

Agenda

- Case / Need For Change
- Scale of the Challenge
- What is ZEBCat
- The Proposal / Solution
- Technology



What is ZEBCat

- Zero Energy Buildings Catalyst Programme (ZEBCat)
- 3 Year ERDF R&D Joint Funded Programme
- Stimulate Supply Chain & skills
- Led By Devon County Council Supported By Regen SW
- 3 Registered Providers:
 - Exeter City Council
 - North Devon Homes
 - Sanctuary
- 16 Property Programme in the South West
- 2 further pilots in Essex & Nottingham under Energiesprong

The Case For Change

- Climate Change Act 2008
- Decarbonised Electricity Production Complete
- 38% Reduction in Greenhouse Gas Emissions achieved by 2015
- 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) to achieve these budgets .
- 30% of electricity use is domestic heat & hot water.
- In 2016 12% of households in England were in Fuel Poverty .
- Welsh government committing to decarbonisation of social housing by 2030.

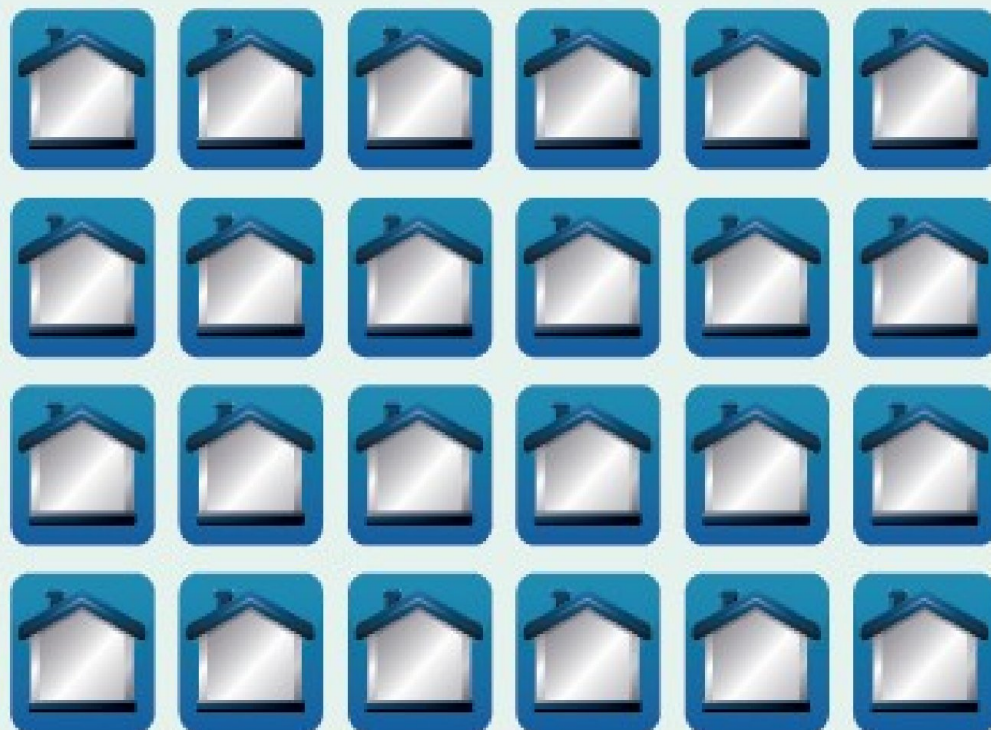
The Case For Change

Housing stock in 2050



5 million new build

Opportunity to address energy demand through building regulations



24 million buildings

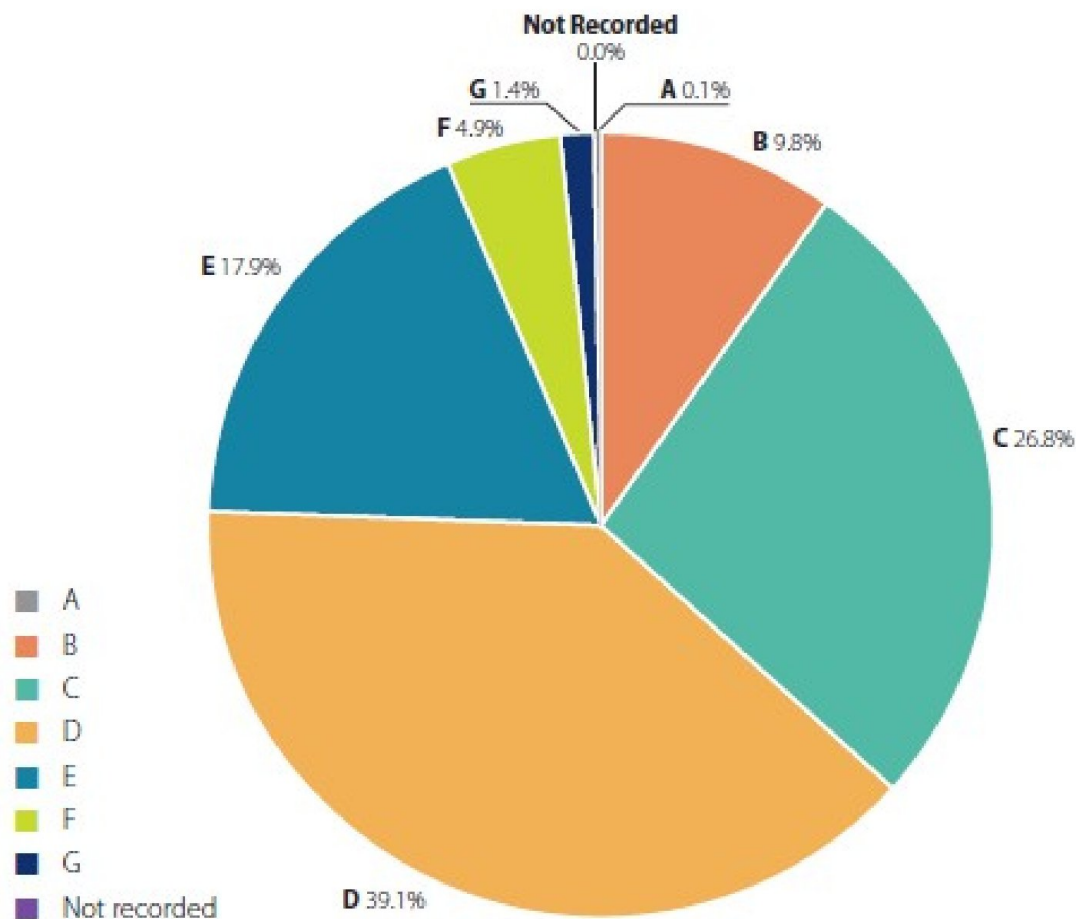
These buildings are already built. They must be retrofitted by 2050 to achieve zero energy

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.
- Programme: 800,000 properties a year to be retrofitted if we started now.

