CHALLENGES IN COMMERCIALIZING THE OCEAN WAVE ENERGY TECHNOLOGY

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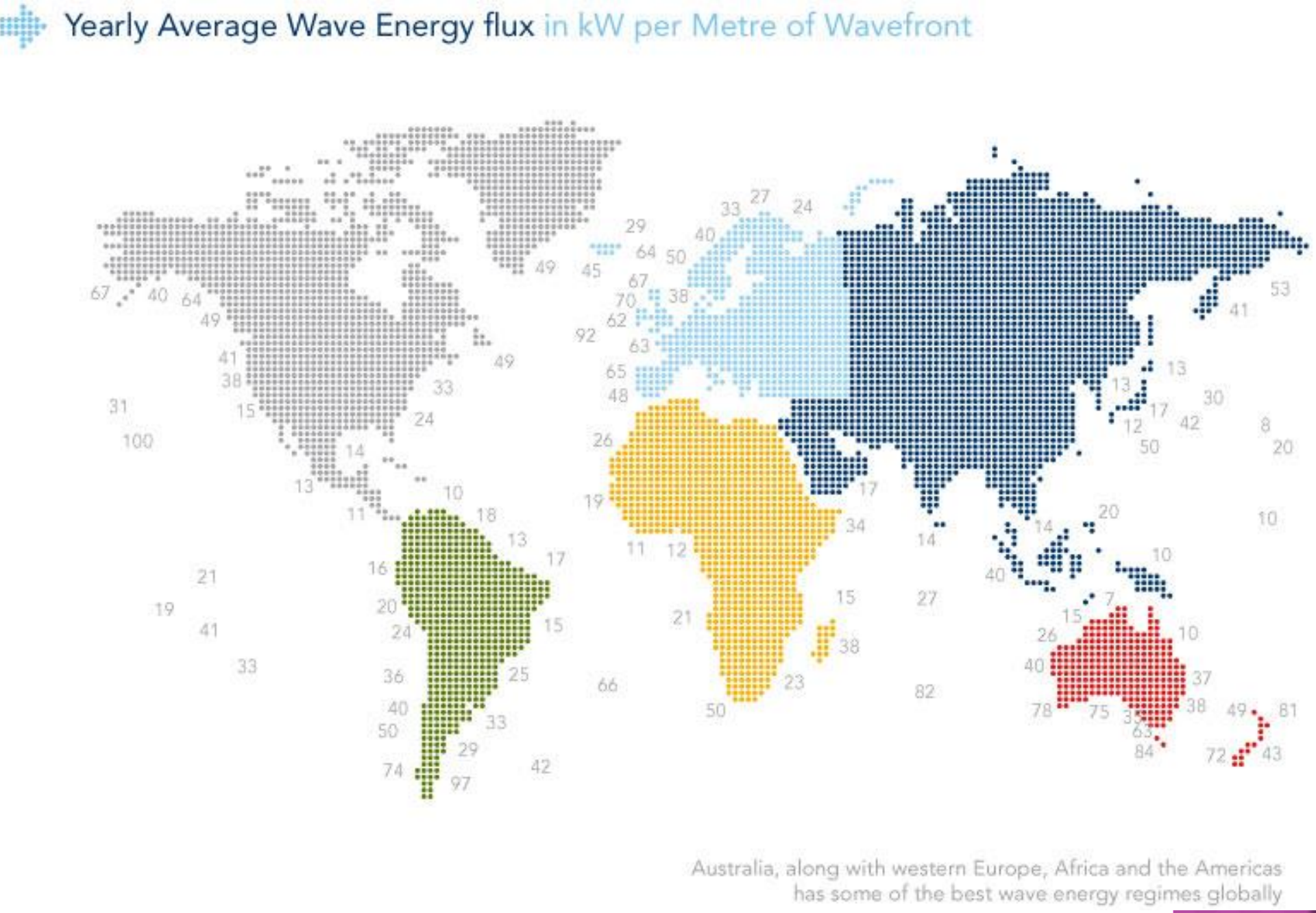
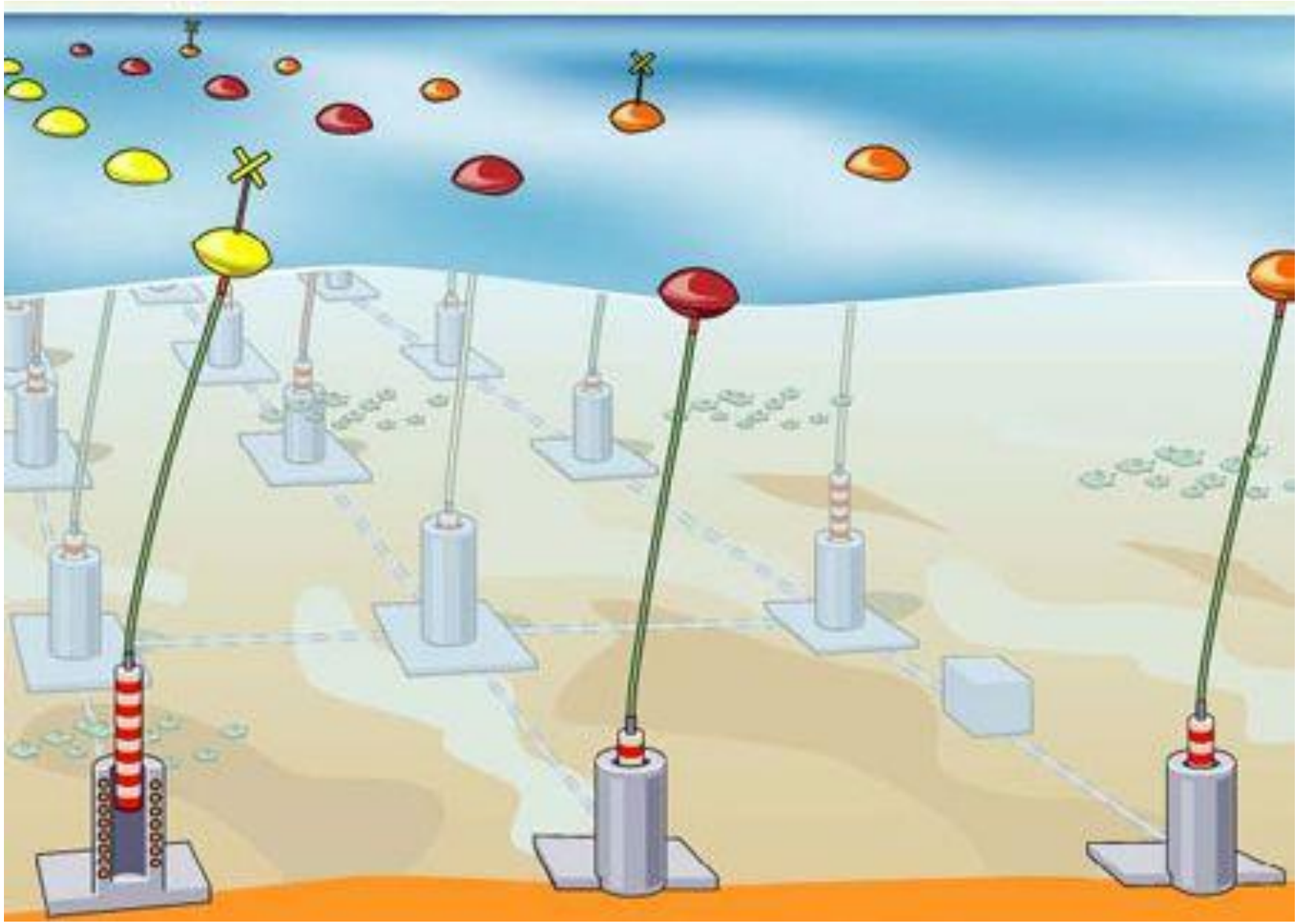
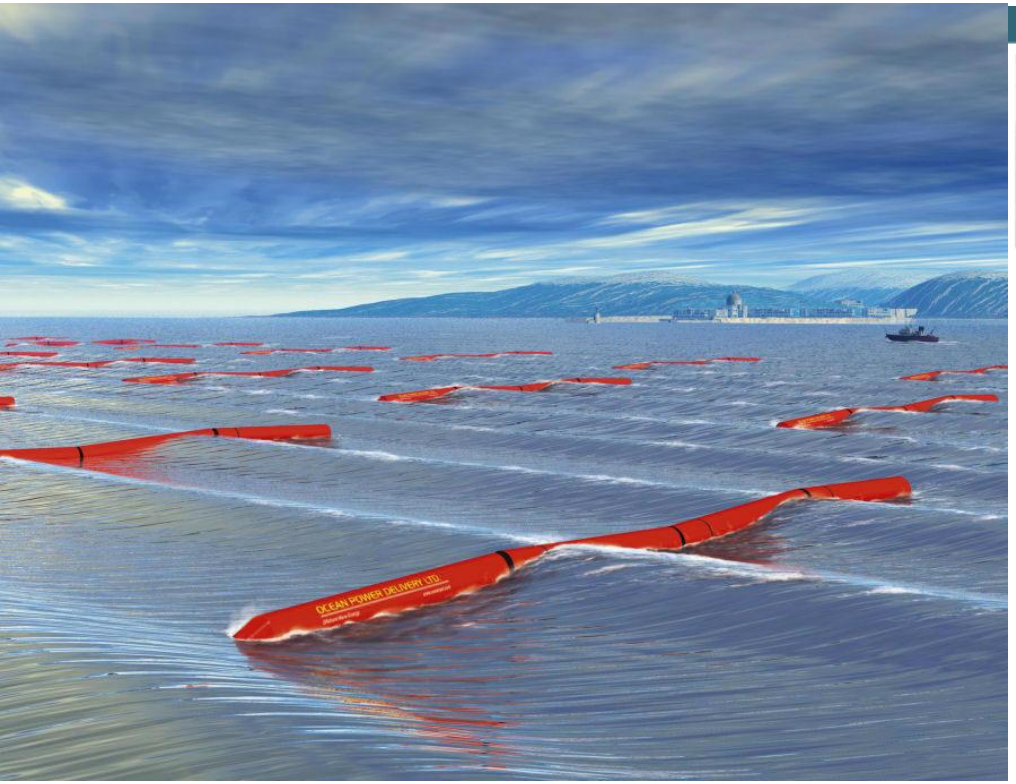
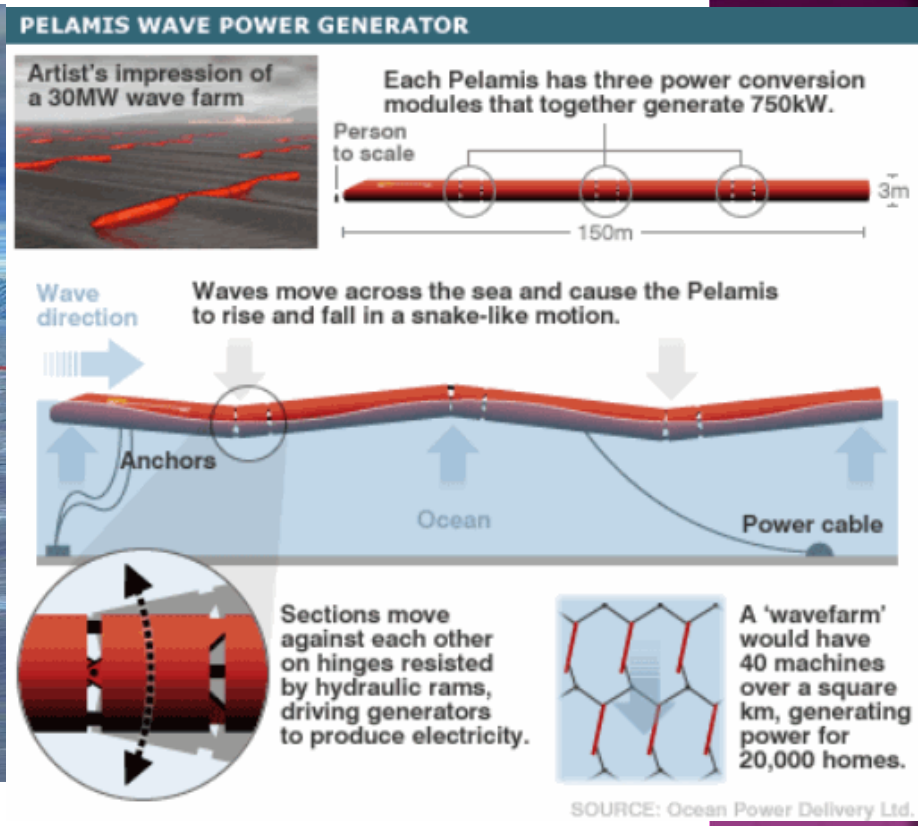


