensure that the renovation of housing will be among the projects eligible to apply for various EU funding opportunities. Such projects require long term and low-cost capital financing, thus public support in one form or another. A clear obstacle is the long payback time on investment, reducing the interest of private investors or energy service contractors and having a preference for implementing only superficial measures that offer short-term returns. What we need is a subsidy covering the gap between energy efficiency measures that are profitable for the housing company in the long run and meet the climate goals – a guarantee that energy savings not covered by up-front costs and energy production made over the lifetime of the project are covered by subsidies. Key to success will be the guarantee of affordability for residents.

3 - ENERGY MARKET INTEGRATION

WHAT THE EUROPEAN COMMISSION SAYS

"Market integration of renewable electricity generation requires flexible markets, both on the supply and demand side, within and beyond a Member State's borders. Electricity grids must therefore evolve significantly. There is a need to expand the possibilities for distributed generation and demand-side management, including intraday markets, to develop new high-voltage long distance connections (supergrids) and new storage technologies."

The market redesign announced by the European Commission needs to take into account the regulatory issues that prevent locally based production of renewable energy (energy cooperatives, community-based projects, micro-grids, etc.). Support is needed to cover the up-front cost of these investments and it should be on equal terms for all tenures, including multifamily buildings. Member states should be encouraged to eliminate barriers for distributed generation in buildings and in neighbourhoods.

ENABLING EU LEGISLATION

The EU has set itself the target of reaching at least 27% energy savings by 2030. In 2015 and 2016, the Commission will review all relevant energy efficiency legislation and will propose revisions, where needed, to underpin the 2030 target.

There is a widespread consensus in the European Union that in order to achieve energy transition and meet the collectively agreed objectives in terms of reduction of GHG emissions, we need to accelerate the average rate of renovation in the residential sector. However, there is strong divergence of views on how to increase the renovation rate.

While some stakeholders call for new legislation in the field of energy efficiency in buildings, the social, cooperative and public housing providers share the view that the challenge lies in fully and efficiently implementing the current framework (EPBD and EED) in promoting approaches that have proven successful on the ground and in continued support for research and innovation.

We know that many countries are struggling to implement the measures proposed so far and that measures vary from country to country in terms of their efficacy. The need for flexibility for Member States to meet the goals in different ways while ensuring affordability is vital.

Find out more on the Energy Union:
http://goo.gl/nwE0Lb

3 BARRIERS & CHALLENGES TO NEARLY-ZERO ENERGY BUILDINGS

Back in 2012, Member States were working on new definitions and a framework to promote nearly-Zero Energy Buildings, with the EPBD and EED implementation already underway. Within this context public, cooperative and social housing federations across the EU, represented by Housing Europe, revealed the obstacles to delivering nearly-Zero Energy Building through surveys and discussions with external experts in the field.

The feedback received indicated that a variety of barriers and challenges exist, which can be broadly categorised into the following five key areas:

1. **TECHNICAL BARRIERS** – there is still a major lack of skills and expertise throughout the construction sector, as well as uncertainty as to how new technologies perform;
2. **ECONOMIC & FINANCIAL BARRIERS** – the lack of access to affordable finance to carry out new construction or retrofit existing stock to meeting nearly-Zero standards is also a major barrier;
3. **LEGISLATIVE BARRIERS** – the lack of definition of nZEB, a lack of policy coherence and legal structures to address energy retrofit in divided ownership are all key issues to be addressed;
4. **SOCIAL & ORGANISATIONAL BARRIERS** – saving energy is not simply a technical issue but it also depends on the lifestyle of residents and correct stock management;
5. **CREDIBILITY BARRIERS** – a lack of mainstream examples of good practice and robust data from nearly-Zero homes has fostered an atmosphere of confusion and misinformation.

It was recognised that the two key areas of work to be carried out, i.e. construction of new nearly-Zero energy buildings and refurbishment of the existing stock, present different barriers and challenges to delivery. Each of the barriers listed above applies to a greater or lesser degree, and in different ways, to both areas of work.

More details on Barriers & Challenges to nZEB **http://goo.gl/u2BLkv**

4 THE POWER HOUSE NEARLY-ZERO ENERGY CHALLENGE IN A NUTSHELL

The obstacles and issues identified served as a starting point for the definition of the POWER HOUSE TaskForces' Work Programmes in order to help public, cooperative and social housing providers in their path towards a fair energy transition.

Involving 14 partners from 10 countries, the POWER HOUSE nearly-Zero Energy Challenge project provided a platform for a pan-EU knowledge exchange among public, cooperative and social housing practitioners to learn from each other about the practical implications and costs of ambitious energy performance codes and to inform policy makers of the outcomes of this exchange.

The work was carried out in four thematic inter-European TaskForces:

Nearly-Zero energy housing experiences in Warm/ Mediterranean climates

Nearly-Zero energy housing experiences in Cold/ Continental climates

Nearly-Zero energy housing in regions characterised by Divided/Cooperative ownership

Financing of nearly-Zero energy housing renovation and new-build

All partners involved in the TaskForces used the appropriate tools at national level to ensure that the solutions chosen were tailor-made to the members' needs, paving the way for a fair, inclusive and sustainable energy transition.

WHAT *HOUSING EUROPE* MEMBERS MEAN BY 'A FAIR ENERGY TRANSITION'?

Public, cooperative and social housing providers typically provide a range of services and support to their residents, who are often drawn from amongst the more vulnerable and marginalised groups in society. There are a variety of competing pressures on the providers to ensure the best outcomes for their residents, and whilst recognising the crucial importance of the energy saving agenda being driven by the recast EPBD, they are also particularly concerned to ensure that the transition to nearly-Zero Energy is a fair and equitable one for their current and future residents. **By a fair transition, it is meant that:**

- Energy efficient refurbishment should not result in increasing rents to levels that residents can no longer afford, forcing them to leave their homes.
- New construction is not restricted, since with the higher costs of building to nearly-Zero energy standards fewer homes can be built from a limited budget, thus impacting on the lives of those waiting for a decent home to live in.
- Policies and funding schemes should also embrace those hardest to reach, who are most likely to be victims of fuel poverty.
- In respect of the production of renewable energy, that there is diversification of ownership of the energy produced, and that monopolies do not use their positions to control these new markets.

5 THE HIVE DATABASE: TRACKING REAL ENERGY CONSUMPTION IN BUILDINGS

In Europe, buildings are responsible for 40% of energy consumption. But how much energy is actually consumed by residential buildings? Where does most of the energy go – for heating spaces, or water heating, for domestic appliances, or for cooling? What is the actual contribution of solar panels in the energy balance of buildings?

To monitor and record the actual energy performance of buildings, POWER HOUSE nZEC developed the HIVE database, an on-line energy tracker, to monitor heating and cooling, the production of hot water and technical services such as ventilation and lighting as well as the production of in-situ renewable energy systems. Around thirty test cases of low and nearly-Zero Energy Buildings in different climate zones and types of tenure are monitored in order to determine their real energy performance and cost-optimality.

All data collected are available on-line on the HIVE project database at

http://phe.hiveproject.net/building-chart.php

The added value of HIVE

HIVE is a user-friendly tool that helps to map, monitor and understand actual energy consumption under real use conditions in buildings, even in the most complex ones. It may be considered to be the first, concrete step towards a strategy to reduce energy consumption in building stock.

