

Renewable energy

-An introduction

Factsheet 1



Introduction

Energy plays an indispensable role in modern society. We all depend on a constant and reliable supply of energy - for our homes, businesses and for transport. But have you ever thought about the source of the energy you use?

The majority of the UK's electricity comes from burning fossil fuels (e.g. coal, oil and gas) which is a major contributor to climate change. The mix of fuel sources has changed significantly in the last 50 years. In 1950, about 90 per cent of our electricity came from coal; but today, coal accounts for only about 33 per cent. Gas now provides a large proportion, with oil and nuclear making up the rest and renewable energy accounting for only about 3.5 per cent. However, Scotland already has a high level of hydro output meaning approximately 8 per cent of our electricity is generated from renewable sources.

In the future, the amount and proportion of renewable energy generated is set to rise, largely because of scarce supplies of gas and oil and also because of government policy and programmes to support renewable energy generation.

What is renewable energy?

Whilst there is a range of energy sources, the way we use energy - the end product - is usually for one of three needs:

- Production of electricity.
- Generation of heat.
- Energy for transport.

Renewable energy can be used to produce electricity, generate heat and transport goods and people. It comes from sources that are essentially inexhaustible. They include the sun, the wind, flowing water and the heat of the Earth; or replaceable fuels such as plants.



Picture is courtesy of Bord Na Mona

Why is renewable energy important?

Until the industrial revolution, renewable energy sources were virtually the only forms of energy used by humans - we burned biomass (wood) and made use of windmills, watermills and sailing ships. But during the last 150 years, modern civilisation has become increasingly reliant on fossil fuels: oil, coal and natural gas. Fossil fuels form so slowly in comparison with the rate of energy use that they are considered finite or limited resources.

In addition, the burning of fossil fuels produces greenhouse gases and other pollutants. Greenhouse gases are believed to be responsible for trapping heat in the Earth's atmosphere, heat that would normally be radiated back into space. This effect is being linked to changes in the Earth's climate.

Renewable energy generally produces few or no greenhouse gases. The exception, however, is biomass. The carbon dioxide emitted is balanced by the amount of carbon absorbed from the atmosphere while the organic material is produced. If biomass is being used sustainably, there are no net carbon emissions over the time frame of a cycle of biomass production. Biomass is therefore generally considered to be carbon neutral.

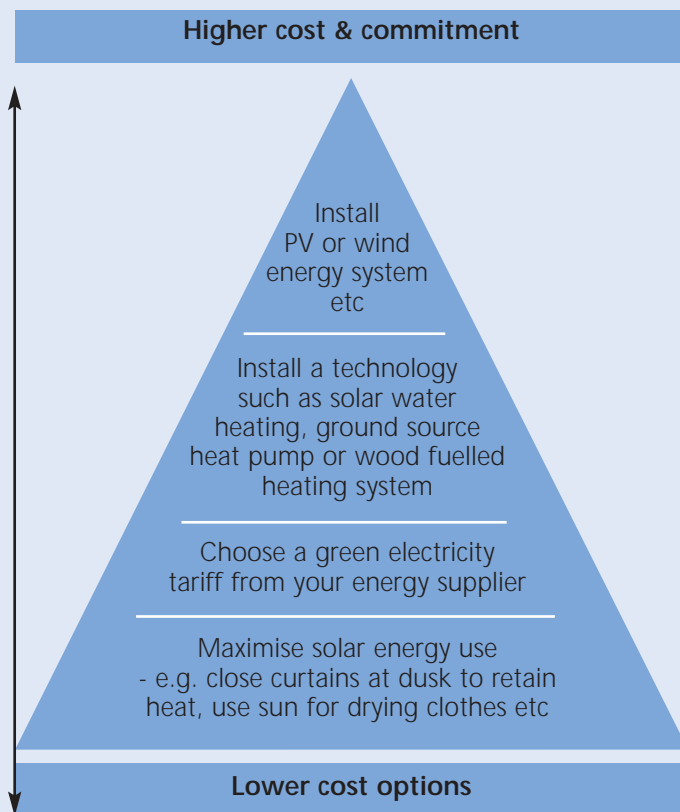
Using renewable energy can provide many benefits, including:

- Making use of secure, local and replenishable resources.
- Reducing dependence on non-renewable energy.
- Helping to keep the air clean.
- Helping to reduce the production of carbon dioxide and other greenhouse gases.
- Creating new jobs in renewable energy industries.

What are the different types of renewable energy?

The most common types of renewable energy and the technologies used to extract the energy from the source are shown overleaf.

Renewable energy source	Technology/ Application
Solar	1. Photovoltaic (PV) cells to produce electricity 2. Solar thermal system for heating water
Wind	1. Wind turbine: single turbines or a number of turbines in a wind farm 2. Conventional windmill to pump water
Water	Hydro electric, wave and tidal systems to produce electricity
Biomass	Direct combustion of gas produced from biomass, or biogas, to generate electricity and/or heat - e.g. wood stoves or larger commercial operations
Geothermal	Using the temperature of the earth to produce electricity and/or heat, e.g. ground source heat pumps



How can I use renewable energy?

It doesn't necessarily mean that you have to change your lifestyle or your appliances. Nor is it more, or less, reliable than conventional energy sources. There are a number of ways you can use more renewable energy at home. The 'pyramid' shown here is a guide to the options you could consider. They range from making some minor behavioural changes to installing your own renewable energy system.

It is important to remember renewable technologies should generally only be considered after carrying out all basic energy efficiency improvements.

Not all technologies will be suitable for your circumstances and you should consult a relevant specialist to ascertain which renewable energy system best fits your needs.

Are there grants available?

Yes, householders and community groups in Scotland can access grants from the Scottish Executive. These grants are managed jointly by the Energy Saving Trust and the Highlands and Islands Community Energy Company. Householders can access capital funding of up to £4,000 and community organisations can access up to £10,000 for feasibility assistance and up to £100,000 for capital assistance. For more information call the helpline on 0800 138 8858.

Where can I get more information?

The Energy Saving Trust offers a one-stop shop that provides funding, advice and project support to further the development of small-scale renewable energy projects. To assist community projects there is a network of Development Officers which the Energy Saving Trust co-manages with the Highlands and Islands Community Energy Company;

these officers provide an advisory and project management service to community groups within their local region. To find your nearest Development Officer call the helpline on 0800 138 8858.

The Energy Saving Trust also provides information and advice for householders via its Energy Efficiency Advice Centre (EEAC) network which provides householders with free and impartial advice on how to improve energy efficiency in the home. EEAC advisors have been trained to provide advice about renewable energy and will be able to advise you on the issues you need to consider when installing a renewable energy technology. To contact your nearest EEAC call 0800 512 012.

Useful links

- The Energy Saving Trust renewable grants for Scottish householders and community groups: www.est.org.uk/schri
- For advice and information about renewable energy technologies and other energy saving measures for your home: www.est.org.uk/myhome
- Scottish Renewables Forum (SRF): www.scottishrenewables.com/home.asp

