

# Electric Ireland

## Area-based Energy Retrofits

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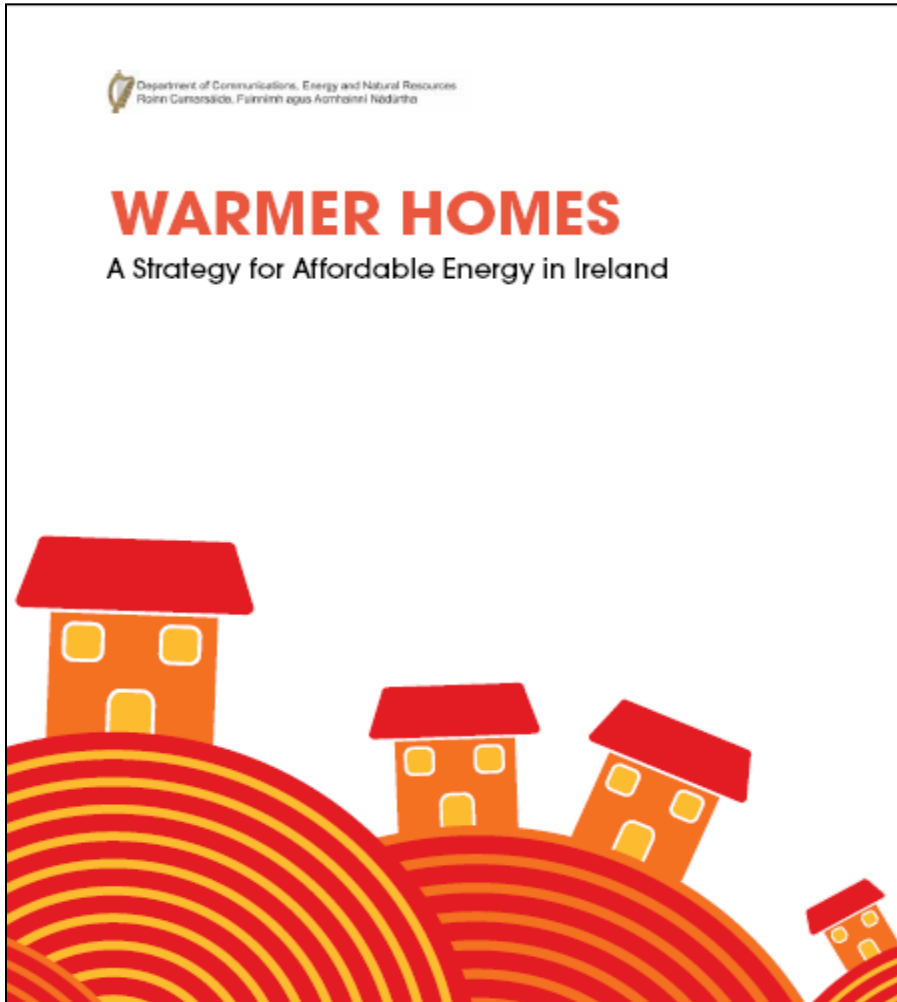
Electric Ireland

# Contents

- Why Area-based Retrofits?
- Case-Study – Dundalk Area-based Partnership Pilot
- Observations with regard to Deep Retrofits



# Ireland's Energy Affordability Strategy proposes Area-based Approach to Retrofit



## 5.4 Introducing an Area-based Approach to Energy Poverty Mitigation

“This strategy proposes a number of steps for implementing an area-based approach to address energy poverty through energy efficiency investments;”

# Why is Electric Ireland interested in Area-based Retrofits?

- Corporate Social Responsibility
- Potential Solution to alleviate Energy Poverty
- Complements our Domestic Home Services Business
- Opportunity to work with Partners – e.g. Local Authorities and SEAI
- May be an obligation for energy suppliers re Energy Efficiency targets in time (not currently)
- Pilot lower cost delivery model (economies of scale – materials, resources, logistics, administration)

# Energy Price Competition



Start Saving

Price Plans

Why Switch?

