



Developing Ocean Energy Technology

TIP Ocean Energy

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Image courtesy of Aquamarine Power Ltd

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SPACE | SCHOOL OF Planning Architecture & Civil Engineering





Developments in Ocean Energy Technology

Where are we now?

Where do we want to go?

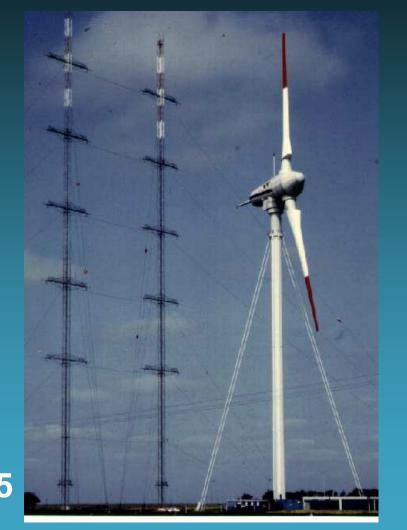
How will we get there?

Workstream 1: Technology OE Forum Dublin June 2014



Where are we now ? GROWIAN 1980 – 1988 90 Mio DM ~ 75 Mio € 100m tower – 100m rotor diameter 340 ton nacelle 3MW capacity

"We built GROWIAN to proof that it cannot be done!" Source: Spiegel 24 1985



Source: http://www.heiner-doerner-windenergie.de



Will Ocean Energy develop similar to Wind Energy Industry ?

We are still at an early stage 6MW installed capacity in Europe in 2014! GROWIAN is still seen as the ignition of wind power in Germany

Wave & Tidal Energy not a back yard business!! 10 - 50 Mio Euro to get first reasonable full scale prototype in the water

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Do we have enough experienced professionals? Young industry – young professionals **Engineers – Researchers - Scientists** Lack of past experience! Oil & Gas sector is experiencing the same - offshore engineers retiring Image courtesy of EON "We have very few left, who know how to do it!" (NCE2013) Industry is competing for the same pool of (young) professionals



We can (need to) do it all?

- Device developers need to fullfill a wide spectrum of roles / duties to get device into the water:
- Financing Technology
- M&O

Environmental aspects

Construction
Foundation
Substructure
Rotor/nacelle/reacting body
PTO
Electrical & Monitoring
Grid connection

Small companies compared to task!!



Where do we want to go?

Linking knowledge and transferring skill & expertise across sectors & disciplines

- Naval architecture
- O&G Offshore sector
- General power generation
- Smart components and composite materials
- Power control F One
- Economy of scale wind?



Image courtesy of IBERDROLA

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Where do we want to go?

Incorporating environmental issues at an early stage

- Involve licensing agencies
- Get expert advice from environmental scientists
- Get public involved
- and test your device for these issues





Where do we want to go?

Developing a sectorised industry

- Resource assessment
- **PTO**
- Substructure
- Foundations
- strong supplier backbone!



Image courtesy of Aquamarine Power Ltd



How will we get there?

