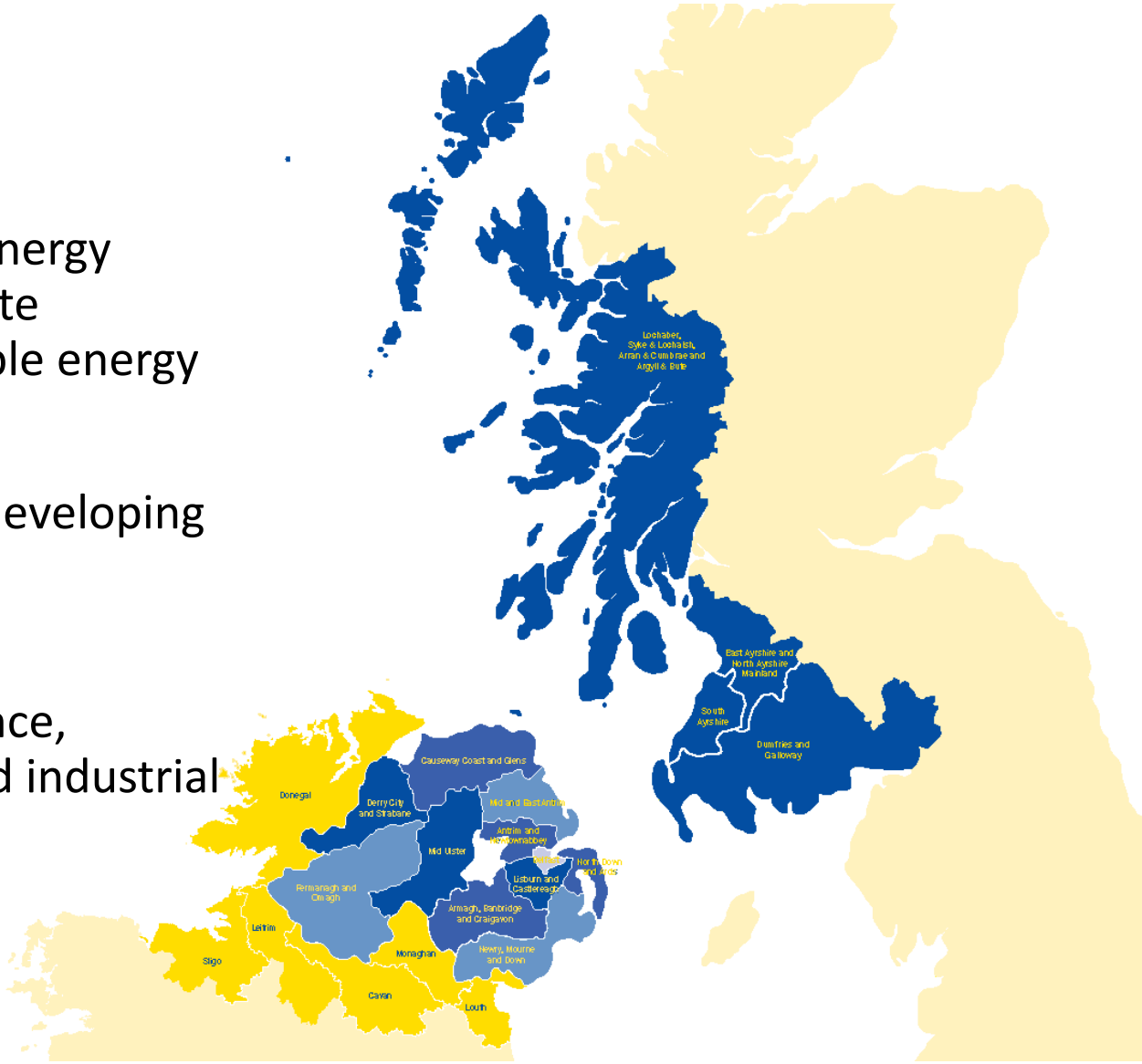
The Bryden Cente

A centre for Advanced Marine and Bio-Energy Research, named to pay tribute to the late Professor Ian Bryden's legacy in renewable energy

An Industrial Doctoral Research Centre developing the next generation of energy leaders

A Virtual Interregional Centre of Excellence, strengthening academic connectivity and industrial innovation.



