Warwickshire's Renewable Energy Resources – 10% Scenarios Report

Overview

Objective: 1. To determine the potential for a variety of technology options to contribute to meeting renewable energy targets in the Warwickshire.
2. To identify major renewable energy technology areas where the County Climate Change Strategy & Action Plan should focus.

Main Partners: **Encraft, Warwickshire County Council.**

Audience: Renewable energy project developers, strategic planners.

Rationale: The UK target is for 10% of all electricity generated to be produced from renewable sources by 2010. This could cut carbon emissions by 2.5 million tonnes a year.

The West Midlands Energy Strategy contains a differently phrased target – for 5% of the electricity consumed in the region to come from renewable sources by 2010 (1,250 Giga Watt hours of electricity (GWhe)).

Web Link:
http://www.warwickshire.gov.uk/Web/corporate/pages.nsf/Links/A1967A42DD43BEA6802572E20057781F

Warwickshire's Renewable Energy Target

In 2003 the total electricity consumption in the domestic, commercial & industrial sectors in Warwickshire was 2,728 GWhe. To meet 5% of this means that 136 GWhe is required from renewable sources. In 2003, 81 GWhe was generated annually by landfill gas sites in Warwickshire. This output was equivalent to 3% of the county's electricity demand. This source will remain in the short term, however it is a declining resource as the fraction of biodegradable waste sent to landfill reduces. At present we do not know how long this resource will last.

In this report, 14 hypothetical and distinctive scenarios which would deliver 10% of either electrical or heat demand from renewable sources are modelled and compared. The scenarios reviewed range from large-scale wind farms through to solar systems and community combined heat and power schemes. Also modelled is a base case option of simply allowing replacement of existing heating systems with modern condensing boilers, and a straightforward approach encouraging switching to green electricity tariffs.

The report is not intended to promote specific technologies, nor should its conclusions be taken as a blanket recommendation for Warwickshire to support any one technology at the expense of others. It is intended as a guide to strategy and policy debates, and to stimulate action to encourage implementation of a diverse and far-sighted climate change strategy for the county.

Summary of model outputs

The table below shows selected results from the model. The table ranks technologies using total cost per tonne of carbon dioxide (CO_2)saved. The third column shows how many permanent jobs might be created in Warwickshire were 10% of the county's electricity demand to be sourced from this technology locally, and the fourth column shows how many standardised installations would be required. (Installations in this context means installations for modelling purposes

Table 1. Initial sample of 10% electricity supply options

Option	**Cost per t CO2**	**Total investment**	**Long-term local jobs**	**"Typical" Installations**
Industrial-scale 1.5MW wind turbines on sites > 6.5m/s	£33	£83 million	8	83
Community 600kW wind turbines on sites > 6.5 m/s	£36	£93 million	9	208
Farm-scale 6kW wind turbines on sites > 5 m/s	£142	£347 million	52	24,800
2MW community-scale biomass generating stations	£152	£108 million	97	22
Rooftop micro-wind turbines 1.5kW on sites >4 m/s	£153	£317 million	106	211,309*
Households switching to green electricity	£201	0	0	50,119**
78 sqm 10kWp solar photovoltaic (PV) electrical installations	£672	£1723 million	173	36,815

* There are only 210,000 households in Warwickshire (plus 20,000 businesses).
** One green electricity installation is 5,443 kWh – the equivalent of an average Warwickshire household.