

## **LOCAL GOVERNMENT AND HOUSING COMMITTEE**

### **Home Energy Efficiency in Rural Areas**

#### **Purpose**

1. To consider how the Assembly provides assistance through HEES to reduce fuel poverty amongst vulnerable low-income households living in difficult to heat homes in areas without mains gas and/or in properties with solid walls. To consider the results of commissioned research into the issue and proposals for piloting alternative measures to those currently offered under HEES.

#### **Summary/recommendations**

2. The consultant's report recommends practical piloting of three heating/insulation combinations based on oil, wood pellets and heat pumps. With further investigative work to be undertaken in respect of communal LPG. The committee is invited to comment on the action proposed.

#### **Background**

3. It is estimated that there are approximately 220,000 households in Wales eligible and capable of benefiting from the Home Energy Efficiency Scheme. Of these 41,000 households are eligible and capable of benefiting from the central heating and insulation element of the scheme (HEES+). Of these, an estimated 6,000 properties do not have access to the mains gas network. Additionally, many properties have solid walls and consequently are not suitable for installing cavity wall insulation. Currently HEES+ is able to offer off peak electric storage heaters together with loft or cavity insulation in properties without mains gas. For those properties without cavity walls the combination of storage heating and loft insulation is unlikely to reduce heating costs to affordable levels.

4. Because of this the Welsh Assembly Government commissioned National Energy Services Ltd to investigate options for other measures that HEES might offer to provide benefits comparable to those available to households able to utilise mains gas and/or cavity wall insulation.

#### **Consideration**

5. The project brief tasked NES Ltd with investigating a number of alternative heating fuels and

insulation measures The recommendations contained in the report at Annex A consider capital costs, running costs, installation issues, environmental concerns, and operability. Where an alternative fuel is susceptible to price fluctuations, the prospect of increased prices has also been considered.

6. The following options were modelled in isolation and combination in terms of initial and whole life cost, running costs, energy efficiency (SAP) and emissions (CO2):

### **Heating sources**

Oil central heating

Individual LPG central heating

Communal LPG with individual central heating

Electric storage heaters

Wood pellet central heating

Ground source heat pump

Coal fired central heating (automatic feed)

Micro CHP (Combined Heat and Power)

### **Insulation**

Externally applied insulation

Proprietary thin sheet internal insulation

Internal dry lining

Loft insulation (as current HEES)

### **Other measures**

Solar hot water heating

## Photo voltaic electricity generation

### The Method

7. Combinations of measures were modelled against a Base (the current unimproved property), a Benchmark (the property improved with currently available HEES measures) and a Target (the property improved with mains gas central heating were it to be available). The report recommendations identify those combination of measures which come closest to the Target, that is, which would lead to similar running costs with houses with gas central heating at lowest cost. Whilst the analysis focussed on initial capital and annual fuel costs consideration was also given to both whole life costs and environmental performance.

8. Modelling was based on dwelling archetypes typical of the Welsh housing stock.

### Some Observations

9. Coal;

Coal fired central heating fared poorly in terms of both capital and running costs and environmental performance. Modelling was based on an automatic gravity feed boiler whose costs are higher than manual batch feed front-loading fires. This was felt appropriate given the client groups HEES is seeking to assist and the Knowledge that the HEES regulations were amended in 2001 to allow replacement of existing coal systems with gas central heating in the face of complaints from elderly and disabled households over the difficulty in operating and maintaining coal systems.

10. External and internal insulation;

None of the insulation measures other than loft insulation have been recommended for piloting.

A range of internal and external insulation methods was investigated however, internally, only thin (10mm) 'Sempatap' lining was considered. Dry lining (plasterboard on timber studs packed with insulation) whilst practical in dealing with void social housing was considered too disruptive for potential HEES households and expensive once consequential work are taken into account.

The External wall insulation modelled suffered from high costs for savings achieved. There is considerable experience in over-cladding in social housing where its' costs effectiveness improves when incorporated into larger scale

renovation schemes. In the context HEES where currently 70% of funding goes to single dwellings in the private sector external insulation was not felt to be worth pursuing.

#### 11. Electric storage heating;

Storage heaters require significant improvements in the external envelope to produce affordable heating levels. Even with both external and internal insulation (and a relatively high capital cost), storage heaters were unable to approach the target running cost.

#### 12. Micro CHP;

Given the infancy of the technology at this scale the modelling was largely based on theoretical costs and benefits for oil and LPG units, neither of which are commercially currently available. In the context of this project i.e. dealing with dwellings without mains gas there is little that can be currently offered.

### **The Conclusions**

13. The report identifies four combinations of measures that could potentially provide comparable running costs with that of a mains gas property receiving central heating and one main insulation measure, loft insulation:

Communal storage LPG

Oil central heating with loft insulation

Wood pellet Central heating with loft insulation

Ground source heat pumps with loft insulation

14. Whilst single installation LPG was not determined as cost effective a proposal by Calor Gas Ltd for a communal storage installation piped to individual heating systems offers a method of reducing installation and fuel costs. Communal storage LPG depends on the availability of clusters of eligible properties, which could in theory comprise a combination of private and social housing. This option will require further investigation to look at the possibilities of a co-ordinated approach for specific settlements. In tandem the practicality of a similar arrangement using oil will be investigated.

## **Next steps**

15. It is proposed that some further investigation take place with manufacturers and users of wood pellet and heat pump installations following which we would expect to let a contract to develop the technical specification, confirm supply sources, obtain and evaluate tenders and monitor the results.

16. We are in discussion with the HEES manager EAGA Partnerships about the oil option. They are already involved in oil heating installations as managers of the HEES equivalents in Northern Ireland and Scotland. Clearly we would not want to reinvent work that has already been done and would wish to learn from the experience of the other devolved administrations.

17. The actual size of the pilot has yet to be finalised but it is envisaged that a mix of 50% Oil, 30% Heat pump and 20% wood pellet would be appropriate. There will of necessity be a geographical limit to wood pellet installations given the current delivery infrastructure and location of the local manufacturer. We will however be seeking to ensure alternative imported pellet sources to avoid reliance on one supplier.

## **Financial Implications**

18. The current Assembly HEES budget of £11.1 million contains the necessary financial provision to establish the pilot programme described above.

## **Compliance**

19. The Assembly Government's workfunctions to improve energy efficiency and tackle fuel poverty isare undertaken using powers under S.15 (1) of the Social Security Act 1990 – the power to make grants for the provision of energy efficiency. AndThe Assembly also has relevant functions under S.5 (1) of the Science and Technology Act 1965 - the power to defray expenses incurred in carrying on or supporting scientific research. Section 40 of the Government of Wales Act enables the Assembly to anything that is calculated to facilitate the exercise of any of its functions.

## **Action for Subject Committee**

20. The Committee is asked to note and comment on the Assembly Government's proposals to take forward the recommendation in the NES report to pilot alternative measures for possible inclusion in HEES.

**Construction and Domestic Energy Branch – Housing Directorate**