THE BRYDEN CENTRE

ADVANCED MARINE AND BIO-ENERGY RESEARCH

Interreg
Northern Ireland - Ireland - Scotland
European Regional Development Fund

Agri-food and Biosciences Institute (AFBI)

Donegal Co Co,

Dumfries & Galloway Co Co,

Letterkenny Institute of Technology, (LYTI)

Queen's University Belfast, (QUB)

University of Highlands and Islands, (UHI)

Ulster University (UU)

34 PhD studentships (3.25 years)
PDRAs
Technicians
Administrative support

Total Funding: €9.7m

This project has been funded by the EU's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB)

Special EU Programmes Body
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THE BRYDEN CENTRE
ADVANCED MARINE AND BIO-ENERGY RESEARCH

Board Members

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Northern Ireland - Ireland - Scotland
European Regional Development Fund

- Members
  - Mr Alan Mortimer, Director of Innovation, Woodplc
  - Mr Conor Ronan, Director, Ronan Group Renewables,
  - Professor David Rooney, Director of Sustainable Energy Research, QUB
  - Mr David Surplus, Founding Director B9energy Group
  - Mr Mícheál O hÉanaigh, Director of Enterprise & Employment, Údaras na Gealtachta
  - Professor Neil Simco, Assistant Principal for Curriculum Growth & Acting Vice-Principal (Research), UHI
  - Mr Paul Hannigan, President Letterkenny Institute of Technology
  - Mr Thomas Cromie, Development Director, AgriAD LTD

27 Member Scientific and Commercial Advisory Panel

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Doha: 1978

Abu Dhabi: 1948

Belfast

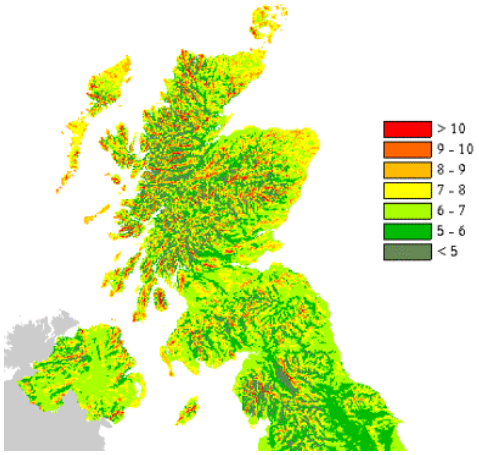
Shipbuilding to Renewables

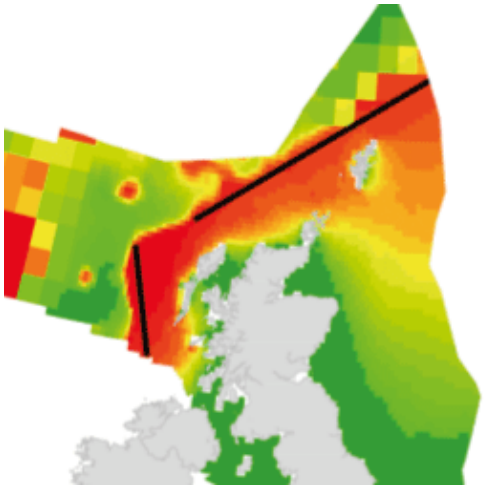
1912

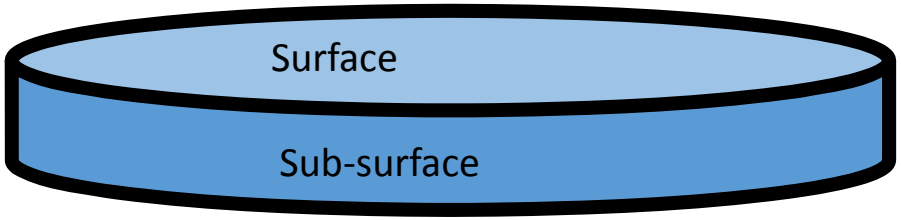
Power boost: the wind terminal assembly port represents the largest single investment in Belfast Harbour's 400-year history

BY CLARE WEIR - 25 JULY 2013

Belfast Telegraph







Biomass	0.5 W/m^2
Wind	2.5 W/m^2
Solar	5 W/m^2
Tidal	3 W/m^2

Resilient
Integrated
Smart
Economical

NI-Scotland: A history of innovation in marine renewables
75kW Station 1988 - 1999

