CHAPTER 1: INTRODUCTION

1.1 Developer

The developer of the proposed Burbo Offshore Wind Farm is SeaScape Energy Ltd (SeaScape). SeaScape Energy is a joint venture partnership between Zilkha Renewable Energy, enXco A/S and Wind Prospect Ltd.

SeaScape Energy Ltd is a project specific company created for the Burbo Offshore Wind Farm. It is backed by the three parent companies:

Zilkha Renewable Energy (ZRE)
ZRE was formed in 1991. The company is based in Texas and jointly owned by Michael and Selim Zilkha. ZRE has a portfolio of eight onshore wind energy projects in USA, the United Kingdom and Costa Rica which total more than 250MW (megawatts). ZRE has many more projects under development in the USA.

enXco A/S
enXco was founded in 1985 and has experience in financing, developing, and operating wind power projects. enXco currently owns 191MW of onshore wind generating capacity (178MW in the US, 8MW in the UK, and 5MW in Germany) and operates and maintains 3,400 wind turbine generators (which represent an installed capacity of approx. 550MW). The company has a development portfolio in the US, in Europe and in Australia exceeding 1,600MW of capacity.

Wind Prospect Limited
Wind Prospect Limited (WPL) is a vertically integrated provider of renewable power, developing, constructing and operating wind farms. WPL has operations underway in the United Kingdom, Ireland and Australia.

The combined partnership of these three companies creates a team with significant international experience of wind farm development.

1.2 Burbo Offshore Wind Farm

The proposed Burbo Offshore Wind Farm ("Burbo Offshore") will be situated on Burbo Flats in Liverpool Bay. At its closest point, the site is approximately 6.4 km (4.0 miles) from Wirral and Sefton coastline.

The wind farm will contain thirty wind turbines of the latest design, each with a rated capacity of three megawatts (3MW). This wind farm will therefore be capable of providing a maximum output of ninety megawatts (90MW) of electricity. The wind turbines will be approximately 130m high to blade tip above mean high water (MHW), with an 80m tower height and a 90m blade diameter. The turbines will be arranged in a regular grid pattern, spaced at intervals of 560m in a NW/SE direction and 760m in an NE/SW direction. The wind turbines will be anchored to the seabed by a foundation consisting of a steel monopile (a single tubular structure) approximately 4m in diameter.

The wind turbines will be inter-connected using buried subsea cables. The wind farm will be connected to the shore by three close spaced buried subsea cables operating at 33 kV (kilovolts). Once the cables reach the shore, they will connect into a new electrical substation to transform the power to 132 kV for input into the National Grid.

A monitoring mast is proposed for the site (65m high above MSL) at the SW limit of the wind farm. The purpose of the mast is to record meteorological data to determine the operational parameters of the wind farm.

The construction phase for the wind farm is expected to last 8 to 9 months, with the majority of the construction work taking place throughout the summer.

The wind farm and monitoring mast will be serviced throughout their lifetimes using local port facilities. The anticipated lifespan of the turbines is 20-25 years, whilst the lifespan of the monitoring mast is up to 5 years. Inspection of the wind farm and monitoring mast will be carried out on a regular basis. Replacement of turbine components will take place as and when required, on a timescale dependent on the urgency and importance of maintenance work necessary.

Decommissioning of the wind farm once it has reached the end of its operational life will be carried out in accordance with the directives laid down by the Crown Estate. It is expected that the removal of all the wind farm components will take a similar length of time as installation.

1.3 Need for Renewable Energy

There is a recognised need for an increase in the level of sustainable energy production to help combat global warming and reduce environmental degradation. The installation of wind farms in coastal waters around the UK will contribute to the reduction in emissions of greenhouse gasses and those which contribute to acid rain. Wind energy is non-polluting and does not rely upon the extraction and burning of finite fossil fuels.

The present UK Government's support of renewable energy, including wind power, is intended to ensure that sustainable power will continue to grow. The target of securing 10% of electricity from renewable sources by 2010, (as stated in the Government's Energy Review (2000)) will mostly be met using wind technology. Burbo Offshore will provide a contribution to meeting this target.

1.4 Benefits of the Development

1.4.1 Environmental

The development of the proposed Burbo offshore wind farm would make a significant contribution to the reduction of atmospheric pollution, though not necessarily in the immediate locality.

For a given level of national electricity demand, every kilowatt-hour produced from a non- polluting source such as a wind turbine replaces one produced by a fossil fuel power station. The impact of the proposed Burbo wind farm on atmospheric pollution can be calculated as follows.

The Parliamentary Office of Science and Technology quotes the following emissions figures typical of coal-fired plant (it should be noted that these figures are slightly different to those given by the British Wind Energy Association, due to differing calculation methods):

Carbon Dioxide (CO_2)	936-1079	grammes per kilowatt-hour
Sulphur Dioxide (SO_2)	14-16.4	grammes per kilowatt-hour
Nitrous Oxide (NO_x)	2.5-5.3	grammes per kilowatt-hour

The following formula can then be applied:

Emission Reduction (tonnes per annum) = (A x B)/1000

where,

A is the predicted site output per year
B is the avoided emission for each substance per kWh

The predicted site output per year (A) is calculated as follows:

Predicted site output per year (A) = C x K x 8760 x 1000 kWh/yr

where,

C is the rated capacity of the wind turbine inMW.

