Webinar: The Nearly Zero Energy Challenge for Housing providers and cities

4 November 2014

Europe - Delivery vs Need

- €25,800,000,000 = Annual Shortfall of investment

Cost & Affordability

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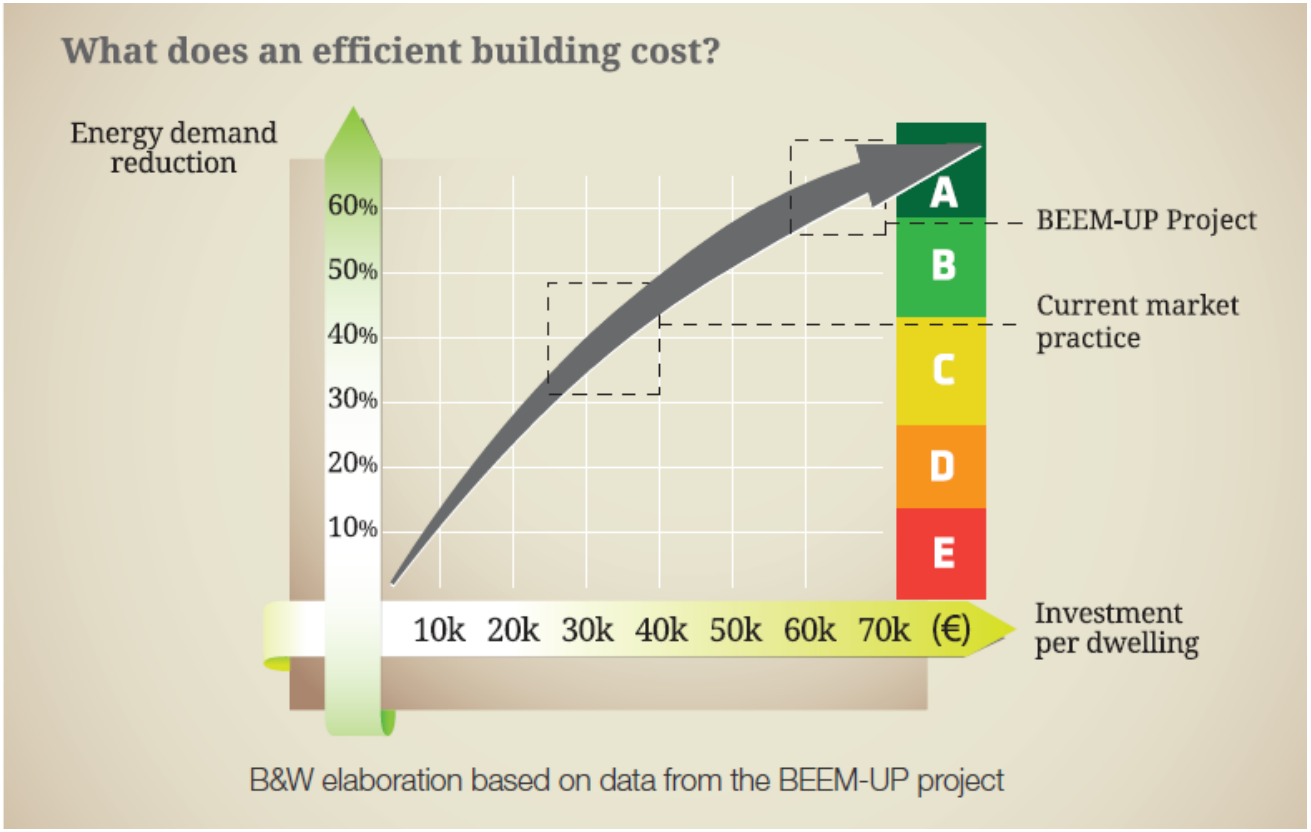
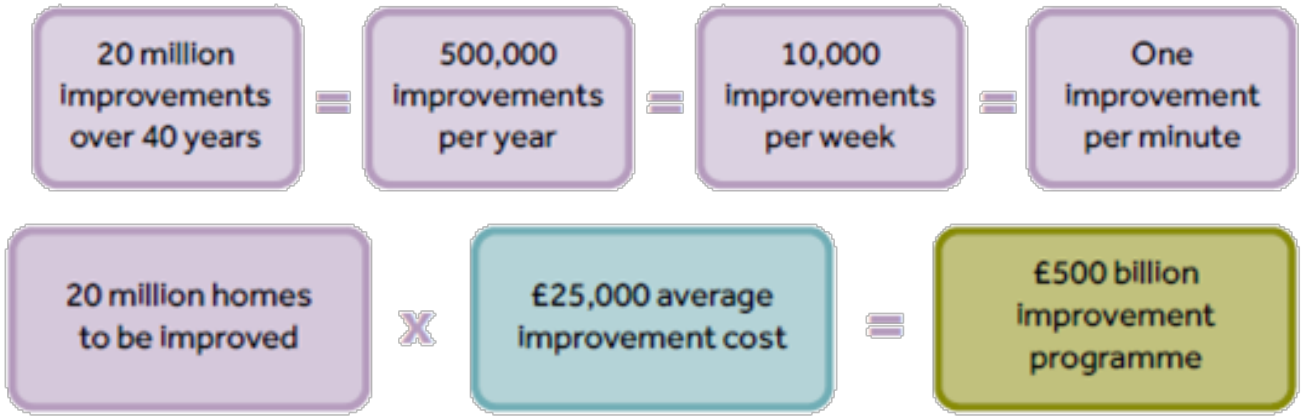