Switch back and  
save up to 14% on  
Electricity\* & 6%  
on Gas\*\*



OR Save up to 6%  
on Electricity\* &  
14% on Gas\*\*

14%

[View our price plans](#)

## Start saving

Choose an option below to begin  
saving

[Existing Customer](#)

[New Customer](#)

Or contact us over  
the phone

Please call us on 1850 30 50 90

# Dundalk Area-based Partnership Goals



Dundalk Town Council



- upgrade local authority housing in Aisling Park
- meet DoECLG “SHIP” Guidelines
- pilot a solution for similar local authority projects

- support delivery of housing cluster energy retrofit pilot
- analyse the results of the pilot and disseminate lessons learned

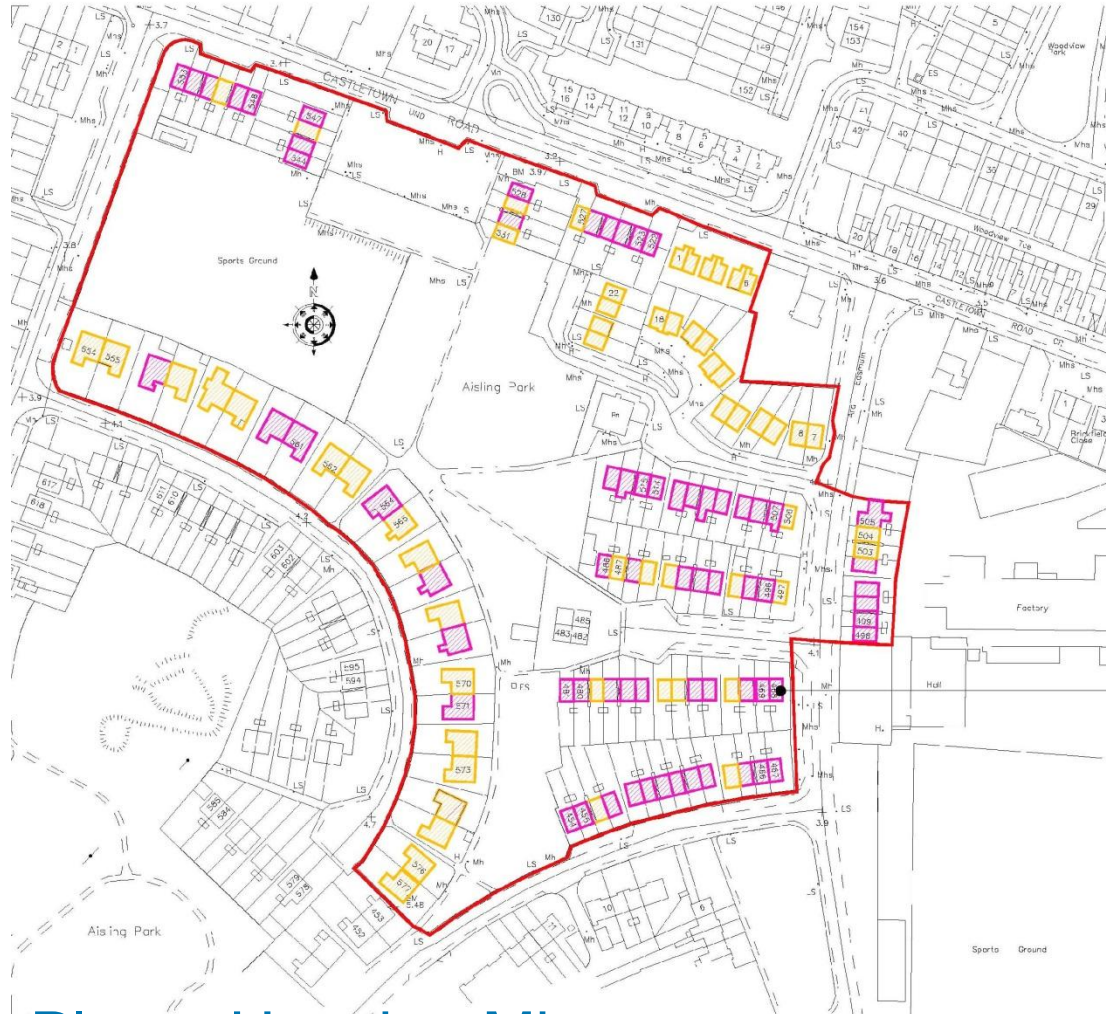


- trial delivery of Home Retrofits to a 100+ housing cluster.
- assist those at risk of fuel poverty