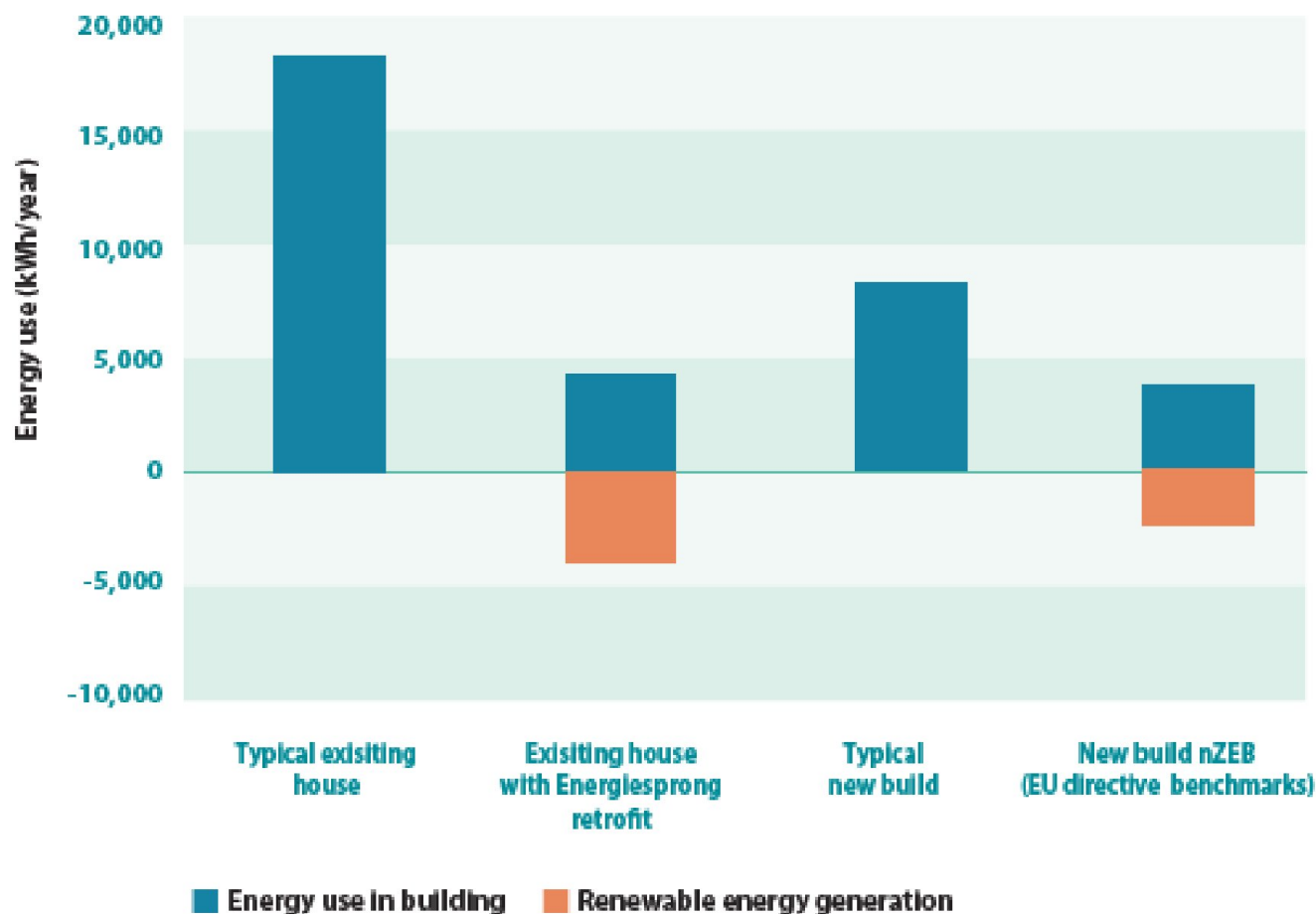
Current Stock Energy Performance

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



Energy Performance nZEB

How does an nZEB compare?



Mi-Space ZEBCat Model

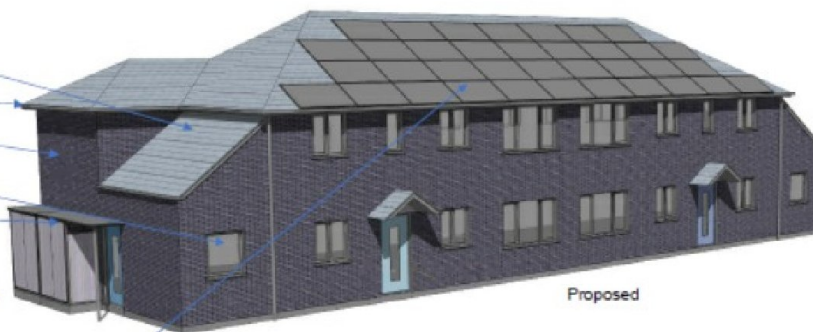
- Design solution developed by Mi-Space to achieve nZEB
- Reduced Energy Consumption
 - Insulation to walls , roof & floor
 - Air tightness
 - Smart controls
- Micro Generation of Electricity (PV)
- Electrical Storage (Battery)
- Low Carbon Heat & Hot Water Provision (GSHP)
- Heat Recovery
- Smart BMS
- Offsite Cladding & Energy Pod