Wave power variation around the world (Source: Google web)

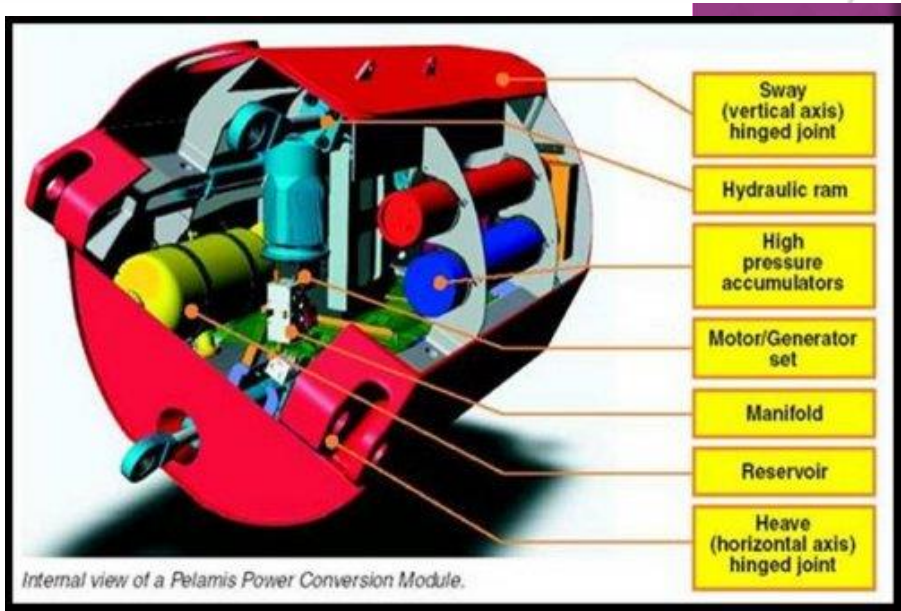


