APPENDIX R

WAVERLEY BOROUGH COUNCIL

EXECUTIVE - 8 JULY 2008

Title:

CENTRAL OFFICES BOILER REPLACEMENT

[Portfolio Holder: Cllr Ms D Le Gal]
[Wards Affected: All]

Summary and purpose:

To consider options for the replacement of the Council's Central Offices gas boilers which provide heating and hot water to the offices. The replacement of the existing boilers would also provide an opportunity to reduce the Council's overall carbon emissions.

Environmental implications:

The replacement of the Council's existing gas boilers which are over 25 years old would provide an opportunity to significantly reduce the Central Offices CO2 emissions.

Social / community implications:

One of the aims of the scheme would be to provide a positive and visible statement to Waverley's communities of the Council's commitment to sustainability.

E-Government implications:

There are no E-Government implications.

Resource implications:

The capital programme for 2008/09 includes provision of £70,000 for replacement of the Council's central offices boilers. The 2008/09 Central Offices Accommodation revenue budget for gas was reduced by £2,000 in anticipation of the introduction of more energy system which would need to be installed before the winter of 2008/09.

Information / Background

1. The existing two gas boilers at the Council Offices are over 25 years old and are due for replacement. The age of the existing boilers means they are not as energy efficient as new boilers would be and the annual budget for gas in 2007/08 for the Central Offices was approximately £22,000 with annual gas consumption of approximately 1,100,000kWh. This level of consumption is estimated as emitting approximately 209 tonnes of CO2 per annum.

2. As part of the consideration of alternative solutions to the provision of heating and hot water to serve the Central Offices, the Energy Centre for Sustainable Communities (ECSC), a not for profit company working across the field of sustainable energy and climate change, were engaged to advise officers on the integration of renewable energy technologies at the Central Offices.

3. Local authorities are to be judged on the energy efficiency of their buildings and local councils should be seen as exemplars for their communities in terms of reducing carbon emissions. From October this year public sector occupiers of large buildings (such as the Council's Central Offices) will be obliged to display a Display Energy Certificate (DEC) in a prominent place clearly visible to the public. The energy usage information provided on the DEC will enable a calculation to be made on CO_2 emissions and a rating will be given on a scale from A to G on whether energy performance is improving or not.

Alternative solutions

4. Officers with advice from ECSC have considered a range of options for the replacement of the Central Officers gas boilers and comments on the alternatives examined are detailed below.

Condensing Boiler

5. A three module multi-bank condensing boiler has been considered and a tendered price of £72,000 has been obtained for this solution which would also include a four panel solar collector to be used to pre-heat water using solar power for which planning approval would be required. The improved efficiency of operation of the condensing gas boiler would achieve savings of £5,000 per annum (note a reduction of £2,000 has already been made in the base 2008/09 revenue budget so the net further saving would be £3,000 per annum at current costs) on the Central Offices gas bill at current prices.

6. It is estimated that the annual CO_2 emissions from the Central Offices would reduce gas consumption by an estimated 29% from 209 tonnes to 148 tonnes an estimated saving of 61 tonnes of CO_2 per annum.

Biomass Boiler

7. Biomass is produced from organic materials, either directly from plants or indirectly from industrial, commercial, domestic or agricultural products. It does not include fossil fuels, which have taken millions of years to be created. Producing energy from biomass has both environmental and economic advantages.

8. It is a carbon neutral process as the CO_2 released when energy is generated from biomass is balanced by that absorbed during the fuel's production. Furthermore, biomass can contribute to waste management by harnessing energy from products that are often disposed of at landfill sites.

9. The biomass boiler considered would be burning wood chips or wood pellets. As long as the woodchip originates from forests that are sustainably managed, it is considered a renewable source. Wood pellets can be produced by sawdust or wood shreds that are by-products of other processes.

10. The biomass boiler considered for the Central Offices would provide a maximum of 60% of the heat demand of the offices but would need to operate in conjunction with a conventional gas boiler at times of peak demand. This is because biomass boilers need to operate at a constant base level to ensure maximum efficiency and are designed for meeting fluctuating demands. The option under consideration is based on the installation of a 250 Kw biomass boiler.

