

Ocean Energy in Ireland

National Policies and Strategies for RD&D and Commercialisation of Ocean Energy

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Head of Renewable Energy

Sustainable Energy Ireland

Overview

- **Sustainable Energy Ireland**
- **Renewable Energy Status and Targets**
- **Ocean Energy in Ireland**
 - **Resource**
 - **Development Activities**
 - **Research Facilities**
- **Policy Development**

Sustainable Energy Ireland



- State energy agency
- Established 2002
- Energy efficiency
- Renewable energy
- Funding programmes
- Policy support



Built
Environment

Industry

Renewable
Energy

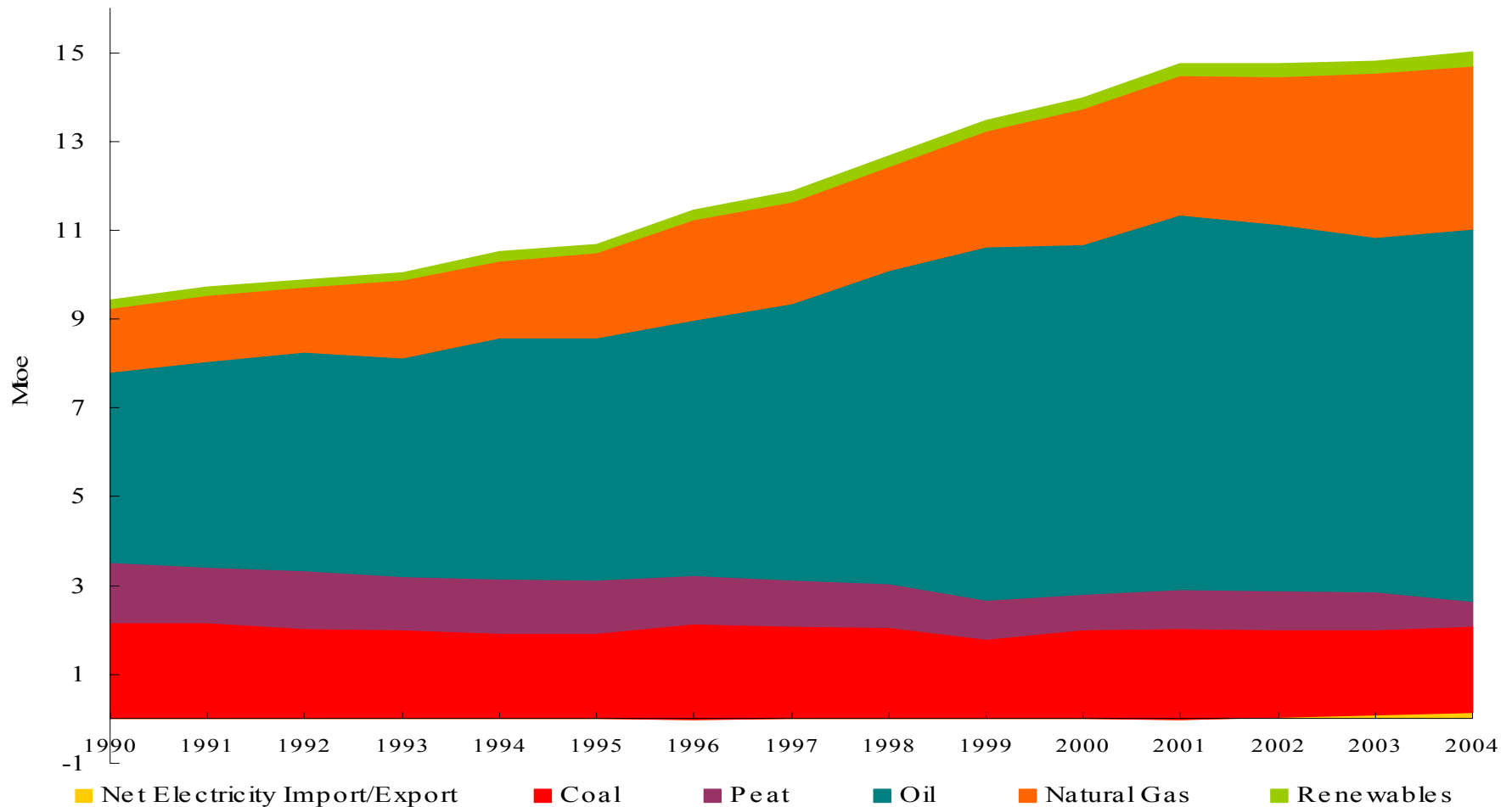
Consumer
Awareness

WWW.SEI.IE

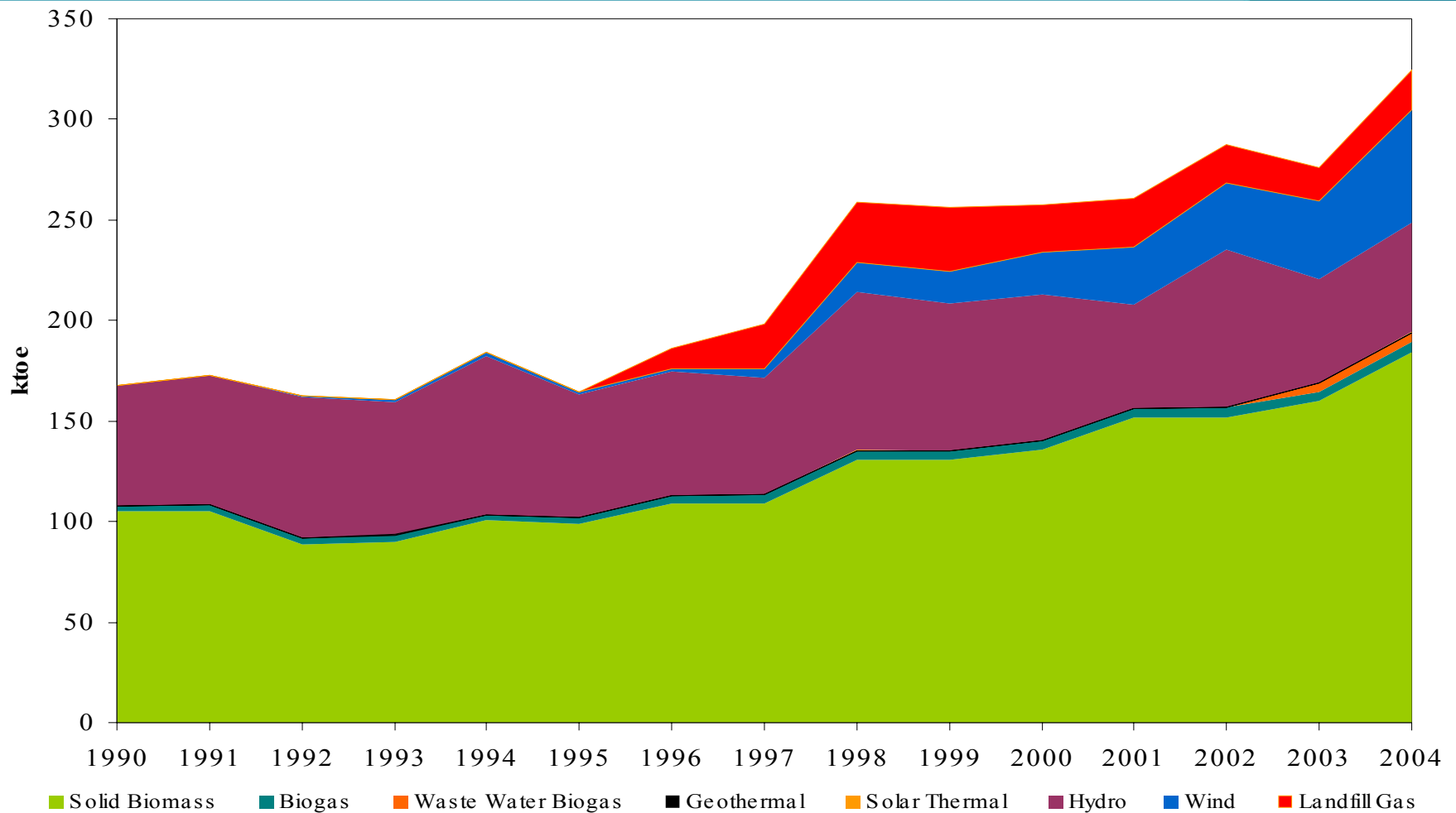
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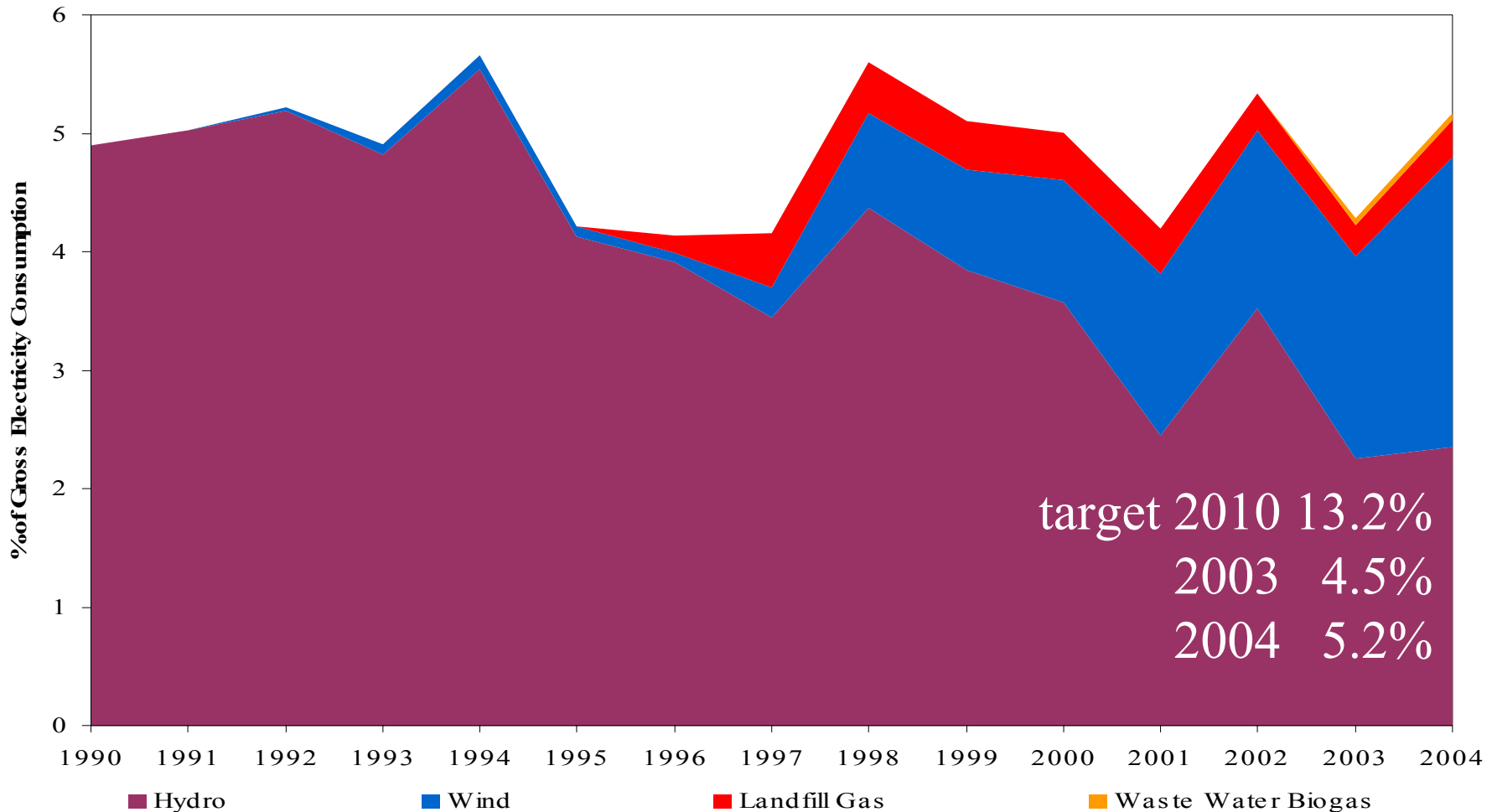
RE in Total Primary Energy Requirement