What this means at a national level



Institute for Sustainability: Technology Strategy Board (2011). Introduction to the low carbon domestic retrofit guides. Edition 1. September 2011

- Social housing sector accounts for some 18% of total housing stock
- 80% of 2050's housing stock already built
- 1.4 million social homes classified as hard-to-treat, requiring more complex and expensive measure to improve their energy efficiency
- 600,000 English social households are in fuel poverty

➢ **Cost of retrofitting social housing stock estimated at around £80-100bn (equals £2.3bn pa to 2050)**

Powerhouse:
Nearly Zero Energy Challenge

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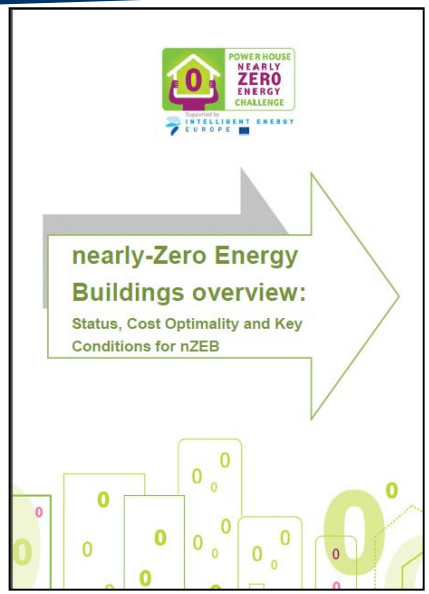
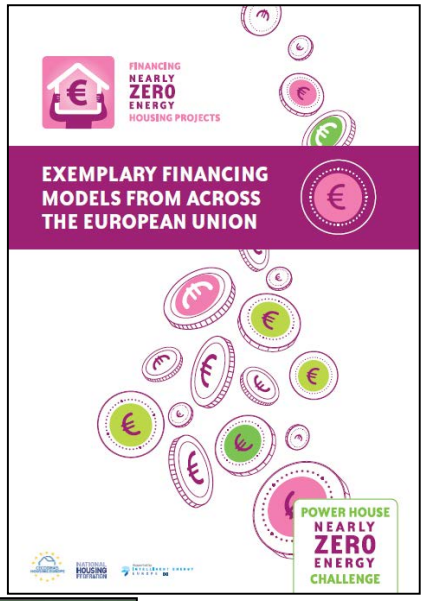
NEARLY ZERO ENERGY HOUSING FOR WARM/MEDITERRANEAN CLIMATE ZONES