# Aisling Park & Patrick Tierney Crescent (126 Homes)



# Context – Mixed Housing Estate; 7 Different House types



Private Dwellings  
68



DTC Properties  
58

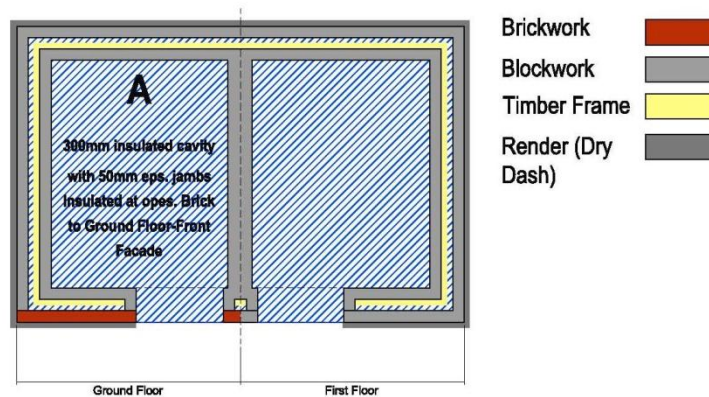


House Type	No of Units		
	DTC	Private	Total
A	16	0	16
A1	6	0	6
B	5	16	21
B1	4	17	21
B2	9	25	34
C	17	7	24
D	1	3	4
<b>Totals</b>	<b>58</b>	<b>68</b>	<b>126</b>

**Housing Mix**

## Site Plan – Housing Mix

# Context



## A/A1 Type

- 300mm Cavity Wall with 50mm EPS-Brick and Blockwork Rendered.

- Suspended Concrete Floor with 55mm eps

- Attic insulated at ceiling with 150mm MF

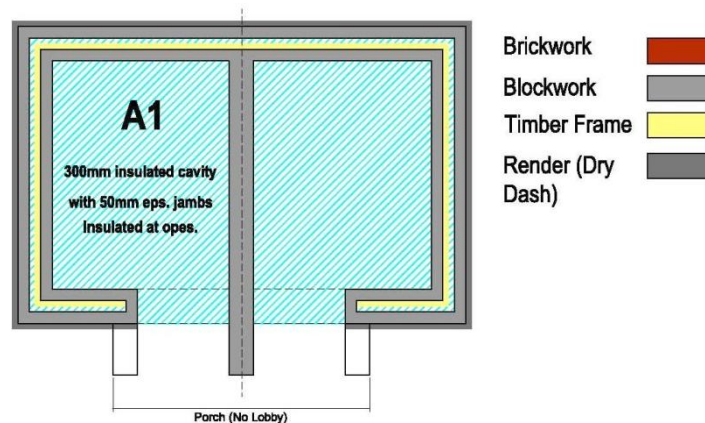
- Double Glazed windows-PVC/Wood Frames, assumed U-Value 2.8.

