Nature Exchange Visit
Sustainable Energy in Northern Scotland
22 to 28 September 2012

Summary Data

Culgower Microgen

General Data

Location	Location	Population	Area (km^2)
Helmsdale	Village	550	
Brora	Village	1,200	
Brora Ward	**Local Council**	**2,600**	**850**
Sutherland	District	11,500	5,252
Highlands	Region	221,630	26,489
Scotland	Country	5,222,100	77,925

Highlands:

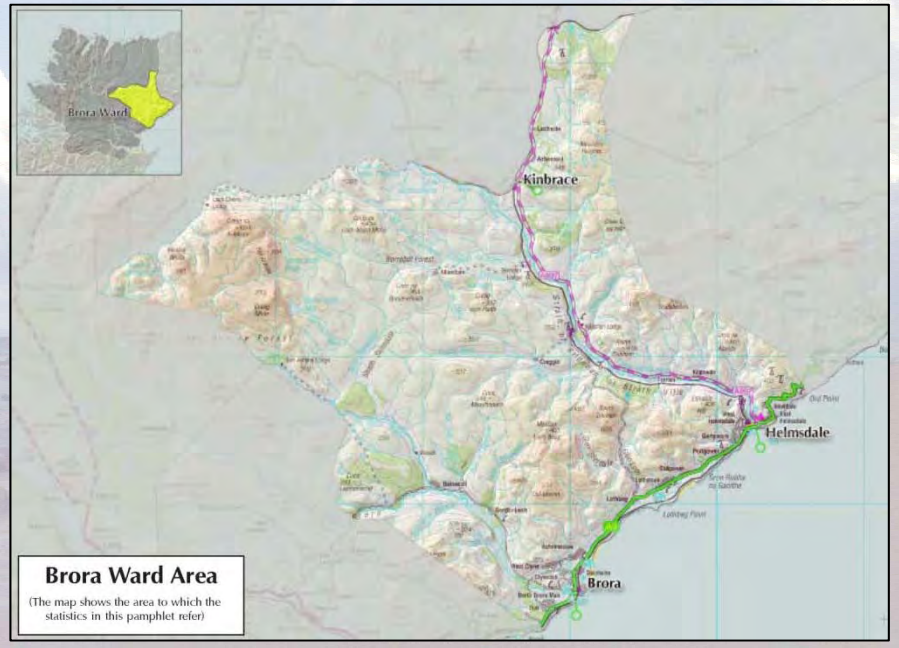
89,500 households, of which:

15.2% (13,600) council houses

6.2% holiday homes (Scotland average 1.3%)

4.0% vacant

1.6% (1,450) new houses completed every year



Sources: UK National Statistics, Wikipedia, Google, The Highland Council


The Findhorn way...

Estimated numbers are in italics

Sunday 23 September

Location	System(s)	Peak Power (kW)	Energy per year (kWh)	Notes	Contact	Email
Findhorn	Biomass		*72,000*	6 x new eco-houses, total cost £1.5 million sharing common pellet boiler and 2000 litre accumulator tank. Projected use 3 x 5,000 kg pellets per year.	Lianne Milligan / Graham Meltzer	enquiries@findhorn.org
	Wind	3 x 225 kW & 1 x 75 kW		Community wind turbine farm providing most of electricity to site plus 1/3 as export to grid (until new eco-houses are occupied).		
	Biomass	250 kW		Community wood-chip boiler system serving main communal buildings on site.		

Monday 24 September

Location	System(s)	Peak Power (kW)	Energy per year (kWh)	Notes	Contact	Email
Loth Manse	Solar thermal	3 kW	- -	3 x 1 kW panels connected to 300 litre triple coil hot water tank (solar, biomass and oil backup).	Peter Daniels	
	Biomass	25 kW	30,240	Large wood stove connected to central heating system. Annual usage approx. 9,000 kg of hardwood.		
Culgower House	Building performance	- -	Saving of 27,000 kWh	Improved insulation, reduced ventilation losses and new windows have reduced the heat loss from 1,400 W/°C to 700 W/°C and saved 2,800 litres of heating oil a year.	John Whitfield	mail@culgowermicrogen.com
	Electrical efficiency	- -	Saving of 4,500 kWh	Relocating existing and buying more efficient appliances, replacing lighting with CFL and LED and careful monitoring have reduce electricity demand by over half.		
	Solar thermal	4 kW	1,495	4 x 1 kW panels serving 400 litre hot water tank. Provides 68% of annual hot water.		
	Solar PV	1.5 kW	1,095	8 x Sharp 180 W panels on frame in garden installed in February 2011 at cost of £7,000. Provides 28% of annual electricity demand		
	Biomass	2 x 5 kW	15,200	2 x 5 kW stand-alone wood stoves used to supplement oil central heating, saving around 1,400 litres of heating oil a year.		

