Powering the Island through Renewable Energy

A Renewable Energy Strategy for the Isle of Wight to 2010

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List of acronyms and abbreviations

Abbreviation	Meaning
GOSE	Government of the South East
RES	Renewable Energy System
BWEA	British Wind Energy Association
IRESSI	Integrated Renewable Energy Systems for Small Islands
ETSU	Energy Technology Support Unit
SERE	South East Renewable Energy Study
UDP	Unitary Development Plan
SRB	Single Regeneration Budget
AONB	Area of Outstanding Natural Beauty
GEA	Gotland Energy Agency
NFU	National Farmers Union
EA	Environment Agency
SSSI	Site of Special Scientific Interest
NETA	New Electricity Trading Arrangements
GHG	Greenhouse Gas
RDF	Residue Derived Fuel
IPC	Integrated Pollution Control
EF	Ecological Footprint (study)
CCP	Climate Change Programme (UK Government)
RO	Renewables Obligation
CCL	Climate Change Levy
CHP	Combined Heat and Power
NFFO	Non-Fossil Fuel Obligation – the previous UK government guaranteed price scheme for renewable energy generators
AD	Anaerobic digestion
BFF	Best Foot Forward (who carried out the EF study)

1 Introduction

Purpose of this report

1.1 This report presents the results of a project to prepare a renewable energy strategy for the Isle of Wight, and is part of a larger project called “IRESSI” – Integrated Renewable Energy Systems for Small Islands.

1.2 A Background Analysis for A Renewable Energy Strategy for the Isle of Wight to 2010, was presented in March 2002. This report discussed options for the Isle of Wight in terms of renewable energy potential and gave the **technical** potential for various options. It also stated the possible lower and upper bounds for the contribution renewable energy could make to the Island by the year 2010.

1.3 A cost benefit analysis was presented in July 2002 and this gave the indicative economic costs in detail and discussed the environmental and social issues concerned with each technology option.

1.4 This report presents the results of a Renewable Energy Strategy. The report is aimed primarily at the Isle of Wight Council staff, and the EC project co-ordinators, and partners. However, it is also intended that relevant extracts will be circulated to key stakeholders, both on and off the Island.

1.5 The report is divided into 4 main parts. These are:

- General Background and context to the Renewable Energy Strategy for the Isle of Wight
- Renewable Energy Assessment for the Island
- Cost Benefit Analysis
- Actions taken by the Isle of Wight
- Policy Recommendations

2 Project Background and context

2.1 This Renewable Energy Strategy has been prepared as part of the IRESSI project, which stands for Integrated Renewable Energy Systems for Small Islands. The project is being 50% funded by the EC ALTENER programme, which falls under the EC Directorate of Energy and Transport. The ALTENER programme, and this project, form part of the EC Campaign for Take Off, which aims to kick start the implementation of renewable energy in Europe, in order to achieve the target of meeting 12% of EU energy demand from renewable energy sources by 2010.

2.2 The IRESSI project aims to prepare a renewable energy strategy for the Isle of Wight, and more specific renewable energy feasibility studies for 3 islands owned by the National Trust, namely, Lundy, The Farnes and Brownsea Island. As well as funding from the EC, the IRESSI project is being match funded by the National Trust, and the Isle of Wight County Council.

2.3 The IRESSI project is being managed by Intermediate Technology Consultants (ITC). The project partners are the Isle of Wight County Council, and the Isle of Gotland Energy Agency (GEA). GEA is acting in an advisory capacity, to assist the Isle of Wight in producing a renewable energy strategy. As well as producing a renewable energy strategy, for the Isle of Wight, the project also identified five exemplar energy projects on the Island, and has been working towards producing feasibility studies for these, through public working groups.

2.4 The IRESSI project is part of a larger cluster of 3 projects, all looking at Renewable Energy on Islands. The overall cluster is being co-ordinated by ISLENET, of which the Isle of Wight is a member. ISLENET is a network of European Island Authorities, which promotes sustainable and efficient energy and environmental management. It actively promotes the adoption of local energy saving strategies and renewable energy projects.

2.5 A Renewable Energy Strategy is a fundamental first step in creating an enabling framework for the development of renewable energy projects on the Isle of Wight.

