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Welsh Government

# Innovative Housing Programme Optimised Retrofit

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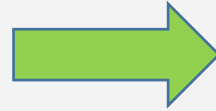
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# What started us on this journey? (one thing leads to another)



(Committee for Climate Change - Net Zero Tech Report p.79)



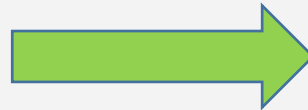
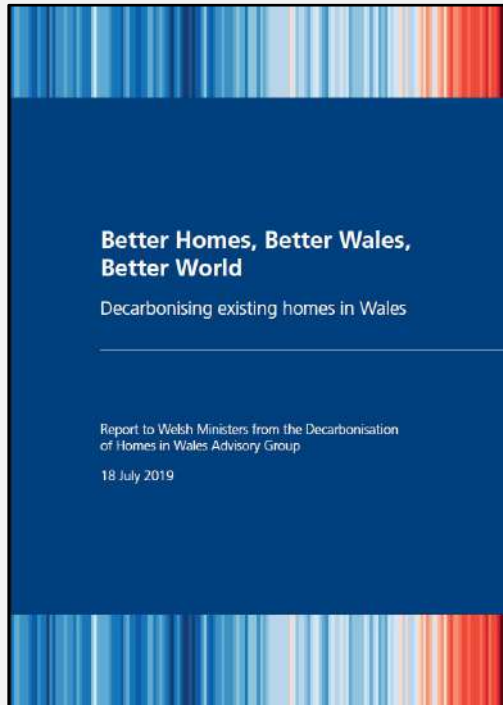
*'Critical role of energy efficiency in the near term'*

*'Early deployment of measures to maximise energy bill and Carbon savings and prepare the stock for low carbon heating.'*

This is set in the context of,

- Environment (Wales) Act 2016
- Welsh Ministers have made decarbonisation one of their top six cross government priorities in "Prosperity for All: the national strategy"
- Declaration of a 'Climate Emergency' by Welsh Ministers on 29 April 2019 – pushing towards a 95% target.

**Set up independent advisory group led by Chris Jofeh**



**Action 2.3** – The Welsh Government should urgently commence a 10-year programme to prioritise the retrofit of certain homes.

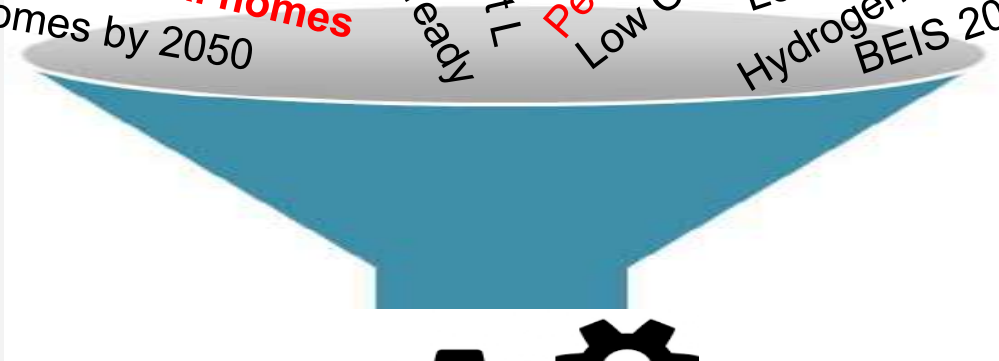
(a) The Welsh Government should set a target of EPC Band A for homes in social ownership and homes in fuel poverty.

(b) The Welsh Government should incentivise early adopters to retrofit homes to a target of EPC Band A.