- Gas Boiler with 82% Seasonal Efficiency

- Solid Fuel Open Fire secondary heating

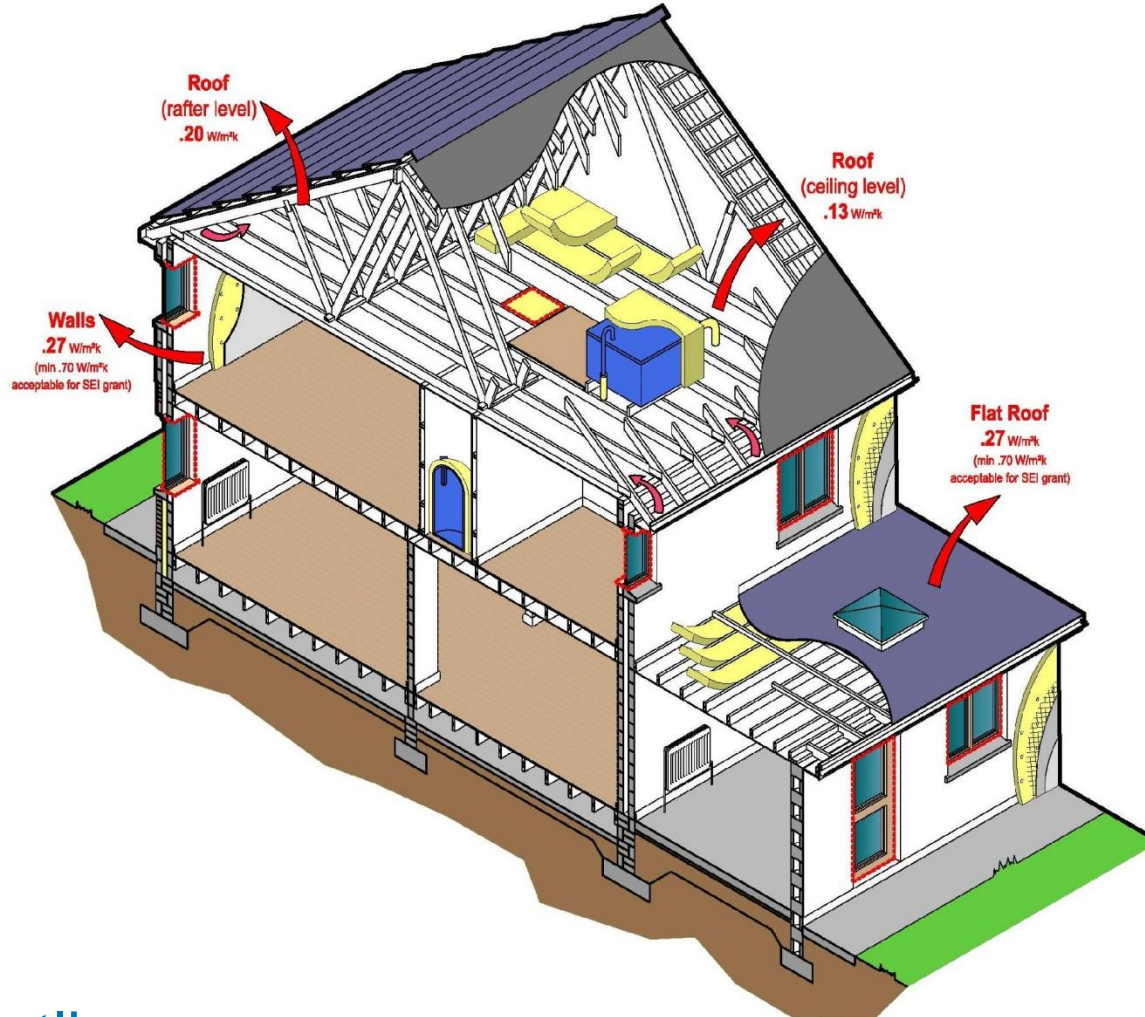
- Space heating controlled by Programmer only.

- DHW cylinder with Immersion with no separate DHW from Boiler, Lagging Jacket 30mm.