Isle of Wight

2.6 This work is within a national context of the UK government's commitment to supplying 10% of the UK's electricity from renewable sources by 2010. This forms part of the government's Climate Change Programme, which aims to cut UK emissions of CO_2 to 20% below 1990 levels, by 2010. Furthermore, it follows on from, and draws heavily on, the South East Renewable Energy Study (SERE), which was completed in January, 2001. SERE was commissioned by the UK government as part of a positive strategic approach to planning for renewable energy at a regional level.

2.7 This shaped the recently produced Strategy for Energy Efficiency and Renewable Energy (SEERE), which has a vision for the region of 14% of the region's electricity generation being produced from renewable energy sources by 2026. It recommended that 4% of the region's electricity should come from renewables by 2010. A specific target for Hampshire and Isle of Wight was set of 159 MW coming from renewables, of which 67 MW should come from the Isle of Wight[1].

[1] This includes a 50MW off-shore wind turbine mentioned in point 3.6

2.8 The Isle of Wight, through this study, and also earlier work from the Island Agenda 21 strategy and Ecological Footprint Study, has been working to promote sustainable development on the Island. In particular, the Council has been exploring and maximising the opportunities that making use of the Island's renewable energy resources can have for the Island Community. This is not just in terms of reducing environmental impact, and the Island's Ecological Footprint but also for economic development and regeneration, diversification of rural incomes, and promoting the idea of the island as a centre for "Green Tourism".

2.9 This renewable energy strategy, has been prepared through a process of consultation and active participation of the Island community, and is an essential step in creating an enabling framework for the development of RES on the Island, that will maximise the opportunities for bringing environmental economic and social benefit to local people.

2.10 The IRESSI project aims to build directly on the work carried out under SERE. The latter study explicitly states that targets at the sub-regional level can be fine tuned to suit local needs and preferences, and this is what this Isle of Wight Renewable Energy Strategy aims to do. The SEERA draft referred to above specifically identifies the need for the active involvement of local communities in the development of renewable energy projects and policies and this is exactly the path that the Isle of Wight has followed.

2.11 The Strategy also takes account of the Energy Report issued in February 2002 by the Cabinet Office Performance and Innovation Unit which recommends that the planning system should take a more proactive approach towards renewable energy planning and to ensuring informed decision making in this area.

2.12 The IWC Unitary Development Plan specifically states "The Council's view is that this plan should reflect a positive approach to harnessing the generating potential from renewable energy sources in an environmentally acceptable way. Of particular concern is the total effect of a number of different proposals on the intimate scale and nature of the Island's landscape, which perhaps makes it unsuitable for extensive schemes. The development itself need not always be large-scale and an adverse impact might be created by the cumulative effect of small-scale developments"

2.13 The recently agreed Isle of Wight Rural Development Strategy identifies the need for the development of renewable energy technologies which will benefit rural communities, promote green tourism and blend with the Island's unique landscape and environment.

2.14 The Renewable Energy Strategy will form an integral element of the Community Strategy, which actively supports the use of renewable technologies for the generation of electricity and which also seeks to secure localised production of those technologies particularly appropriate for Island development and manufacture.

2.15 Finally the development of the Renewable Energy Strategy is key to the implementation of the Island Agenda 21 Strategy. This important strategy, put together in consultation with over 1.700 Island people, identifies sustainable resource management as a key priority. It specifically states that the Island should be *"efficient in the use of our energy and where possible use our renewable resources to generate electricity"* The associated Action Plan requires "*research of the optimal use of the Island's natural and waste resources in the local generation of electricity and identify specific initiatives which will develop the use of this generating capacity"* The Agenda 21 Strategy is identified within the Council's Corporate Plan as a key component of the Council's strategic priorities, with a specific commitment made to *'promote alternative*

and renewable energy initiatives, improve waste management recycling and energy management

3 Resource Assessment and Technical Analysis

3.1 The resource assessment and technical analysis (Appendix 1) was undertaken to determine the amount of renewable energy that could be developed on the Island, and therefore set appropriate targets.

