



#### 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?

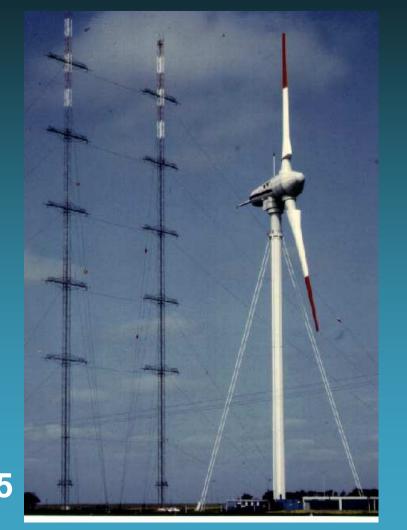
How will we get there?

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?