## House Type A

# Typical Possible Fabric Upgrades

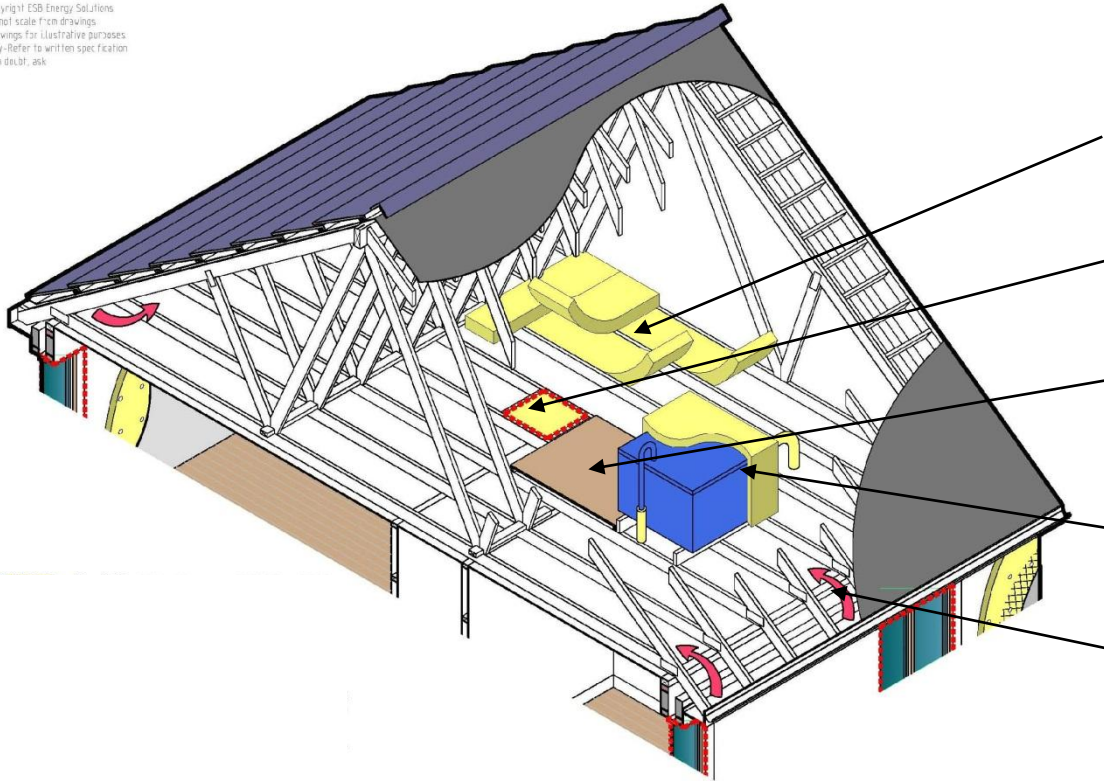


- Attic Insulation Measures
- Wall Insulation Measures
- Boiler and Heating Control Upgrade Measures
- Replacement Double Glazed Windows and Doors
- Energy Efficient Lighting, Lagging Jackets and Improved Air Permeability
- Renewable Technologies (Solar TH, Solar PV, Heat Pumps)
- Ventilation Systems and Other Measures

## Outline

# Typical Possible Fabric Upgrades

Copyright ESB Energy Solutions  
Do not scale from drawings  
Drawings for illustrative purposes  
only. Refer to written specification  
if in doubt, ask.



## Attic Insulation

- HES specification utilised.
- 300mm quilt insulation laid between joists at attic ceiling level and counter-directionally across joists
- Insulate and draught-proof all attic hatches
- 2m Walkway from attic hatch to cold water storage tank constructed to avoid compression or damage to insulation.
- Insulation to all cold water storage tanks and associated pipe-work.
- Retention of existing ventilation by appropriate means or implementation of new ventilation as appropriate.
- Movement of all electrical cabling or other services as required.

## Insulation Measures - Attic

# Cost-optimum basket of measures was delivered to each house



# Work Packages

Package 6 (P1a + P2)	
Area	Description of Works
Roof	<b>Attic Insulation 0.13 w/m²k</b> 300/200/150mm quilt insulation laid between joists at attic ceiling level and counter-directionally across joists. 2m Walkway from attic hatch to cold water storage tank. Insulation to cold water storage tanks and associated pipe-work. Insulate and draught-proof all attic hatches.
Wall	<b>50mm Cavity Pump 50 EPS 0.32w/m²k</b> All drilling, inspection, retaining and filling of insulation and making good.
Envelope	<b>Air-permeability Q50 7</b> Draught-proofing to doors windows and attic penetrations. Attic hatch included in Insulation measures above.
Lagging	<b>Replace 30mm Lagging with 50mm</b>
Controls	<b>Control: Time and Temp separate DHW</b> Creation of 2 heating zones to separate hot water and space heating in accordance with SEAI HES grants. All equipment, labour and materials required are included in price plus 10m pipework and 3 TRVs.
Lighting	<b>Replace all existing lights with CFLs (9 No.)</b>
Boiler (Gas)	<b>replace with 90% efficient boiler</b> Removal of existing boiler, re-connecting fuel and power supplies, disposal of old boiler and provision of condensing flue. Adjustments to existing kitchens or fittings are not included.

Achieve C1 BER

# Quality Assurance

All works are completed and finished to the ESBES requirements and guidelines published by:

- **DoEHLG (incl. Building Regulations)**
- **NSAI Agrément**
- **Sustainable Energy Authority of Ireland**
- **The UK Building Research Establishment**
- **System Supplier/ Product Manufacturer**
- **Members of RGI, RECI or ECSSA**
- **All aspects of SHWW Act 2006**



Cornshool, Oidhreacht agus Rialtas Áitiúil  
Environment, Heritage and Local Government



**NSAI**



# Quality Assurance

1.QA during works and after works (Quality and Health & Safety) by Electric Ireland

2.Quality Assurance by external consultants – Carillion. Monthly Review by Contractor Management Team based on audit results