3.2 Much of the data for the technical assessment analysis drew heavily on data collected during the Ecological Footprint analysis and on previous ETSU studies and the SERE. Existing Council plans, namely: the Unitary Development Plan, Agenda 21 Strategy, Local Transport Plan, Ecological Footprint Study were also used. Further data from energy suppliers and from larger end-users was collected and discussions were also held with several key stakeholders, namely: Council staff, ETSU, NFU, EA, Island Waste Services, Southern Water, Isle of Wight Grain Storage, the Forestry Commission, renewable energy companies and technology suppliers

For more information on the methodology used and assumptions made for this section, see Background Analysis Report

3.1 The Renewable Energy Strategy is primarily concerned with Renewable Energy as distinct from energy efficiency. However the importance of energy conservation and efficiency should not be ignored, and is the focus for one of the flagship projects (zero energy housing)

3.2 The analysis covered a full range of renewable energy sources and technologies. The potential contribution of each of these is summarised in the table below.

Table 1: Summary of potential contribution of different renewable energy options for meeting electricity and total energy demand on the Isle of Wight, by 2010

Type of Renewable Energy	Practicable Resource (MW)		Practicable Annual Energy Output Electricity (GWh)		Practicable Annual Energy Output Heat (GWh)		% Achievable Contribution to 2010 Electricity Demand		% Achievable Contribution to 2010 Total Energy Demand	
	LB	**UB**	**LB**	**UB**	**LB**	**UB**	**LB**	**UB**	**LB**	**UB**
Wind										
on-shore wind	12.0	18.0	30.0	44.9	n/a	n/a	5.1%	7.7%	0.9%	1.3%
off-shore wind	0.0	50.0	0.0	159.9	n/a	n/a	0.0%	27.2%	0.0%	4.6%
Biomass:										
Anaerobic digestion using dairy cow manure	0.2	0.5	1.7	4.3	0.5	1.3	0.3%	0.7%	0.1%	0.2%
Centralised CHP Plant, using SRC and forestry residues as fuel	2.8	5.3	21.0	39.3	31.5	59.0	3.6%	6.7%	1.5%	2.8%
OR Up to 5 decentralised heat only biomass systems, using forestry residues and SRC	1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tidal Currents	0.0	3.0	0.0	9.4	n/a	n/a	0.0%	1.6%	0.0%	0.3%
Existing RDF/CHP Plant	1.7	1.7	6.6	6.6	not used	not used	1.1%	1.1%	0.2%	0.2%
Liquid biofuel (biodiesel)	n/a	n/a	n/a	n/a	0.0	21.9	n/a	n/a	0.0%	0.7%
Solar water heating	n/a	n/a	n/a	n/a	0.2	0.5	n/a	n/a	0.01%	0.01%
PV	0.0	0.1	0.0	0.1	n/a	n/a	0.00%	0.02%	0.00%	0.00%
Totals	**18.2**	**78.6**	**59.3**	**264.6**	**32.2**	**82.7**	**10.1%**	**45.1%**	**2.6%**	**10.0%**

LB = LOWER BOUND
UB = UPPER BOUND
n/a = not applicable

3.3 Based on economic and near economic options, the lower bound of estimates is that the Island could meet 10% of its electricity requirements by 2010, coming primarily from on-shore wind, biomass CHP, and the existing waste-to-energy plant.

3.4 Of the options considered, on-shore windpower is the main option for a new renewable energy development on the Island that is commercially viable in the near term. The range of achievable contribution to electricity demand by 2010 is estimated to be 5-8%. This could take the form of 2-3 small wind clusters, of 4-6 machines in each.

3.5 The waste-to-energy plant on the Island currently produces about 13GWh of electricity per year, which equates to just over 2% of 2010 electricity demand. There are no plans to expand the plant. However, under the latest government guidelines, only 50% of the plant's output can be considered to be renewable, when assessing contributions to the 10% government target.

3.6 Options that are close to being economic, and could become economic by 2010, and that could make a significant contribution to meeting Island energy demand are: biomass heat and power production, using energy crops (most likely short rotation coppice) and forestry residues as feedstock; anaerobic digestion, both farm-scale and centralised; biodiesel production as a substitute for diesel fuel for transport; and off-shore wind. These technologies will most likely require grants or some form of price support in the short term to make them economic.