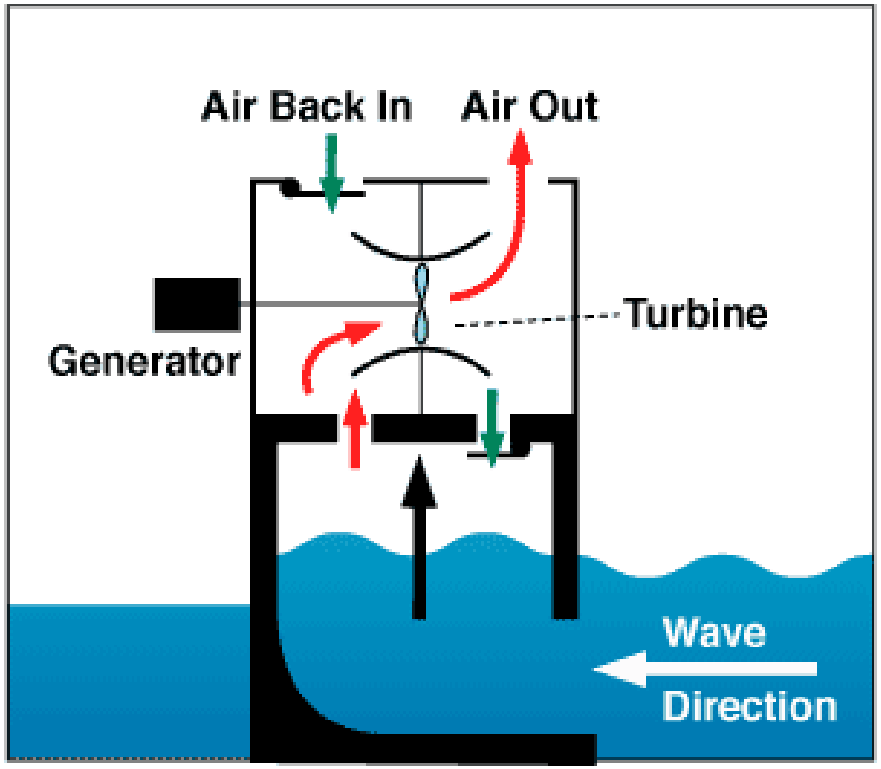
Floating buoy type wave energy converter
(Source: Google web)

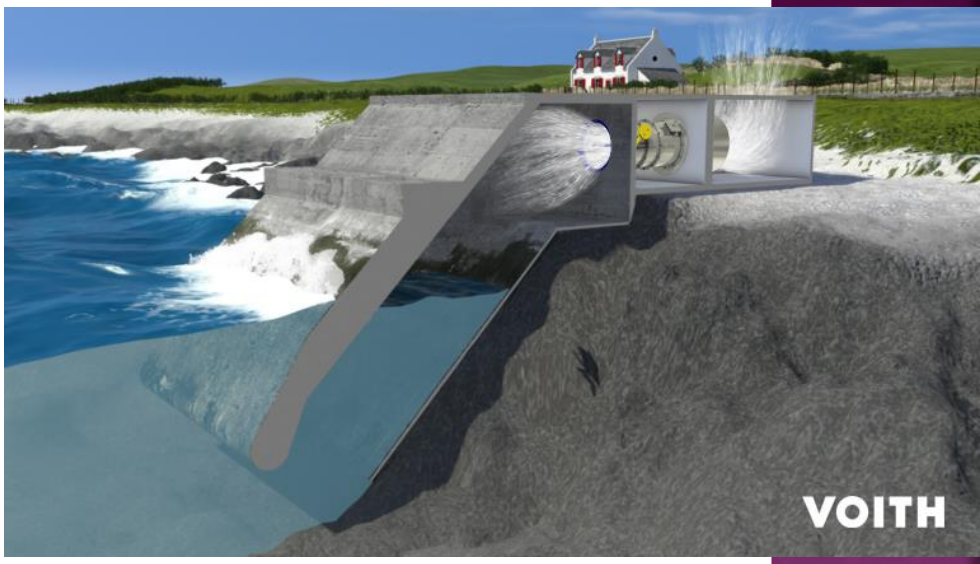