3.Quality Assurance by SEAI

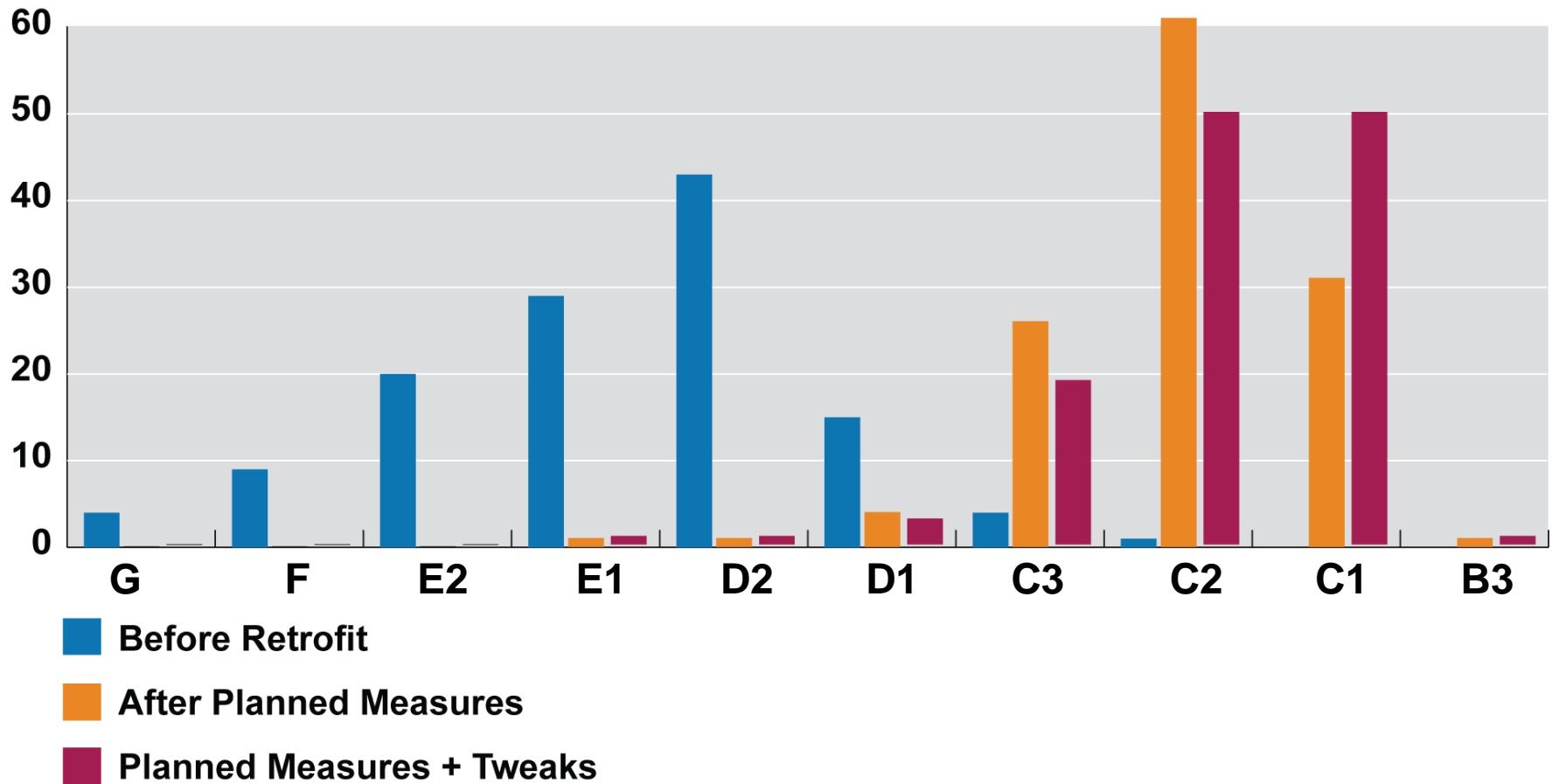
# Project Process

Collect Data	DTC Data	Tech Surveys		
Design & Prepare	Cost-Optimal Design	Detailed Delivery Plan	Community Comms	Safety
Deliver	Project Delivery	Documents	Design Mods	
Post-Delivery	Quality Control	Community Training	Final Report	