The system allows the data to be presented systematically, via an on-line website, with the possibility for the user to choose between different options such as total consumption per square meter; energy / primary energy / CO_2 / price and make comparisons between different buildings. To protect data privacy, HIVE only presents the data in an aggregated form, i.e. it shows data of the total building and not per single dwelling.

WHY IS SUCH A PLATFORM NEEDED?

Because the Energy Performance Certificate can only assess the energy consumption of a building in standard use conditions and not its real energy consumption or costs. It is intended to inform potential buyers or tenants about the energy performance of a building, so they can consider energy efficiency as part of their investment or business decision when buying or occupying the building.. An Energy Performance Certificate (EPC) will provide an energy rating for the building ranging from A to G, where A is very efficient and G is the least efficient.

Browsing through HIVE

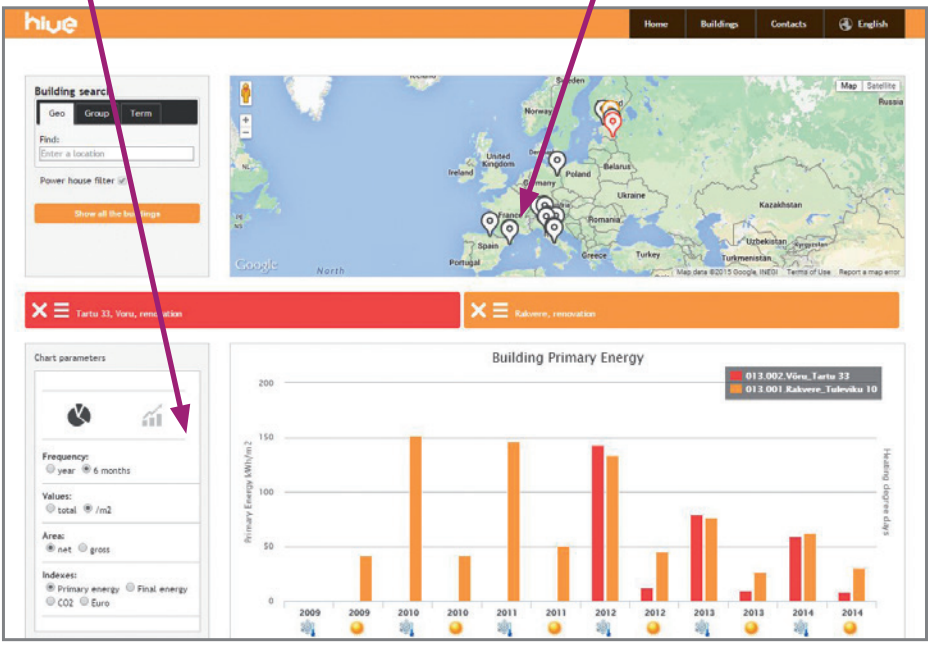
HIVE is particularly suited for those who are in charge of managing houses and buildings, those who operate in the energy retrofitting of existing buildings, and those who are active in the low energy construction sector. At the same time, it also provides actual and reliable data to work on and feeds the debate on cost-optimality and the considered use of financial resources at policy level.

Concrete figures from HIVE

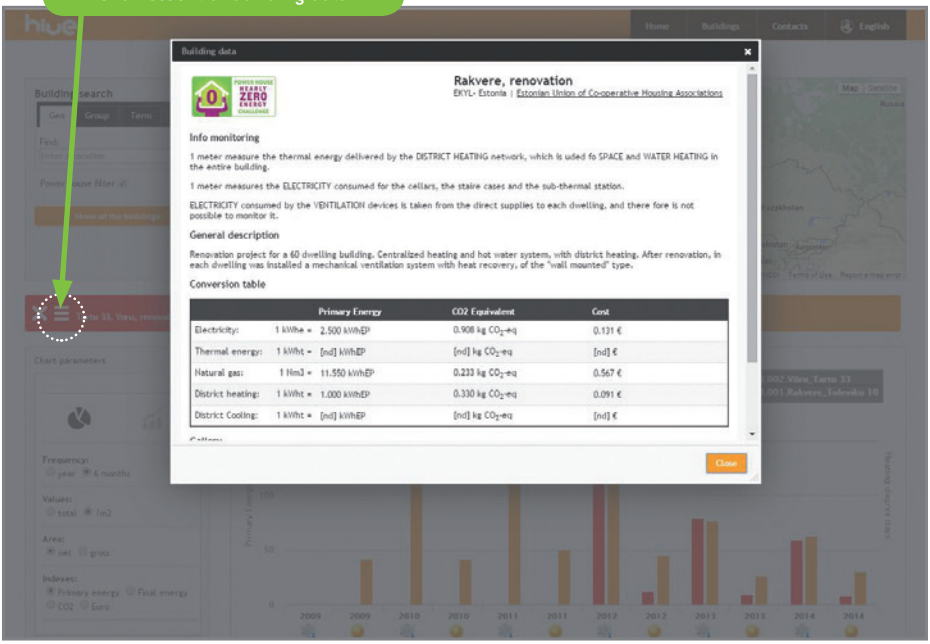
Thirty test cases of low and nearly-Zero Energy Buildings in different climate zones and types of tenure are being monitored in order to determine the real energy performance, rather than the values estimated by designers in the planning phase.

Compare simultaneously the data of up to 4 buildings while setting your preferred parameters

Pay a virtual visit to one of the Case Studies monitored



For each Case Study, find the summary of all essential building data



6 THE FAIR ENERGY TRANSITION AND THE ROLE OF PUBLIC, COOPERATIVE AND SOCIAL HOUSING PROVIDERS

A few words about Housing Europe

Housing Europe is the European Federation of Public, Cooperative and Social Housing. Established in 1988, it is a network of 42 national and regional federations which together gather about 43,000 public, social and cooperative housing providers in 22 countries. Altogether they manage over 26 million homes, about 11% of existing dwellings in the EU.

Public, Cooperative and Social Housing providers in the driving seat of fair energy transition

As organisations with huge amounts of housing stock, the ability to work across neighbourhoods and a commitment to the welfare of their residents as well as to cutting carbon, Housing Europe members are well-placed to drive the requirements of the EPBD process forward.

In many Member States these housing providers have been the pioneers of low energy housing provision. They must provide housing that is affordable in terms of construction, maintenance and running costs. Given that they retain a long-term responsibility for managing and maintaining the stock, as well as having a commitment and responsibility for their tenants, there is a strong incentive to ensure that the energy efficiency of the stock is optimised. This has been particularly the case in colder climates, where fuel poverty is a major issue for those residents on low income. Between 50 million and 125 million people in Europe are estimated to be fuel poor and this figure will inevitably increase in the future in line with rising energy prices and increased fuel bills. [2]

The focus on climate

Housing Europe members provide housing in a range of different climatic situations and with different ownership models. This includes both warm Mediterranean-type climates such as those found in Italy and Spain, where cooling and ventilation are key users of energy in people's homes and the cold and/or continental climates such as those found in Estonia and Sweden, where space heating in the cold months is a major consumer of energy.

Citizens have different lifestyles and house types reflect these climatic differences. In Spain and Portugal effective low energy homes can be built without the need for active ventilation systems and highly insulated shells. Moreover, the well-established criteria developed for the Passive House standard in the colder countries of Europe are inappropriate for warmer climates.

