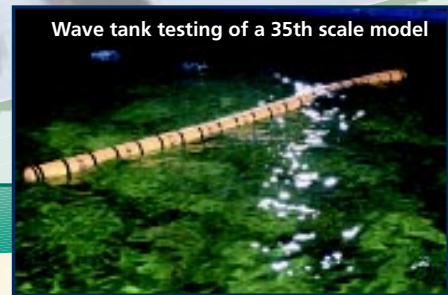
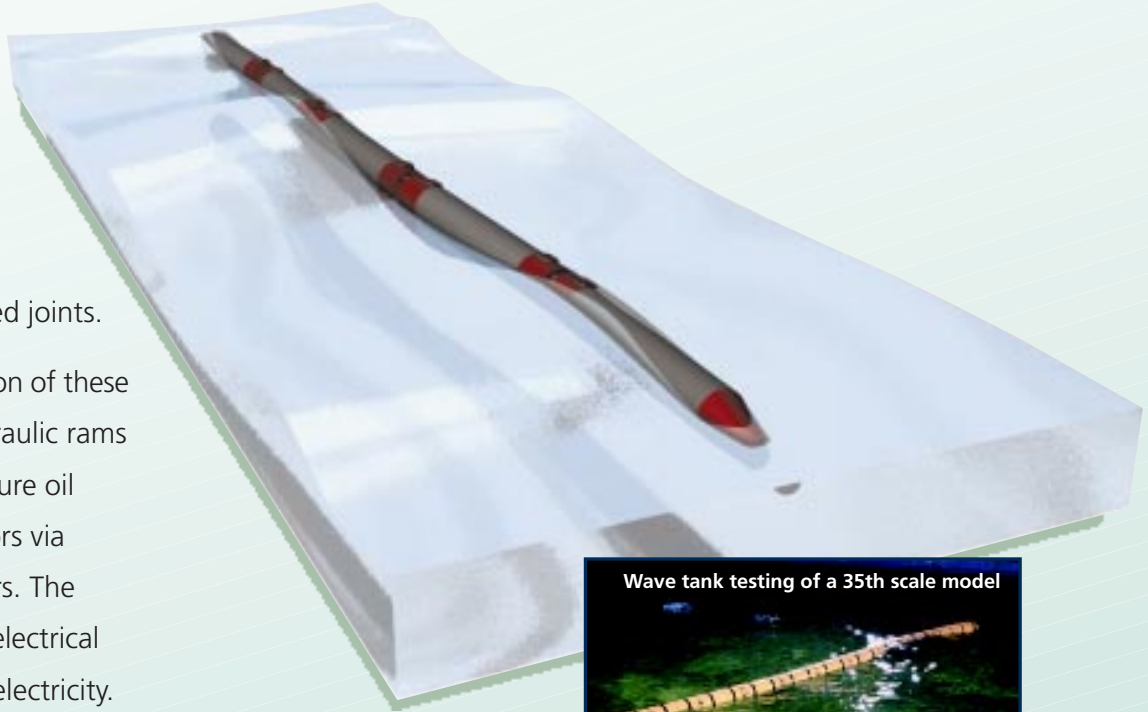


THE PELAMIS WEC, from Ocean Power Delivery Ltd, is a semi-submerged, articulated structure, composed of cylindrical sections linked by hinged joints.

The wave-induced motion of these joints is resisted by hydraulic rams which pump high pressure oil through hydraulic motors via smoothing accumulators. The hydraulic motors drive electrical generators to produce electricity.

A 750kW device will be 150m long and 3.5m in diameter, and composed of 5 sections.

Power will be linked to the grid via conventional subsea power cables. A typical offshore 'wave-farm' would consist of 50 Pelamis devices providing sufficient power for over 11,000 homes.



Wave tank testing of a 35th scale model

KEY FEATURES

• SURVIVABILITY

Pelamis is designed with survivability as the primary objective.

The device concept incorporates inherent 'load-shedding', presents a minimal cross-sectional area to storm waves and is self-referenced (ie does not rely on reaction against the sea-bed to absorb energy).

• POWER CAPTURE EFFICIENCY

Power capture efficiency is increased in small waves by 'tuning' the device to the wave frequency. The device 'de-tunes' in large waves to prevent excessive loads and motions.

• NON SITE SPECIFIC

Pelamis can be installed in a range of water depths and sea bed conditions

• MINIMUM ON-SITE WORK

The complete device can be constructed, assembled and tested off-site with a minimum of installation work required on-site.

• 100% 'AVAILABLE' TECHNOLOGY

Prototypes and initial production devices will use 100% available technology.

• MODULAR CONSTRUCTION & SYSTEMS

The device is modular in design, dramatically reducing production costs.