11. There are difficulties concerning the location of a biomass boiler to serve the Central Offices because existing services are toward the central core of the offices and the only suitable location for a biomass boiler and storage area would be on the grassed area outside the offices, off Bridge Street outside of the IT wing of the building – see plan attached at Annexe 1. There would also be the need for large flue to be installed which would need to be above the height of the existing building. For these reasons planning approval would be challenging.

12. The capital cost of this solution is estimated at £150,000 - £175,000 including installation. It may, however, be possible to attract grant funding to contribute towards these costs of up to £30,000.

13. The major benefit of the biomass option would be a saving of carbon emissions of 125 tonnes per annum.

Combined Heat and Power

14. Officers have considered a Combined Heat and Power (CHP) solution but it was not considered to be a viable option to supply energy to Council Offices only. This is due to the fact that the offices are only fully occupied during traditional office hours with limited weekend use and it would be unlikely that CHP would be a cost effective option for installation. This is because to achieve maximum efficiency, a CHP unit needs a constant heat demand over a long period throughout the year. This is due to the fact that excess electricity produced by a CHP can be exported directly back to the national grid and will provide a small income. However, excess heat produced is wasted and requires that a heat dump be installed, at considerable additional capital cost, to ‘dump’ the excess heat into the atmosphere.

15. The base heat demand, and thus the viability of CHP, could potentially be increased by connecting other nearby buildings with different use types to a CHP engine housed at Council Offices, via a district heating network. However, there are currently no plans to create a community energy scheme in Godalming town centre.

Ground Source Heat

16. This solution would use buried coiled pipes at depth to heat water to 11-13 centigrade. The technology is based on utilising the constant temperatures (summer and winter) in the ground at depth. This option was discounted as not being viable for Waverley's Central Offices unless an under floor heating system were installed throughout the offices which would be both expensive and disruptive.

Conclusion

17. It is the officers' view that the Combined Heat and Power option and the Ground Source Heat option be discounted.

18. This would leave two options for consideration for the replacement of the boilers with a Condensing Boiler or with a Biomass Boiler supplemented by a gas boiler. As set out above there would clearly be practical and planning concerns around the option of installing a biomass boiler as well as significant cost implications which have not been budgeted for.

19. At Annexe 2 a Whole Life Costing table has been produced to compare the Condensing Boiler and Biomass Boiler options. Even after inflating the Council's existing gas contract price by 40% the whole life cost, based over a 15 year period, shows a significant cost saving in favour of the Condensing Boiler of more than £150,000 as against a Biomass woodchip burning boiler or more than £430,000 saving on a Biomass pellet burning boiler. However in terms of CO_2 reduction the estimated Biomass Boiler option produces more than double the CO_2 emission saving than the Condensing Boiler option, with savings respectively of 1,875 tonnes as against 915 tonnes over the 15 year life cycle.

20. A detailed benefits and dis-benefits table for the two options is attached at Annexe 3.

21. Officers have considered the options carefully and with some reluctance have concluded that the practical difficulties surrounding the installation of a Biomass Boiler on the congested Central Offices site, and the significantly higher financial costs involved in this option, leads them to conclude that the Condensing Boiler option with a four panel solar collector to be used to pre-heat water using solar power is the most appropriate solution for the Council.

Recommendation

It is recommended that the Executive approves:

1. the installation of a Condensing Boiler with a four panel solar collector to be used to pre-heat water using solar power;

2. that the cost of £72,000 be met from the 2008/09 specific capital programme provision of £70,000 with the balance of £2,000 to be vired from the capital programme provision for Central Offices Maintenance; and

3. that a first resolution in accordance with Regulation 3 of the Town and Country Planning (General) Regulations 1992 be approved to allow a planning application to be submitted for a four panel solar collector to be installed.

Background Papers (SD(E))

There are no background papers (as defined by Section 100D(5) of the Local Government Act 1972) relating to this report.

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