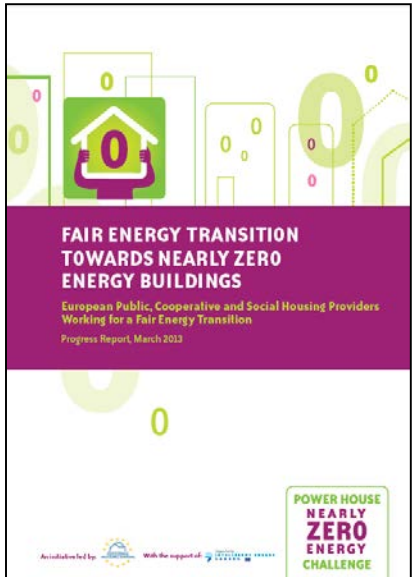
NEARLY ZERO ENERGY HOUSING FOR COLD/CONTINENTAL CLIMATE ZONES

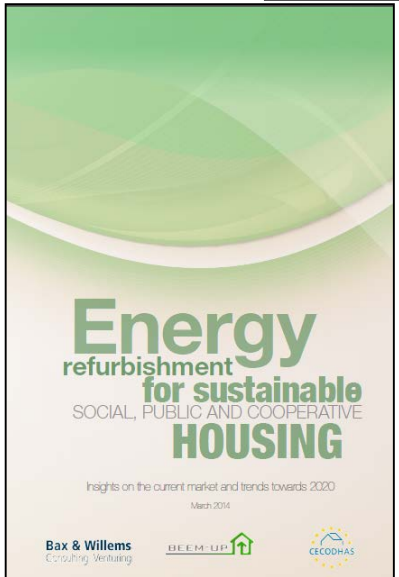
NEARLY ZERO ENERGY HOUSING IN DIVIDED OWNERSHIP

FINANCING NEARLY ZERO ENERGY HOUSING PROJECTS









The Problem

A survey of the social housing providers in ten member states identified five key types of barriers in delivering new build and retrofit to nearly Zero Energy Building standards.

1) **Economic and Financial** – the lack of access to available and affordable finance to carry out new construction or retrofit existing stock to meeting nearly-zero standards is a major barrier.
2) **Technical** – there is still a major lack of skills and expertise throughout the construction sector as well as uncertainty as to how new technologies perform.
3) **Credibility** – lack of mainstream examples of good practice and robust data from nearly-zero homes has fostered an atmosphere of confusion and misinformation
4) **Social and Organisational** – there needs to be recognition that saving energy is not simply a technical issue, but also depends on the lifestyle of residents and correct stock management
5) **Legislative** – the lack of definition of nearly-zero energy buildings, a lack of policy coherence and legal structures to address energy retrofit where there is a divided ownership are all key issues to be addressed.

Traditional Funding

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The European Investment Bank (EIB)

European Local Energy Assistance Facility (ELENA)

The European Bank for Reconstruction and Development (EBRD)

European Energy Efficiency Fund (EEE-F)

Powerhouse:
Nearly Zero Energy Challenge

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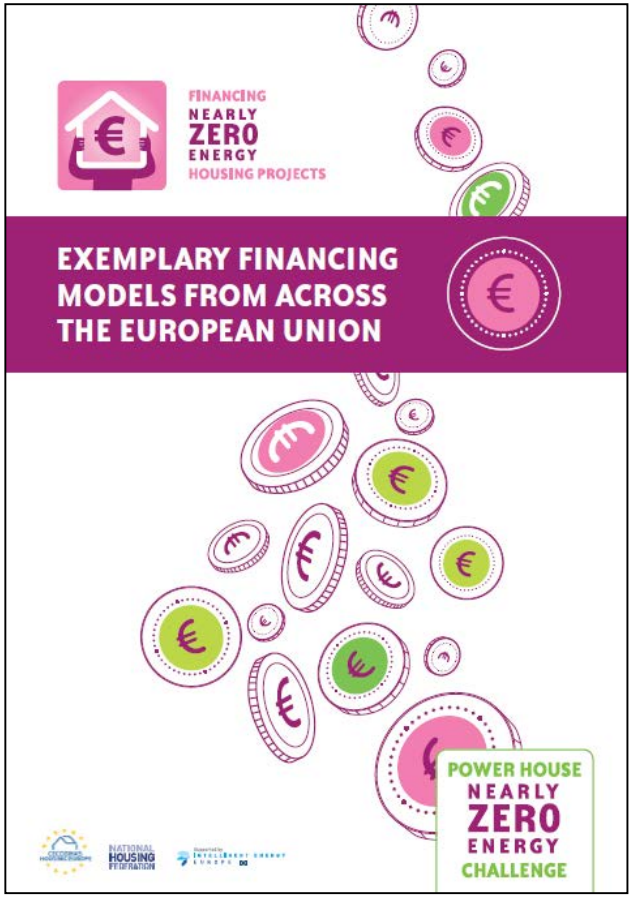

National Innovative Financial Models

- Enhanced Loans
  - Pro: Low interest government backed capital
  - Con: Subject to changes in government
- Pay as you save (PAYS)
  - Pro: Self financing
  - Con: Saving often fails to cover real cost
- Guarantee Programmes
  - Pro: spreads credit risk of investment
  - Con: Lack of good quality data
- Energy service companies (ESCO's)
  - Pro: Guarantees a fixed return
  - Con: Lack of good quality data

Think Strategically

Renewable Energy

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- UK's largest Social Housing renewable contract worth £600m
- 75,000 homes (one million photovoltaic panels)
- Taking tenants out of fuel poverty
- Significantly reducing the carbon footprint of stock
- Creating sustainable and prosperous communities
- Generating new revenue to help fund future asset investment
- Incorporates wide energy efficiency measure to benefit all

Count Us In

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"I sometimes have the impression that low energy housing engineers feel that people should stay outside, so that they do not interfere with the perfect energy-efficient house they have created," Ralf Protz, Kompetenzzentrum

The pilots

Trafford Housing Trust

1960s tower blocks undergoing retrofit, including a new communal heating system.