In some cases, there is a diversity of climatic conditions within the country itself, for example, the six climatic zones in Italy with cold conditions in its northern alpine areas and hot Mediterranean conditions in its more southern areas.

The effect of types of ownership

There are also different types of ownership in the housing sectors in these Member States – with social rental housing, a range of cooperative housing models with differing tenure systems and the former state-owned housing in the former East European countries. In the latter case, the state-owned housing was transferred into the ownership of the former tenants at very little cost but now presents significant problems in terms of energy efficient renovation. In existing apartment blocks with multiple ownerships the residents play a major role in the decision making processes, especially with regard to the renovation and management of the building.

[2] Tackling Fuel Poverty in Europe: Recommendations Guide for Policy Makers. European Fuel Poverty and Energy Efficiency (EPEE) 2009. http://www.fuel-poverty.org/files/WP5_D15_EN.pdf

An integrated approach to future-proofing people's homes

Whilst approximately 2 million new homes are being built per year in the 28 countries of the EU, the existing housing stock will still account for nearly 70% of the building stock in 2050. Whilst the development of highly energy efficient new stock is important, the ability to retrofit the existing stock to an appropriate standard will be the key determinant of whether the 2050 targets for energy reduction can be achieved. **A key role for public, cooperative and social housing providers is that of being able to look in the longer term at their housing stock and understand how it should be 'futureproofed'**. Improving the energy efficiency of people's homes is only one aspect of future housing provision, while others relate to demographics (an ageing population), social inclusion (increasing migration levels), and social trends (an increased demand for single person accommodation), health care and employment creation. Such an integrated approach is definitely the recommended approach.

Improving energy efficiency has also been shown to be an effective way to stimulate economic growth, thus improving job opportunities for those on lower incomes. The housing providers represented by Housing Europe work in partnership with the construction sector every day and are in a good position to understand the possible ways in which it could be improved to deliver affordable and energy efficient homes.

POWER HOUSE NZEC MOBILISATION IN NUMBERS

15 Partners
from **10**
EU Countries

68 Case Studies
30 monitored on-line
on HIVE

7 Video clips
with more than
1,500 views

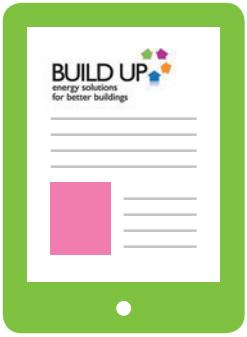
1 On-line course
and **1** Webinar
attended by more than
300 participants

6 biannual Newsletters
and more than
50 articles in the Media

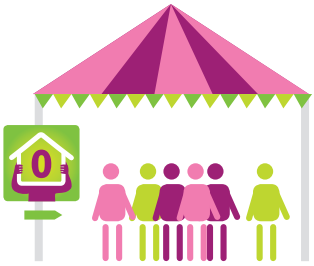
13 Study Visits in
8 EU Countries
attended by more than
250 participants

2 International Symposia
and **12** Workshops
attended by more than
600 participants

95,000 page views
on the POWER HOUSE
Website



40,000 views of the
20 articles posted
on BUILD UP



10,000 people found out about
POWER HOUSE nZEC
in more than **150** events
including **1** international exhibition

8 THE POWER HOUSE NEARLY-ZERO ENERGY CHALLENGE TASKFORCES

Europe's public, cooperative and social housing organisations manage and/or own 11% of the European housing stock and are the only actors who have the financial base and the interest to bring existing homes to nearly-Zero standards.

Any effective roadmap to nearly-Zero building renovation and new construction requires a combination of measures covering financial, technical, legal, organisational and training.

To assess the needs and tackle the challenges identified, POWER HOUSE nZEC Partners decided to work together according to the following four thematic inter-European TaskForces:

Nearly-Zero energy housing experiences in Warm/ Mediterranean climates

Nearly-Zero energy housing experiences in Cold/ Continental climates

Nearly-Zero energy housing in regions characterised by Divided/Cooperative ownership

Financing of nearly-Zero energy housing renovation and new-build

Each TaskForce, co-led by forerunner Housing Federations, identified obstacles and challenges that local housing organisations are facing in reaching nZEB targets for existing housing stock and new build and implemented a tailor-made work programme with the aim of paving the way for a fair and inclusive energy transition.

More on the POWER HOUSE nearly-Zero Energy Challenge TaskForces :
http://goo.gl/LJZEgK

The POWER HOUSE Warm/Mediterranean climates TaskForce

Overview

Reaching nearly-Zero Energy standards in Mediterranean climates where energy needs are greater for summer cooling than for winter heating entails different technical and regulatory challenges to those faced in cold/continental climates. In addition, the global economic crisis has adversely affected Mediterranean countries and brought financial challenges to the energy sector in the region. One of the main priorities of the nZEB Warm / Mediterranean Climate TaskForce, therefore, was to look closely into financing innovations and solutions for energy efficiency to overcome low access to capital and the landlord-tenant dilemma or split incentive issue.

The TaskForce was coordinated by **Federcasa**, the Italian Federation of Public Housing Companies, and **AVS**, the Spanish Association of Public Social Housing and Land Providers. The overall aim of the TaskForce was to help local housing companies to adapt nearly-Zero Energy principles to their climate conditions. The French Federation of Social Housing Providers, **USH**, also joined the TaskForce, given the interest of its members based in southern France, and contributed to the exchange on very low energy house technologies with a focus on construction and management costs, quality assurance, maintenance issues and monitoring of energy consumption. Moreover, **CECODHAS Portugal**, the Portuguese Association of National and Regional Social Housing Umbrella Organisations was invited to all meetings and kept informed of the TaskForce's activities and findings.

ACTIVITIES

2012

- **27 September –** 1st TaskForce Workshop, Madrid

2013

- **March –** 1st Module of the Spanish nZEC on-line course
- **4-5 July –** 2nd TaskForce Workshop + Study Visit, Pisa and Empoli
- **October –** 2nd Module of the Spanish nZEC on-line course

2014

- **13-14 February –** 3rd TaskForce Workshop + Study Visit, Barcelona
- **March –** 3rd Module of the Spanish nZEC on-line course
- **October –** 4th Module of the Spanish nZEC on-line course

2015

- **19-20 March –** 4th TaskForce Workshop + Study Visit, Marseille
- **May –** Advanced Module of the Italian nZEC on-line course

Lessons learnt

Listed below are some of the key findings and conclusions identified by the TaskForce Members:

Distinct characteristics of Mediterranean Housing

Nearly-Zero Energy Mediterranean homes should be designed taking into account local climatic factors and technologies/features that work effectively both in winter (heating) and – most importantly – in summertime (cooling). Moreover, the Passive House concept must be adapted to the Mediterranean social, cultural and geographical context as well as to the specific typologies of users. Air, sun, water and other climatic factors can become true allies. In order to achieve this, a careful design of the building preferably making use of local materials and bio-architectural principles is vital for the sustainability of the construction project and the comfort of its residents.

Quality assurance

Regarding refurbished buildings, a quality control system for the intervention is recommended (especially when innovative solutions are implemented) by enlisting an accredited expert to ensure proper execution. This is a necessary step in quality assurance since installers are often not the manufacturers and they do not have the experience necessary for their implementation, which could lead to subsequent system failures. Similarly, it is necessary to develop training courses that will enable construction workers to acquire knowledge and skills regarding innovative solutions in the field of energy retrofitting.