3.7 The possible contributions from these near economic technologies (see also summary table) are as follows:

- A centralised 5MW CHP biomass facility, burning forestry residues and energy crops, to generate heat and electricity. This would meet about 7% of 2010 electricity demand, and 3% of total energy demand. This would require about 10% of agricultural land on the island to be planted with energy crops – most likely short rotation coppice poplar or willow.

- A biodiesel production plant, making use of waste vegetable oil, and rapeseed grown on set aside land, could produce 2.4 million litres of biodiesel per year. This would provide enough diesel to meet the needs of the Island Waste Services, Wightbus, and Southern Vectis diesel fleet. This would meet about 3% of 2010 transport energy demand, and 0.7% of total energy demand.

- There are estimated to be 5500 dairy cows on the Island. The slurry from these animals could be anaerobically digested to produce methane, to power a CHP engine. This could either be in a single centralised plant, or in a number of smaller, farm based units. This could meet 0.3-0.7% of 2010 electricity demand.

- One offshore wind farm, 50MW capacity, would meet 27% of 2010 electricity demand, and 5% of total energy demand.

3.8 Of these, the contribution of a single, offshore wind farm would make the largest contribution to electricity and total energy demand. However, it is also the option over which the Island community has the least degree of control or influence over. However in the Regional Assembly Strategy it suggests a 50 MW off shore wind farm for the Isle of Wight, but there are strong reservations about this option.

3.9 Solar water heating is another well-proven, mature technology that can make a small, but valuable contribution to meeting heat demand on the Island, for domestic, and institutional water heating, as well as for heating outdoor swimming pools. The main constraint for this technology are the relatively long payback times, which are unlikely to decrease much, with current energy prices, due to the mature nature of the technology.

3.10 Photo-voltaic (PV) technology (also known as solar panels) are another relatively well demonstrated technology that can also make a small, but valuable contribution to meeting the electricity demand of domestic as well as commercial buildings. However, the current relatively high capital costs of these systems will limit their degree of penetration by 2010. But cost reductions are foreseen for this technology, particularly with building-integrated PV, which could increase its economic viability beyond 2010. Both PV and solar water heating both have the advantage that they are readily suited to urban environments, and therefore can be introduced without many of the planning constraints associated with other types of renewables technologies.

3.11 There is one further RES option possible for the Island, which is still at an R&D stage. This is tidal stream, or marine current turbines, which make use of tidal currents to generate electricity. The Island is one of the few sites in the UK with suitable resource. Although it is not certain as to whether this technology will be commercially viable by 2010, there is an opportunity for a demonstration installation of up to 3MW off the coast of the Island. This could provide about 1.6% of 2010 electricity demand, with an annual energy output similar to the existing waste-to-energy plant. If this technology did prove to be technically and commercially viable, then there could be opportunities for wider deployment of this technology off the Island's coast in the longer term.

3.12 Based on the analysis, a number of exemplar, or "flagship" projects are identified, which could be submitted for grant funding, and would act as important pilot and demonstration projects for renewable energy on the Island. These are:

- A community wind project
- A biomass CHP or heat-only scheme, providing energy for a large end-user
- Zero energy housing development, incorporating a combination of different RES and energy efficiency measures.
- Farm based anaerobic digestion
- A biodiesel production plant
- Demonstration marine current turbine

4 Cost Benefit Analysis

4.1 This looks in detail at the **non technical** parameters concerned with the various options, and covers:

- *Economic* issues- including market costs and prices
- *Environmental* issues- both in terms of national effects such as global warming and atmospheric pollution, but also local environmental effects such as noise, and visual intrusion
- *Social* issues- concerning level of employment, regional development and overall attitude of the population towards the technologies and specific options proposed

4.1 In terms of the economic analysis the costs and prices were taken from data collected during the background analysis and from other available information. The costs included capital, fuel and Operation and Maintenance (O&M) costs. The capital costs were annuitised - using specific lifetime figures and discount rates. The annual costs of fuel and O&M were added to this capital cost to give a total energy cost. The direct economic cost in p/kWh is then calculated based on the energy output of the system. A simple rate of return (average annual return divided by capital cost)- ROR- has also been calculated to provide a pseudo measure of profitability, ignoring discounting.