ZEBCat Units

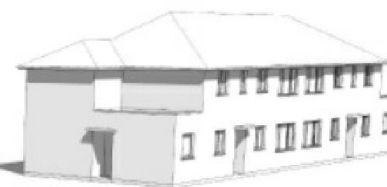


Energiesprong Concept

- 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



Existing



Garden View

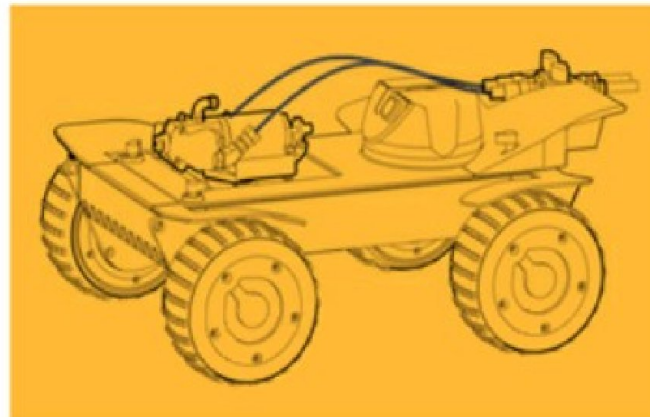


Entrance/Side Elevation



Front/Street Elevation

Developing Concept: Floor Insulation



SprayBot

SprayBot insulates buildings from below. This means the job can be done remotely, without disruption in spaces that are inaccessible or dangerous to operate in. SprayBot is as tough as a tank but has more power for its size than a top of the range sports car. The robot is quasi-autonomous with some operations undertaken by the robot and others by an operator, who thankfully does not need to be under the floor!

Developing Concept: Wall Panels



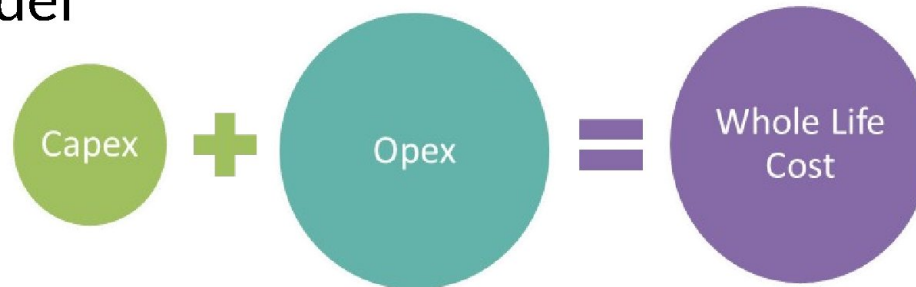
 **MAUER**



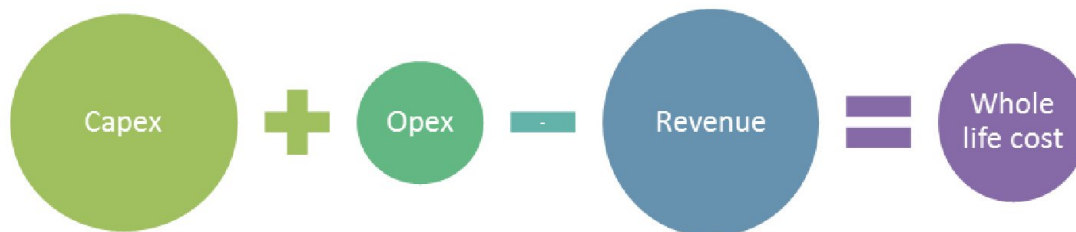
Developing Concept: GSHP



Traditional model



ZEBCat model



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

Conclusions

- Significant pilot 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

