

# Developing a holistic approach – How industry and higher education can work together to support the development of marine renewables

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# The potential of the UK Marine Renewable Industry

By 2050\* the UK Marine Renewable Industry is estimated to be worth £4.2bn if we invest in it fully today.

This would result in 29GW of installed capacity.

43,500 direct jobs

210,000 indirect jobs

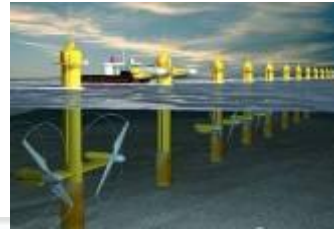
Reduction in the wholesale cost of electricity by 3.3%

\*Employment opportunities and challenges in the context of rapid industry growth, Bain and Company, October 2008.



# A call to arms

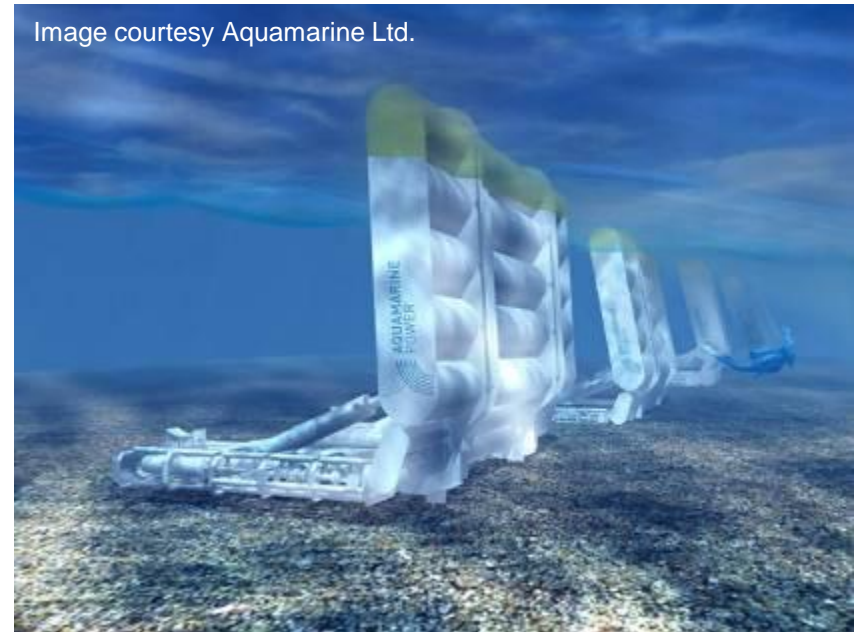
To achieve this potential Government, Developers, Industry, Finance and Academia must work together.



# Renewables – Concept Development (Academia / Developer)

## Enabling concept development through

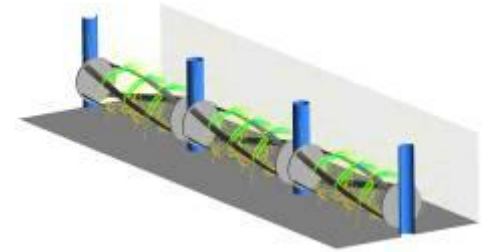
- Initial assessment of concepts
  - Feasibility of concept
  - Prototype evaluation at small scale
  - Initial power output potential
- Design revision
  - Reviewing initial data and optimisation
  - Updated prototype testing
  - Initial business case preparation
- Support via student projects / EPSRC
- Promotion through academic papers



# Renewables – Design & Optimisation (Academia / Industry)

## Enabling design optimisation through

- Scale model testing
  - Small scale tank testing
  - Hydrodynamic evaluation
  - CFD Optimisation
- Design Development
  - Concept drawings
  - Engineering Drawings
  - Design for Manufacture
- Larger Scale (1/5<sup>th</sup>) Prototype
  - Manufacture
  - Evaluation
  - Data Collection
  - Design Iteration



# Renewables - Commercial development (Industry / Finance)

## Enabling commercial exploitation through

- Safety Management
  - Assessing approach and philosophy
  - Oversee safety management process
  - Safety Case development
- Through life capability management
  - Condition based monitoring
  - Noise and vibration mitigation
  - Fatigue/corrosion control
- Project management
- Device deployment
  - Bespoke vessel design
  - Scaling up for manufacture



Image courtesy OPT Ltd.



Image courtesy MCT Ltd.

# Other Collaborative Roles

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- Training
  - Industry to identify skills shortfalls
  - Higher Education to provide Academic and Vocational skills courses to meet requirements
  - Industry to provide placements for students to gain real world experience
  - Government to provide the legislative and financial framework
- Development of tools and technology
  - Industry to identify technology gaps and shortfalls from in-service operation
  - Academia to lead EPSRC research initiatives to address gaps in concert with Industry
  - Industry to put together multi-disciplinary consortia involving academia to address major technology shortfalls

***QinetiQ***