RE Only Contribution to TPER



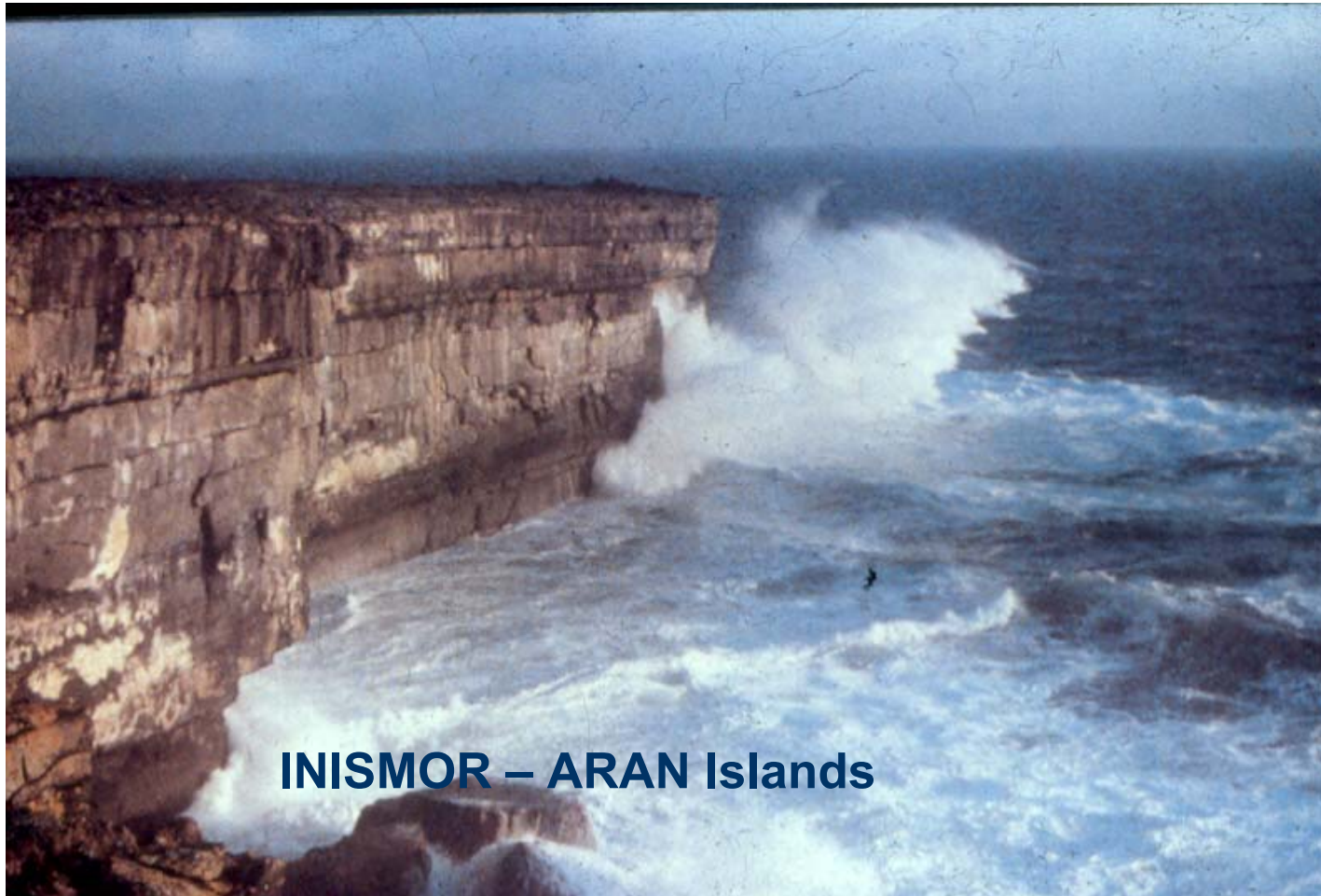
RES-E as % of Final Electricity Consumption



Overview

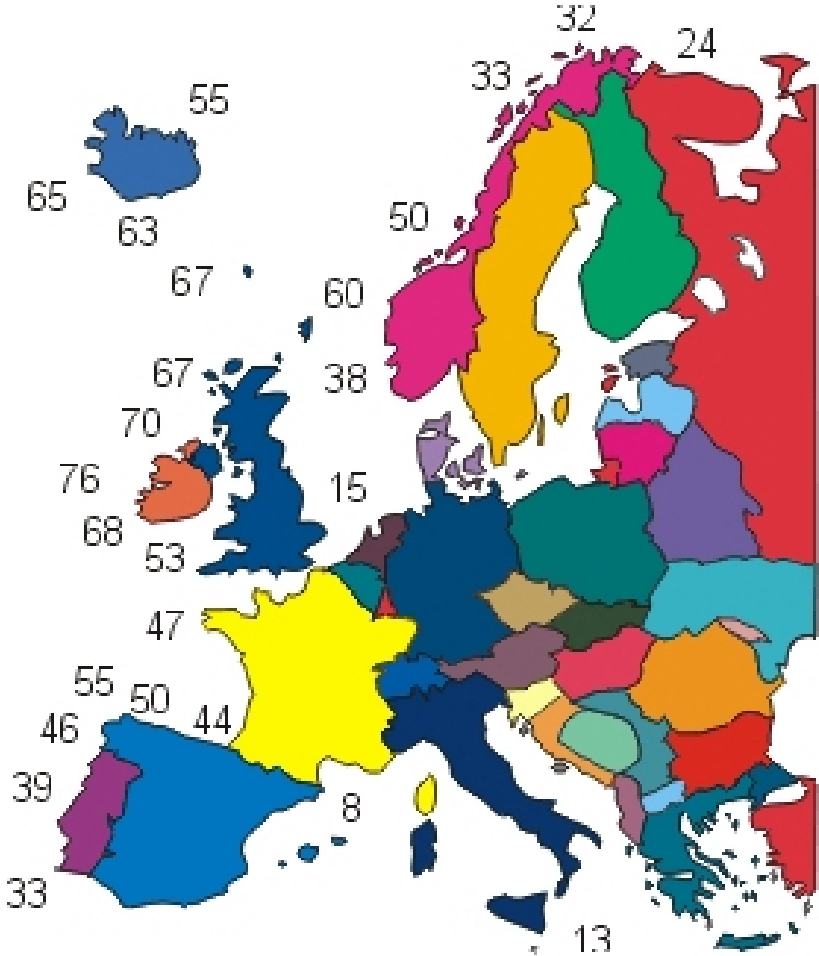
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Ocean Energy in Ireland Resource



