

Constructing Excellence Midlands Decarbonising Existing Stock

 **mi-space**
creating communities

 **CONSTRUCTING
EXCELLENCE
Midlands**



- Case / Need For Change
- The Proposal
- Technology
- Next Steps

<https://youtu.be/xk9dE>





UN 
environment

The Case For Change

- **Climate Change Act 2008 Set Out Commitment to reduce carbon emissions**
- **Decarbonised Electricity Production Complete**
- **By 2017 Carbon emissions reduced to levels from 1890's**
- **Clean Growth Strategy (2017) Sets out how UK Gov will achieve carbon budgets (2023-2027 & 2028-2032)**
- **By 2050 Homes will need to be nearly Zero Energy Building (nZEB)**
- **Majority of Local Councils Now declared a Climate Emergency**
- **Welsh Government: Decarbonisation of social housing by 2030**
- **In 2016 12% of households in England in Fuel Poverty**

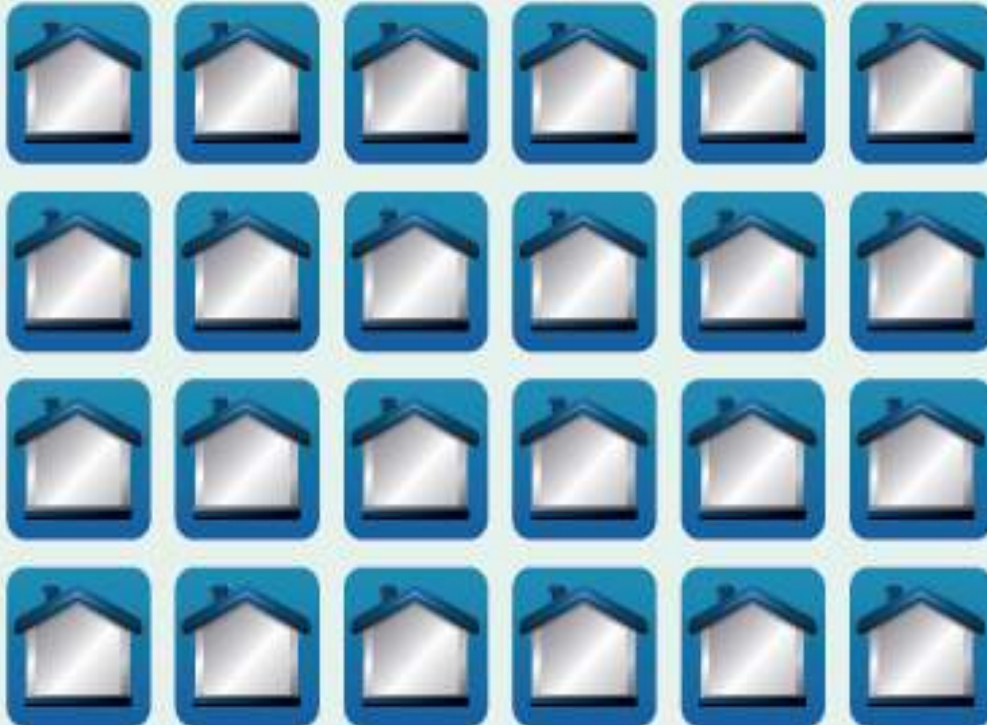
The Case For Change

Housing stock in 2050



5 million new build

Opportunity to address energy demand through building regulations



24 million buildings

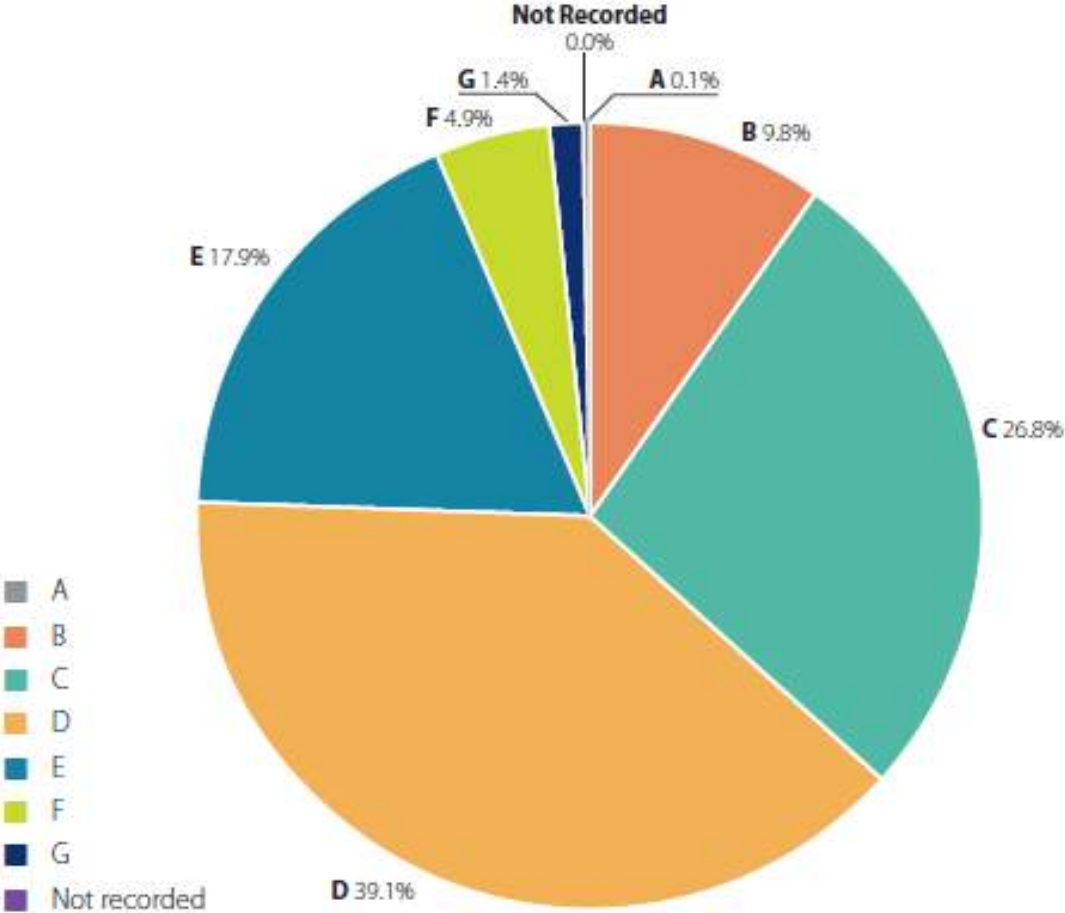
These buildings are already built. They must be retrofitted by 2050 to achieve zero energy

The Case For Change

- New homes are a long way short of nearly Zero Energy Building (nZEB)
- 30% of energy use is domestic.
- Focus on electrification of heat & hot water
- Security of supply: UK now a net importer of gas
- By 2050 All Homes will need to be nZEB to meet Carbon Budget
- In Wales all 250,000 social housing units to be EPC A rated and a SAP of 90 by 2030.
- Government committed to carbon reduction as part of their manifesto.

Current Stock Energy Performance

Domestic EPC ratings in England 2017 (70% of total stock)