4.2 The economic figures can, by their very nature, be quantified, whereas the social and environmental indicators are generally hidden impacts and may be viewed either as external costs (i.e. to the environment – local and/or global) or as external benefits (i.e. job creation). The social and environmental indicators have been quantified using data from an EU project, ExterneE that researched these costs in detail for a wide range of electricity producing technologies. A range has been given for these costs and an average taken in order to calculate the final production cost including all of these externalities.

4.3 A list of the social and environmental impact indicators is included in the report- as although a quantitative figure has been given overall, many of these are qualitative. These have been considered in Section 5 on Policy Recommendations.

4.4 The cost benefit analysis considers the non-technical issues for each strategy within both the upper and lower bounds. Table 2 below is a summary of the **local** environmental and social impact indicators that are of particular relevance to the specific technology and a summary of the specific economic costs. More detail is given the Cost Benefit Analysis Report in Appendix 2.

Table 2: Summary of Economic, Social and Environmental Costs for each specific technology to be considered in a Renewable Energy Strategy on the Isle of Wight

Renewable Technology	**Specific Environmental Impact Indicators**	**Specific Social Impact Indicators**	**Specific Economic Costs (with assumptions)**
Wind- on shore	• Noise • Visual • Impact on landscape • Effect on birds • Planning process • Use of land	• Community cohesion • Tourism • Political • Employment • Education • Self reliance	Economic: 2.9-3.6 p/kWh
Wind off shore	• Noise • Visual • Impact on landscape • Effect on birds • Planning process • Recreational	• Tourism • Political • Employment	Economic: ~3.6 p/kWh
Biomass- anaerobic digestion	• Noise • Visual • Use of land • Transport of fuel	• Community cohesion • Tourism • Political • Employment • Education • Self reliance	Economic: 4.7-8.2 p/kWh (Electricity only) Economic: 3.6-6.3 p/kWh (Heat and Electricity)
Biomass-centralised CHP	• Noise • Visual • Use of land • Transport of fuel • Planning process	• Employment • Education • Tourism	Economic: 2.6-2.9 p/kWh
Biomass- de-centralised heat only	As above	• Community cohesion • Tourism • Political • Employment • Education • Self reliance	Economic: ~1.8 p/kWh
Tidal Currents	• Visual • Impact on landscape • Effect on marine life • Planning process • Recreational	• Tourism • Political • Employment • Education	Economic: ~7 p/kWh
Solar water heating	• Visual	• Employment • Education • Self reliance	Economic: 13.9-20.9 p/kWh
Solar PV	• Visual	• Employment • Education • Self reliance	Economic: 78.5-104.7 p/kWh
Biodiesel	• Use of land • Transport of fuel	• Employment	Economic: ~82p per litre

5 Actions taken by the Isle of Wight

Creating the framework for the development and management of the Project

5.1 The first step of this project was to meet with key players on the Island in the public private and voluntary sector, specifically to identify the organisations, groups, agencies and networks that would need to become involved in the development of the Renewable Energy Strategy. A plan for community participation and involvement was then put together linked to the main stages of resource and technical assessment process.

5.2 All of those identified as having an interest and possible involvement in renewable energy development on the Island (over 230) were invited to the project launch, which took place in Newport in July 2001. Members of the general public were invited to take part through the local press and radio. Altogether 85 members of the community attended the launch nearly all of who signed up to remain in touch with the project as it developed.

5.3 The resource assessment and technical analysis took place from July through until January 2002 involving very regular liaison with members of the Renewable Energy Task Group, a working party formed from officers and Councillors from the Environment & Transport Select Committee (see Appendix 3)

5.4 An important feature of the work and one of significant interest to the Task Group was the identification of potential 'Flagship Projects' which would be particularly appropriate for the Island and which would promote understanding of how RES technologies can benefit local communities.

5.5 As soon as the Technical Analysis Report was nearing its final stages arrangements were made for a daylong workshop, which was held in Newport in March 2002. All those members of the community who had expressed an interest in remaining involved were personally invited to the Workshop and once again the general public were encouraged to attend by means of the local press and radio.

