Orkney – energy solutions

How many times do you hear in the energy debate – well this or that can't happen. Well in Orkney things are different because they can happen, the do happen and people are working hard to make sure they will happen.

Being blessed with buffeting winds, wild seas, streaming tides and productive soils as well as a self reliant and determined community Orkney has been, continues to be and will continue to be an energy power house for the UK.

But it is not just in the handling and production of energy that Orkney excels it is also about ideas, collaboration and overall finding solutions, particularly energy solutions.

Historically the islands have utilised renewable energy for 100s of years. The remains of micro hydro mills, large wind mills and smaller micro wind turbines can be found in many places.

During the two world wars Orkney held a strategic location for fueling merchant and military shipping.

In the 1970s the islands became home to the Flotta Oil Terminal which handles ??? TWh of energy potential in the form of oil.

Large wind turbines have been tested at Burgar Hill since the 1980's adjacent to an important nature reserve and nesting Red Throated Divers.

The EMEC wave and tidal test centres have been established over the last few years and deployments of various technologies are underway.

Some 200 MW of onshore wind energy potential has been identified and is actively being developed.

Designs for 2 novel tidal generators have been developed with the Scotrenewables device now receiving significant financial backing.

Systems for producing bio fuels and latterly biogas have been developed recently and even the kids are getting involved in energy with an electricity standby management device being developed by a pupil at Stromness Academy.

Not just content with sorting out our own energy issues Orkney based consultants and engineers are engaged nationally and internationally helping governments, businesses and communities achieve their goals and overcoming their challenges.

Given all of this experience at finding solutions it is little wonder that Orkney is now turning its attention to some of the strategic issues that the energy revolution is facing.

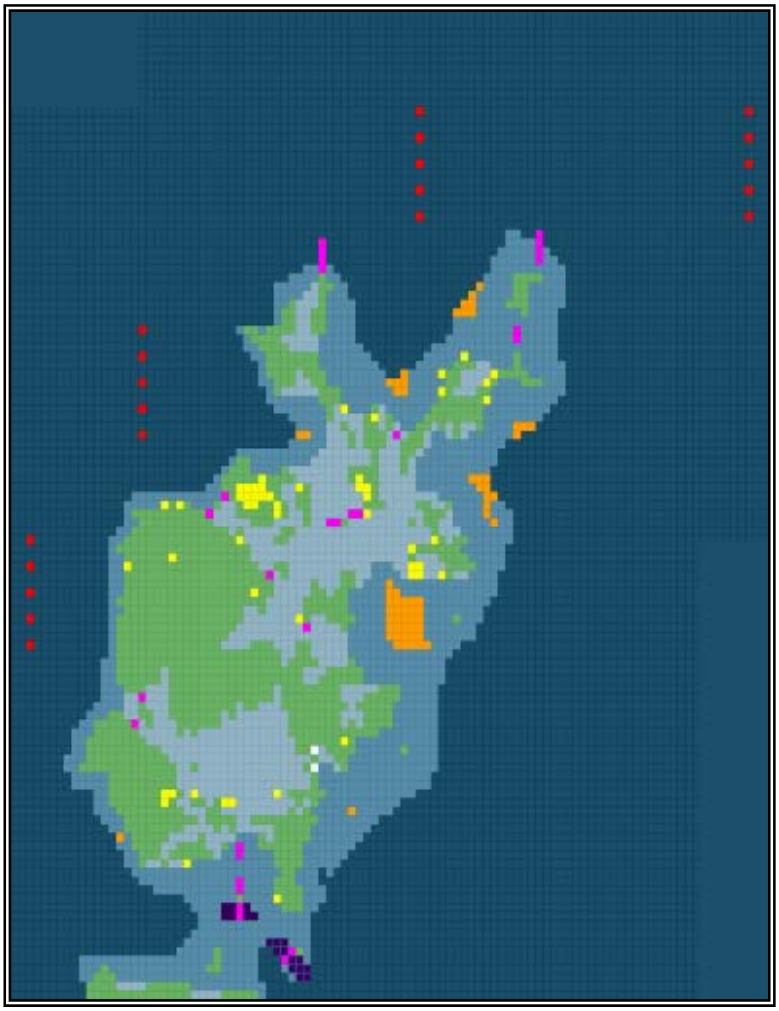
Ambitious targets have been set for energy over the coming decades:

- **Large increases in renewable energy contribution to electricity supply (x% by 2020)**
- **Large contributions of renewables to overall energy supply (EU 20% by 2020)**
- **Reducing our carbon footprint (50% reduction be 2050)**

One of the first stages in the process was to establish the level of energy resources available. The results of the ensuing resource assessment showed that there was a constrained renewable energy development potential of between 1.6 GW and 4.5 GW across a range of technologies – particularly marine.