INISMOR – ARAN Islands

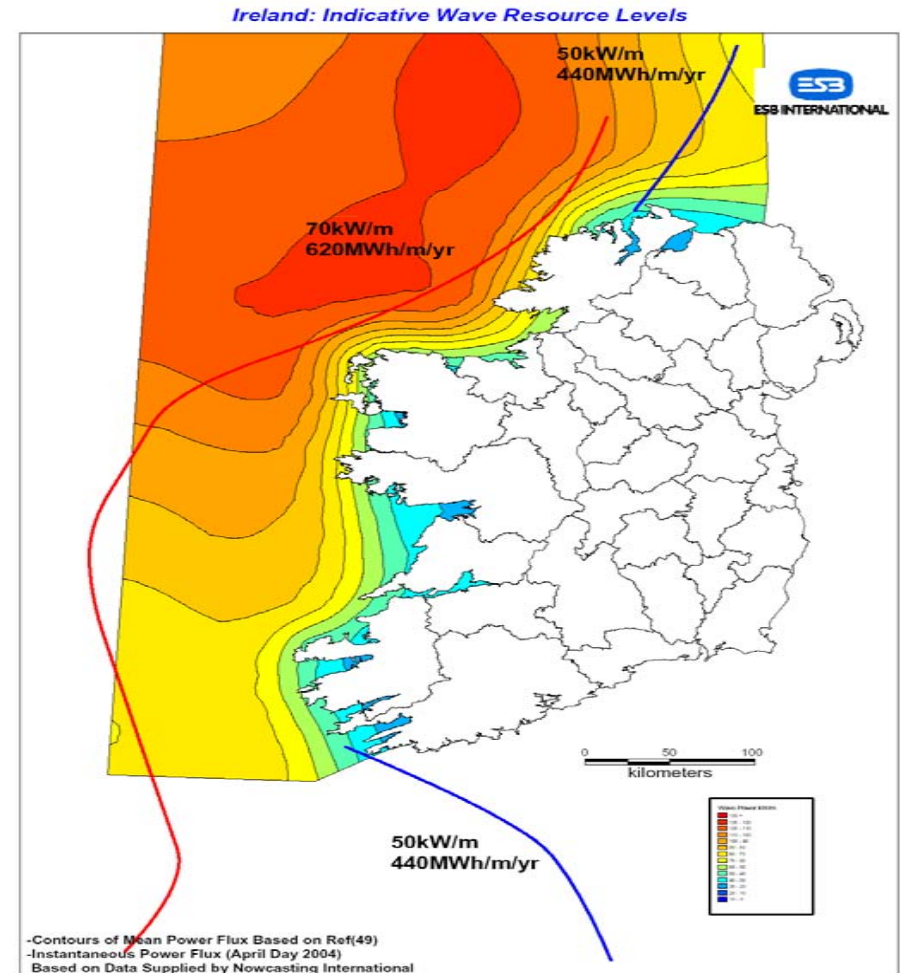
Wave Energy Resource in Europe



Wave Resource Size

Total Irish nearshore resource estimated to be 18.6 GW giving annual output of 48 TWh (HMRC, 2000).

- Practical short term exploitable resource estimated at 833MW before consideration of grid integration issues. (HMRC, 2000).
- Recent wave energy atlas shows 24 TWh/year wave resource (ESBI 2005 with SEI/MI). Accessible at www.marine.ie