1st UK Shoreline Device
Islay, Scotland
75 kW Capacity
Successful Prototype

Oyster 800 – 2012 Aquamarine Power

Feedstocks & Digestion → Process Monitoring → Upgrading & Supply → Optimum Biogas Utilisation

QUESTOR CENTRE

ATBEST

THE BRYDEN CENTRE
ADVANCED MARINE AND BIO-ENERGY RESEARCH

Key Cluster / Scoping

Interreg
Northern Ireland - Ireland - Scotland
European Regional Development Fund

Marine Renewable Energy	Overarching Sub-Theme: Reducing the Levelised Cost of Energy	• Advanced Design & Manufacturing • Modelling / Resource Assessment • Environment / Marine Life / Habitat • Biofouling • Foundations & Deployment.
Bio-Energy	Sub-theme 1: Bio-resources	• Algal biomass; • Other non-food biomass sources; • Waste Heat Recovery.
	Sub-theme 2: Biogas Utilisation	• Grid integration; • Dual Fuel Vehicles;
'Cross-cutting' Themes		• Economics; • Supply chain; • Community/localised energy systems; • Life Cycle Analysis;

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Sandpit event – August 2017

Wave and tidal

Materials and storage

Bioenergy

Efficiency and economics

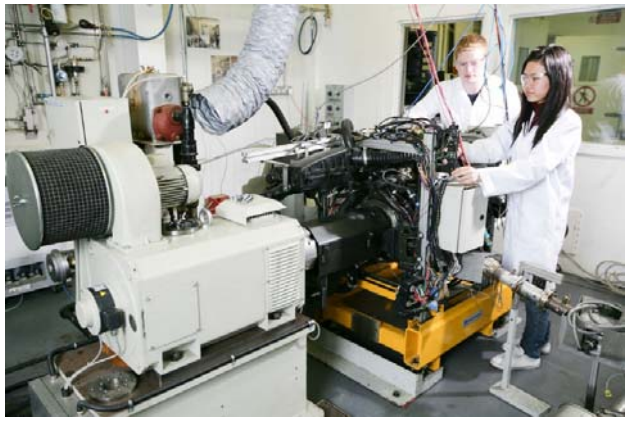
Example Projects

- *Fatigue assessment of composite blades of offshore wind turbines*
- *Quantifying the impact of marine renewable energy devices on harbour seals*
- *Assessing the influence of inflow characteristics on tidal turbines*
- *Coupled FEM-CFD analysis of offshore renewable structures*

- *Developing a Multi-Disciplinary Optimisation Method for the Automotive, Energy and Environmental sectors*
- *Regional Geochemical Provenance of Feedstocks*
- *Lithium-battery Energy Storage for Transport and Stationary Renewable Bio-Energy*

- *Assuring biofuels meet future emission legislation standards.*
- *Adding value to the G-Waste stream to produce renewable fuels and chemicals*
- *Extraction of Biofuels from Residual Lignocelluosic Biomass from Anaerobic Digestion*
- *Nutrient Management of Digestate and Slurry combined with Energy Recovery*

- Analytical
- Conversion and upgrading
- Battery testing
- Fuel testing
- Multi-scale modelling



MRG Wave & Tidal Facilities

Wave Testing Facilities

- QUB Wide Wave Tank
  - 18m x 4.5m x 0.8m
  - Freq. 0.3Hz – 1.5Hz, Amp. < 0.125m
- QUB Portaferry Coastal Wave Basin
  - 18m x 16m x 0.65m
  - Freq. 0.3Hz – 1.5Hz, Amp. < 0.1m

Tidal Testing Facilities

- Montgomery Lake Towing Facility
  - 400m towing track, 6m deep, 33m wide
- Strangford Narrows Field Test Site
  - Tidal flow up to 2.5m/s, 10-20m deep, 1km wide
- Extensive Field Testing Equipment & Expertise
  - Marine Foundation, ADPs, ADVs, Acoustics etc.

Final words..

- Significant history of expertise across partners
- The Bryden Centre will build on the strengths of the interregional area to ensure its natural resources (people and energy) are maximised for societal benefit
- Second cohort of studentships will be available for interregional industry led projects in 2018-19

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www.brydencentre.com

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Email: d.rooney@qub.ac.uk

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