Energy category	Acceptability scenario		
	High	Medium	Low
	Installed generation capacity (MW)		
Current energy use	201	201	201
R & D	8	11	17
Existing/approved wind	23	23	23
Tidal current	**1462**	**2443**	**3571**
Offshore wind	**0**	**385**	**986**
Offshore wave	**101**	**226**	**226**
Onshore wind (1 MW units)	**0**	**46**	**256**
Tidal head	**1**	**6**	**7**
Coastal wave	**0**	**0**	**0**
Energy efficiency	19	33	47
Micro-renewables	16	29	47
Biomass crops	3	7	14
Biomass harvest	2	3	3
Bio-digestion	0.1	0.4	0.7
Energy from waste	0	0	0
Total installed capacity (MW)	**1603**	**3177**	**5158**
Annual power production (GWh)	**5580.1**	**11057.6**	**17951.3**

Not only has this work given an estimate of the scale of the potential it has also examined its likely distribution and the timing of development.



Orkney is also actively developing a sustainable energy strategy including a vision and targets for energy production in 2010, 2020 and 2050.

This work and the discussions that it has highlighted some key strategic questions that need to be answered:

- **How is the energy going to reach the market**
- **What facilities will the future marine renewables industry require**
- **Can the use of systems charging regimes be changed to reflect a fairer distribution of cost taking into account wider sustainability issues**

As usual Orkney is seeking to find solutions to these issues. Regarding grid upgrades etc the islands recognise that the current land based grid upgrades can only deliver relatively small capacity opportunities to some where like Orkney. Neighbouring islands such as Shetland and the Western Isles have similar challenges to overcome.

Local specialists are actively investigating schemes that would make large DC inter-connectors more viable by using mixes of energy sources.

There is also keen interest in undertaking feasibility study work into the potential for large scale fuel production.

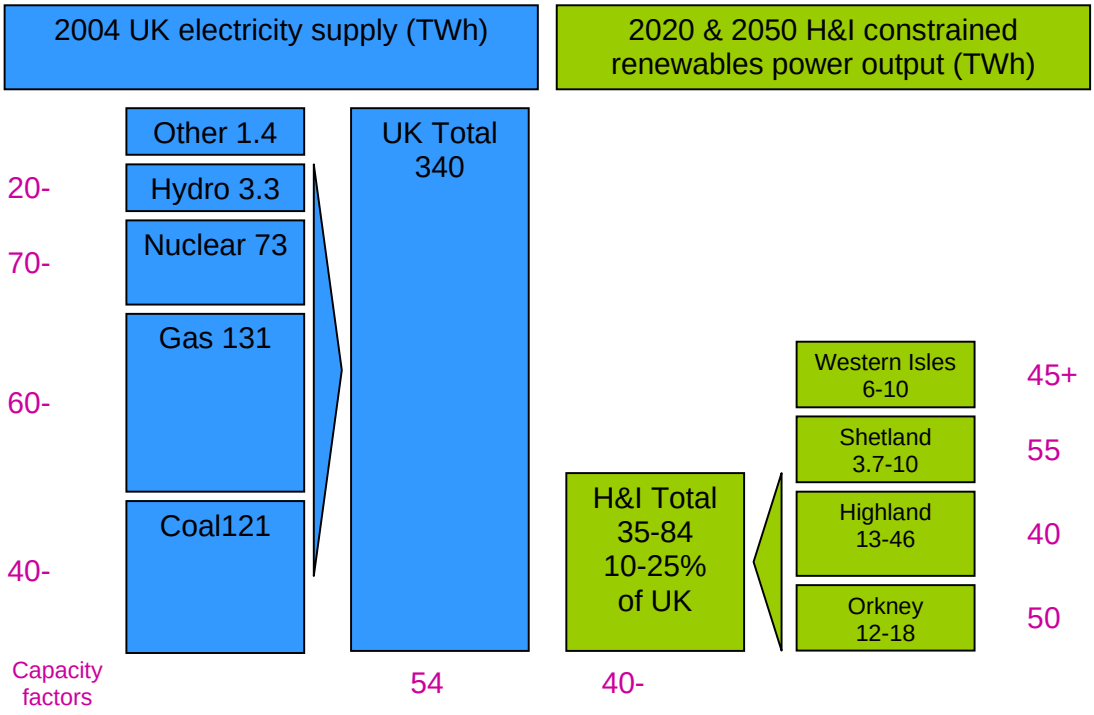
Regarding facilities Orkney recognises the need for strategic port locations and associated infrastructure. The town of Stromness has already had community meetings to discuss how the town could adapt to an influx of energy related people, businesses and vessels.