Cross-section of Pelamis Joint Sections with hydraulic rams and Hydraulic Power Pack

TECHNICAL SPECIFICATION

Pelamis P-750

Power Rating: 750kW
 Length: 150m
 Diameter: 3.5m
 Weight: 700 tons
 Annual output: 2.7GWh

COMPARISONS

Equivalent gas turbine:
 Fuel: 600 ton/year
 CO₂ emissions: 2000 ton/year

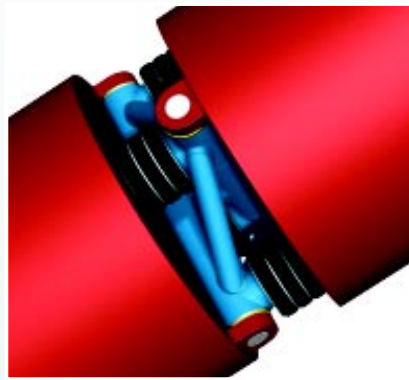
Equivalent coal generation:
 Fuel: 760 ton/year
 CO₂ emissions: 2800 ton/year



POWER PACK

The 'Power Conversion Pack' is a compact modular unit that can be built and fully tested before installation. One 'Power Pack' is mounted in the end of each section of the device. Weight is kept to a minimum so that it can be easily replaced on-site without the need for specialist handling equipment. This philosophy is applied

to all system components.



JOINT CONFIGURATION

A novel joint configuration is used to induce a tuneable cross-coupled resonant response that greatly increases power capture in small seas. Control of the restraint applied to the joints allows the resonant response to be 'turned-up' in small seas where capture efficiency must be maximised, or 'turned-down' to limit loads and motions in survival conditions.

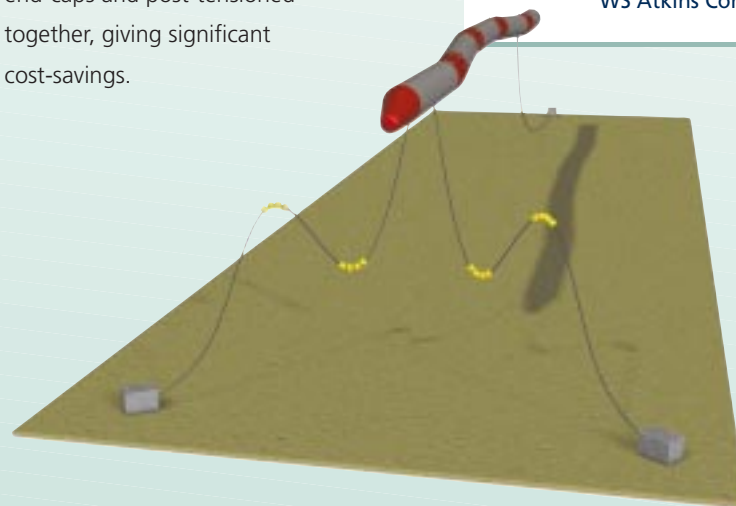
CONSTRUCTION

The modular sections have steel 'end-caps' containing the power conversion equipment. The prototype devices are designed to be easy to modify and repair and therefore use steel tubes to link the end-caps.

For large scale production, tubular concrete sections would be sandwiched between end-caps and post-tensioned together, giving significant cost-savings.

"We are entirely serious about wave power, whose time has come ... and we regard Ocean Power Delivery as the equivalent of the Wright Brothers."

ROD RAINEY
 Head of Technology, Floating Structures,
 WS Atkins Consultants Ltd.



DEVELOPMENT PROGRAMME

| | 2001 | | 2002 | | | | 2003 | | | |
|------------------------------------|------|---|------|---|---|---|------|---|---|---|
| | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Conclusion of R&D | | | | | | | | | | |
| Intermediate Scale Model | | | | | | | | | | |
| Full-scale design | | | | | | | | | | |
| Full-scale technology demonstrator | | | | | | | | | | |
| Test & development | | | | | | | | | | |

Once the technology has been demonstrated at fullscale, development will focus on driving down the cost-of-energy of the system to make the Pelamis fully competitive with wind energy and other renewable technologies by 2010. Key areas for development will include:

- Optimisation of device configuration
- Improving structural efficiency
- Use of concrete as main structural material
- Development of structures & systems for 'volume production'
- Optimisation of energy capture & power conversion efficiency

Ocean Power Delivery was formed in January 1998 to develop, demonstrate and commercialise the Pelamis concept. The company was awarded a power purchase agreement under the third Scottish Renewables Order (SRO3) and is now seeking major business partners in the offshore oil and gas industry.

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