

29 November 2012**Agenda Item: 9****REPORT OF THE SERVICE DIRECTOR FOR TRANSPORT, PROPERTY AND
ENVIRONMENT****RENEWABLE ENERGY – APPLICATIONS AND OPPORTUNITIES FOR
NOTTINGHAMSHIRE COUNTY COUNCIL****Purpose of the Report**

1. This report provides an overview of a range of renewable energy technologies, their application within Nottinghamshire County Council and the opportunities they present to the Council as both landlord and landowner. A tour of a case study building (Worksop library) will demonstrate the practical application of several of the technologies mentioned in this paper.

Information and Advice

2. In essence, renewable energy is energy derived from a renewable resource, such as solar, wind or wave power, although eligibility for financial support mechanisms blurs this simple definition. The UK has a legally binding target to source 15% of its energy from such resources by 2020, and the Government has set out how it intends to achieve this target by increasing the percentage of renewable energy used in generating electricity, providing heat and powering transport in its 2011 Renewable Energy Roadmap. Support for large-scale, centralised renewable electricity generation is provided by way of the Renewables Obligation, which requires electricity suppliers to source a specified and increasing proportion of their electricity from renewable sources. Renewable heat and small scale renewable electricity generation are being encouraged by '*clean energy cash-back schemes*' for households, industry, businesses and communities. Guaranteed payments for such generation are supported through Feed-In Tariffs, introduced in 2010, and the Renewable Heat Incentive, introduced in 2011.
3. Whilst recent years have seen an increased uptake in renewable energy technologies (last year global investment in renewables, at £143bn, outstripped investment in fossil fuels for the first time), it is important to remember that from an energy management perspective, in which the objective is to try and reduce costs and in turn deliver carbon savings, following the energy hierarchy of firstly reducing wastage of energy, secondly increasing the efficiency of energy use, and thirdly utilising renewable energy, remains a sound approach. Generally speaking, energy waste reduction measures provide quick returns for little or no investment; energy efficiency measures can pay back from 3 years upwards; and renewable energy measures currently pay for themselves from around 8 years and upwards.
4. This report excludes consideration of renewable energy in transport and the partnership work that the Council is engaged with around renewable energy,

particularly via the Nottinghamshire and Derbyshire Local Authorities Energy Partnership (under which the Warmstreets insulation scheme also offers renewable energy solutions to householders), but briefly looks at renewable electricity, renewable heat, and the combination of both, from a property and land owning perspective.

5. The Council's major investment in renewable energy has been in biomass boilers and solar, photovoltaic panels (PVs). The Council has a history of investing in biomass boilers going back to 2003, and probably operates more wood-fuelled sites than any other UK local authority. A report recommending further investment by the Council in biomass boilers, linked to making effective use of the Government's Renewable Heat Incentive payments, was approved by Finance and Property Committee on 17 September 2012. The Council's history of installing PV systems has largely been more recent, following the introduction of Feed in Tariffs (FiTs) for electricity generated by renewable technologies. The new library at Worksop includes both of these technologies, and solar water heating, as well as other environmental features such rainwater harvesting and a sedum roof.
6. In general, such technologies can offer a range of benefits, including:
 - Cost savings associated with displacing grid-supplied electricity
 - Income generation
 - Carbon reduction and associated cost savings under the Carbon Reduction Commitment Energy Efficiency Scheme
 - Supporting the local, low carbon economy
 - Assisting to meet planning and building regulation requirements
 - Enhancing and supporting the educational experience of schoolchildren
 - Improving local energy security.

Applications and opportunities

A. Electrical energy

7. Electricity generated by photovoltaic (PV) panels probably provides the largest scope in terms of number of opportunities for utilisation across the Council's portfolio. The Council's SunVolt scheme has so far seen around £600,000 invested in over 1,300 panels on its non-school buildings, which are expected to generate just under 250,000 kWh per year, saving around £15,000 in electricity costs at current prices, and yielding around £55,000 p.a. in FiT payments. These panels will save over 100 tonnes of CO₂ p.a. and represent an annual return on investment of around 10%. In addition to this, some schools have had PV panels installed on their roofs, predominantly under a recent scheme offered by British Gas, which enables the schools to benefit from free electricity generated by the PVs. To date 28 schools have benefited from this scheme at no cost to themselves, and have had over 500 kWp of PV panels installed. This will generate electricity cost savings to the schools collectively of c. £44,000 per year. The schools will benefit from this for at least the next 20 years. The Government has indicated that FiT rates will decline as technology costs decrease, with a view to maintaining a return on investment of 5-8% p.a.