The importance of suitable access to tidal streams such as the Pentland Firth is also recognised with the adjacent natural harbour of Scapa Flow being a key asset.

Being at the end of the current grid system it is hardly surprising that grid management strategies are not yet focussed on island issues. Nevertheless Orkney has successfully lobbied to be one of the first RPZ areas in the UK and this has already provided a small but valuable 15 MW of non-firm grid capacity.

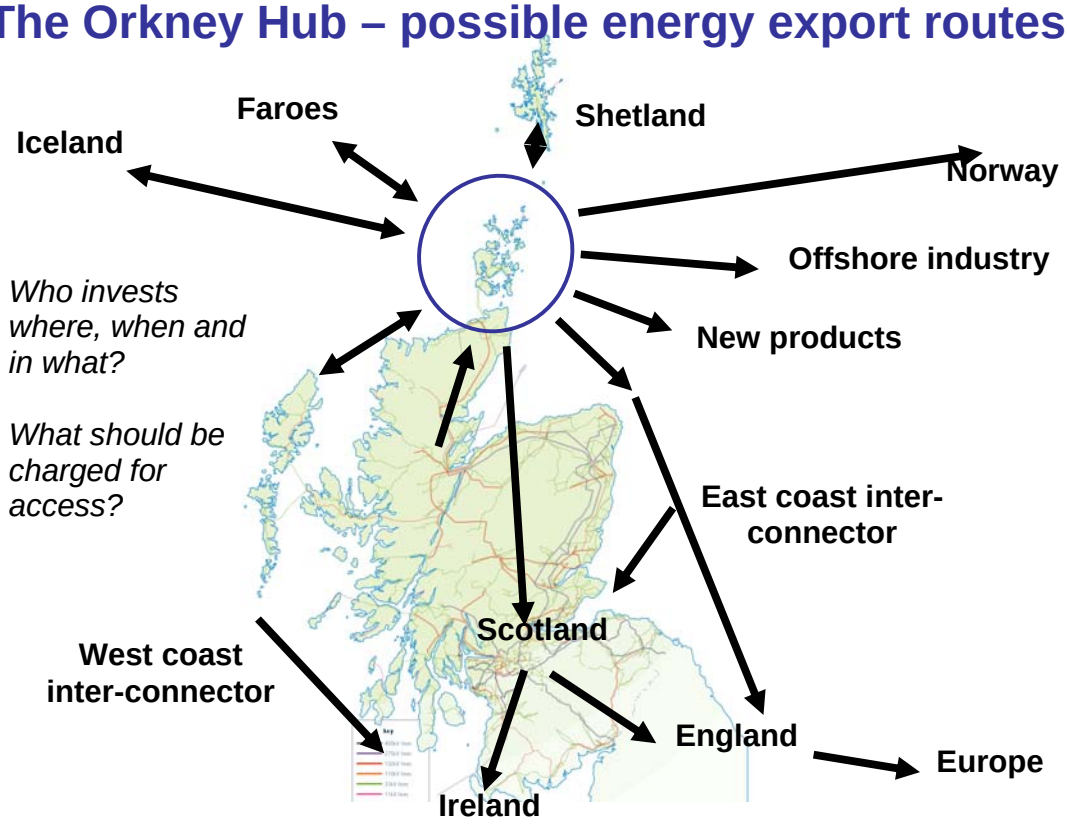
This lobbying focus is now moving on to issues such as use of system charging mechanisms, which as presently configures could unfairly penalise energy from remoter places like Orkney even where the overall carbon benefits and reliability of the generated energy is so much greater due to the excellent resources in the area.

What is clear is that Orkney has been involved with renewable energy for centuries and it has the potential along with other parts of the highlands and islands to deliver a large amount of UK energy.



Orkney has the solutions, the key is whether the country wants to ask the question

The Orkney Hub – possible energy export routes



Who invests where, when and in what?

What should be charged for access?