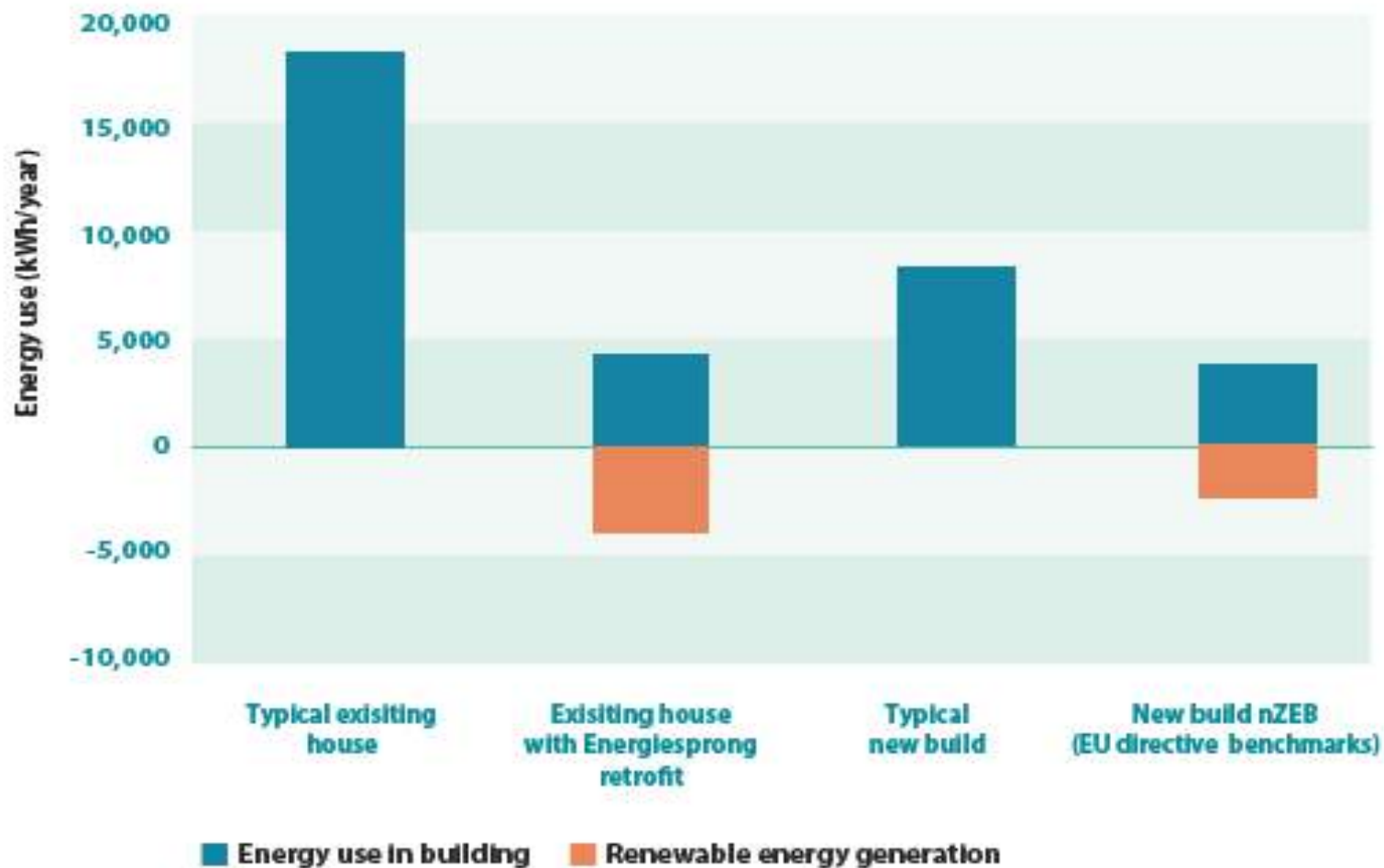
Case Study: ZEBCat

- Zero Energy Buildings Catalyst Programme (ZEBCat)
- 3 Year ERDF Joint Funded Programme
- Stimulation of Supply Chain To Adopt Energiesprong Principals
- Led By Devon County Council Supported By Regen SW
- 3 Registered Providers:
 - Exeter City Council
 - North Devon Homes
 - Sanctuary
- Phase One: 16 Property Programme
Phase Two: Potentially 100+ Property Programme

What is ZEBCat / Energiesprong: Principal

- Improved Insulation: Fabric First
- Off Site Manufacture
- Micro Generation & Storage
- Low Carbon Heat & Hot Water Generation
- Heat Recovery
- Creating A Nearly Net Zero Home (nZEB)
- Minimal Time On Site
- Utilising Savings To Pay CAPEX

How does an nZEB compare?





Add mono pitch roof and
Extend gable wall

Insulate roof

Apply 'Mauer' modular EWI system

Replace windows and doors

Replace canopy

Install individual MVHR

Insulate floor

Service pod
(heat pump, thermal store and battery)

Black in-roof PV system



Proposed





Energie
Sprong
uk

- Removing hipped roof
- Offsite EWI wrap
- Shared Ground Source Heat Pump
- Roof Integrated PV



Developing Concept



Developing Concept



Developing Concept: Wall Panels



MAUER



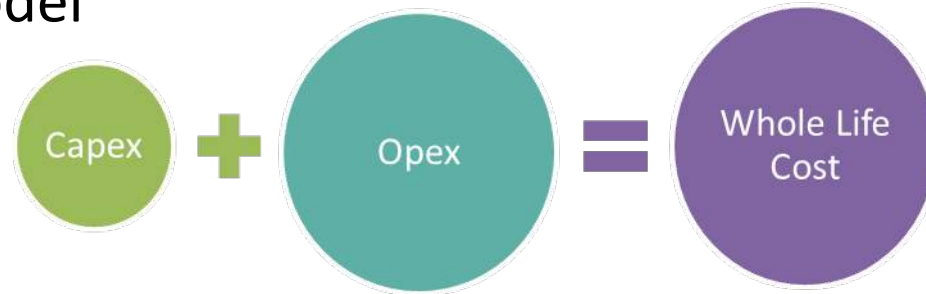
Energiesprong Concept

- 30 Year Warranty & O&M
- Guaranteed Energy Performance / Cost
- Local Offsite Manufacturing Facilities
- Assessment & Reduction of Embodied Carbon
- Focus on Carbon Neutral Production
- Comfort Plan