Main techniques

- Home advice visits
- Illustrated top-tips guide
- Community events
- Tenant energy champions

"Residents became more comfortable in their homes, sometimes at the expense of energy consumption. Overall, households were low energy users.

The disruption caused by the major retrofit works made engaging residents challenging."

Yorkshire Housing

A mix of housing types including off-gas houses, new build, and homes recently fitted with heat pumps.

Main techniques

- Home advice visits
- Personal action plans
- Feedback on consumption
- Advice leaflets and calendar

"Different customers favoured different engagement techniques. Trusted messengers such as neighbourhood wardens play a crucial champion role.

Positive experiences with recent retrofit works provided a good basis for engagement. However, poor experiences with air source heat pumps put some off."

Helena Partnerships

1960s and 1970s houses and bungalows across St Helens.

Main techniques

- Smart meter with in-home display
- Home advice visits
- Workshops
- Quarterly information leaflets

"Residents became more confident using their heating efficiently.

Personal contact was the most effective way to engage. Smart meters were also popular, though negative experiences with installation put some residents off."

Shepherds Bush Housing Group

Victorian street-based properties across West London.

Main techniques

- Smart meters with in-home display.
- All engagement was delivered virtually, through an online social networking platform.

"The design and functionality of the social networking platform is crucial. Using an existing network or combining it with other online services and activities may generate more use than our stand-alone platform did."

Aspire Housing

1960s and 1970s bungalows in two sheltered housing schemes, including one retrofitted with heat pumps and photovoltaic panels (PV).

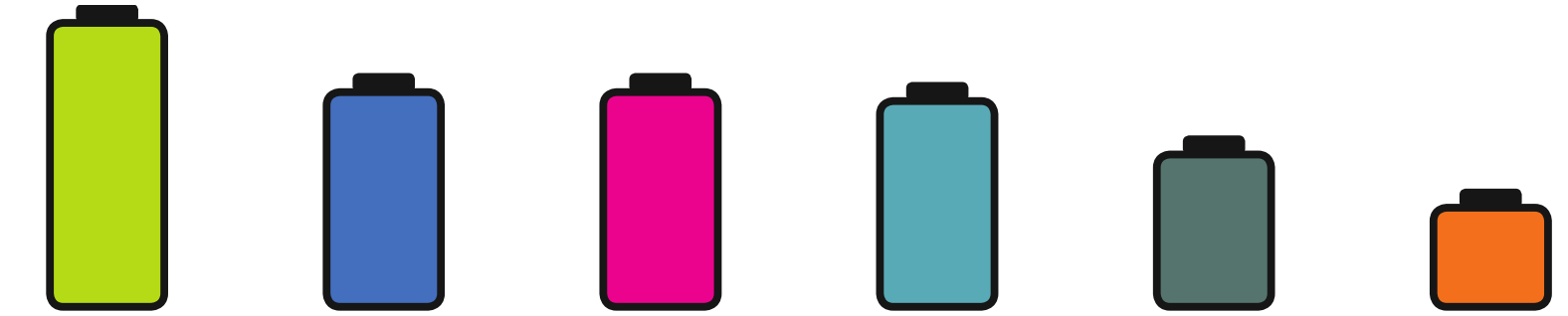
Main techniques

- Home advice visits
- Communal events
- Top-tips leaflet

"To avoid under-heating, residents adopted a zonal approach to controlling temperature and off-set their consumption by better using the free electricity from the PV.

Continual reinforcement of simple messages worked best. Involving scheme managers was key to getting buy-in and maintaining engagement."

Energy use



National average
19,800 kWh

Shepherds Bush Housing group
13,900 kWh

Aspire Housing
13,400 kWh

Helena Partnerships
13,100 kWh

Yorkshire Housing
11,700 kWh

Trafford Housing Trust
6,200 kWh

- There was large variation in consumption levels across households.
- Many participants were already low energy users, limiting the scope for further savings. Others were limited by health conditions.
- Because of the higher cost of electricity compared to gas, relatively small changes in appliance use will have a bigger impact on bills, helping to offset the cost of heating.