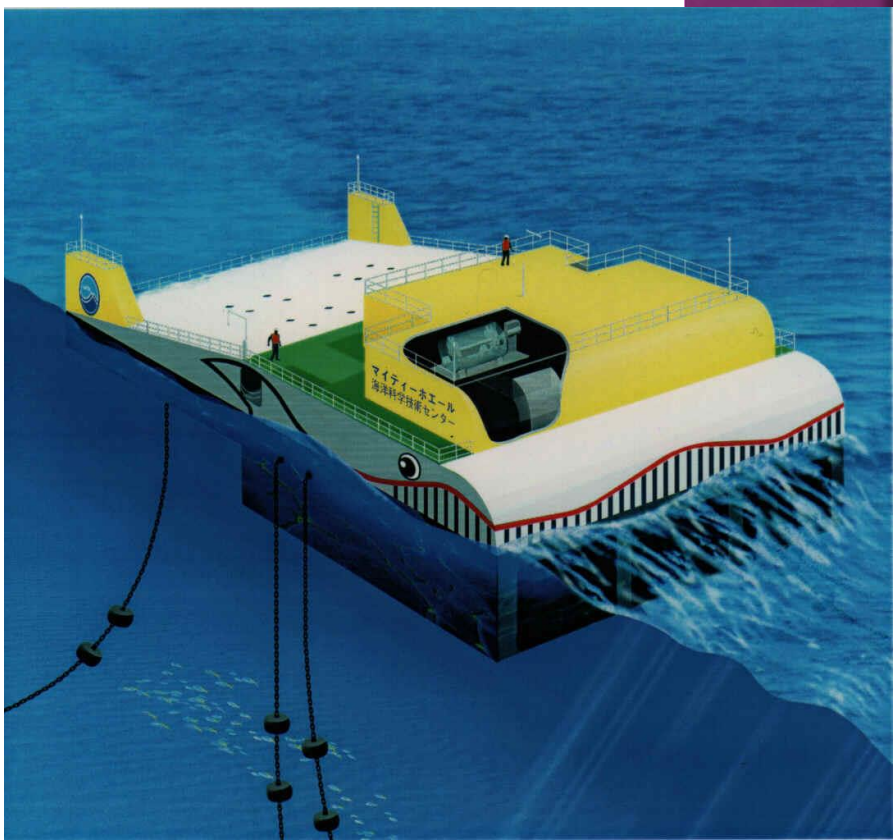


Pelamis wave energy converter (Source: Google web)

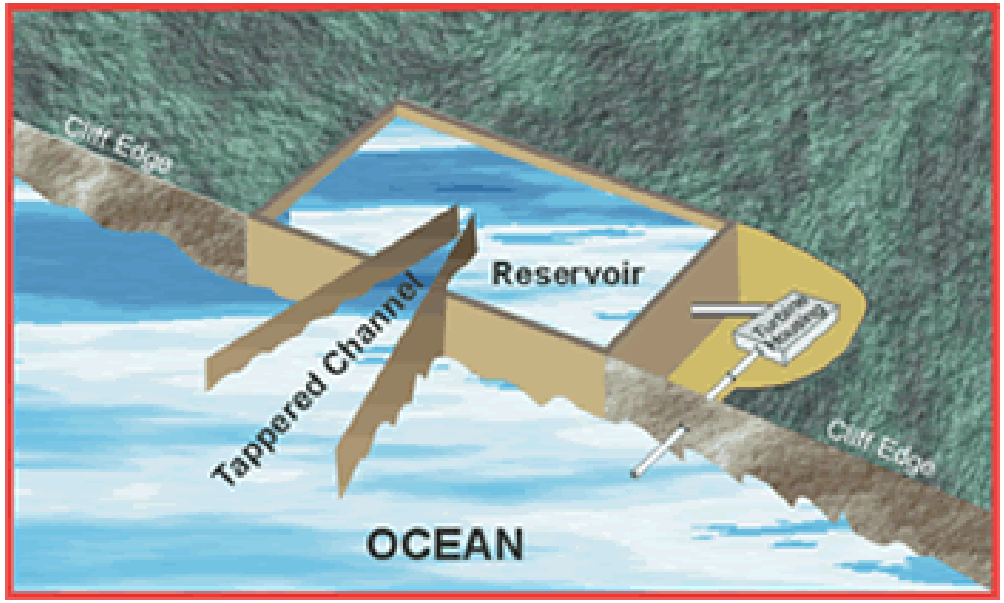




