

'Heat solutions for Rural Areas'

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**Northern Periphery and
Arctic Programme**
2014-2020



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HEATER is a Cluster of Projects with Common Synergies



Housing
Executive



Project value is €153k across four partners



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Communicate the Message

1. Develop network
2. Virtual Workshop & Webinars
3. Knowledge sharing, collaborate
4. Virtual Final Conference

**Common Challenges of
fuel inequity, fossil fuel
dependence,
decarbonise**

**Result: Educate &
Empower rural
communities**



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HANDIHEAT Project

Transnational EU funded project with 7 partners across 5 northern European and Arctic regions - focused to **reduce carbon emissions and energy efficiency in rural communities**

Deliverables & Outputs

1. Policy Review, Fuel Poverty, Health/Housing and Winter Deaths
2. Benchmark existing Best Practice across Partner countries
3. Demonstration Pilots in N Ireland and Finland
4. Toolkit of Best Practice Policies and Sustainable Solutions for Retrofit

protect *rural communities* from energy *price fluctuations* & improve the *social wellbeing and quality of living* throughout the *participating regions*



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Off Gas Grid Bio Gas Heating in rural Finland – 1st Pilot



CBG solution for remote areas



HANDIHEAT – 2nd PILOT



- ☐ *6 dwellings **Rural & off gas grid***
- ☐ *Energy Efficiency Retrofit & Low Carbon Heating (**within budget**)*
- ☐ *Rural Social Housing - Co Fermanagh*
- ☐ *1-2 years data monitoring*
- ☐ *Householder **FOCUS***
- ☐ *Pilot Outputs:*
 - ***Capital Costs***
 - ***Household bills***
 - ***Improved thermal comfort***
 - ***Carbon emissions***





DESIGN - SAP

- ☐ **Existing:** SAP Range 51 (Band E) - 57 (Low Band D)
- ☐ **Requirement:** Thermal envelope non intrusive measures under £10k
- ☐ **Aim:** Try to achieve SAP Band C with CWI, Loft & Windows
- ☐ **Interventions:**
 - Cavity Wall Insulation
 - Loft Insulation
 - Passive House fitted double glazed windows
 - Non intrusive air tightness measures
- ☐ **Designed Outcome:** SAP Range 65 - 69 (High Band D)
- ☐ **Airtightness**



Thermal Improvement Measures

- ❑ Issue: Walls heat loss - 35%, Roof 25%, Windows/Doors 15%, Draughts 10%



Low Carbon Heating Hybrid Oil/ASHP

- ☐ Only need 6kw ASHP for 90m2 house
- ☐ Utilise existing oil boiler
- ☐ Don't need deep retrofit (Aim for low Band C)
- ☐ Need control system to manage heating primacy



Low Carbon Heating Hybrid Oil/ASHP



Low Carbon Heating Electric Battery, Solar PV and Electric heating

- ❑ 11Kw battery, 2.5 Kw Solar PV
- ❑ Electric Storage heating
- ❑ Householder/Landlord 'Prosumer'
- ❑ An electricity demand profile that is both reduced & smooth control and planning
- ❑ A measurable, 40% reduction in carbon emissions and energy bills



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Measuring Data

- ☐ Grant data loggers
- ☐ Data from heat & electric loggers
- ☐ Sonnen data loggers
- ☐ Climote temperature & energy use
- ☐ Open source at project end

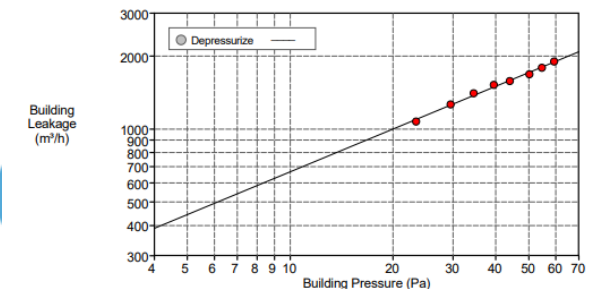


Initial Findings & Feedback After 1st heating season

- ❑ Hybrid Oil/ASHP tenant bills £13-16 extra per week (Nov - March 2020), which is offset by savings in oil - *(Oil data based on previous bills and current oil data usage)*
- ❑ ‘Heat feels different, doing our bit for the planet’
- ❑ ‘house feels warmer after the battery and PV was fitted’
- ❑ Air test from 10-12 to 5.45 - 7 with £7k of energy efficiency measures
- ❑ Carbon reduction 40-55%

BUILDING LEAKAGE TEST

Date of Test:	24/08/2021	Test File:	152 Carrowshee park
Technician:	Timothy Elliott		
Project Number:			
Customer:	CFM 152 Carrowshee Park Lisnakea Enniskillen, Phone: Fax:	Building Address:	152 Carrowshee Park Lisnakea
Test Results at 50 Pascals:			
V50: m ³ /h Airflow	1710 (+/- 1.8 %)		
n50:			
w50:			
q50: m ³ /(h·m ² Envelope Area)	5.45		
Leakage Areas:			
743.5 cm ² (+/- 7.0 %) Canadian EqLA @ 10 Pa or 2.37 cm ² /m ² Surface Area			
420.0 cm ² (+/- 11.5 %) LBL ELA @ 4 Pa or 1.34 cm ² /m ² Surface Area			
Building Leakage Curve:			
Air Flow Coefficient (Cenv) = 171.9 m ³ /(h·Pa ⁿ) (+/- 18.3 %)			
Air Leakage Coefficient (CL) = 173.1 m ³ /(h·Pa ⁿ) (+/- 18.3 %)			
Exponent (n) = 0.586 (+/- 0.049)			
Correlation Coefficient = 0.99645			
Test Standard:	EN 13829		
Test Mode:	Depressurization		
Type of Test Method:	B		
Regulation complied with:	Part F Building Regs		



Summary

- ❑ **Capital Costs** of Heat Pumps & Additional Insulation more than the status quo of fitting a gas/oil boiler.
- ❑ **Additional Energy Efficiency measures** essential for heat pumps, but with current energy price crisis, **this should be a focus**
- ❑ **Householder energy bills**, based on early analysis oil costs in line with electrical costs, but the additional energy efficiency/capital cost isn't considered in this analysis
- ❑ **Issue with converting oil to oil hybrid**, as tenants don't appreciate their oil use. However householders who convert gas to gas hybrid have no issue as aware of weekly gas bills (based on evidence from another trial).
- ❑ **Thermal comfort increased** with energy efficiency
- ❑ **Thermal comfort issue about perception**, low temperature radiators indicate a cooler house, but data shows the ambient temperature is similar. Trials indicate tenants not using condenser boiler properly, which is compounding this issue
- ❑ **Time of Use tariffs are essential** for electrification of heat
- ❑ **Hybrid and Electric Generation/Storage** significantly reduce household carbon emissions 40 - 55% compared to Oil boilers
- ❑ **Two key issues: Tariff Change and Education/Behaviour Change**

Any Questions



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