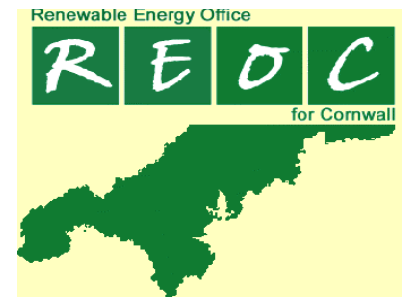


Case study for Cornwall by REOC

Renewable energy for commercial and industrial buildings in Cornwall.: summary



REOC report WP5 for SEIPLED

November 2007

Project aims and objectives

The aim of the project is to develop a programme of encouraging the installation of RE on all new and refurbished industrial and commercial buildings in Cornwall.

Specifically this is to be achieved through the following three deliverables:

- Setting up training for designers and installers
- Helping develop local planning polices for new industrial and commercial buildings to incorporate RE
- Preparing and submitting a grant application for a programme to assist the installation of RE in all new industrial and commercial buildings in the region

Low carbon vision

As part of the development of the programme for RE in industrial and commercial buildings in Cornwall it has been imperative to show the public sector and the Convergence Programme development team the background to energy decisions, in relation to climate change, peak oil

The REOC paper on the Low Carbon Vision showed how the local economy could be grown by around 50% through energy efficiency, RE and local food production and processing to save CO₂ and oil needs.

Possible savings and economic benefits for Low Carbon pathway

<i>Savings source</i>	<i>CO₂ savings tpa</i>	<i>New Employment FTE approx</i>	<i>Increased business turnover £m pa approx</i>
Energy system			
Energy efficiency	220,000	1,500	200
Renewable electricity supply	2,000,000	4,000	385
Renewable heat supply	375,000	900	109
Biofuels for transport	258,000	90	41
Newquay airport CO ₂ offset	42,000	30	8
Food system			
Organic agriculture	100,000	550	50
Local production & supply	282,000	22,000	2,200
Total savings	3,277,000	29,070	2,993

The Convergence Programme

This new EU Structural Funds programme aims to move Cornwall towards a Low Carbon Economy and to build around one million square metres of new industrial and commercial buildings, and major infrastructure buildings to a high environmental standard.

The existing area of non domestic buildings in Cornwall is around 3.7m m², therefore the new stock would require an increase of some 27% over the next six years, of which some 279,000 sq m is expected in the commercial and industrial sectors. The Aspirational Scenario suggests that this could be increased to around 407,000 sq m, with a large annual growth.

The proceeding Cornwall Economic Forum *Strategy and Action* vision has four main themes, of which one is to ensure environmental sustainability. The Convergence actions include establishing a 'low-carbon', competitive economy for Cornwall and the Isles of Scilly

Within this overall proposed Vision is a strong programme for the installation of renewable energy in new and refurbished commercial and industrial buildings, as well as CO₂ savings of around 52% of Cornwall's present emissions.

Possible allocation of funds to RE in commerce and industry

Priority Axis	Expected funds approx €m
1 Innovation/ R & D	2.3-5.8
2 Enterprise	8-15
3 Strategic investments	small
4 Place based	Main strand
Total	Possibly 37-48

Industrial and commercial energy use in Cornwall

As part of assessing the potential for RE installations in Cornish industry and commerce the present energy use was analysed. The table shows the energy use by fuel

Industrial and commercial energy use in Cornwall (GWh pa 2005)

	Electricity	Gas	Coal	Oil	Total
%	38%	34%	<3%	25%	100%
Total	1,620	1,427	110	1,073	4,230

Source DTI Regional Energy statistics

This total of 4,230 GWh for the commercial and industrial sectors in Cornwall is 9% lower than in 1999, probably due to the loss of some major companies and in particular the reduction in activity by the main china clay company which has a very large and constant energy demand.

Cornish industrial and commercial energy use

Sector	GWh pa
china clay	1,054
commerce	1,013
industry -production	1,704
agriculture, construction, transport	460
total	4,230

Of the main industrial sectors in Cornwall,(excluding china clay) the food processing industry uses 43% of industrial energy and mechanical engineering takes around 14% of the demand.

Heat makes up 73% of local manufacturing energy demand and oil provides 43% of the total energy use, making industry very vulnerable to oil price and supply insecurity.