Findhorn Sanctuary

Estimated numbers are in italics

Tuesday 25 September

Location	System(s)	Peak Power (kW)	Energy per year (kWh)	Notes	Contact	Email
Kintradwell	Hydro	97 kW	*430,500*	£0.5 million investment. All electricity sold through a green energy company and an expected payback time of 5 years. Annual energy estimate based on 1st 3 months of operation.	John Billett	kintradwellestate@yahoo.co.uk
Brora	Insulation	- -	- -	Retro-fit council houses carried out in 2011. No data on savings in heating costs yet available.		
Achrimsdale	Wind	3 x 5 kW	*3 x 9,167*	3 x 5 kW wind turbines, each on 18 m masts. £75,000 total investment, including access track and self-installation.		
Dalchalm	Solar PV	2.7 kW	*2,250*	12 x Schuco 225 W panels installed in March 2012. Total investment £8,300. Annual energy estimate based upon data to date.	John Ross	John-Ross@delta-online.co.uk
	Biomass	24 kW	*38,400*	Total cost £13,650 including electrical and plumbing work and after grant. Replaced gas and expected savings of £1,000 per year plus hoped-for Renewable Heat Incentive (RHI) payment per kWh. Energy estimate based on expected usage.		
Timespan, Helmsdale	Solar thermal	8 kW	- -	Originally connected to base of central heating accumulator tank. Now connected to base of hot water tank.	Caroline Kelly	finance@timespan.org.uk
	Biomass	55 kW	96,250	Wood chip burner connected to 2,200 litre accumulator tank providing all heating to museum. 23 m^3 chip storage needs filling 3 to 4 times a year at approximate cost of £2,500. Previous electric heating system cost £6,000 a year to run.		


timespan
A MEETING PLACE BETWEEN
OUR PAST & OUR FUTURE
MUSEUM
GALLERY
ARCHIVE

Helmsdale

Estimated numbers are in italics

Wednesday 26 September

Location	System(s)	Peak Power (kW)	Energy per year (kWh)	Notes	Contact	Email
Golspie	Hydro	225 kW	- -	Community project in planning on land leased from Sutherland Estate for 100 years. Current design uses head of around 100 m and average flow of 500 litres per second. Anticipated annual income for community use of £140,000.	Gordon Robertson	email@gcpower.org.uk
Kilbraur	Wind	67.5 MW	158,000,000	27 large 2.5 MW turbines with a small share owned by around 500 members of a wind energy co-operative.		
Ascoil	Hydro	66 kW	0	Old estate-built hydro scheme abandoned in 1970s when grid electricity was brought to area!		
Culbuie	Hydro	10 kW	- -	Potential micro scheme on croft with 3 streams. Currently in flow gauging and outline design phase.	John Ross	John-Ross@delta-online.co.uk
	Wind	20 kW	- -	Potential wind turbine on croft.		
Andrew Vinen	Wind	6 kW	3,900	Proven turbine in use for 7 years. Annual data for latest year (11 months at annual rate).		
	Solar PV	4 kW	3,250	1st year of production from solar PV array on neighbouring house.		

Thursday 27 September

Location	System(s)	Peak Power (kW)	Energy per year (kWh)	Notes	Contact	Email
Scoraig	Wind	1 to 6 kW	- -	Off-grid community which started experimenting with home-made wind turbines in 1970s. Each house has its own turbine and generally a solar PV array (2 also have small hydro systems). Each house has around 1,000 Ah of battery storage to supply a generally 24 V system an average daily electrical usage of 5 to 10 kWh per day.	Hugh Piggott	hugh@scoraigwind.co.uk
	Solar PV	1 to 4 kW	- -			

Kilbraur Wind Farm


Over the sea (loch)
to Scoraig...

Poster seen in Findhorn

So let's look after this one better....