Maintenance

Systems maintenance in tertiary buildings such as offices, shops and hospitals is usually handled by companies offering specialised maintenance services within a certain price range. This type of service would also benefit residential buildings, particularly low energy buildings or nZEBs, as they may have specific devices or installations that require special handling or care. . In the social housing sector, there is a need to develop specific maintenance programmes for nZEBs. Clear guidelines should be produced to aid technicians in the proper maintenance / management operations of nZEBs as well as establish preventive maintenance measures and procedures to avoid damage to devices, over-consumption of energy or even total system failure.

Operating costs

The analysis of operating costs is useful for setting the range of maintenance costs of innovative projects. Therefore, the Warm / Mediterranean climates TaskForce proposes to set up " Regional Observatories for the nZEB " for collecting data on operational costs of nZEBs based on the criteria established within the POWER HOUSE nZEC. This database can help create a common reference and basis for defining standardised costs as part of the reference building calculation.

Usability

The analysis conducted on the case studies highlighted the limited usefulness of user manuals or handbooks; this is why automated scenarios that allow the building to automatically adapt to the external conditions and to generate the internal micro-climate accordingly to optimal indoor comfort level, are favoured in order to limit the manual use of devices.

Cost-effectiveness

The evaluation of cost optimal parameters related to the heating supply system are much more sensitive than those relating to the improvement of the thermal envelope. In general, it is difficult to assess the impact of user behaviour, a variable not included in the calculation method. The experience of the TaskForce has shown that tenants' incorrect use or misuse of installed devices or systems may lead to differences in energy consumption compared to cost optimal values calculated between 10 and 30%.

Building skills and digital revolution in the Mediterranean

AVS – the Spanish Association of Public Social Housing and Land Providers, in collaboration with IVE, the Valencian Institute of Building, designed an on-line course on energy efficiency, renovation and financing with four modules of 20 hours each for Spanish social housing practitioners. The aim of the course was to provide participants, with different academic backgrounds, with an adequate level of knowledge about energy efficiency, use of renewables and the legal and financial framework in place in order to help them in their path towards nZEB.

Following the success of the course, which has been attended by more than 150 participants, two modules are being reconsidered to meet the increasing interest in this area.

Similarly, Federcasa, the Italian Federation of Public Housing Providers, with the technical support of CasaQualità and in cooperation with the Department of Energy of the Polytechnic of Milan, developed and initiated an advanced module on 'Implementation and management of social housing projects to nearly-Zero Energy' for Italian social housing practitioners in April 2015.

The POWER HOUSE Cold/Continental climates TaskForce

Overview

The TaskForce working in Cold / Continental climates addressed, in particular, the concerns regarding the hidden cost implications of increased air tightness linked to ventilation and air quality through the monitoring and reporting of costs for works carried out, maintenance and consumption during the use-phase in ten exemplary developments. Members of this TaskForce included representatives from Belgium, Estonia, France, Italy, Sweden, Germany, Austria and the United Kingdom.

Gbv, the Austrian Federation of Limited Profit Housing Associations representing both cooperatives and capital companies took the lead in the TaskForce in order to share their experience of managing very low energy buildings in Cold/Continental climates. **GdW**, the German Federation of Real Estate and Housing Associations, **VMSW**, the Flemish Agency for Social Housing, **SABO**, the Swedish Association of Municipal Housing Companies, **NHF**, the National Housing Federation and **USH**, the French Federation of Social Housing Providers (considering the interest of its members based in the northern part of France) also joined the TaskForce in order to contribute to the knowledge exchange on very low energy housing technologies with an emphasis on construction and management costs, quality assurance, maintenance issues and monitoring of energy consumption.

ACTIVITIES

2012

- **19 June –** Study Visit with BUILD-UP and Bruxelles Environment, Brussels
- **27 September –** 1st TaskForce Workshop, Madrid

2013

- **27-28 February –** 2nd TaskForce Workshop + Study Visit, Vienna
- **19 September –** Study Visit with Bruxelles Environment, Brussels
- **4-5 December –** 3rd TaskForce Workshop + Study Visit, Wiesbaden

2015

- **13 January –** Study Visit with Bruxelles Environment, Brussels
- **22-23 January –** Study Visit with Energiesprong, Heerhugowaard and Utrecht
- **25 March –** Study Visit with Bruxelles Environment, Brussels

Lessons learnt

Listed below are some of the key findings and conclusions identified by the TaskForce Members:

Definition of cost-optimal levels

The cost-optimal level is defined as the "energy performance level which leads to the lowest cost during the estimated economic lifecycle" of a building or building element.[3] The level is determined by taking into account a range of costs such as investments, maintenance, operating costs and energy savings. However, some parameters to calculate cost-optimal levels are not easy to predict such as future primary energy factors, cost development, price trends and performance of new technologies. A crucial question regarding cost-optimal building standards and the cost-efficiency of nearly-Zero Energy Buildings is whether calculated energy demand and costs assumptions correspond with measured energy consumption and real cost data from buildings when in use. Additionally, there are some competition factors between different technical components of energy efficient buildings: insulation vs. heating and ventilation technologies vs. renewable systems (heat pumps, solar plants, PV); the calibration between these components is challenging and definitely not only subject to expert calculations but also a matter of competition between different stakeholders in the energy services sector including energy providers.

Actual performance vs. calculated demand

The monitoring results from the Austrian test cases (selected out of a bigger sample of housing projects) that took into account construction, energy consumption and service costs showed that the predicted margin in energy demand between low energy buildings and very low energy buildings was bigger than the actual differences in energy consumption for heating and hot water. Therefore, housing energy policies should be based on consumption data rather than on calculated demand, since there is a substantial divergence between these figures.

Cost-effectiveness in new housing projects

In new, very low energy buildings and passive houses, extra construction costs for additional/extra insulation and ventilation with heat exchange total 6.7% for small buildings and 9.7% for large (compact) buildings. These extra costs cannot be compensated for by energy savings in the long run. Between very low energy vs. passive buildings the differences in consumption are very small. However, we should take cost implications into consideration when defining the optimal level of nearly-Zero Energy Buildings. Austrian housing associations are in favour of "simple" low energy buildings without the need for automatic ventilation in order to manage the cost and use of technical systems.

Cost-effectiveness in refurbishment projects

The average costs of energy-efficiency measures amount to 180 €/m² (VAT has been deducted based on Austrian VAT rules). These investment costs cannot be compensated for by actual energy savings of 40-50 kWh/m² within a period of 15-30 years, unless a cost reduction is calculated for components that would have been replaced anyway and/or subsidies are granted.

The average refurbishment costs for 35-40 year old buildings/dwellings are 250 €/m². However, "complicated" older buildings of very poor quality have higher refurbishment costs of up to 1,000 €/m² (this includes installing elevators, improving the dwellings, eliminating architectural barriers, etc.). This demonstrates that energy quality is not the only aspect of refurbishment as other elements such as accessibility, comfort and aesthetics positively affect the overall performance of the refurbished building.