5.6 After the presentation of the Resource Assessment and Technical Analysis Report the workshop was divided into two interactive sessions when participants were assigned to one of five facilitated groups to consider:

- Islanders Vision for Renewable Energy
- Practical next Steps for Flagship Projects

The Visions Statements and the results from the Potential Flagship Project Subgroups can be seen in Appendix 4

5.7 At the conclusion of the workshop it was very clear that there was a very high degree of interest from participants in remaining actively involved in the development of the RES strategy and the Flagship projects. Therefore, although within the scope of the Altener Project there was no resource available to support additional community participation it was decided to run ongoing meetings focusing on each Flagship project, where members of the community could meet with the officers and members of the Task Group and decide how best to progress each technology here on the Island. These community working groups were arranged to take place during the evenings in May, June and July.

Community Working Groups

5.8 Each of the Community Working Groups focused on a particular Flagship Project (these were: Marine Current Turbines; Biomass/CHP; Zero Fossil Energy Build; Community Wind; Biodiesel and Anaerobic Digestion) Each meeting followed an identical format:

Meeting 1 general discussion. Information share and identification of expert speaker to be invited to the subsequent meeting

Meeting 2 Expert speaker, general discussion and identification of priority actions

Meeting 3 Final combined discussion to consider the Cost Benefit Analysis Report and to identify which of the Flagship Projects should be taken forward as priorities.

Terms of Reference for the Community Working Groups are attached in Appendix 5
With the exception of the final combined meeting the meetings all took place in County Hall during weekday evenings and were each attended by up to 35 Island people.

Developing knowledge and understanding within the community and the Council

5.9 To adequately service these meetings and to better explore the potential of each 'Flagship' Project, officers of the IW Council sought advice and background information from experts and others involved in RES across the country. The Renewable Energy Task Group and leading officers and members involved with planning issues visited South Lakeland District Council to learn of the policies and processes developed to incorporate renewable energy generation into the Lakeland the National Park. Throughout the period of the Altener Project there has also been very close liaison with and input from our mentor island Gotland which is working towards 100% renewable energy generation by the year 2025.

5.10 Thus by the time the final combined meeting took place at the end of July 2002 all of those involved in developing the Renewable Energy Strategy were very eager to hear the results of the Cost Benefit Analysis which had been undertaken by Intermediate Technology Consultants and which was to form the main focus of the event.

5.11 This meeting was again publicised widely through the local media and a general invitation was extended to members of the public, all Councillors, the Member of Parliament and other key partners.

The RES Target and the Flagship Projects

5.12 Following the Cost Benefit Analysis presentation and the many questions, which ensued, the meeting broke into 4 groups to discuss the targets for renewables that the Island should be achieving by 2010.

5.13 This led to very lively debate and when the meeting reconvened for the final report back some very interesting conclusions had been reached.

5.14 Discussion also took place on the progress of the Flagship Projects

Level of RES Target for 2010

5.15 Some participants were keen to set 100% for the RES generation of electricity by 2010 citing global warming and the size of the Island's Ecological Footprint as overwhelming reasons for the phasing out of fossil energy

5.16 Others thought that the 'predict and provide' model should be abandoned as flawed and that a reduction in consumption should form the basis of any target.

5.17 Generally there was agreement that the target should be as high as possible but that 10% should be an absolute minimum and that we should be working towards a much more ambitious target past 2010.

The Flagship Projects

5.18 Participants expressed concern about the fate of the 'Flagship Projects' as it was felt that they needed to be progressed as a priority or they would be lost.

5.19 *Community Wind* - There was acknowledgement of the fact that wind power had scored highly on the Cost Benefit Analysis and that it was the only currently viable source/technology that was not self-limiting. There was strong feeling that any wind development should be community owned and that planning guidance should be developed as an immediate priority in consultation with local communities and drawing upon the best of practice world-wide. A suggestion was made that the Island should only be countenancing 600 KW turbines but possibly trialling a 1.5MW machine to assess reaction and to attract tourists.

5.20 An *offshore wind farm* was thought to be a possible option but there were serious concerns about the impact on shipping, fishing, sailing and the marine environment. Also it was difficult to see any possibility of community ownership.

5.21 *Marine Current Turbines* - Interest remained high in locating a Marine Current Turbine as a demonstration project providing that the marine environment and local fishing and sailing were not jeopardised in any way.

