

Appendix E

GIS System

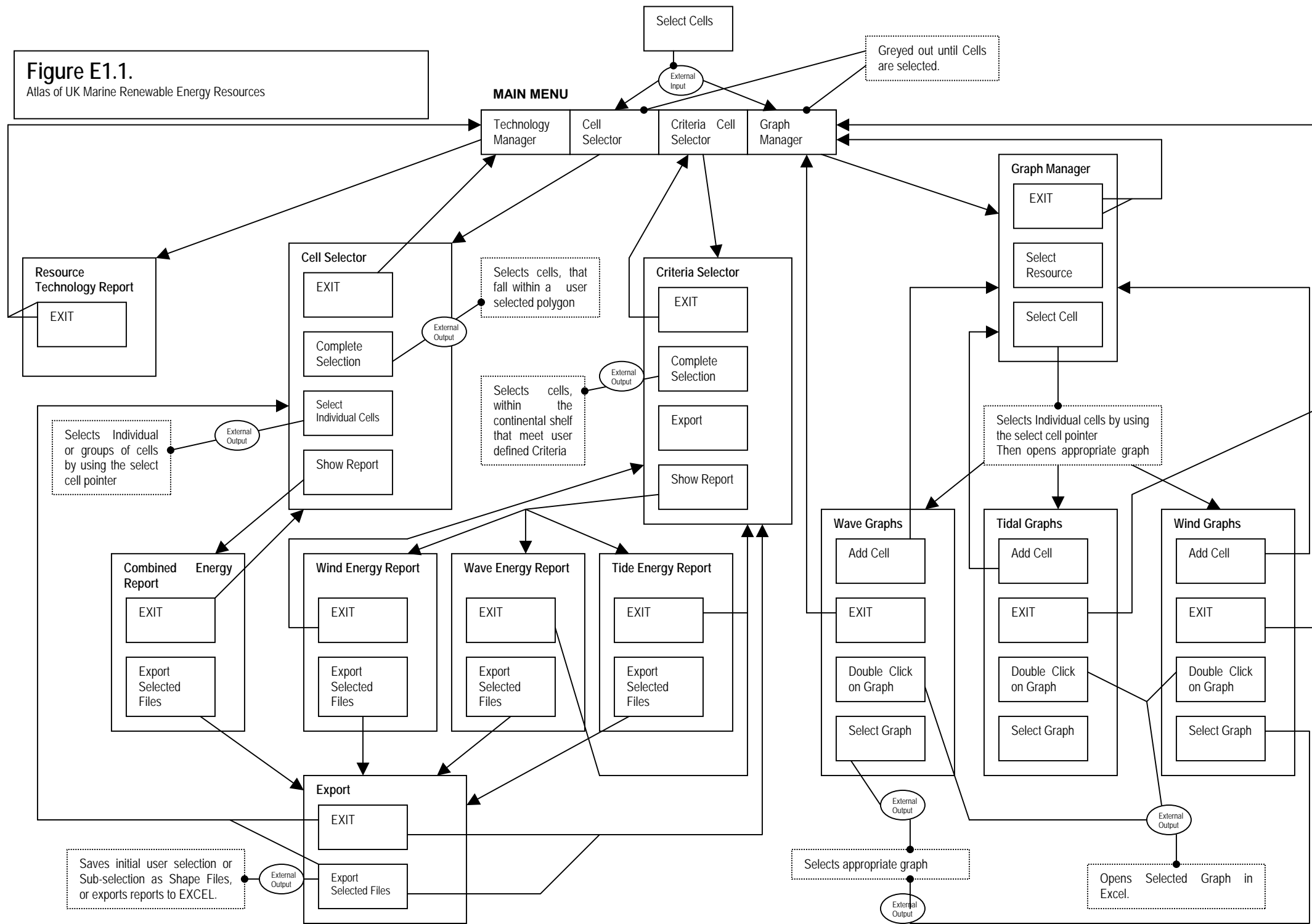
Appendix E. GIS System

E1. The Atlas GIS System

Introduction

The purpose of the GIS system is to allow the interrogation of the resource parameters held within the Atlas. In order to capture a wide range of work flows and ensure the necessary level of data security and consistency, the UK Marine Renewable Atlas System was designed using SSADAM, or Structured Systems Analysis and Design Methodology. This approach is a widely regarded and respected analysis technique designed and used by the Government for systems analysis and design.

The application of this approach to the Atlas is illustrated in Figure E1.1, which sets out the links between all the tools held within the GIS database.





E2. Atlas of UK Marine Renewable Energy Resources: Questionnaire

The following document is set out as it was originally issued.