Obstacles to RE implementation

Obstacles include:

- Planning and regulatory problems
- Cost of installations
- Lack of awareness of the issues for SMEs
- Lack of capital in SMEs
- Lack of awareness in buildings professionals including architects and builders
- Institutional issues relating to the public sector and central government eg confusion between energy efficiency and RE messages, ambiguous attitudes from public authorities eg policies in favour but practical obstacles to implementation
- Insurance issues

RE is often thought not financially worthwhile for new industrial buildings as they are often already grant aided, as the cost of building is higher than the completed value in the local market place, due to low demand for quality buildings.

Planning policies

Work is underway with local planning officers to develop local planning policies for the requirement of on site renewable energy for all new developments above a certain size. The approach to renewable energy and sustainability in general by the Councils is very positive, supporting and even enhancing the government and regional policies, including setting up a training course with the local further education college for the training of planning members and officers in renewable energy.

The planners aim is to ensure that all industrial developments over 1,000m² will have on site renewable energy, for at least 10% of their requirements. It is

the intention of some of the District Councils that this amount will be higher, at 15% or 20%.

Training for RE designers, installers and operators

A major part of the programme development to reduce obstacles to the development on RE on commercial and industrial buildings in the region is the development of a programme to train RE designers, installers and operators. This will it is hoped go hand in hand with a grant programme for the installation of RE on commercial and industrial buildings.

Under the Convergence Programme the training of installers and designers of RE would be a European Social Fund activity rather than an ERDF activity.

REOC is in the process of working with all the local training providers, through the Learning Partnership in a partnership to put a joint bid into Convergence for funding on a broad range of issues including RE in industrial and commercial buildings.

Grant programme for capital assistance for RE installations

There are two main options for the grant application for the proposed programme to install RE on new and refurbished industrial and commercial buildings in Cornwall.:

- Convergence Programme
- SW Regional Development Agency

Convergence

This Programme is well developed to accept a grant application on the topic of assistance with RE installation on all new industrial and commercial buildings in Cornwall, as many industrial buildings already receive capital assistance and the Convergence programme requires high standards which will in practice mean RE installations for new build.

SW Regional Development Agency

The RDA has major funding streams and covers the SW of England of which Cornwall is administratively a part and already funds industrial building in Cornwall, to overcome local market failures

Structure of local Convergence Programme

The local Convergence Programme has four strands of supported activity

- Innovation, research and development
- Enterprise and Investment
- Transformational Infrastructure
- Unlocking the economic potential of place

Within these priority Axes there are several niches within which the development of a programme to assist the design and installation of RE on industrial buildings could comfortably fit. In addition the standard for new build

requesting support has been specified as BREEAM Excellent, which will tend to require RE installations

The expected programme is noted in the table above, which suggests the following significant parameters for the potential for RE

- area over 2008-2013 1,000,000m²
- possible number of buildings c.400
- average building size 3,500m²

Programme expected outcomes

The technologies which are expected to make the main contributions to the proposed programme are

- Biomass boilers
- Wind turbines
- Ground source heat pumps
- Heat mains providing distribution from chp biomass or waste plants

Illustrative programme

Technology option	No projects	average size kW	average cost £k	total cost £m	total MW	MWh pa	tpa CO ₂
Biomass	100	100	80	8	10	35,000	6,650
Wind	150	660	990	148.5	99	277,517	119,332
Ground source heat pumps	100	60	48	4.8	6	18,000	1,456
Enabling technology heat mains	3	2km	1,700	5.0	15**	112,000	48,000
	353			166.3	130	442,517	175,438

***assuming 3 X 5MW biomass fired district heating +electricity*

The programme will yield some 175,000 tpa CO₂ savings and considerable long term savings to Cornish industry once increasing fuel and electricity prices begin to bite, with around 400 GWh pa or some 10% of energy demand in these sectors coming directly from RE sources.

Each technology has potential for good financial savings for the participating companies, particularly once the expected rapid rise in energy price really begins to take hold. Thus the RE installation programme will have major economic benefits to local companies and to the region, safeguarding over 16,000 jobs and providing a growing home market for local RE installation and maintenance companies .

Charmian Larke
 For REOC
 Charmian@atlantic-energy.co.uk