5.22 *Biomass/CHP* - It was agreed that the use of Biomass is a very practical option for the Island as borne out by the Cost Benefit Analysis. There is keen interest in the development of a Biomass fired CHP/heat only system at Sunnycrest Nurseries. It was particularly felt that this could be used as a demonstration project to build confidence in the system and to encourage diversification by identifying and developing markets for energy crops.

5.23 *Biodiesel* - The Biodiesel project was agreed to be a must for the Island as not only would it reduce the overall fossil fuel energy demand but also it would significantly contribute to waste reduction.

5.23 *Zero fossil energy build* – everyone present identified the urgent need to not only to ensure the maximum energy efficiency and sustainability of all new build on the Island but also to address issues of energy conservation within the current housing stock

6 Policy Recommendations

6.1 The Isle of Wight Council is committed to achieving sustainable development and has undertaken the Altener project as a first step towards reducing the energy component of the Island's Ecological Footprint. Furthermore, the Council is conscious of its responsibility towards the global environment and the urgent need to reduce the emission of climate changing greenhouse gases. The Council has also committed to playing its part in achieving the government's target of 10% electricity generation from renewables by 2010 and is eager to ensure that in doing so he Island economy gains maximum benefit from the development and use of its renewable energy sources.

6.2 From both the Technical Analysis and the Cost Benefit Analysis it is very clear that the Isle of Wight is well placed to achieve significant electricity generation from renewable energy sources. Nevertheless, as has been agreed throughout the consultation process, the protection of the beauty and character of the Island's unique environment and landscape is of major importance in determining policies governing the extent and nature of renewable energy development.

Renewable Energy Targets

6.3 The summary of the potential contribution of different renewable energy options for meeting electricity demand on the Isle of Wight by 2010 identified in the Background Analysis Report Resource assessment (see Table 1) shows a lower boundary of 10.1% and an upper of 45.1%.

6.4 Wind energy is identified as the major potential contributor (Lower Bound 5.1%; Upper Bound 34.9%) and Biomass as potentially making a lesser but significant contribution (Lower Bound 3.9%; Upper Bound 7.4%)

6.5 The Cost Benefit Analysis of these options also identifies the above renewable resources as having the most competitive production costs.

6.6 Taking into account the above resource assessment and Cost Benefit Analysis, the process of investigation of the RES technologies in consultation with the Island's community, and the considerations identified in Para 6.1 the following conclusions have been reached:

Policy RES 1 - Level of contribution of RES technologies to electricity generation on the Isle of Wight by 2010

6.7 This should be identified as at least 10%

Policy RES 2 - Contributing RES Technologies

On-shore Wind

6.8 To achieve the above target on-shore wind energy should be developed to at least the capacity identified in the Background Analysis (5.1%). This should take place within the following context:

- Within a framework of planning criteria that have been developed and agreed with the Island's community
- With full regard to all the environmental and landscape designations applying to the countryside marine and coastal environments
- On the condition of community ownership and/or local economic benefit

Biomass

6.9 The 3.6% contribution to the 10% Lower Bound target should be encouraged through the development of a Flagship CHP Project using forestry residues, other waste woods and energy crops to pilot and showcase the technology. From the information and research associated with this Flagship project it should be possible to:

- Quantify the amounts of source material and production capacity required to move towards the 3.6% RES target.
- Assess the volume of additional biomass able to be supplied through Island produced energy crops and
- Identify the impact of feedstock production and movements on the environment and transport system

6.10 If appropriate, the technology could then be applied to a centralised CHP system, which would possibly supply heat and power to newly developed residential areas and adjacent public/private utilities.

Anaerobic Digestion

6.11 Through the consultation process it has been noted that this may not be a realistic option for Island farmers. The Background Analysis Resource Assessment identified dairy cow manure as the only significant source for anaerobic digestion (0.3% of the total 10% target) but the long term commitment required both in providing the necessary capital outlay and to dairy farming itself is not easily achievable from the farming community in these uncertain times.