[3] Wittchen, K and Thomsen, K. 2012. 'Introducing cost-optimal levels for energy requirements' (http://www.rehva.eu/fileadmin/hvac-dictio/03-2012/introducing-cost-optimal-levels-for-energy-requirements.pdf)

Innovation and Market uptake in the EU North

The POWER HOUSE nearly-Zero Energy Challenge helped provide housing associations in England with a better understanding of European energy efficiency models. The National Housing Federation (NHF), one of the project partners, identified EnergieSprong as a European energy efficiency model that could be applied to the UK housing environment.

The Netherlands' EnergieSprong is an innovative refurbishment programme delivering 111,000 whole house retrofits to net zero energy levels via an off-site manufactured building envelope and funded by savings delivered via a contractor-guaranteed energy performance contract.

Following a study tour which was supported by the POWER HOUSE nZEC project, a group of major UK housing associations, in partnership with the NHF and the Mayor of London, met in April 2015 and agreed to provide seed funding to set up a social enterprise, EnergieSprong UK, to deliver the model in the UK and develop pilot projects.

The POWER HOUSE Divided/Cooperative ownership TaskForce

Overview

Incentivising and implementing nearly-Zero Energy strategies in Divided/Cooperative ownership, particularly in multi-apartment buildings with mixed tenures, requires an adapted financial, legal and organisational framework as well as good communication and participatory processes. In divided and cooperative property housing, residents play a major role in the decision making process concerning the management of the building. The resident, who is either the owner of the dwelling in a multifamily building (divided ownership) or has a stronger right of occupation (cooperative ownership) than in the case of a standard rental contract, is called to participate actively in the decision making process regarding the management of the building or its renovation.

Considering the particular type of housing stock that housing cooperatives are managing, Finabita, the service agency of **Legacoop Abitanti**, the Italian National Federation of Housing Cooperatives representing 3,000 cooperatives across Italy, took the lead in this TaskForce. **EKYL**, the Estonian Union of Cooperative Housing Associations, an independent organization that brings together over 1,400 housing cooperatives from all over Estonia and **CAC**, the Bulgarian Union of Homeowners Associations representing homeowners in condominium apartment buildings (among the forerunners in the management of renovation programmes for housing in individual/cooperative ownership), also contributed to the work of the TaskForce by providing their expertise in adapting solutions specifically in regions where the housing sector has been largely privatised and has different legal frameworks.

ACTIVITIES

2012

- **27 September –** 1st TaskForce Workshop, Madrid

2013

- **4 March –** Debate on Decentralised Energy Production, Ownership and Consumption, Brussels
- **11-12 June –** 2nd TaskForce Workshop + Study Visit, Milan
- **20 November –** TaskForce National Workshop on investments opportunities for the 2014-2020 period, Milan

2014

- **12-13 June –** 3rd TaskForce Workshop + Study Visit, Tallinn

2015

- **25 March –** TaskForce National Workshop on Urban regeneration and Housing, Milan

Lessons learnt

Listed below are some of the key findings and conclusions identified by the TaskForce Members:

Clear rules and a legislative framework

A condominium law, clearly defining the owners and tenants' rights and obligations, and with clear rules for approving "energy requalification" [4] of a building is essential in order to facilitate the decision making process for retrofitting projects in Divided and Cooperative ownership.

Communication and marketing

The importance of having good communication between the actors involved in the renovation project, in particular the management board of cooperatives and/or apartment associations and the owners, cannot be underestimated. It is key to demonstrating the advantages and implications of the renovation projects at the very beginning, where the involvement of an experienced energy expert with good communication skills can make a difference. Good communication also makes it easier to gain the support and participation of the owners in all stages of the renovation project.

Skills and competences

Aside from professionally trained construction workers, having qualified architects, engineers and housing managers who are able to understand each other and mediate between owners and tenants is essential in a renovation project in order to achieve the expected results in terms of energy savings, costs and residents' indoor comfort.

Renewable Energy Sources (RES)

Widespread fully developed technologies and simple systems are generally preferable to use since complex systems require more maintenance and consequently have higher running costs. Training the owners and tenants on how to operate and make the most out of the devices installed and monitoring the performance of the RES used are effective in preventing system errors or breakdown.

Access to adequate financing

Simple, sustainable and reliable financing schemes tailor-made for divided and cooperative ownership buildings are essential in order to gather the initial capital required for deep or comprehensive renovation projects. Loans must be available to complete the subsidy part of the financing scheme, possibly all integrated within the same mechanism. Having seen the issues at stake, qualified support from third parties could be required (such as sector associations and energy agencies), to help the condominium start the process and meet the right project partners.

Cost-effectiveness

The analysis of the Case Studies monitored by the TaskForce showed a payback period of 20-30 years from energy savings (the calculation does not include possible subsidies). This means that deep renovation pays back itself only if it is done when there is already a need to renovate the property. In many cases, the increase in property value after the renovation (or of the new construction compared to the basic energy standard building) is almost equal to or higher than the money invested for the energy refurbishment.

[4] "Energy Requalification" means improving the quality and performance of the energy efficiency of a building. This includes improving all of the technological and managerial aspects of constructing or renovating a building or improving the energy flow of the exchanges that happen between the building and the outside environment.

SUCCESS STORY

Involving residents in the renovation process

To be effective, deep renovation requires well-informed households to obtain good energy savings after renovation works: residents should act as "energy managers" of their own dwellings. To this end, the housing cooperative F. Degradi, on the refurbishment of a property located in Via Caldera, Milan, contacted experts working in the field of energy, water and waste reduction. The experts not only informed tenants about energy savings strategies but also proposed "collaborative actions" with them in order to reduce consumption also in common spaces and generally to improve the sustainability of the renovation project. This successful approach, meant to be replicated by the housing cooperative in other refurbishment projects, was very well appreciated by residents and led to 30.6% thermal energy savings, 35.8% electric energy savings and to 23.5% reduction of water consumption.

The POWER HOUSE Financing TaskForce

Overview

Access to finance is one of the key challenges that all public, cooperative and social housing providers encounter and is considered a main obstacle, which prevents housing organisations from improving the energy performance of their stock. Moreover, the EU is increasingly playing a catalytic role in changing the perception of Energy Efficiency as a new investment area among financial institutions.

Housing Europe, the European Federation of Public, Cooperative and Social Housing co-led the nZEB Financing TaskForce along with **NHF**, the National Housing Federation (United Kingdom). All the partners of the POWER HOUSE nearly-Zero Energy Challenge also contributed to the exchange of information on the topic and provided concrete examples of innovative financial engineering solutions from their respective countries.

ACTIVITIES

2012

- **18 May –** Answer to DG Energy Public Consultation on Financial Support for Energy Efficiency in Buildings
- **27 September –** 1st TaskForce Workshop, Madrid
- **19 December –** Answer to the EIB Public Consultation on Energy Lending Policy

2014

- **4 March –** 2nd TaskForce Workshop, Brussels

2015

- **24 March –** 3rd TaskForce Workshop with EU Policy Makers, Brussels

Lessons learnt

Listed below are some of the key findings and conclusions identified by the TaskForce Members:

Lack of funding

There is no "one-size-fits all" approach to low-carbon funding in the affordable housing sector. Factors such as type of tenure, rent legislation, potential for energy savings due to considerations in relation to specific climates need to be taken into consideration when reflecting on how to improve the supply and demand for funding in order to trigger energy transition in the affordable housing sector. However, lack of available funds to carry out new construction or refurbishment projects, either through the provision of subsidy or access to affordable capital is considered to be a major barrier by Public Cooperative and Social Housing providers.

