



Various alternatives for capturing energy are being developed and tested. As yet, there is no clear victor

Types of wave energy converters

Oscillating water column (OWC)

The waves drive a column of water which pushes the air in a sealed chamber through a two-way air turbine



OE Buoy, Ocean Energy (IRL), 1.5 MW (prototype)

Oscillating Wave Surge Converter (OWSC)

The wave strikes a hinged or flexible structure which transfers the energy



Oyster 800, (UK), 800 kW

Point absorbers

The energy is generated by the movement of a floating body relative to another fixed (anchored or submerged) body



Powerbuoy, Ocean Power Technologies (US) (Prototype. A 2.4 MW version is under development)

Overtopping

Operates like a storage vessel, with wave water spilling over the top and being emptied through the bottom via turbines



Wave Dragon, Wave Dragon (DK) 7 MW (under construction)

Linear absorbers or attenuator devices

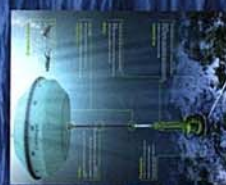
Energy generated by the movement of long, hinged floating devices situated at right-angles to the waves



Pelamis P2, PWP (UK), 450 kW (prototype)

Pressure differential

The submerged devices anchored to the seabed move as a result of the pressure gradient force generated by the wave and tidal movements.



CETO 3 (C3), 80kW



Wave energy plants consist of a number of fundamental components...



STRUCTURE



ENERGY CONVERSION SYSTEM



AUXILIARY CONVERTER EQUIPMENT



MONITORING AND CONTROL EQUIPMENT

- Sensors
- Communications
- Actuators



CONVERTER

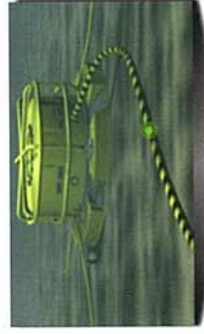
MOORING AND POSITIONING SYSTEMS

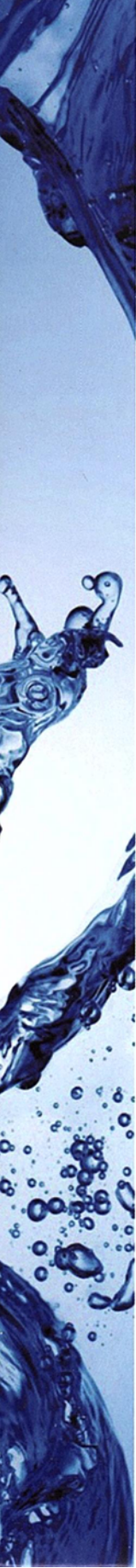
- Fixed structures
- Mooring lines
- Means for maintenance and installation



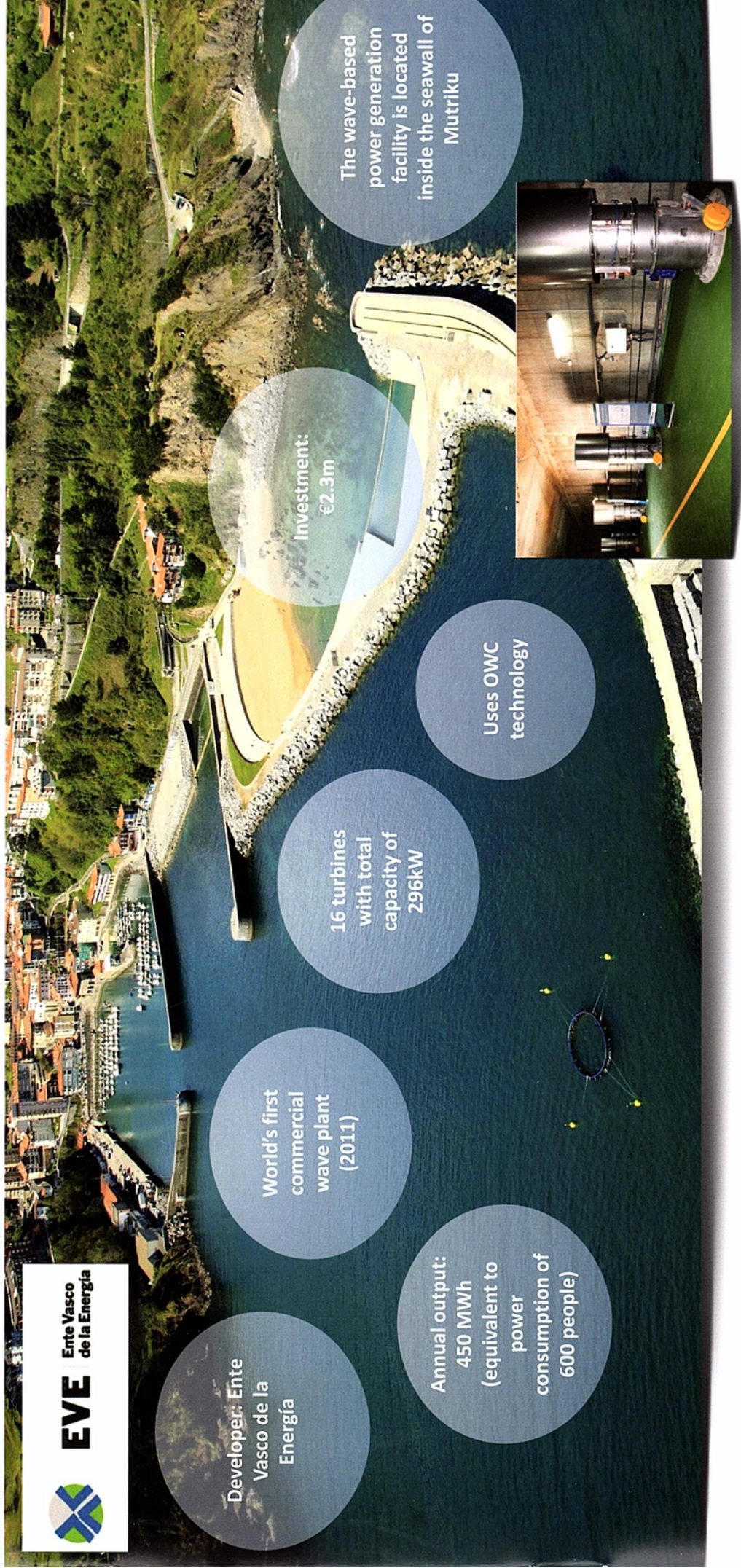
GRID CONNECTION


- Submarine cable
- Submarine connectors
- Onshore substation





...and in the construction of pilot plants with wave technology such as the Mutriku plant



 **EVE** Ente Vasco de la Energía

Developer: Ente Vasco de la Energía

World's first commercial wave plant (2011)


Investment: €2.3m

16 turbines with total capacity of 296kW

Annual output: 450 MWh (equivalent to power consumption of 600 people)

Uses OWC technology

The wave-based power generation facility is located inside the seawall of Mutriku



Mutriku: pioneering wave-based power generation facility; first grid-connected wave energy plant in Europe (mainland)



wave energy

BASQUE COUNTRY