Changes in behaviour

Behaviour Change

75%

of participants reported making at least one change in their behaviour during the pilot.

Appliance Use

51%

of households made at least one change to their appliance use.

- For some, changes took time to embed, whilst for others early changes made reversed towards the end of the pilot. This suggests the need for ongoing prompts around appliance use.

Heating habits

49%

of households made at least one change to their heating habits.

- Participants were better able to control how they heated their homes.
- Rates of under-heating more than halved.

Success factors

- Engagement should not take a one-size-fits-all approach as different participants favoured different techniques.
- How a technique was delivered was key to it effectiveness.
- Key success factors included:

One-to-one engagement with households was most effective.

Engaging with all members of a household.

Coordinating engagement by neighbourhood or scheme.

Locally-based staff such as wardens helped to overcome apathy or scepticism.

Energiesprong

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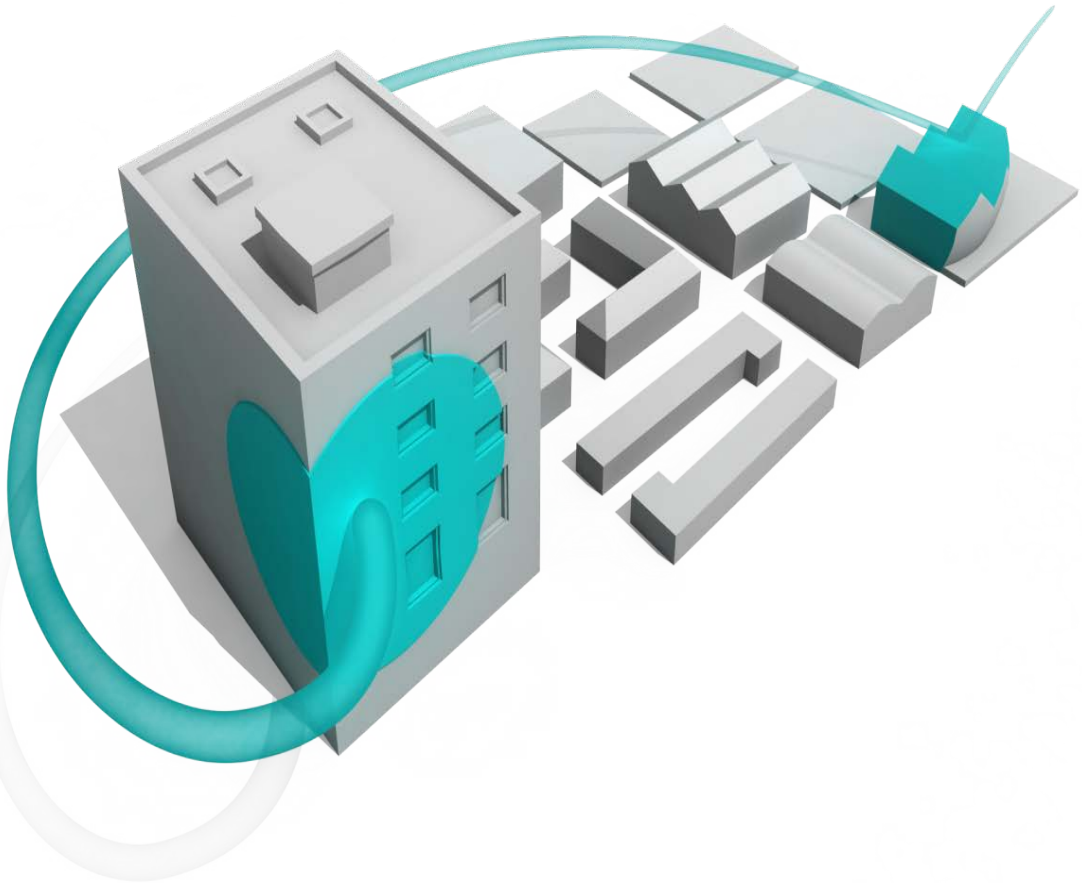

Parameters for Success

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1		Energy performance guarantee. The E=0 refurbishment package needs to come with a long year (i.e. 30) energy performance warranty on the house. This can only work if an insurer backs it.
2		One-week delivery. The installment of the packaged should not require more than one week and allow occupants to continue living in the house for the greater part of the works
3		Affordability. The ability to finance an investment requires a business case. This implies the investment (largely) needs to be paid for by the resulting energy cost savings. The net present value of the energy cost savings over the lifetime of the package therefore sets the price target.
4		Attractiveness. The refurbishment packages need to be attractive to occupants. It needs to improve quality of life and the appearance of the house. In order to bring this about, products must be made desirable, given the appearance of being easy and fun, which is not how construction companies currently sell refurbishment products.