Simplify access to funding

Access to funding needs to be simplified – currently there are many different schemes, all with different rules, forms and criteria and all requiring their own due diligence to be performed. This is resource intensive in terms of both time-and money and streamlining the process to create a simple 'one stop shop' would allow a single application process which would generate access to a variety of different funding options.

Threshold required for accessing funds

Although various European funding options are available, one challenge for many housing organisations is the threshold required for accessing these funds. Often, projects led by individual housing organisations fall far below this threshold and this leads to the need to form partnerships with local authorities, or collaborative groups of organisations. This leads to a significantly more complicated bureaucratic, inefficient process. A way out of this deadlock could be the creation of a financial initiative at EU level that would allow a national aggregator to hold an allocated sum of funding, and act as distributor of this funding with a lower threshold requirement.

Ease of access and attractiveness to financial organisations and customers

In many cases, lenders may be hesitant about financing energy efficiency works as much of the market is currently untested and the risks are considered to be high. This in turn leads to higher rates of interest and fees, which can reduce the attractiveness of a scheme to consumers.

One way in which member states have addressed this issue – for example the German KfW scheme – is by using a state guarantee that allows the risk to be shared. Other possible solutions include the U.K. Housing Finance Corporation, where an organisation acts as aggregator for loans and accesses low rate funding which can then be passed on in smaller amounts to housing organisations. Ease of understanding is also important – the less complex the scheme is, the more likely it is to be a success both for customers and lenders.

Administrative costs

Where a scheme costs a lot to administer, the funding for this should obviously be covered and generally this cost is passed on to the end consumer resulting in higher rates and additional fees. Schemes where administrative costs are not borne by the housing organisation (e.g. Estonia's Kred-Ex scheme, where the majority of administration is carried out by the lending bank) tend to have lower costs, which may make them more successful. A robust and thoroughly thought-through assessment mechanism for the scheme will also allow costs to be lower.

Becoming self-sustaining

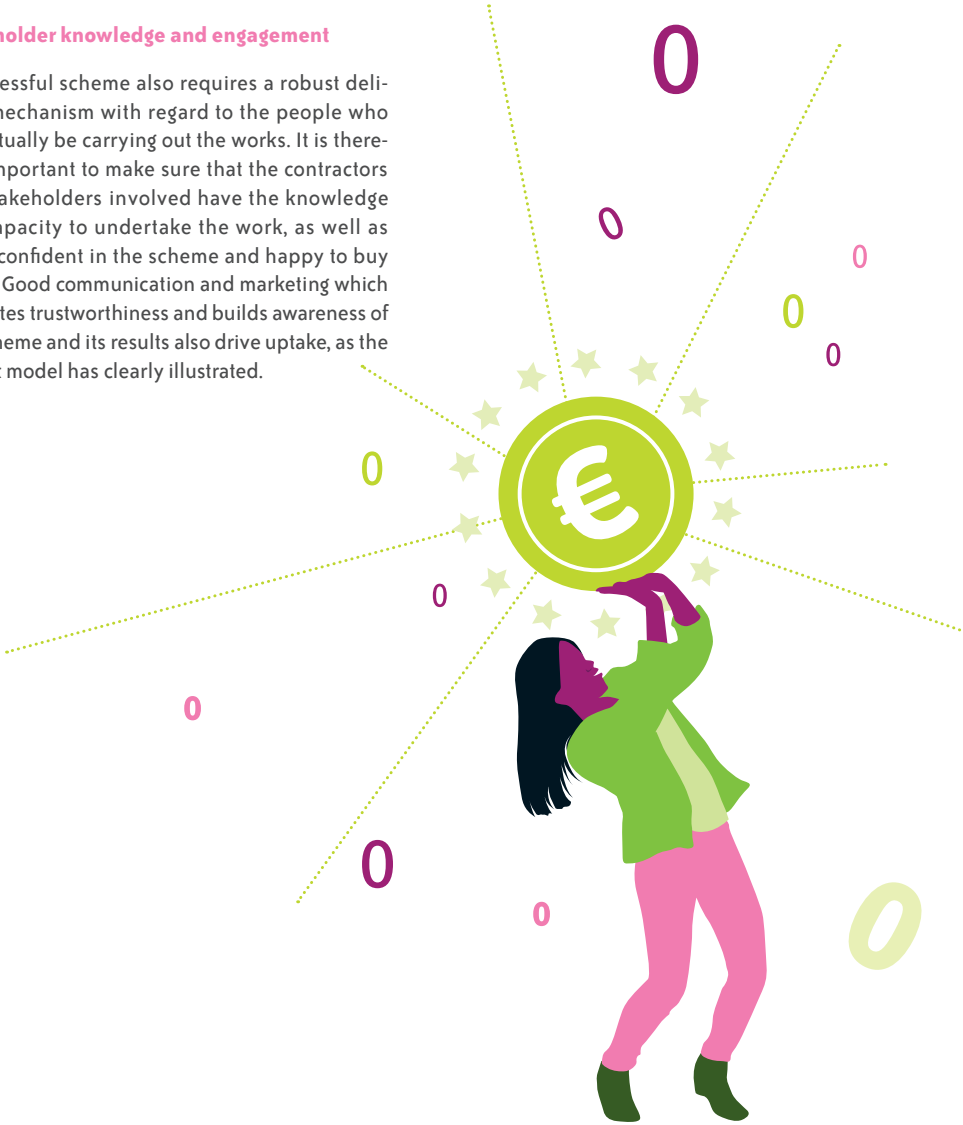
This is a significant hurdle for many financial mechanisms, as state or private funding is not ideal if the scheme is to become a long-term success. As seen with the British ECO model or the German KfW model, uncertainty regarding long term funding can cause problems with the uptake of the scheme as organisations are unsure about the future costs and implications. What has proven to be successful, as in the Estonian Kred-Ex model, is the use of a revolving fund, where savings generated are ploughed back into the model to be reused and thus generate further savings.

Legal issues

Any successful scheme should be supported by a well-planned and implemented framework which allows it to operate effectively. Planning requirements, building codes, property law and legal requirements for financial transactions can all have a detrimental impact on an energy efficiency model if not fully taken into account and if not appropriately adjusted.

Stakeholder knowledge and engagement

A successful scheme also requires a robust delivery mechanism with regard to the people who will actually be carrying out the works. It is therefore important to make sure that the contractors and stakeholders involved have the knowledge and capacity to undertake the work, as well as being confident in the scheme and happy to buy into it. Good communication and marketing which promotes trustworthiness and builds awareness of the scheme and its results also drive uptake, as the KredEx model has clearly illustrated.



SUCCESS STORY

Making efficient use of EU Funding

The POWER HOUSE nearly-Zero Energy Challenge project activities organised by EKYL, the Estonian Union of Co-operative Housing Associations, were integrated into EKYL's wider advocacy work for energy efficiency in apartment buildings. Therefore, the project has played an important role in discussions with key players and stakeholders about efficient usage of energy resources in Estonia.

At a national level EKYL actively participated in the preparation of the Estonian Development Plan for the Energy Sector 2030+, a strategic source document for developing the housing sector over the next few years and the future of energy consumption of buildings. The objectives and measures set out in the Development Plan serve as a basis for planning state budget resources and funding from the EU Cohesion Fund for 2014-2020.