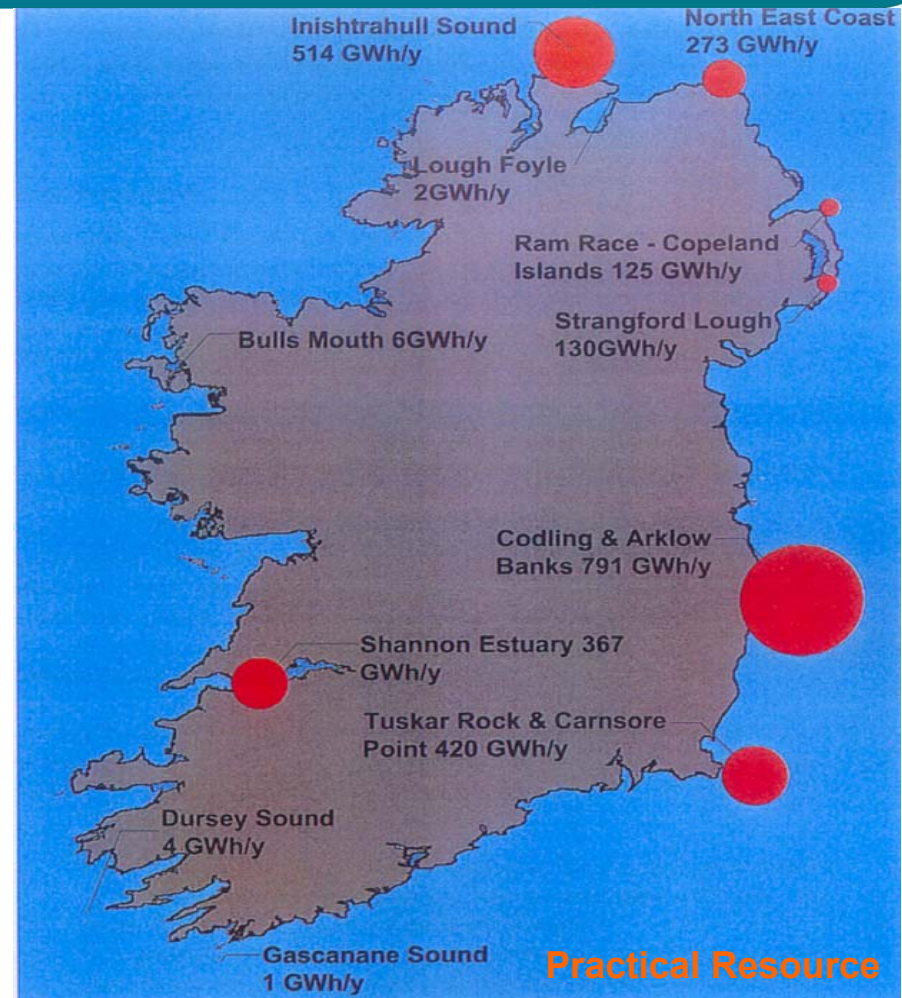


Grid Infrastructure Issue



Tidal Resource Size

- SEI commissioned report on Ireland's tidal current resource undertaken by KMM.
- Estimates of accessible resource utilising present technology in the order of 2.633 TWh/year.
- Majority of resource situated in Irish sea.
- Large increase in accessible resource expected when technology to exploit slower current velocities developed.



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Development Activities

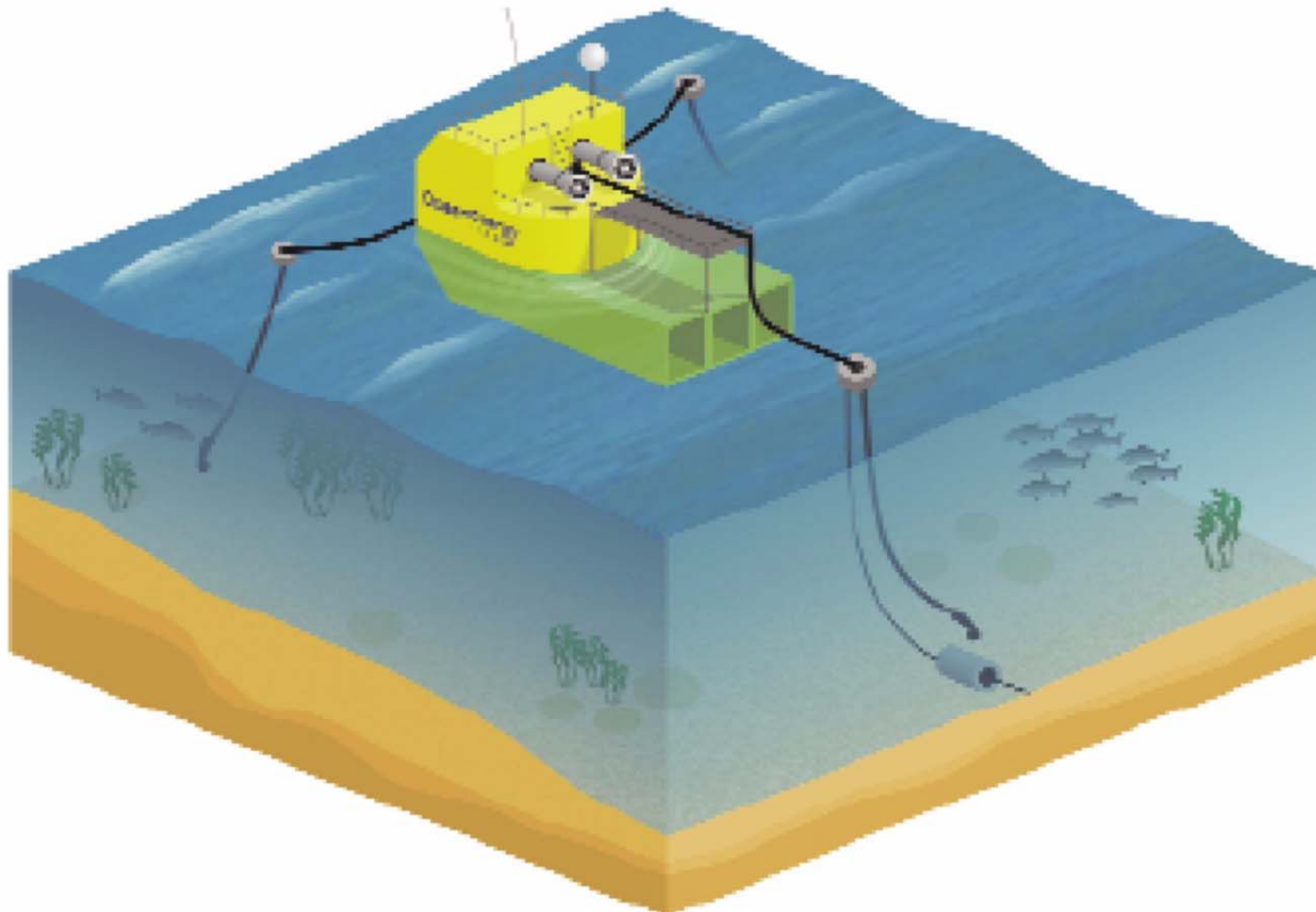
- Wavebob
 - Point Absorber
- Ocean Energy Buoy
 - Oscillating Water Column
- McCabe Wave Pump
 - Hydraulic Pump
- Recent entrants to Ireland
 - Open Hydro
 - Finovera



