Wave Energy – why?

- Resource is enormous
- Most ‘dense’ renewable resource
- ‘Out of sight & out of mind’

- Renewables needs ‘options’…
- Dependable & forecastable
- Aggregation with wind => good

Major energy source & industrial opportunity
PELAMIS – Business Overview

Industry standard model

- Technology provider
- Model adopted across power sector
- Proven through wind industry success

Business & finance

- Incorporated January 1998
- Private - UK Limited Company
- Currently 78 staff
- ~$0.75m seed from ‘friends & family’, Angel
- ~$12.5m first stage VC 2002
- ~$60m since in 3 rounds
- 2 commercial contracts to date, ~$15m

Proven, accepted, financeable business model…
Pelamis WEC technology - USPs

- Offshore deployment
- Non-site specific
- Inherent survivability - CRITICAL
- 3 x power/tonne of competitors
- Available technology
- Designed to DNV standards
- Patented core technology, all key know-how in-house
- Acknowledged market leader

- Forecastable output
- Negligible visual intrusion
- Minimal environmental impact
- Minimum on-site construction work
- Off-site maintenance

Breakthrough technology with unique competitive advantages
Wave Energy – where have we got to?

• We have come a long way in 11 years…!!!
• Significant Venture Capital now engaged in sector
• We are at the stage of proving-out the technology:
  – Prototype and now pre-commercial machines
  – Manufacturing and supply chain development
  – Project infrastructure
  – Operational procedures
• We are putting in place industry design, performance & operational standards and best practices

• We have gained credibility, and the interest of energy sector

But… we have not proven full commercial operation yet
FROM THIS....
TO THIS....
PELAMIS - Status

• ‘P1’, first generation technology demonstrated:
  – 4 x 750kW machines built/installed
  – All related wave farm infrastructure, operational procedures, SCADA systems etc proven
  – P1 machines have some limitations in terms of performance & reliability
  – ‘First-of-kind’ project costs fully defined
  – Lessons learnt captured & fed into onward programme

• ‘P2’, second-generation machine currently in build:
  – Range of advances & improvements from R&D plus experience
  – Approaching double annual yield for similar cost
  – First machine currently being built under contract to E.on, launch schedule for Q2 2010

CONCLUSION: First technology-cycle complete, P2 will be platform for commercial roll-out
Wave Energy – costs

Cumulative finance

Investment risk

Current focus

First-of-a-kind

Capital cost

Conceptual phase

Rapid learning

Normal learning curve

Extended learning

Cumulative capacity
Wave Energy – parallels with wind

The wind industry….. 1980s

- Fully converged & consolidated…
- Into mainstream global roll-out
- Delivered by solid policy actions in EU
Wave Energy – costs & cost reduction

- Photovoltaics learning rate ~20%
- Windmills (U.S.) learning rate ~20%
- Gas turbines (U.S.) learning rate ~20%, ~10%

Cumulative MW Experience

R&D and technical demonstration phase
Commercialization phase
Status of Markets – EUROPE

- Many initiatives have come through specific lobbying at National level
- Scotland has led this with:
  - Saltire prize – (c.f. ‘X Prize’), ~$15m for first commercial demonstration project
  - EMEC test centre – 4 berth all inclusive test site for prototypes
  - WATES grant scheme – 40% grant plus 5 years of revenue support at 15$c/kWh for prototype & pilot demos
  - Feeder market support – 35-40$c per kWh for pre-commercial/commercial projects
  - Planning & regulatory framework - First Marine SEA, spatial planning etc
  - Licencing – first managed sea bed licencing programme in process

- Attractive schemes also in Portugal, Ireland etc
- R&D support from European Union
- Many other countries assessing options

**CONCLUSION: EUROPE IS LEADING WITH POLICY & ACTIVITY**
Status of Markets – UNITED STATES

• Lots if interest, enthusiasm & activity in various States
• West Coast leading as resource & renewables focus higher
• Wave energy eligible for tax credit, levels & timescale insufficient
• Initial permitting requests/exercises in process – complex
• Various RFPs & grants schemes at Federal (+1 State) level
• Various companies active in US

• At a state level (CA, OR, WA) there are significant individual programmes & initiatives, but little sign of a holistic coordinated plan so far
• Little concerted or coordinated action at a Federal level, there is a need to move to push this up the policy priority list

CONCLUSION: COORDINATED ACTION WITHIN US ESSENTIAL TO MOVE FORWARD STRONGLY
What are Key Industry Issues?

• Stepping to the next level of funding for technologies & projects…
  – Private Investment
  – Grants
  – Feeder markets
• Key issues – scale of finance required, perceived risks & time to return
• Achieving industry convergence/consolidation
• Absence of clear National & Regional objectives & targets
• Poor industry coordination in some areas

CONCLUSION: UNLOCKING FINANCE KEY TO SECTOR SUCCESS
What should Industry & Government do?

• Significantly raise the profile of the sector in forward thinking to enhance investor & customer confidence
• Move strongly to drive technology demonstration, refinement and early roll-out in key first-mover markets:
  – Address sector risk profile efficiently
  – Learning from / mirroring experience of wind, oil & gas industries and other heavy industrial technologies
  – Build solid domestic technology and industry base(s) in first mover markets before taking technology global
• Move strongly to lobby for holistic policy initiatives at US Federal level to provide solid and consistent investment, development and deployment platform

Above all else: CREATE A SOLID PLATFORM FOR PRIVATE SECTOR TO DELIVER!