Embracing renewable energy, The Orkney Islands - UK

1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space
- SUSTAINABLE ECONOMIC GROWTH: Balancing economic, social, cultural development whilst enhancing environment

2. Key Approaches

- Integration
- Participation
- Ecosystems based approach
- Technical

3. Experiences that can be exchanged

Wind and marine renewables can make a significant contribution to our energy needs in terms of reducing our reliance on non-renewable carbon-based energy supplies.

4. Overview of the case

The case looks at the way that the Orkney Islands have tackled the problem of meeting renewable energy targets set by the Scottish National Executive. In doing so, the Orkneys have become a centre of excellence for marine renewables.

5. Context and Objectives

a) Context

The Orkney Islands lie off the north-east tip of the mainland of Scotland. They cover an area of nearly 975 km2 comprising about 70 islands of which 17 are inhabited by a population of ca. 20,000. These numbers are swollen by 127,000 visitors/yr as the economy is based on tourism, farming and off-shore oil. Fish farms are becoming an increasingly important element of Orkney’s economy. The Orkney Islands Council adopted the current Orkney Islands Local Plan in December 2004. It sets out detailed policies and specific land use proposals/allocations for the development and use of land in Orkney that guides day-to-day planning decisions. There is a requirement for the Council to ensure its Local Plan remains up to date and in January 2007, it commenced a review. The Plan covers all the islands up to the low water mark.

Off-shore, Orkney has some of the best resources in Europe for the research, development and testing of wind and marine renewable technologies, bio-energy and energy efficiency, building on 50 years experience in the sector. It is estimated that these islands could generate 18,000 GWh of renewable energy annually, more than is needed to meet the Scottish Executive target of 40% of Scotland’s total power from renewables by 2020. The small island community of Westray, for example, has aims to go 100% renewable with a combination of technologies including plans for a community run biogas facility. With wind, wave and tidal resources, excellent test facilities, local enterprise, academic expertise and international experience in the energy business, Orkney is also home to EMEC, the European Marine Energy Centre, which has a global role in testing and verifying wave and tidal converters – crucial in turning prototypes into income-generating technology.

b) Objectives

Within the Orkneys, it is the aim to stimulate and encourage appropriate development whilst protecting the environment from inappropriate development. The siting, scale, ownership and local benefit from developments are all important concerns. Within this context, the preferential use of renewable energy in Orkney is encouraged and the best technical and sustainable options for increasing renewable energy and energy efficiency in Orkney is publically debated.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

The Orkney Islands Council is the responsible authority for governing the Orkney Islands. It was set up in 1974 and is Britain's smallest local authority.

b) ICZM tools

The new Local Development Plan for Orkney covers all community aspects. It sets out the strategic framework for the development of land in Orkney to 2011. The Chapter on the Coast has as a key objective to protect Orkney's coastline from inappropriate development and distinguishes the coastal zone as developed, undeveloped and isolated coast. Policies for harbours & piers and fish farms are defined within an integrated management of the coast. No development will be permitted in areas strategically at risk from coastal erosion. These areas are primarily 'land bridges' comprised of very low-lying soft substrate (commonly sand) linking peninsulas to island masses. Many of the actions identified within the Local Plan will require partnership with both public agencies and the private sector. All draft planning policies and allocations are discussed with the public before finalisation.

One such partnership body is the Orkney Renewable Energy Forum (OREF) which was formally established towards the end of 2000, and became a Company limited by guarantee in 2005. It is working in partnership with the Orkney Islands Council in leading a wide ranging debate on the islands' renewable energy future. Members of the Forum include representatives of the local authority, renewable energy generators, energy experts, civil engineers, Island Development Trusts, environmental consultants, educational and research establishments, electrical engineering and construction companies. Its principal aims are to promote and develop sustainable local energy resources and promote local skills and expertise.

Based at Stromness in Orkney, The European Marine Energy Centre has an international role to play in driving the advancement of tidal and wave technologies. It was established to help the evolution of marine energy devices from the prototype stage into the commercial market place. It is at the forefront of the development of sea-based renewables – technologies that generate electricity for homes and businesses by harnessing the power of waves and tidal streams. EMEC is the first centre of its kind to be created and offers developers the opportunity to test prototype devices. Wave and tidal energy converters are connected to the National Grid via seabed cables running from open-water test berths. Testing takes place in a wide range of sea and weather conditions, with round-the-clock monitoring. A world first was achieved when Pelamis, a marine energy converter developed by an Edinburgh-based company, Ocean Power Delivery, generated electricity for the National Grid from this wave energy converter.

The islands are, further, harnessing on-shore wind energy with wind farms located on remote hill tops or ridges to avoid noise and shadow nuisance. Such renewable energy development requires a balanced approach, considering impacts upon both natural resources and communities. Achieving a balance requires a project which avoids impact on sensitive species and habitats, while at the same time avoiding impact on neighbours and maximising local and community benefits e.g. before three turbines were allowed to encroach upon a Special Protection Area (SPA), a detailed assessment of birds flight paths and a collision risk model were used to quantify impact. Direct community governance of renewable energy developments is being achieved. Taking the project forward from the initial study is the responsibility of the island community, with environmental studies, planning, turbine purchase, contract negotiation and energy trading all to be undertaken e.g. the Orkney Housing Association investigated mechanisms to reduce the cost of energy to their tenants, with the aim of using renewable sources where possible. They identifying a range of possible options, including enhanced energy efficiency, alternative energy supply and the provision of energy from renewable sources. Recommendations included establishing a combined heat and power district heating scheme, ownership of a wind turbine, change to a green electricity supplier and the incorporation of solar and ground-source heating systems into housing stock.

7. Cost and resources

EMEC, from Government and other public sector organisations, has invested around £15 million in the creation of the centre and its two marine laboratories.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The number of local businesses and organizations actively engaged in both community and commercial scale renewables, including energy efficiency and bio-fuel related work, continues to grow in number (over 80 professionals working in the renewables sector and a further 200+ in wider energy related work).

9. Success and Fail factors

Intellectual capital, built up over the years since Orkney became a key player in the oil and gas industries with the opening of the Flotta oil terminal in the mid 1970's. The planning system is an integral part of a much wider process of public policy formulation not only within the Council, but externally involving a number of other key agencies. Partnership working is a powerful means of co-ordinating and focusing action by drawing on the expertise and resources of other organisations.

10. Unforeseen outcomes

A new cable connection to the National Grid, across the Pentland Firth, is being explored by the Scottish Executive.

11. Prepared by

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12. Verified by

It has not been possible to verify this case.

13. Sources

- The Orkney Local Plan (2004) Department of Development, Orkney Islands Council. Chapter 1. Introduction
- The Orkney Local Plan (2004) Department of Development, Orkney Islands Council. Chapter 6. The Coast
- The Orkney Local Plan (2004) Department of Development, Orkney Islands Council. Part IV. Implementation, Monitoring & Review
- The Orkney Local Plan (2004) Department of Development, Orkney Islands Council. Chapter 8. Sport, Recreation & Community Facilities Policies
- www.emec.ork.uk
- www.oref.co.uk
- www.orkney.gov.uk (the Local Plan is downloadable as 15 separate chapters + Annexes)
- www.tidalenergy.eu/tidal_barrages.html

The Orkney Local Plan - Chapter 1 (73.17 KB)
The Orkney Local Plan - Chapter 6 (380.03 KB)
The Orkney Local Plan - Chapter 8 (225.37 KB)
The Orkney Local Plan - Part IV (3.06 MB)