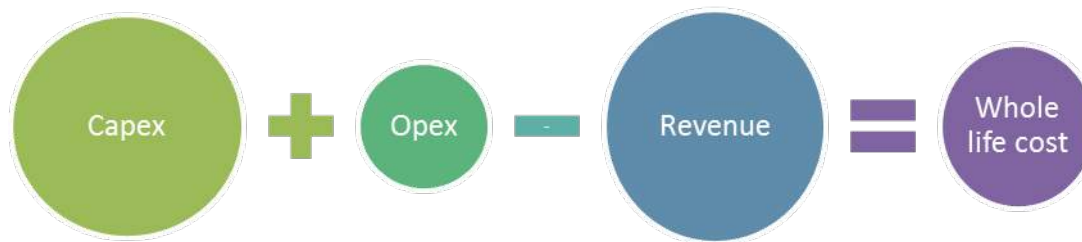
Commercial Model

- Increased CAPEX
- Reduced / Zero Operating Costs
- Capital Replacement Savings & Repairs Savings
- Revenue / Income RHI / Fit / Export
- Revenue / Income: Comfort Charge
- Future Proofed Stock (Decent Homes 2)
- Increased Asset Value

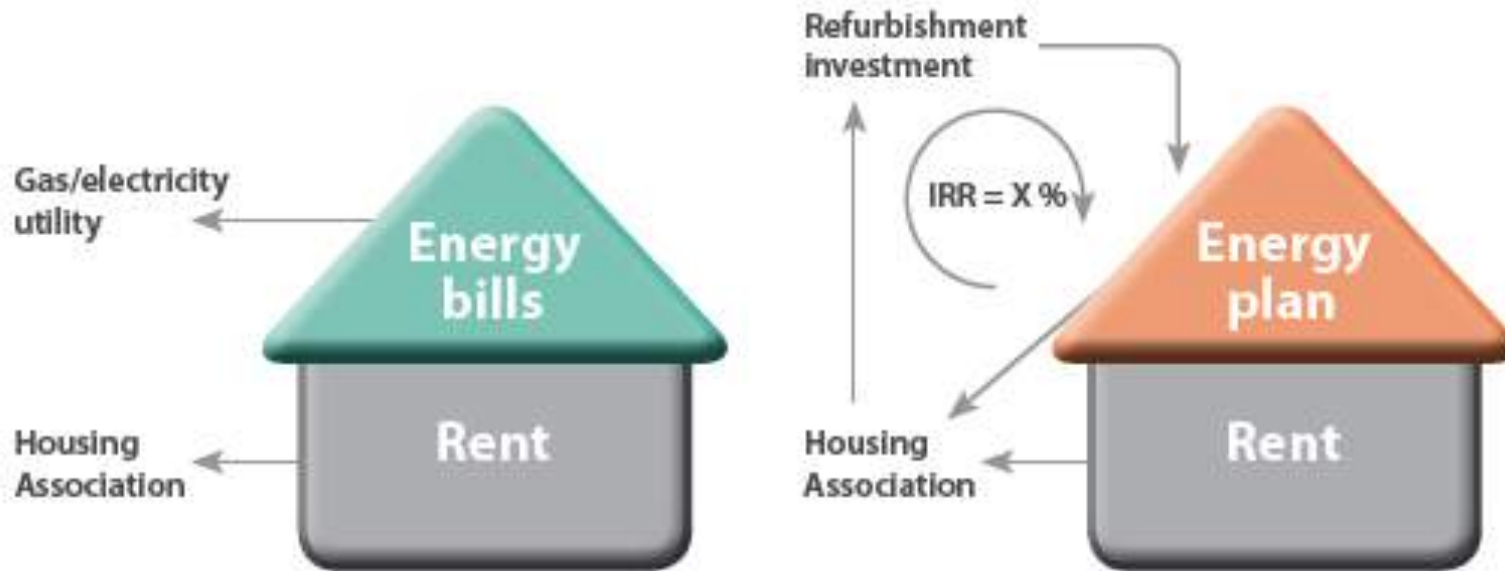
Traditional model



Alternative model



Resident Proposal



Next Steps

- Design Development
 - Monitor energy consumption
 - Monitor behaviour
 - Track the benefits
- Artificial Intelligence
 - Machine learning
 - Resident algorithm
- Technology
 - Integration
 - Combination
 - Long term storage
- Off site
 - Energy enclosures
 - cladding
 - Delivery
 - Volume



Conclusions

- Significant programmes need to start now
- Stock owners need to develop a nZEB strategy
- Volume = Efficiency
- VAT needs to be reduced to 5% or less
- Legislation (Decent Homes 2 / Better Homes, Better Wales Better World) needs implementation.
- Need to solve the funding gap
- We must end Fuel Poverty



ZEBCat
Delivering net
zero energy
homes in
Devon.
2017-2020