The impact of the POWER HOUSE nZEC activities is mirrored in the content of the Estonian Operational Programme, where under the "energy efficiency" priority axis structural funds will be used to support the reconstruction of multi-apartment buildings and the improvement of the energy efficiency of the housing stock through renovation.

9 POWER HOUSE NZEC IN PICTURES

Cold/Continental TaskForce
Study Visit to Brussels

Debate on Decentralised
Energy Production in Brussels

Cold/Continental TaskForce
Study Visit to Vienna

Cold/Continental TaskForce
Study Visit to EnergieSprong

Warm/Med TaskForce
Study Visit to Barcelona

Financing TaskForce
Workshop in Brussels

Warm/Med TaskForce
Workshop in Madrid

Divided/Cooperative TaskForce
Study Visit to Milan

Warm/Med TaskForce
Study Visit to Pisa

Divided/Cooperative TaskForce
Study Visit to Tallinn

Cold/Continental TaskForce
Study Visit to Wiesbaden

Divided/Cooperative TaskForce
Workshop in Tallinn

Cold/Continental TaskForce
Workshop in Wiesbaden

Warm/Med TaskForce
Study Visit to Marseille

10 POWER HOUSE NZEC & THE SOLAR DECATHLON EUROPE

Having identified the challenges of balancing social and ecological goals towards nearly-Zero Energy Buildings, Housing Europe teamed up with Solar Decathlon Europe in order to tap into the inspiration and motivation of the world's best architectural schools in their quest to shape this focus on innovation within the public, cooperative and social housing sector.

What is Solar Decathlon?

Solar Decathlon is an international academic architectural competition that aims to improve education and research in the fields of sustainable architecture and solar energy.

Originally initiated by the U.S. Department of Energy in 2002, the competition is open to universities and institutions of higher education worldwide and gives students an opportunity to compete by meeting a challenge: to conceive, design and build a full-scale, entirely functional house, using only the sun as its power source. A European edition of the Solar Decathlon (SDE) now takes place every two years.

A strategic cooperation – Symposia and Awards

In 2012 and 2014, in Madrid and Versailles respectively, Housing Europe was among the major contributors to this ground-breaking international competition and exhibition, which leads the way toward sustainable living.

Two POWER HOUSE nZEC Symposia were part of the main programme:

The first one, in Madrid, focused on affordability and adaptability to ensure the future proofing of homes, taking into consideration social, environmental and economic impact.

The second one, in Versailles, was dedicated to the 'City of Tomorrow' and the role of affordable and social housing providers within it.

More information about both events
http://goo.gl/A6dPgC

On both occasions, a Team of Jurors, coordinated by Housing Europe, composed of high-level Housing Experts, evaluated the proposed projects and awarded the **"Housing Europe meets Solar Decathlon Europe Award"** to those that were considered more suitable for replication by Public, Cooperative and Social Housing providers from all across the EU, according to a series of criteria previously identified.

The Award aims to identify and recognise the ideal home for social housing which fulfils the following four criteria:

- **Adaptable and replicable in the social housing sector;**
- **With user-friendly energy efficient technologies;**
- **Affordability of operational expenses;**
- **A home that reflects the evolution of lifestyles and includes services for older adults.**

THE AFFORDABLE AND SOCIAL HOUSING AWARD 2012

Laureate: Canopéa Nano Towers, France

The winning Team selected by the Jury was Canopéa Nano Towers from the Rhone-Alpes region in France. The team aspired to provide a solution to the problems of densification in cities through Canopea, a habitat that combines the qualities of an individual house and the availability of urban services.

The assessment of the winning team pointed to affordability, mobility and adaptability to hot and cold climate as the reasons why this project was selected.

More information about the award, including special mentions for Mediterranean climates
http://goo.gl/aNNCc0

THE AFFORDABLE AND SOCIAL HOUSING AWARD 2014

Laureate: On Top, Germany

OnTop from Frankfurt, Germany introduced a symbiotic concept (Symbiont) that reinterprets roof shapes and builds quality housing spaces with solar solutions on top of existing buildings in a region where post-war architecture has resulted in many unused spaces. The symbiosis acts as an innovative and intelligent solution supporting the issues of demographic change and energy transformation.

More information about this award **http://goo.gl/XD2eis**

11 COOPERATION WITH OTHER NETWORKS AND INITIATIVES

The exchange of knowledge, expertise and best practices did not only take place among the POWER HOUSE nZEC partners but extended beyond the network to include external stakeholders. Housing Europe expanded the scope of the nearly-Zero Energy Challenge by establishing partnerships involving key EU players, such as:

The **BUILD-UP initiative**

POWER HOUSE nZEC project-related articles were presented in the "Sustainable Public, Cooperative and Social Housing Community" which Housing Europe manages.
www.buildup.eu/communities/sustainablehousing

The **Covenant of Mayors initiative**

The "Covenant of Mayors Partnership Declaration" was signed in October 2011.
www.eumayors.eu/about/associated-partners_en.html

The **Coalition for Energy Savings**

Inputs from the POWER HOUSE nZEC were fed into the discussion within the group.
www.energycoalition.eu

The **EPBD Concerted Action**

Project findings were shared at events and roundtables organised by this EU initiative to contribute to an evidence-based policy debate.
www.epbd-ca.eu

The **UNECE Committee on Housing & Land Management**

POWER HOUSE nZEC representatives were regularly invited to attend the workshops in order to provide the perspective of the Public, Cooperative and Social Housing sector.

www.unece.org/leginstr/hlm.html

The **Energy Efficiency Financial Institutions Group (EEFIG)**

Housing Europe joined this permanent expert group on energy efficiency financing established by the European Commission DG Energy and the UNEP Finance Initiative in October 2013.

www.unepfi.org

The **UNEP Sustainable Consumption and Production Clearinghouse**

Publications and key findings of the POWER HOUSE nZEC project are made available on the SCP website.

www.scpclearinghouse.org/scp-initiatives/687-power-house-nearly-zero-energy-challenge.html

Climate-KIC

Housing Europe has applied to become a member of this initiative to work on the topic area "The Built Environment"; the application is currently under evaluation.

www.climate-kic.org

Other relevant projects and programmes

"Plug-in to POWER HOUSE" works as an on-line hub for further networking with relevant projects and initiatives across the EU.

www.powerhouseeurope.eu/plug_in_to_power_house/policy_support

12 KEY FINDINGS

1. Housing associations can retrofit at scale

With 70% of Europe's 2050 housing stock already built, any attempt to deliver energy efficiency must look at retrofit. However, individual homeowners do not represent a market large enough to develop retrofit technology at scale. Housing associations with their large stock portfolios, either individually or in partnership with others, are best placed to make retrofit happen.

2. A flexible approach to the level of energy performance is the guarantee for success

The final achievable level of retrofit varies widely across the models discussed. Some of the most successful models – KredEx and KfW for example – offer a sliding scale of grant or subsidy which is linked to the final energy performance level achieved. In new housing projects, both for very low energy buildings and passive houses, extra costs of construction for additional insulation and ventilation with heat exchange account for a total of 6.7% for small buildings and 9.7% for large (compact) buildings, and cannot be compensated by energy savings in the long run. Between Very low energy vs. Passive buildings differences in consumption are very small; we should take cost implications into consideration when defining the optimal level of nearly-Zero Energy Buildings. Measuring actual savings rather than predicted savings may be an important factor in the overall success of a scheme. The need for flexibility for Member States to meet the goals in different ways while ensuring affordability is vital.