The Approach

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Industrialisation of construction
Off-site manufacturing solutions

From custom, project-based craftsmanship

To

Industrial product, quality / sales and delivery processes with a fully integrated supply chain

What does it look like?

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The Financial Model

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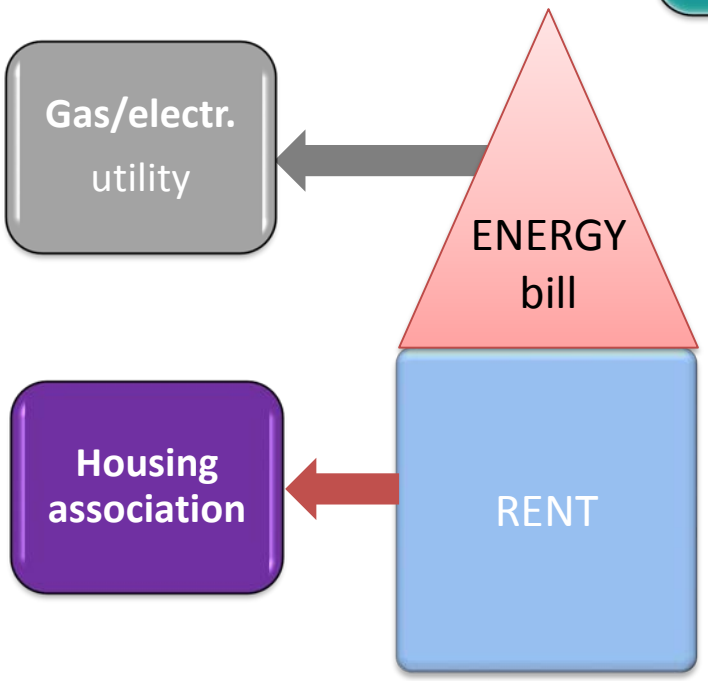
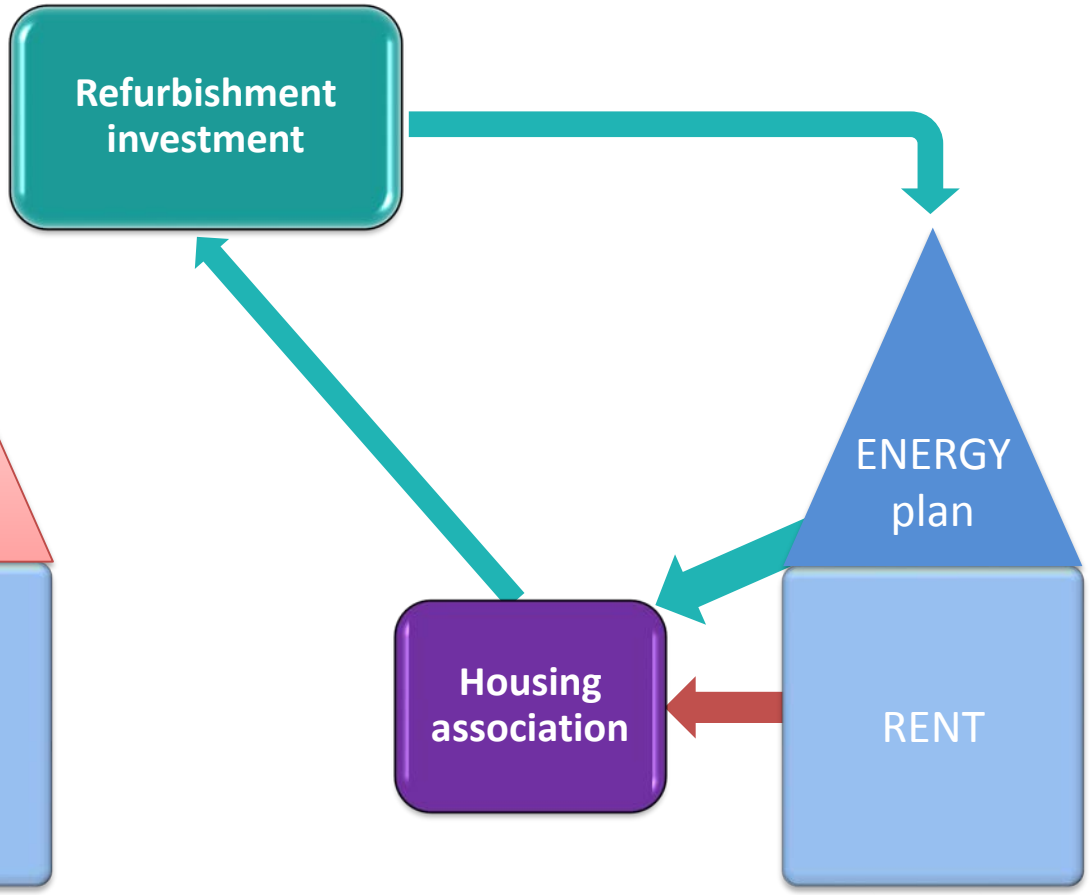
Before refurbishment