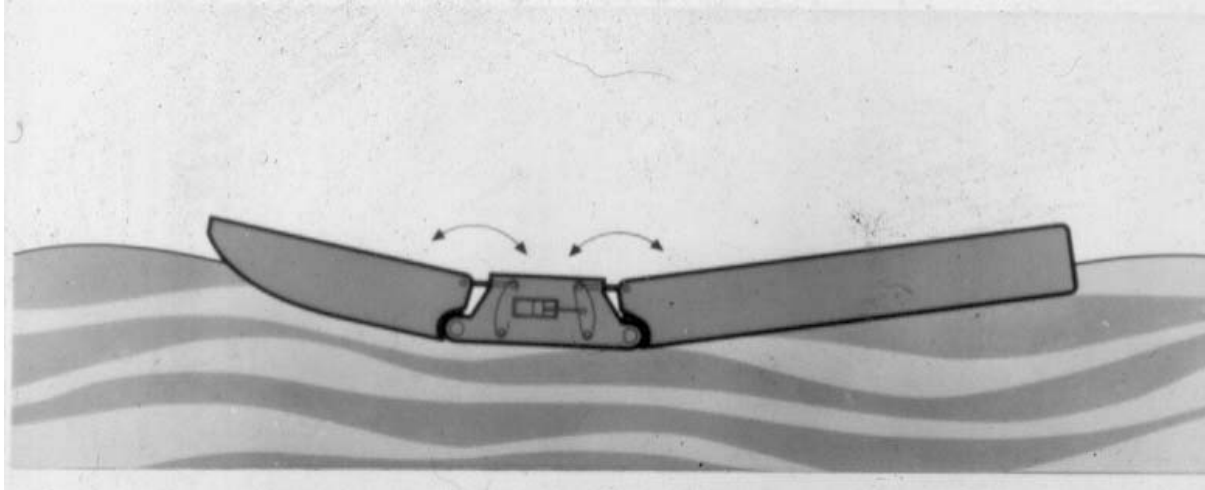
Wavebob 1/4 Scale



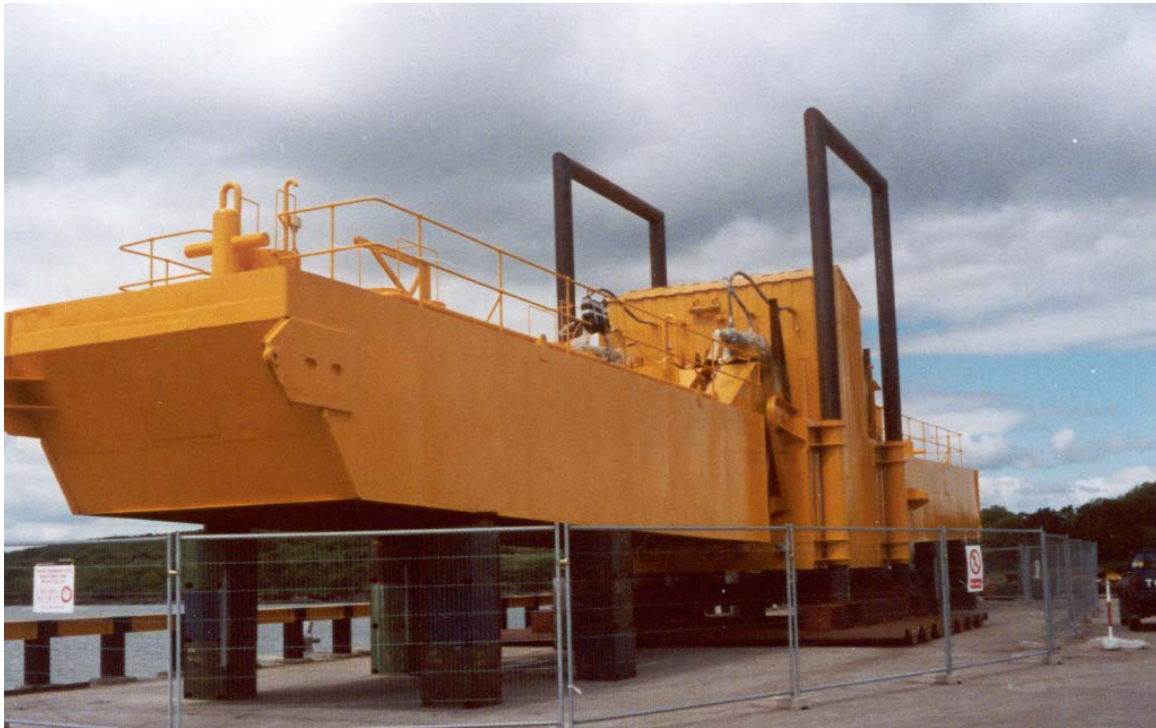
OE Buoy Quarter Scale Model



McCabe Wave Pump



McCabe Wave Pump



2004 Open sea testing

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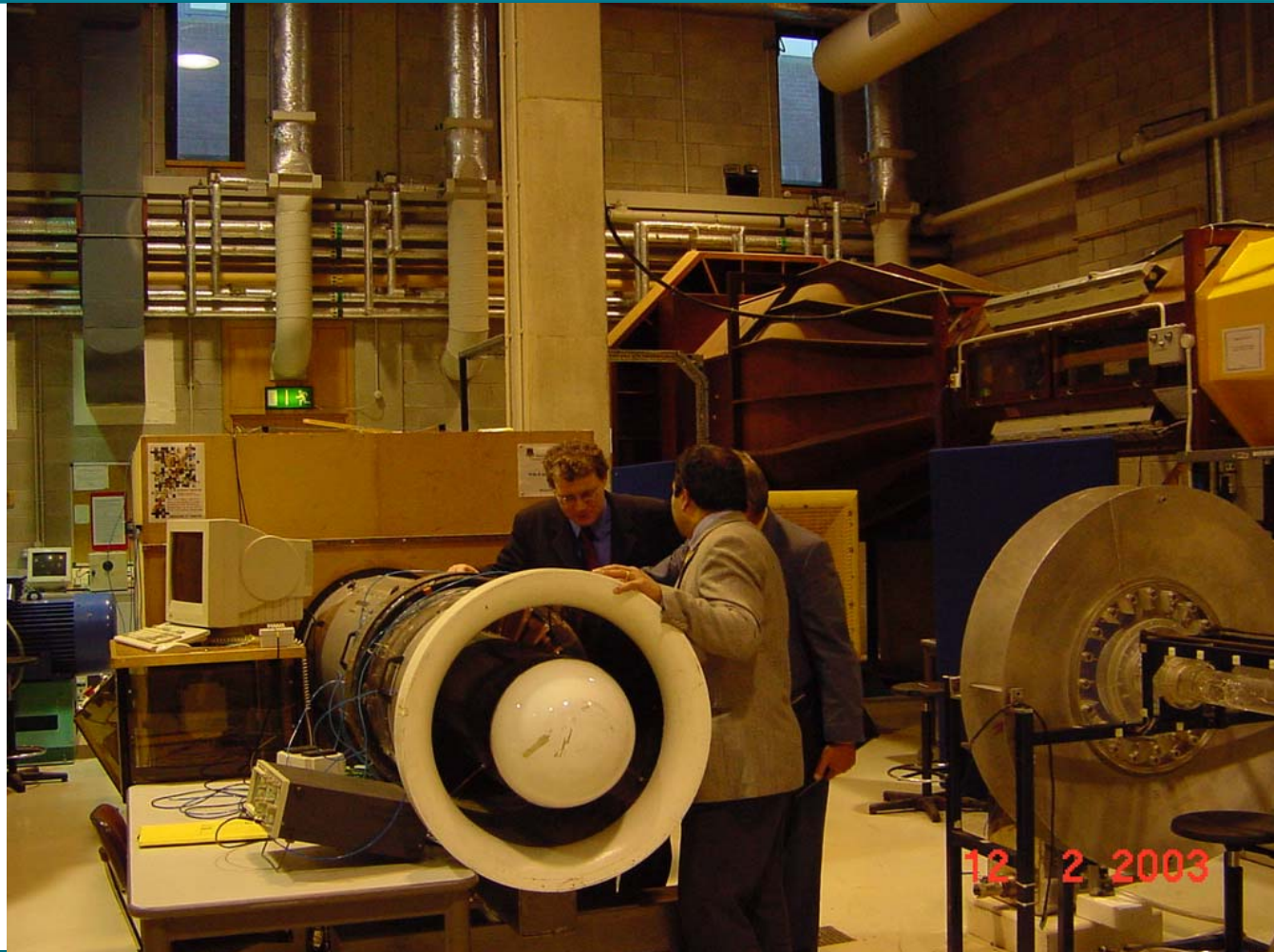
National Status - 3rd Level Activity

- Hydraulics & Maritime Research Centre (UCC)
 - Wave Tank Facility 25mx18mx1m
 - Generation of irregular wave spectra
- Wave Energy Research Team (Univ. of Limerick)
 - Air Turbine Test Rig
- University of Maynooth
- Sources of Funding