3. Cost optimality is a relative concept

Some parameters used to calculate cost-optimal levels are not easy to predict (future primary energy factors, cost development, price trends, performance of new technologies). There are some competition factors between different technical components of energy efficient buildings: insulation vs. heating and ventilation technologies vs. renewable systems (heat pumps, solar plants, PV); the calibration between these components is challenging and definitely not only subject to expert calculations but also a matter of competition between different stakeholders in the energy services sector including energy providers.

4. Projects and funding must be brought together – role of intermediaries

Simple, sustainable and reliable financing schemes tailor-made for Public, Cooperative and Social Housing companies are essential in order to gather the initial capital required for deep renovation projects. Loans must be available to complete the subsidy part of the financing scheme, possibly all integrated in the same mechanism. Having seen the issues at stake, qualified support could be required from third parties (such as sectorial association and energy agencies), to support the condominium to start the process and meet the right project partners.

5. Quality assurance is needed for the housing organisations and for the tenants

Training and certification of building professionals is essential to deliver at anything beyond demonstration scale. 'nearly-Zero' is an innovation technology and as such requires the right skills to guarantee its delivery. There is a market for companies involved in the maintenance of systems that have detailed operations within a certain price range, especially in the field of tertiary buildings. In the residential sector, particularly in Social Housing, it is necessary to develop specific maintenance programmes for nZEB. Guidelines should be produced on this topic to help technicians with ordinary programmed maintenance operations as well as with preventive maintenance to avoid damage, over-consumption or even total system failure. Supporting tenants and residents to make best use of the refurbished dwellings is crucial. Residents must be able to understand the technology used in their home and feel comfortable making decisions about the house.

13 RECOMMENDATIONS TO EU POLICY MAKERS

The project has come to interesting, if not surprising, conclusions. The social, cooperative and public housing sector is a key partner within the EU's priority of working towards a low-carbon economy. However, it is important to remember that progress towards energy efficiency is moving at different speeds and subject to very different political, fiscal, sociological and geographic conditions across countries. Success is linked to the capacity of regions, cities and countries to put in place the right mix of ingredients: (I) adequate involvement of residents in the programme design and implementation. (II) easy and cheap access to funding (III) efficient and integrated technological solutions.

1 Housing renovation to reduce energy consumption and bills is an integrated part of effective neighbourhood, city or region-wide energy transition planning. This must be seen in the context of job creation, therefore reducing the social and economic costs related to unemployment, the burden of which is felt by the whole neighbourhood, city, region and country. This also links directly into reducing fuel poverty and its health impacts, the cost of which is transferred to health services, empowering citizens financially by increasing purchasing power and through the increased comfort which is often one of the most important demand-side considerations. This is also very closely linked to the cost of energy saving measures. Energy efficient refurbishment should not result in increasing rents to levels that residents can no longer afford, forcing them to leave their homes.

There are also limitations to the effect of smart devices on consumption reduction which must be evaluated and taken into account. The housing organisations are doing a lot to make energy use effective but it is also based on the behaviour of the people living in the buildings. In order to make energy consumption lower and make the future energy market possible, we need to include the tenants, we need neutral information and training.

European Structural and Investment Funds (European Regional Development Fund and the European Social Fund), ERASMUS + and Horizon 2020 programmes should be used to support local energy communities and a potential wide range of activities (financing and installation of local energy production capacities linked to social housing providers, training of residents and unemployed tenants to help them contribute to the low-carbon economy.

2 While there is huge potential for energy efficiency gains in buildings, the measures needed are not always cost effective for housing providers – even over the long term. We need to ensure that the renovation of housing will be among the projects eligible to apply for various types of EU funding. Such projects require long term and low-cost capital financing, thus public support in one form or another. A clear obstacle is the long payback time on investment, reducing the interest of private investors or energy service contractors and resulting in a tendency to implement only superficial measures offering short-term returns. What we need is a subsidy covering the gap between energy efficiency measures that are profitable for the housing company in the long run and the climate goals, a guarantee that energy savings not covered by up-front costs and energy production made over the lifetime of the project are covered by subsidies. Key to success will be the guarantee for affordability for residents.

3 Widespread mature technologies and simple systems are generally preferred, since complex systems require more maintenance and have higher running costs. It is important to monitor the performance of RES used to avoid malfunctioning and explain to owners and tenants how to operate and make the most out of the devices installed. Besides, new technologies such as Off-site manufacturing are needed to build new homes, while retrofit has focused more on incremental improvements to existing properties. The Dutch EnergieSprong (literally, energy jump) system changes this by delivering retrofit in one off-site manufactured package. It recognises that, from a property management perspective, you want to refurbish a building only once every three decades rather than in small steps over many years. As the retrofit principally adds a new building envelope to the existing structure it can take place in a week and without residents needing to leave their home.

The discussion on the Energy Union (in particular the review of the EPBD and EED) must take those elements into accounts and the EU must promote those promising approaches if it wants to succeed in achieving a fair energy transition.

Marco Corradi

Chair of the POWER HOUSE nZEC! initiative

POWER HOUSE NEARLY-ZERO ENERGY CHALLENGE PARTNERS ARE:

Housing Europe
The Federation of Public Cooperative & Social Housing, Belgium
www.housingeurope.eu

AVS
Spanish Association of Public Social Housing and Land Providers, Spain
www.promotorespublicos.org

BHSF
Building and Social Housing Foundation, UK
www.bshf.org

CAC
Union of Homeowners Associations, Bulgaria
www.cac-bg.org

CasaQualità
National Consortium CasaQualità, Italy
www.casaqualita.it

e7
Energy Market Analysis, Austria
www.e-sieben.at

EKYL
Estonian Union of Co-operative Housing Associations, Estonia
www.ekyl.ee

Federcasa

Italian Public Housing Federation, Italy

www.federcasa.it

GbV

Austrian Federation of Limited profit Housing Associations, Austria

www.gbv.at

GdW

Federal Union of German Housing and Real Estate Associations, Germany

www.gdw.de

Legacoop Abitanti

National Federation of Housing Cooperatives, Italy

www.legacoop.coop

NHF

National Housing Federation, UK

www.housing.org.uk

SABO

Swedish Association of Municipal Housing Companies, Sweden

www.sabo.se

USH

French Federation of Social Housing Providers, France

www.union-habitat.org

VMSW

Flemish Agency for Social Housing, Belgium

www.vmsw.be

HOUSING EUROPE - The European Federation of Public, Cooperative and Social Housing

Established in 1988, Housing Europe is a network of 42 national and regional federations which together gather about 43,000 public, social and cooperative housing providers in 22 countries. Altogether they manage over 26 million homes, about 11% of existing dwellings in the EU.

Social, public and co-operative housing providers have a vision of a Europe which provides access to decent and affordable housing for all in communities which are socially, economically and environmentally sustainable and where everyone is enabled to reach their full potential.

HOUSING EUROPE

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Twitter: @HousingEurope

www.powerhouseeurope.eu