APPENDIX E2

Atlas of UK Marine Renewable Energy Resources

Questionnaire

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Document Authorisation :

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NATURAL ENVIRONMENT RESEARCH COUNCIL

1. INTRODUCTION AND PURPOSE

In September 2003 the Department of Trade and Industry (DTI), through Geotek, commissioned a consortium led by ABP Marine Environmental Research Ltd (ABPmer) to produce the UK Marine Renewable Energy Atlas. This consortium also includes Garrad Hassan and Partners Ltd, Met Office and Proudman Oceanographic Laboratory.

The main purpose of the Atlas is to spatially map and quantify wave, tidal and wind resource potential within the limits of the UK Continental Shelf (UKCS) using the best available data. The Atlas will then be used to assist DTI on decisions of future rounds of licensing for large-scale deployment of marine renewable technologies.

Stage 1 of the project has been completed, with the production of an interim hardcopy Atlas and technical note and Stage 2 is now underway.

Stage 2 will provide DTI with an interrogative GIS based output to enable assessment of the generating potential from marine resources around UK waters. To feed into this assessment information is being collated on both presently available technology (energy converters) as well as future technologies being funded under the DTI New and Renewable Energy Programme. It is intended to facilitate this information-gathering through industry consultation, and it is the purpose of this questionnaire to capture such details.

The primary details to be collated relate to the generic properties of the relevant technologies that are being developed, for example idealised deployment conditions and predicted energy conversion efficiencies. The full list of questions are given in Section 3. It is recognised that some iteration / re-visiting of the details given here may be required thus this opportunity will be given before application within this project.

2. CONFIDENTIALITY AND ATTRIBUTABILITY

The final output from this study will be supplied to DTI who are then free to distribute as required. However, it is not intended to disclose any technical information on a specific technology or to use the details in any way to pre-select preferred technologies. Acknowledgements to main contributors will, however, be made.

Please let us know if this confidentiality does not satisfy your requirements and we will endeavour to come to an agreement.

3. QUESTIONS

3.1. Instructions

If you have more than one device please copy this section as necessary and answer the questions for all devices.

Where there are boxes, please tick the appropriate answer, otherwise please answer in the gap provided.

3.2 General concept

1. What is the resource for the device?

Tide Wave Wind

3.3. Deployment constraints

What are the constraints for your device due to the various considerations (environmental acceptance, resource, institutional limits, physical limits, costs) ? Please consider the constraints when the technology is in mature commercial operation only.

1. What are the depth constraints for deployment in terms of water depth (in meters)?

Minimum _____ Maximum _____ Ideal _____

What factors constrain the depth of deployment (tick more than one if necessary):

Environmental acceptance

Resource

Institutional limits

Physical considerations

Costs

Other (please state)

2. Is there a constraint on distance from shore?

Minimum _____ Maximum _____ Ideal

What factors constrain the deployments distance from shore (tick more than one if necessary):

Environmental acceptance

Resource

Institutional limits

Physical considerations

Costs

Other (please state) _____

3. Any other critical constraints as regards site selection?

3.4. Technology

1. What is your technology called?

2. Anticipated deployment density (MW peak power per sq km of seabed)

3. Ideal separation and spatial arrangement for multiple array

4. Energy capture efficiency of device (%)

5. Interception area of the device to the resource

6. Approximate load factor

Tidal current devices (as a function of average tidal speed)
Wave devices (as a function of wave height)
Wind devices (as a function of annual mean wind speed)

7. Position in water column, i.e. surface / bed / water column (tidal and wave devices only)

Surface Bed Water Column

Other If so, where? _____

8. Anticipated downstream wake effects

If you have any questions or would like further details please contact:

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E3. Atlas Parameters

Resource	Parameter	Temporal Resolution	Units
Tidal	Tidal Range	spring and neap	m
	Current speed	spring and neap	m/s
	Current speed exceedance	spring and neap	% frequency
	Ellipse Semi-major axis	spring and neap	non-dimensional
	Ellipse Semi-minor axis	spring and neap	non-dimensional
	Ellipse Orientation	spring and neap	deg. clockwise
	Phase of ellipse	spring and neap	+/-
	Tidal power density	Annual, spring and neap	kW/m ²
Wave	Significant wave height	monthly, seasonal and annual	m
	Wave period	monthly, seasonal and annual	sec
	Wave direction	seasonal and annual	deg.
	Wave power	monthly, seasonal and annual	kW/m
	Significant wave height exceedance	monthly, seasonal and annual	Cumulative %
	Wave power exceedance	monthly, seasonal and annual	Cumulative %
Wind	Wind speed	monthly, seasonal and annual	m/s
	Mean power density	annual	W/m ²
	Energy yield	monthly, seasonal and annual	GWh/annum/km ²
	Direction	annual	deg.



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