## Results for Pilot (based on BER data)

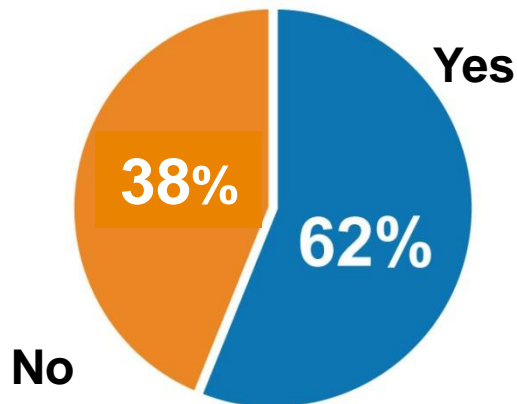
Parameter	Results Calculations (Rounded)
Total Project Energy Savings (PEE)	1.4GWh PEE
Number of Houses retrofitted	124
Expenditure per House	€4,000
Average Saving Level per House	140kWh/m2
Average PEE Savings per year	11,500kWh
Average reduction in heating energy consumption	50%
Average Saving	€690/year
Average Simple Payback	5.8 years
On-the-ground Delivery Time	8 Weeks

# BER Results for Pilot

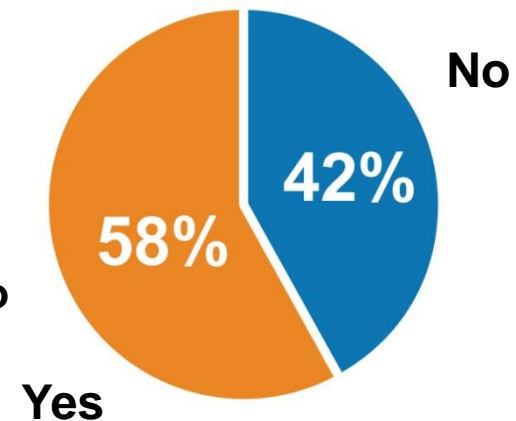


# Socio-economic Survey – Preliminary Findings (107 valid surveys)

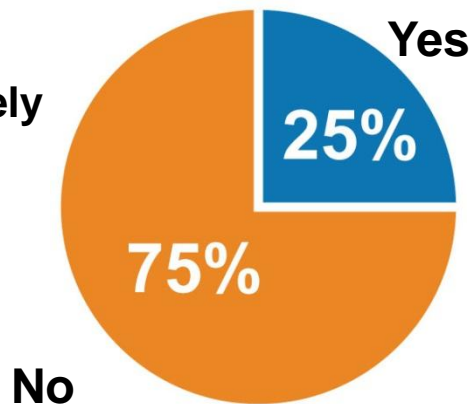
Are you in receipt of a fuel allowance?



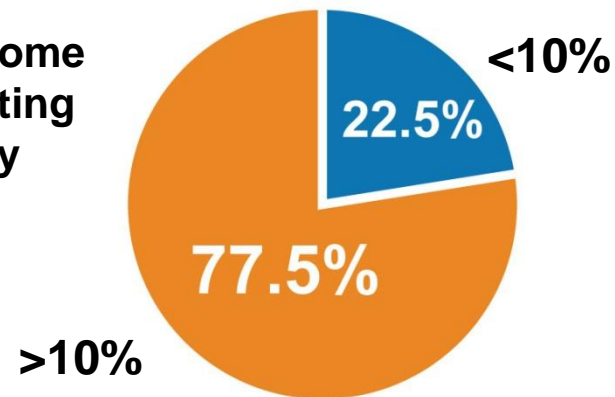
Were there times last winter when you were cold because you could not afford to heat your home?



Is your home kept adequately warm?



% of your income spent on Heating and Electricity bills



# Follow Up Survey

"I'm saving €10 a week on a €30 gas bill"

"Upstairs is like a sauna"

"No real difference"



"I'm happy, they did a great job"

"I'd rather press the on/off button"



"the heating system is too complicated"

"I have great praise for the men"  
"They were very thorough"



"My daughter is still cold in her bedroom" and "we're sweating in the sitting room"

"Windows still draughty; catch on window is broken"

# Recommendations

- Area-based Retrofit can be delivered quickly and efficiently
- Agree clear criteria for success in advance
- Technical assessments for all houses before work commences
- Involve residents, good communications
- Cost-effective approach for Local Authorities
- Lessons learned; Review & Improve
- Area-based Retrofits - a viable way to target people at risk of Fuel poverty



## Dundalk Area-based Energy Retrofit Pilot

# Alone - 30 House Retrofit

- All Elderly homeowners
- House Types – terraced “single storey urban cottages”
- Various houses in Dublin City Centre,
- Measures – internal wall insulation; attic insulation, draught-proofing;
- Great Sensitivity – residents concerned at intrusion – work much slower
- Ultimately quality of living greatly improved
- Funded by ESB Corporate Social Responsibility (€100k)