8. The Council could take a more proactive role to encourage further take up of PVs by schools through the provision of an approved supplier, or suppliers. For example, Members may be aware of a scheme currently being rolled out by Nottingham City Council that will see over 2 mega-watts (MW) of PV installed on school roofs at no cost to the schools. The schools will pay 7.5 p/kWh for the electricity that the panels generate, which is approximately 2p/kWh less than the price they would pay for electricity from the grid.
9. Electricity generated by wind energy also has relatively widespread opportunities across the Council's land holdings. So far, use of this technology has been relatively limited with seven or so schools with small scale wind turbines, including Mapperley Plains Primary; Lake View Primary, Rainworth and The West Bridgford School. Preliminary scoping studies undertaken some years ago identified a number of Council landholdings as potentially technically suitable for large scale wind power, and it is at this end of the wind turbine spectrum that the best returns can be made. This technology, at a micro scale, can also be mounted on to buildings, such as seen at Lawn View House, but generally this is not recognised as giving a good return on investment.
10. The Council's estate has limited opportunity to exploit the potential to generate electricity from water power. One County school, Cuckney Primary, has a water turbine installed, but its performance has not been as good as was hoped, mainly owing to local maintenance issues. Like solar and wind, hydroelectricity can qualify for payments by way of FiTs or Renewables Obligation Certificates, dependant on scale.

B. Thermal energy

11. In terms of impacting positively on carbon emissions, supporting local employment and generating a return on investment, biomass heating probably represents the best opportunity for the Council to exploit, which it is continuing to do following the report to Finance and Property Committee mentioned in para. 5. This will see £2million invested over the next 2 years to offer schools and other Council sites modern wood pellet boilers to replace ageing fossil fuel boiler plant.
12. In addition to biomass, other forms of renewable heat also qualify for RHI payments, including ground source heat pumps, water source heat pumps, geothermal energy, solar thermal and biomethane. To date the Council has had relatively limited experience of utilising these technologies, and generally speaking they tend to lend themselves more to new building projects than retrofitting, such as at the new bus station at Mansfield, which will be incorporating ground source heat pumps. Further opportunities to make greater use of some of these other technologies exist, for example using solar thermal energy to help meet hot water needs for schools outside of the heating season.

C. Heat and power

13. In some circumstances renewable energy can be utilised to generate both heat and power, and whilst this approach can work at a smaller scale it tends to be

limited to larger applications such as biomass-fuelled combined heat and power (CHP) and anaerobic digestion plants.

D. Energy crops

14. In addition to opportunities for generating and using renewable energy, the Council could produce renewable energy crops from its green estate. It has already initiated a pilot exercise by planting Miscanthus (elephant grass) at the former landfill site at Fiskerton, a site that is difficult to let for grazing and unsuitable for growing food and trees. The Miscanthus is now in its third year of growth and is grown and harvested under a contract with a specialist company and should generate c. £4k per annum income from 2013. This is in comparison to c. £400 per year for rent for grazing. In addition to Miscanthus, the Council could potentially grow other crops such as willow and other quick growing trees, and other non-woody energy crops, such as hemp, but no detailed, wide ranging feasibility work has been undertaken.

15. Further to this, parts of the Council's green estate and its operations produce, or have the potential to produce, timber suitable for converting to wood chips or other biofuels and using in appropriate biomass boilers. The Council could look to explore options for growing and processing its own biomass fuel, which may help to reduce risks, such as security and affordability, associated with any energy supply.

Worksop library

16. The Council's new library building at Worksop, provides a good example of renewable energy utilisation. Its environmental features, which have helped achieve a BREEAM rating (the leading environmental assessment method for buildings) of excellent include:

- Biomass pellet boilers
- Photovoltaic panels
- Good levels of natural lighting
- High efficiency lighting
- An automated natural ventilation system
- Solar water heating
- Solar control glazing on south facing elevations
- A rainwater recycling system
- A sedum roof to encourage biodiversity and reduce flood risk
- Rainwater attenuation tanks under the car park, designed to reduce flood risk.

17. A guided tour of Worksop library to see some of these features will be available following the meeting. Worksop library is not unique, for example the new highways depot at Bilsthorpe includes a large PV array and two biomass boilers heating a number of buildings, and other 'green' features.

Reasons for Recommendations

18. This is an information report.

Statutory and Policy Implications

19. This report has been compiled after consideration of implications in respect of finance, equal opportunities, human resources, crime and disorder, human rights, the safeguarding of children, sustainability and the environment and those using the service and where such implications are material they are described below. Appropriate consultation has been undertaken and advice sought on these issues as required.

Financial Implications

20. The contents of this report are duly noted; the related financial implications are explained within the report (DJK 07.11.12).

Implications for Service Users

21. None arising directly from this report.

Recommendation

22. That Committee notes the contents of the report.

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For any enquiries about this report please contact:

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Constitutional Comments

23. As the report is for noting only there is no requirement for constitutional approval. (SHB.06.11.12)

Background Papers

Renewable Heat Boiler Replacement Programme, Report to Finance and Property Committee, 17 September 2012

Electoral Divisions

All