After refurbishment



Ambition Delivered

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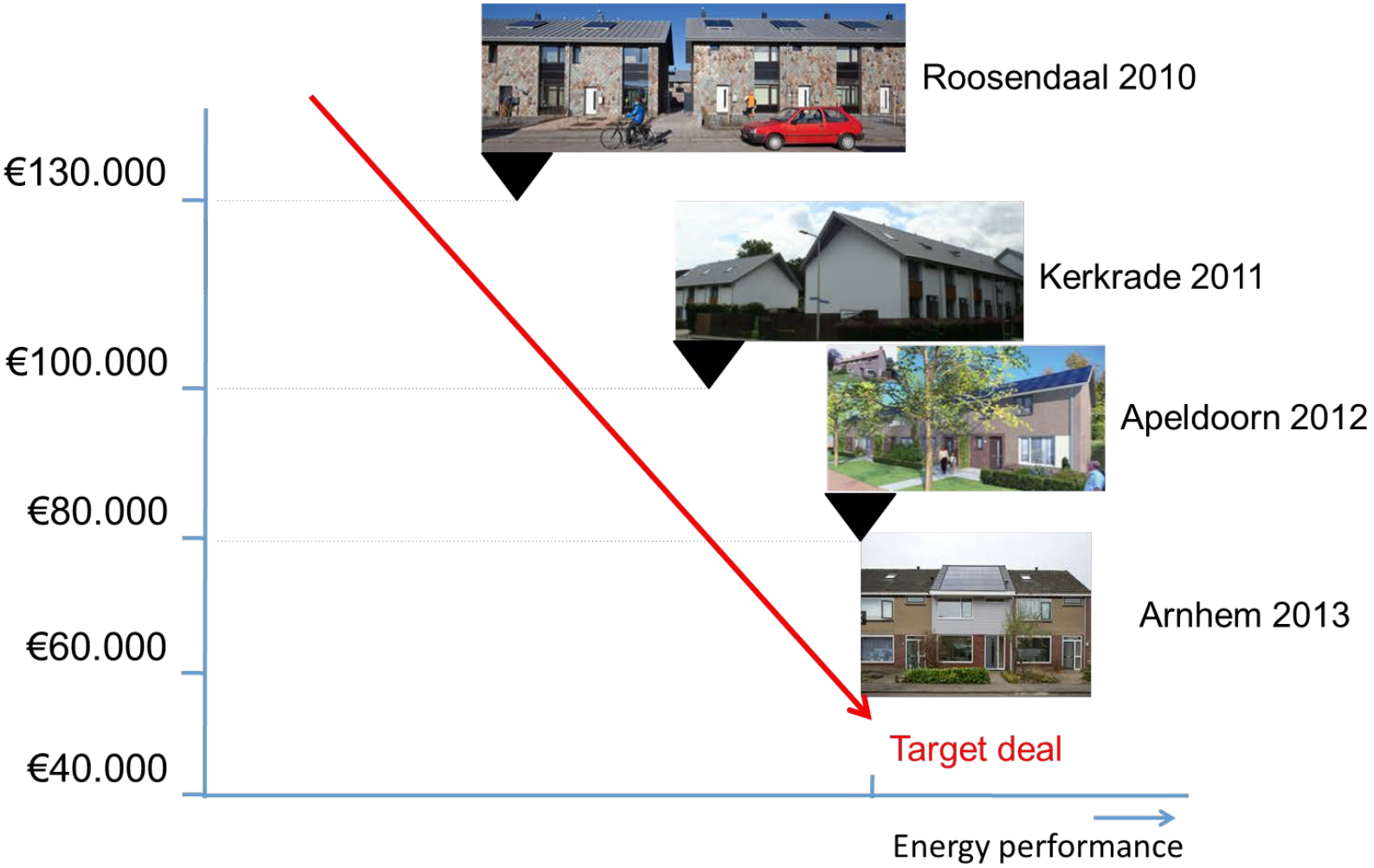

Can we try it?