Marine Current Turbines (Tidal stream energy)

6.12 This technology remains in the research and development phase. Currently a 300kW prototype is undergoing assessment off the North Devon coast. The trial site for the next phase of development has not yet been decided by the production company Marine Current Turbines Ltd. However, the company has expressed interest in locating a demonstration tidal farm either in the Hurst Narrows or off St Catherine's Point

Policy RES 3

6.13 It is proposed that the Isle of Wight Council investigates the possibility of locating a marine current turbine demonstration project off of the coast of the Isle of Wight.

Policy RES4

6.14 The remaining 1.3 % of the RES target will be achieved through the operation of the existing RDF/CHP plant operated by Island Waste Services (1.1%) and the research, development and implementation of photovoltaic technology in new build (.2%)

Energy efficiency and reducing energy demand from fossil fuels

6.15 The domestic sector is the largest energy consumer on the Island. The average Island household consumes annually 15,000kWh of gas and 5,000kWh of electricity. This creates annual carbon dioxide emissions of 5 tonnes per household contributing to global warming.

Policy EE1

6.16 It is therefore proposed that alongside the development of renewable energy resources, energy efficiency within the domestic sector should be promoted as a priority concern of the Council.

6.17 For current housing stock this should be achieved by:

- Identifying and targeting energy conservation grants initially on those households where fuel costs form a large element of household expenditure
- Stimulating and maintaining the highest levels of public awareness and education on matters relating to energy efficiency and conservation

6.18 As regards the impact of future housing development the Council's Unitary Development Plan (UDP) describes a need for 8000 new housing units to be built on the Island by 2011, which will increase current CO_2 emissions on the Island by approximately 40,000 tonnes.

Policy EE2

6.19 Of these 8000 new homes 500 have been planned on a site adjacent to the Pan Estate in Newport. It is therefore proposed that the new ‘Pan Village’ development should

be used as an exemplar project for sustainable, energy efficient building, based on the following principles:

- Wherever possible selecting building materials from natural, renewable or recycled sources and wherever possible brought from within a 35 mile radius
- The installation of a combined heat and power unit able to produce all the development's heat and electricity from Island sourced biomass
- The optimal use of solar energy
- Energy efficient design maximising solar gain and using high efficiency insulation and glazing
- Water conservation through the use of water saving appliances, the use of rainwater and 'grey-water' recycling
- Implementation of green transport management plans reducing reliance on the car by cutting the need to travel (on-site facilities etc), providing safe and enjoyable walking and cycling routes and accessible, affordable public transport
- Waste sorting and composting systems

Biodiesel production and use

6.20 Biodiesel is produced from vegetable oils. The feedstock can come from either used cooking oil, from oil crops such as rapeseed, linseed and sunflowers, or a combination of both.

6.21 It is estimated that the Island produces around 1 million litres of waste cooking oil a year. Approximately 570ha of rapeseed is grown on the island and 621ha of linseed.

6.22 To utilise waste cooking oil in the production of biodiesel would not only remove a significant percentage from the waste stream but would also replace a fossil fuel with a carbon neutral alternative. The use of oil crops as a feedstock could also offer an important opportunity for local farmers to diversify or expand production. With the co-operation of the Island Bus operators and other commercial vehicle fleet operators biodiesel could be utilised widely for freight and passenger transport across the Island. Local branding and advertising this 'green' fuel would add considerably to the Island's image as a green tourist destination

Policy EE 3

6.23 It is proposed that the Isle of Wight Council establishes a multi-partner initiative to:

- Investigate the feasibility of developing a biodiesel production plant on the Isle of Wight
- Identify funding opportunities available to support the initial set-up costs

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Identifying the Target for RES contribution to Electricity Demand beyond 2010

6.24 The Isle of Wight Council acknowledges that Renewable technologies are developing rapidly and will continue to do so into the future. Consequently, opportunities for reaching a higher penetration of these technologies into the energy market will become greater through time.

From the community participation and involvement which has taken place throughout the Altener project it is clear that Island people wish to work in partnership with the Council in creating a sustainable future, within which renewable energy will play an increasingly important part.

Policy RES5

6.25 It is proposed that the target for renewable energy contribution beyond 2010 is considered and determined as part of an ongoing process of monitoring and assessment of:

- The implementation and operation phases of the 10% contribution
- the new wave of renewable technologies (e.g. Tidal stream; hydrogen)
- the trends in energy demand
- global fossil fuel markets
- energy supply security issues