K is a constant, the capacity factor, which takes into account the intermittent nature of the wind, the availability of the wind turbines

and array losses. In the case of Burbo Offshore it has been calculated to be 40%.

8760 is the number of hours in a year.

From the above calculations, it can be predicted that the output from Burbo Offshore would result in the following reductions in levels of atmospheric emissions:

Gaseous Emission	Burbo Offshore Saving (tonnes/yr)
Carbon Dioxide (CO_2)	295,177 – 340,273
Sulphur Dioxide (SO_2)	4,415 – 5,172
Nitrogen Oxide (NO)	788 – 1,671

Burbo Offshore Net Annual Energy Capture (kWh)
= Nominal Installed Capacity (90MW)
x capacity factor (40%)
x number of hours in one year (8,760)
= 315,360,000

1.4.2 Supply of Clean Energy

Burbo Offshore Wind Farm will generate an output equivalent to the electricity consumption of approximately 75,000 homes. This prediction is based on an assumed average domestic electricity consumption of 4,200 kWh (units) per household per year. This is the average of figures obtained from the DTI Digest of UK Energy Statistics 1998 (4,256 kWh-year) and the Electrical Association Review 2000 (4116 kWh-year).

The calculation for Burbo Offshore is therefore as follows:

Number of homes = 315,360,000 / 4,200
≈ 75,000 homes

This number of homes is roughly 12% of all homes in the Merseyside area.

1.4.3 Socio-Economic

The development of Burbo Offshore Wind Farm has the potential to create jobs and economic growth in the region. There have already been benefits before construction, through the appointment of local consultants to carry out much of the investigative work required for the preparation of this document. During construction, manpower and resources will be required for almost a year to erect the turbines. Once construction has been completed, regular servicing and maintenance will ensure the local economy continues to benefit.

An added benefit of the wind farm is the potential for increased tourism in the area immediately adjacent to the site. Onshore experiences have demonstrated that wind farms can attract people who wish to see and experience such groundbreaking technology. An offshore development offers additional potential for boat trips and increased marine leisure in the vicinity of the wind farm.

Burbo Offshore must also be put into the wider context. The development of several wind farms in the North West alone offers greater potential to local economies.

1.5 Scope of the Environmental Statement

This Environmental Statement has been drawn up in line with the requirements for an Environmental Impact Assessment (EIA) contained within the EC Directive 85/337/EEC (Annex II, Article 4) as amended by Directive 97/11/EC. This directive has been transposed into UK legislation through the Electricity Works (EIA) (England and Wales) Regulations 2000 (SI 2000/1927). Specific guidance on the application of these requirements was obtained from four sources in particular:

- DEFRA/CEFAS/DTLR Offshore Wind Farms – Guidance note for Environmental Impact Assessment in respect of FEPA and CPA requirements
- Guidance on the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000
- Wind Farm Development and Nature Conservation. EN, RSPB, WWF & BWEA 2001
- Guidance Notes – Offshore Wind farm Consents Process. DTI 2001

1.6 Consultation

SeaScape Energy Ltd has undertaken a detailed consultation exercise with all parties deemed to have a relevant interest the wind farm development. These include statutory and non-statutory consultees, local organizations and the general public.

A Scoping Study was undertaken by Casella Stanger in October 2001 and involved contact with more than fifty consultees. A follow-up Scoping Report was issued in June 2002 and circulated to an even wider body of organisations and individuals.

1.7 Structure of the Environmental Statement

The Environmental Statement comprises four volumes:

Volume 1 – Non-Technical Summary. The summary provides an overview of the project, the possible environmental effects and any mitigating measures to be undertaken.

Volume 2 – Environmental Statement. The justification for the development containing an assessment of the potential environmental impacts and their mitigation.

Volume 3 – Photomontages and Figures. An A3 volume containing the oversized figures and photomontages of the wind farm.

Volume 4 – Technical Appendix. Individual consultant reports in full, supporting the Environmental Statement.

The Non-Technical Summary of the Environmental Statement is available as a separate document, free of charge from SeaScape Energy Ltd.

Copies of the Non-Technical Summary, the Environmental Statement and all associated volumes are available to download from the SeaScape Energy Ltd website (www.seascape-energy.com) free of charge in Adobe PDF format.

A full copy of the ES is available on CD-ROM in Adobe PDF format for £10 from SeaScape Energy Ltd.

Printed copies of the full Environmental Statement and all associated volumes are available for £175, also from SeaScape Energy Ltd.

1.8 Project Consultants

The following list of consultants have provided their time, effort and expertise in the preparation of this Environmental Statement:

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