## Deep Retrofit: (Thinking Deeper – Financing Options for Home Retrofit IIEA(2011))

Description	Estimated Costs of Measures	Estimated Annual Savings	Estimated Energy Saving
1. EWI, Attic Ins., Hi-eff. boiler & Heating Ctrls, Solar Panel	18,350	1,640	~ 80%
2. IWI, Attic Ins., Hi-eff. boiler & Heating Ctrls, Solar Panel	13,950	1,544	~ 70%
3. CWI, Attic Ins., High Eff.boiler & Heating Ctrls, Solar Panel	9,450	1,496	~ 70%
4. CWI, Attic Ins., High Eff. boiler & Heating Ctrls,	4,000*	690*	~ 50%

\*Average for 124 Homes, Smaller Houses,

# Financing Options for Area-based Retrofits

- Department of Environment – SHIP-emphasis on vacant properties
- Local Authority Financing
- SEAI Grants incl. SEAI Area/Community Grant Scheme
- Social Welfare (FA, HBP) Rebalancing?
- PAYS / EPCs
- Other?

# What is PAYS

**Customer doesn't pay up front but pays on utility bill over time (10 years)**

**Payment over time is less than the savings made from less energy used**

No up-front costs to customer

- Finance provided and debt risk borne by new finance provider
- Energy suppliers recoup costs through a charge in instalments on the energy bill.
- A charge assigned to a meter location, not to an individual customer;
- Billing and payment on the utility bill with disconnection for non-payment;
- Not just a normal loan but an investment in the home which will pay for itself
- Energy suppliers collect the charge and pass it on to new finance provider

# PAYS Schematic



## Schematic



Finance

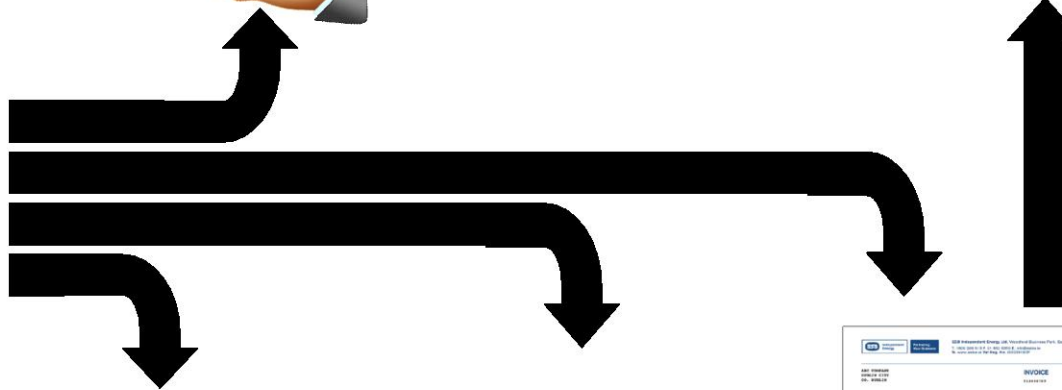


ESB  
BGE  
Airtricity

Industry



SME's

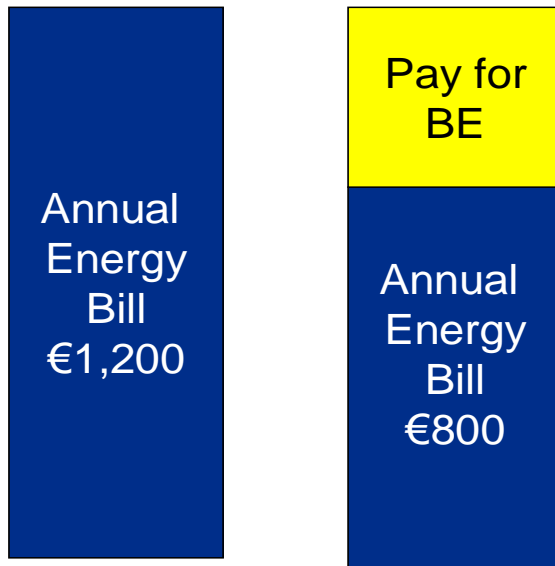


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# Better Energy Programme

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## 'Golden rule'



- Challenges
  - Long paybacks
  - Interest costs
- Payback works better with deposit up front also (grant / customer / other)
  - Works best with boilers, attic, heating controls,
  - Payback works least for for 'deeper measures' solid wall insulations and for low income homes
- Comfort, health benefits, inflation not costed