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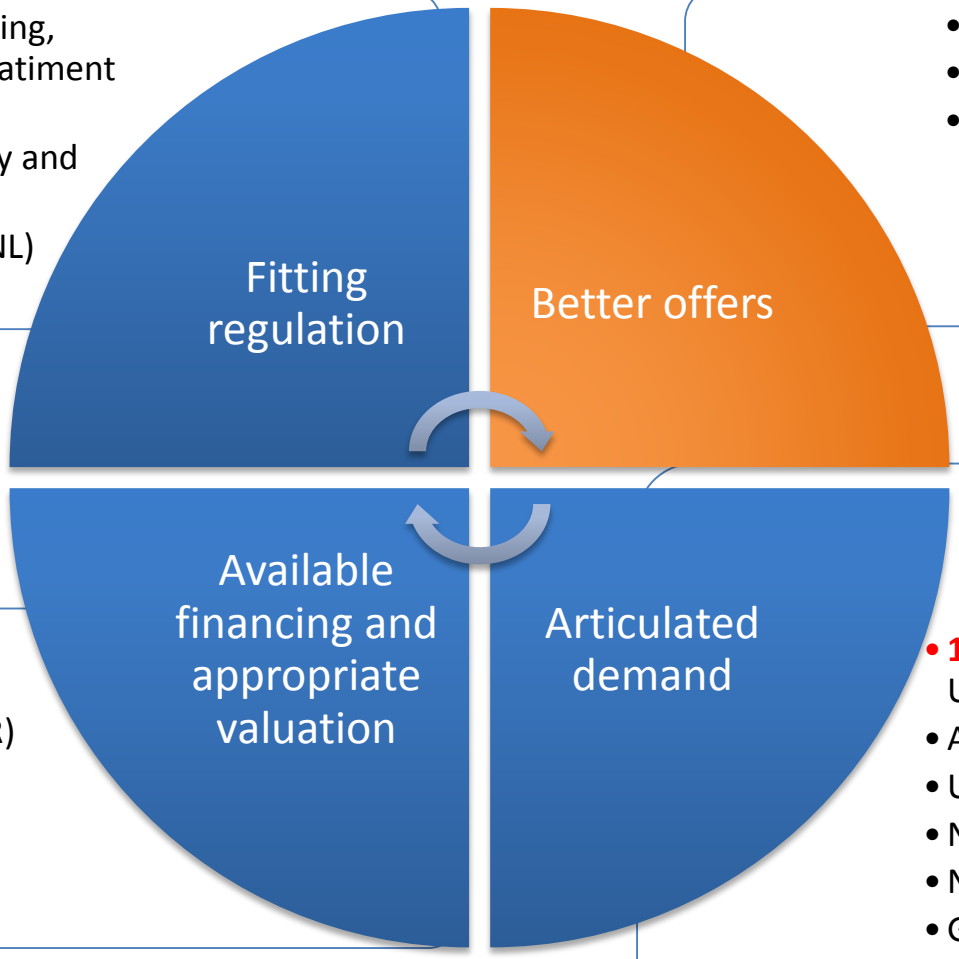
Transition Zero: a European Horizon 2020 bid

- French Ministry Housing, ADAME, CSTB, Plan Batiment Durable (FR)
- Department of Energy and Climate Change (UK)
- Ministry of Interior (NL)



- Construction companies
- Material suppliers
- Retailers

Accord Group
Affinity Sutton
Gentoo
Moat
Orbit

- Caisse de Depots (FR)
- THFC (UK)
- WSW (NL)

- **17** social housing associations in UK, FR and NL
- Aedes (NL)
- USH (FR)
- NHF (UK)
- NF ALMO (UK)
- GLA – RE:NEW (UK)
- CECODHAS – Housing Europe

Many thanks

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The Problem 2

- EIB should complement local schemes
- Ever increasing norms and standards result in higher prices (passiv Haus Premium) but what we want to achieve is affordability
- Need market to come up with an answer to our needs
- Some rennovation in Germany (fair energy transition) has priced people out of their houses
- 1 in 10 social housing residents in the UK in fuel poverty
- Key to the fair energy transition is affordability – it must not price people out of their homes
- 2% of the Belgian energy market is energy co-ops
- Local variation eg Spain taxes local renewable energy