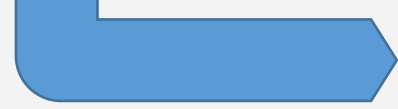
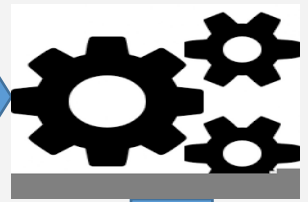
# What do we know so far? (today)



Stock modelling data  
EPC revision  
Heating technology  
Post COVID financial recovery  
UK CCC net zero targets  
DAG recommendations  
SAP 92 by 2030-Social homes  
SAP 92 homes by 2050  
Net Zero ready  
Part L  
Carbon budgets  
Building fabric  
People & Behaviour change  
Low Carbon gas grid – Bio methane  
Renewables  
Low Carbon electric grid – 75% by 2030  
Hydrogen  
BEIS 2050 homes target 15kWh/M2/year



Welsh government policy



Optimised  
Retrofit  
Approach



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# What Does Optimise Mean?

## **Optimise** (verb)

- Make the best or most effective use of (a situation or resource).

# What is Optimised Retrofit?



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## **‘Optimised Retrofit’.**

*‘The best (value) combination of decarbonised heating and fabric improvements for decarbonisation of a home to make it ‘Net Zero’ ready’ when considering a whole system approach to the three interrelated factors of;*

- 1. Building fabric.**
- 2. Heating technologies and Individual Renewables / energy storage.**
- 3. Energy supply grids**

# Available Money, Funding Mechanisms & Innovation



Budget contributions for this financial year have been made by Housing, Innovation and Business & Regions to maximise the economic and innovative elements of the programme:

- £17m from Homes & Places (£15m of General Capital and £2m of Financial Transaction Capital).
- £2m Economic Development Funding
- £500k Innovation funding

Funding (grant or loan?) given for private sector homes if picked up as part of schemes where not including them would impact on success of decarbonising existing social homes.

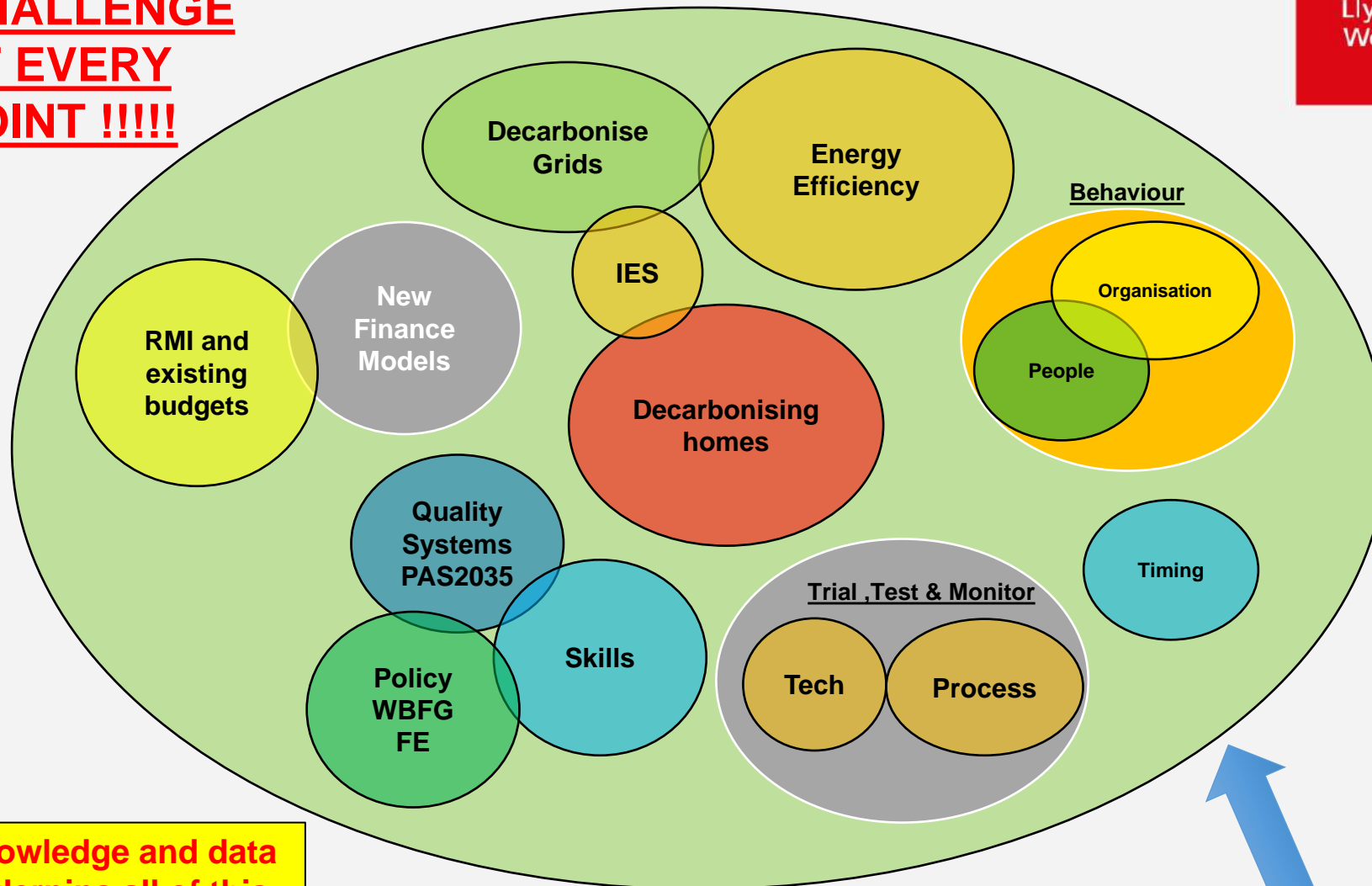
**Schemes must be completed by the end of March 2021**