 - Marine Institute/Industry/EU/University
 - Estimate of direct National Funding to date = 307 kEuro

HMRC Tank



University of Limerick Air Turbine Test Rig



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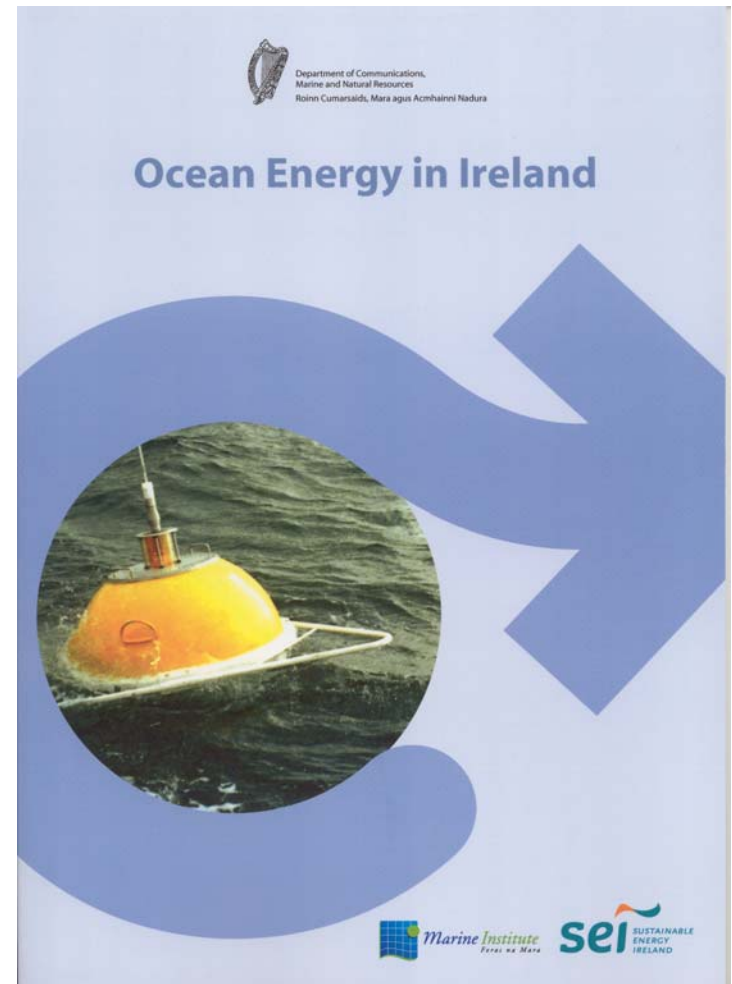
Policy Development Activities SEI and Marine Institute



- Consultation November 2002 (MI and SEI)
- Development and Evaluation Protocol (MI)
- The Economic Benefits of Developing an Ocean Energy Industry in Ireland (MI and SEI)
- Tidal and Marine Current Resource Study (SEI)
- Offshore Wave Atlas (MI and SEI)

