Survey of Wave and Tidal Companies 2010

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Society for Underwater Technology

Society for Underwater Technology (SUT)

- Learned Society – HQ London, UK branches in Aberdeen & Newcastle
- International body – members in 40 countries, branches in Houston, Rio de Janeiro, Perth, Melbourne, Kuala Lumpur, Lagos, Bergen.
- Actively promotes the development, dissemination and exchange of ideas, information, and technology arising from or related to the underwater environment.

Wave & Tidal Survey 2010

Background

- 128 Companies contacted worldwide
- 36 responses
  - USA (10), UK (8), Norway (4), Australia, Ireland, Portugal (3), Sweden (2)
- Not all answered every question
- 78% responders had financial stake in firm

Wave & Tidal Survey 2010

Company Structure

Start-up

- 54% New independent venture
- 17% spin-off from company
- 11% Spin-off from University

Wave & Tidal Survey 2010

Company Structure

Owners of firm

- 85% Founders
- 70% Other private investors
- 39% Employees
- 33% Industry
  - 12% Utility, 6% Oil & Gas
- 6% Government
- 3% University

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Company Structure

Management Team Experience

- Strengths – Research, Start-ups, International Business
- Weaknesses – no gaps but less cover in lobbying, oil & gas and utility experience

Employees (average)

- Full time – 10
- Part time – 5

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Q – Planned Business Model?

	In-house	External	Both	??
R&D	39	4	57	0
Sell technology	61	0	32	7
Make technology	11	64	21	4
Assemble technology	14	39	43	4
Plan power park	29	18	42	11
Operate park	4	50	32	14
Maintain park	11	21	50	18
Decommission park	7	46	21	25
Own power park	4	39	39	18
Sell electricity	11	53	25	11

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Technology

Wave Energy Device	43%
Tidal Energy Device	36%
Both Wave & Tidal	21%

Wave & Tidal Survey 2010

Technology

Wave Energy Device		43%
– Floating body	21%	
– Oscillating Water Column	7%	
– Other wave	18%	
Tidal Energy Device		36%
– Horizontal axis	29%	
– Vertical axis	25%	
Both Wave & Tidal		21%

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Technology

Water depth – device suitability

- Onshore/Coastal 29%
- Nearshore (20-40m) 75%
- Offshore (40-100m) 71%
- Deepwater (>100m) 36%

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Technology

Development phase

- Numerical model/lab 4%
- Physical model, lab or sea (<1:10) 41%
- Prototype, sea (>1:10) 11%
- Demonstration, sea (1:1) 37%
- Power park (1:1) 7%

Standards

- EMEC 48%
- DNV 44%
- Other 48%
- None 30%

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Technology

Rated Power - Final Product (kW/Machine)

- 1-100 kW 15%
- 100-500 kW 33%
- 500-1000 kw 7%
- 1000-3000 kW 33%
- >3000 kW 11%

Delivered to grid to date – undisclosed, only one gave a figure (~1000MWhr)

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Technology Development

Total amount spent on technical development to date - inc external R&D

€0 – 100k	8%
€100k – 500k	23%
€500k – 1m	8%
€1m – 3m	26%
€3m – 10m	8%
>€10m	8%
Prefer not to answer	19%

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Company Development

Year of:	first registration	technology verification (eg model testing)
Before 1990	12%	8%
1990-1999	15%	8%
2000-2004	31%	23%
2005-2009	38%	50%
2010+ (planned)	0%	8%
n/a	4%	3%

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Company Development

Year of:	first prototype testing	first demo project	first full-scale power park
Before 1990	8%	0%	0%
1990-1999	4%	0%	0%
2000-2004	12%	4%	0%
2005-2009	38%	23%	4%
2010-2014	26%	65%	69%
2015+	0%	0%	12%
n/a	12%	8%	15%

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Barriers to Development

Funding 85%

- Generally – funding/finance/capital/subsidies
- Items mentioned specifically –
  - General R&D spend, full scale development financing

Other points

- Licensing (US)
- Grid infrastructure (Scotland)
- Lessons not learned
- Consenting/approvals (Norway)
- Lack of domestic offshore test facilities (US)
- Skilled employees (Sweden)

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Domestic v International

Results show very domestic orientation

- 60% - solely national activities at present
- Work force home grown
- Modelling & first prototype in country
- 70% entirely domestic company/ownership
- 92% home grown concept
- 96% still in original country
- <50% had any employee mainly engaged with international activities

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Domestic v International

BUT in the future

- 67% firms expect full scale park abroad
- 70% see technology main use for traditional electricity supply, 30% for remote power supply to other devices
- 73% have attended international show/conf
- 77% NOT part of supranational R&D prog
- 65% hope to be dominant national firm with extensive international activities in 10 years

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Domestic v International

Why do demo/power park in foreign country?

- Better natural resources
- More available government funding
- More available private funding
- Easier to get a concession
- Better access to grid
- A proactive government

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Domestic v International

BUT – problems of working overseas

- Distance
- Language
- Technology theft
- Time consuming
- Qualify for other government funding
- Prove at home first

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The Future

Barriers

- Biggest/most relevant single issue:
  - Lack of long-term governmental support (80)% [60% rated home country support < average]
- Other highly relevant issues:
  - Difficulty of getting licences
  - Poor access to grid
  - Conflict with other sea area users
- Least worrisome:
  - Lack of public awareness

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The Future

Q: Imagine building a full scale demo project – where would it be?

- Scotland 33%
- England, USA each 13%
- Australia, Portugal each 8%
- Canada, Ireland, New Zealand, Norway, Wales each 4%

Q: Long term – 100 parks where?

- Europe 45%

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The Future

Reasons for previous choice :

- Resource 42%
- Support/political will/consents 29%
- Proximity 17%
- Others
  - Grid access 13%
  - People/partners 13%
  - Test centre 13%
  - Funding 8%

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