# The World of ORP



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**CHALLENGE**  
**AT EVERY**  
**POINT !!!!!**



**Knowledge and data underpins all of this**

**These are examples of issues you need to consider in every home passport**

# Green-led Economic Recovery



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- ORP is a cross Government initiative which is looking to **maximise local content & SME engagement**
- Retrofitting of homes has long been recognised as a key tool in economic recovery
- Evidence shows that for every £1.4 million of investment in the delivery of domestic energy efficiency, 32.6 jobs are created / supported

(Source: The value case for decarbonising homes in Wales literature review, Cardiff University, 2020)



# Green-led Economic Recovery



- Previous housing retrofit projects have demonstrated multiple benefits which could enable a Green-led economic recovery creating:
  - local jobs to build the foundational economy
  - contribute to decarbonisation
  - provide skills
  - tackle fuel poverty
  - provide better homes



# Goals of Optimised retrofit for Net Zero ready

Avoid over investment at all levels ✓

Solution appropriate to each home (passport) ✓

No regret actions that can be built upon in future ✓

Energy efficient to be robust to fuel cost increases ✓

Best Carbon vs capital cost vs fuel cost performance ✓

DSR flexible and smart (IES), grid connected and progressing along the route to net zero capable in readiness for low Carbon energy supplies ✓



## Fabric retrofit Measures

- Draught-proofing
- Well insulated Loft
- Thermally efficient windows and doors
  
- Airtightness
- Ventilation
- Wall insulation (CWI)
  
- Wall insulation (EWI)
- Wall insulation (IWI)
- Floor insulation

- Low levels of cost or technical competency
  
- Moderate levels of cost or technical competency
  
- Higher levels of cost or technical competency

## Technology Measures

- A-rated gas boiler – grid connected
- A-rated LPG boiler with wet heating system
  
- Smart hybrid heat pump system
- Smart grid connected heating controls (IES)
- Battery storage
- Solar Panels
- Heat storage
  
- Active homes thermal panels
- Advanced PV Fabric systems

# IES



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Is **NOT** a smart meter or a  
convenience gadget such as  
HIVE or NEST

# IES

## Mandatory requirement



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- Must be able to connect to energy supply grids and use DSR tariff
- Controls energy in and the use in the home to optimise cost and carbon benefits
- Open source and future proof – can be modular
- Monitors and records energy used in real time to give actual performance of the home / building to demonstrate with data the;
  - Current building energy performance
  - Impacts of any physical measures carried out on the building
  - Demonstrates changes of occupant behaviour (eg effect of energy efficiency advice)



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# Questions?

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