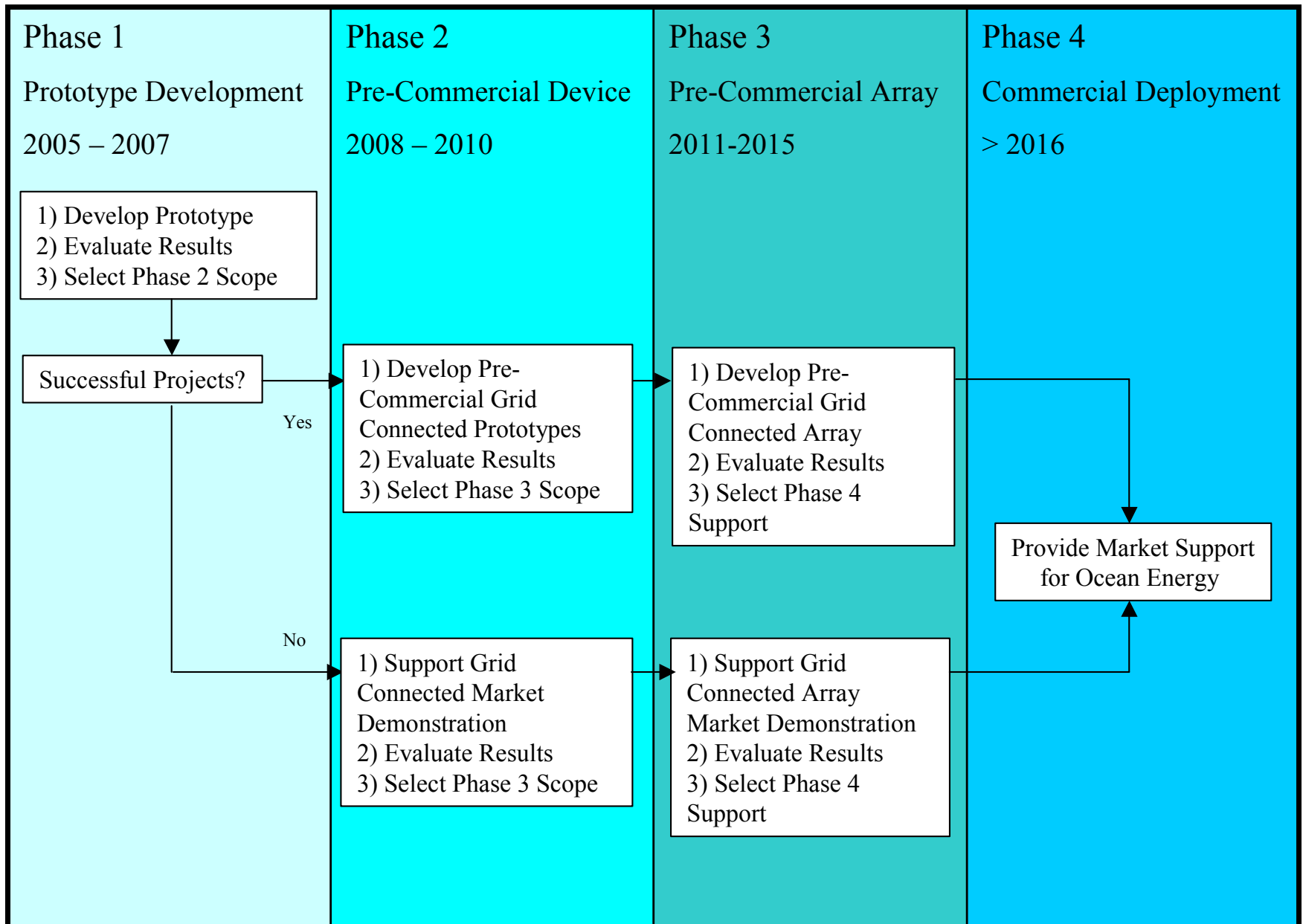
Ocean Energy Strategy – April 26, 2006

- Joint proposal by SEI and Marine Institute to secure long term funding to develop national ocean energy industry
- Four phases
- 2006 – 2025
- Objectives
 - Exploit the resource
 - Develop the industry in Ireland
 - Develop the existing research expertise



Ocean Energy Strategy

- 4 Phase Programme
- Phase 1 (2007) – Development = 4.9mEuro
- Phase 2 (2008-2010) – Demonstration Single Device = 10.5mEuro
- Phase 3 (2011-2015) – Demonstration Array = 11.15mEuro
- Phase 4 – Deployment
- Total Price of R,D&D = 26.6mEuro



Benefits to Economy of OE Programme

	2020	2025
Jobs Created (National+Export)	887	2,236
Cost of CO2 avoided	2mEuro	10mEuro
MW Installed National Market	84MW	485MW
Value of National Market	176mEuro	794mEuro
Value of Export Market (20% of market)	360mEuro	1,587mEuro

Cost of Strategy

Phase	Elements	Cost (excluding FIT)
Phase I – Development 2005-2007	Research facility and interim test site provided, as well as product R&D for Irish device developers	€10.5 M
Phase II – Pre- Commercial Device 2008-2010	Test site, research facility, product R&D, tariff A: With device R&D	€14.5 M
	B: Without device R&D	€8.7 M

Cost of Strategy

Phase	Elements	Cost (excluding FIT)
Phase III – Pre-Commercial Array 2011-2015	Test site, research facility, product R&D A: With device R&D	€24.6 M
	B: Without device R&D	€4.6 M
Phase IV – Commercial Deployment 2016-2025	Price Support for electricity delivered (if required)	

Phase 1 Activities Underway



Galway Bay Benign Test Site

www.marine.ie

Phase 1 Activities Underway



- Blue Power Initiative – Research facilities support, HMRC
- R&D support
 - Wavebob support for $\frac{1}{4}$ scale model
 - OE Buoy support for $\frac{1}{4}$ scale model
 - More applications in evaluation
 - Estimate support in 2006 of ~ €750k

Next Steps

- Implementation Plan
 - Launch Blue Power Initiative
 - Establish management committee
 - Identify project manager
 - Support of large scale converter deployment

Thank you



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