

Green Energy on Crofts



Crofters traditionally provided food, clothing, shelter and **energy** for their families. Energy provision was in the form of generating heat by burning peat and wood to cook and stay warm.

Peat

Peatland covers a fifth of Scotland's land mass and most of it lies in the Highlands and Islands. It has formed over thousands of years from decaying plant material. See more in the Soils of the Crofts book <http://www.hutton.ac.uk/sites/default/files/files/education/croftingbook/pageflip.html>

For this reason it is not considered a renewable source of heat and its use for fuel or as garden compost is not encouraged as it locks up such a vast carbon store which if released into the atmosphere as CO₂ by cutting and drying, contributes to climate change. Peat land stores 20 times as much carbon as the same area of forest. <http://www.james-hc-fenton.eu/Downloads/CarbonStoreComparisonPeat&Forests.pdf> . As peatland is often exposed to high winds, it can be of great value to generating electricity from commercial wind farms so the release of peat from such projects is a large consideration when deciding on location for turbines.

Peatland also has a huge part to play in Scotland's biodiversity as it provides such good habitats for the diverse range of flora and fauna important for our ecosystem. <http://www.snh.gov.uk/about-scotlands-nature/habitats-and-ecosystems/mountains-heaths-and-bogs/peat-bogs/>

The heritage of peatlands and peat cutting is however very important in the history of crofting and small areas which still practice peat cutting can be studied. When researching crofters in your local area you will find that many are also classed as peat cutters, traders, sellers, gatherers etc. for example in the Moray archives <http://libindx.moray.gov.uk/mainmenu.asp> and in many local museums and heritage centres. Is anyone in your school descended from peat workers?

The language and practices of cutting peat can be seen in the Highland Heritage archive http://www.ambaile.org.uk/en/search/do_quick_search.html?q=peat&mime_type

Renewable Generation

Scotland has one of the most ambitious targets for renewable energy generation in the world <http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185> Today's drive to source energy from renewable and sustainable sources is very much in-line with the crofting tradition of living in a self-sufficient and low impact way. There are many ways of generating both heat and light energy locally to use on crofts and/or to feed into the National Grid. 'Local Energy Economics' describes the benefit of this for communities

http://www.communityenergyscotland.org.uk/userfiles/file/steven_uploads/Short-Guide-to-Local-Energy-Economies.pdf .

Electricity

- Solar Photovoltaic cells generate electricity from the light from the sun
- Wind turbines generate electricity from the wind
- Hydro turbines generate electricity from moving water in streams and rivers
- Tidal and wave power enable electricity to be generated from the movement of the tide and waves in the sea

Heat

- Solar thermal panels use heat from the sun to usually heat domestic water supply
- Biomass sources (wood pellets, chips, logs) can be burnt to generate heat and are considered carbon neutral as the CO₂ released when burning is the same as that absorbed when growing. Anyone using biomass fuel is also involved in planting new trees for ongoing source of fuel.
- Heat pumps take heat from one source (air, ground, water) and apply it to another sort of like a fridge in reverse.

Classroom activities to help explain how these technologies work can be found here

- HI Energy – part of Highlands & Islands Enterprise – has useful resources already distributed to Primary schools and available online here
<http://www.hi-energy.org.uk/Education/Primary-School-Factsheets.htm>
- STEM Central – Science, technology and maths – learning with Education Scotland explains renewables
<http://www.educationscotland.gov.uk/stemcentral/contexts/renewables/index.asp>

For an exercise you can see if your school grounds would be a good site for a wind turbine. Wind turbines are only viable in locations with an average wind speed of over 5m/s at the height of 'nacelle' of the turbine. You can find out the wind speed at your school here

<http://www.windspeed.energysavingtrust.org.uk/>

And a great explanation of how wind energy works and what the nacelle is can be found here

<http://energy.gov/eere/wind/how-do-wind-turbines-work>

Efficiency

Generating your own energy makes consumers more aware of the amount of energy used at any one time. To maximise the benefits of becoming less dependent on fossil fuels houses should be well insulated and energy saved where possible. Houses are now rated according to their efficiency in the same way new kitchen appliances are.

What properties of a typical croft house make it efficient and what makes it inefficient. What do you think would need to be added to make it more efficient for modern day use?

You can assess the amount of energy you use at home or in school using tools on the Carbon Trust website and on Eco-schools

<http://www.keepsotlandbeautiful.org/sustainable-development-education/eco-schools/ten-topics/energy/>

Some places in Scotland such as the Isle of Eigg have managed to become more or less powered totally by a mixture of renewable energy installations. This has necessitated the careful use of

energy on the island so the system is not overloaded. Households are restricted to using only 5KW of power at any one time. This means that using kettles, washing machines and dishwashers at the same time is not possible. To find out more about the rating of household appliances see here <http://www.greatbowden.org/documents/TypicalEnergyUsageforHouseholdAppliances.pdf> .

Financial gain from energy generation

Many people think of large wind farms when thinking about renewable energy. These larger commercial farms do donate money to the local communities in the form of a Community Benefit payment which community trusts etc. use to fund facilities in the community, education funds, local economic support and so on. You can find out more about a few of these types of agreements and what the communities are using the money for here <http://www.localenergyscotland.org/view-the-register/> .

But in Scotland we also have a target of 500MW of renewable generation to be owned by Communities by 2020. Some communities enter into a joint venture with commercial companies, landowners or crofters to have a part ownership of smaller scale venture. More details can be found on the Local Energy Scotland website <http://www.localenergyscotland.org/view-the-register/> . In some of these cases crofters have come together to install renewables on common grazing land.

Smaller wholly owned community projects generate money from their renewable installations through a payment from the UK government called the 'Feed-in-Tariff' (FIT) for electricity and 'Renewable Heat Incentive' (RHI) for heat. Different rates apply depending on size and date installed. More information can be found here <http://www.energysavingtrust.org.uk/Generating-energy/Getting-money-back/Feed-In-Tariffs-scheme-FITs>

There are many examples of renewable energy in the crofting counties, some of which are linked to crofts.

- The community owned crofting estate of Galson have erected a 900kW wind turbine which involved a series of agreements with crofters <http://www.galsontrust.com/renewables/4556066495>
- North Harris Trust – wind, biomass supply and hydro <http://www.north-harris.org/nhtc/about/>
- Horshader – wind turbine erected - <http://horshader.com/>
- Stornoway Trust - <http://www.stornowaywind.com/>
- A list of Scottish community projects in Community Energy Scotland's website will give you an idea of projects in your area <http://www.communityenergyscotland.org.uk/case-studies.asp>

Legal and Official

Some things need to be considered before renewable energy can be an option on croftland. Ownership of the land for lease purposes (renewables typically need a lease period of 25 years or more) can be difficult to agree on. The actual footprint of the land the turbine or other installation sits on must go through the legal process of being de-crofted. A few legal firms specialise in supporting crofters through this process.

[http://www.wjm.co.uk/images/uploads/Renewables_and_Crofting -
_A Briefing Note from WJM.pdf](http://www.wjm.co.uk/images/uploads/Renewables_and_Crofting_-_A_Briefing_Note_from_WJM.pdf)