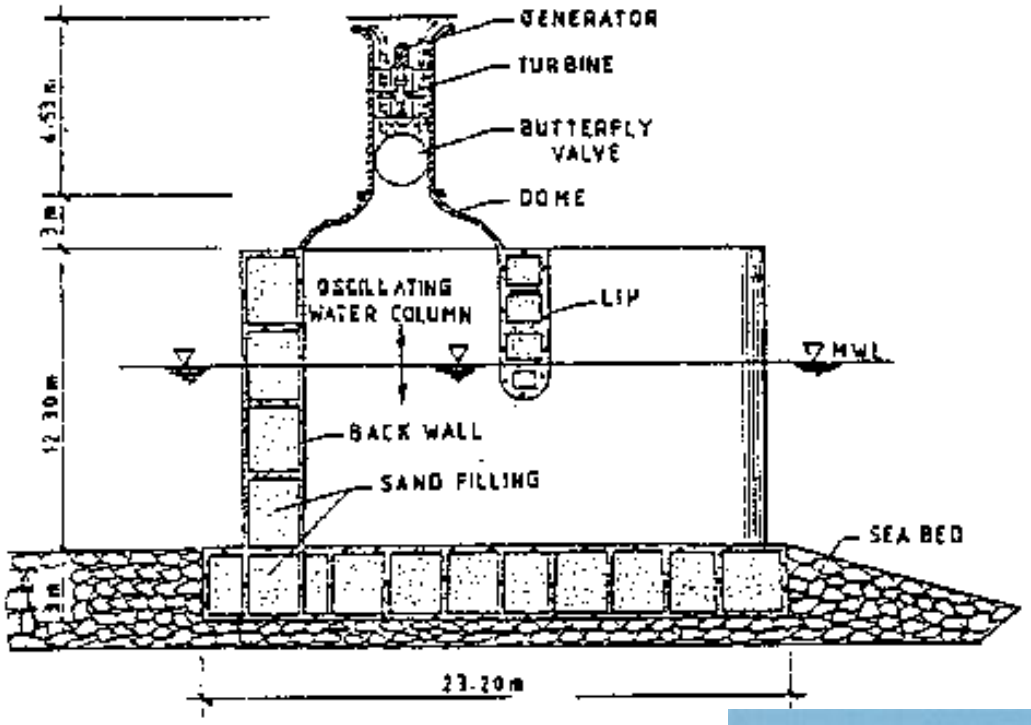




Oscillating Water Column (OWC) type wave energy converter (Source: Google web)

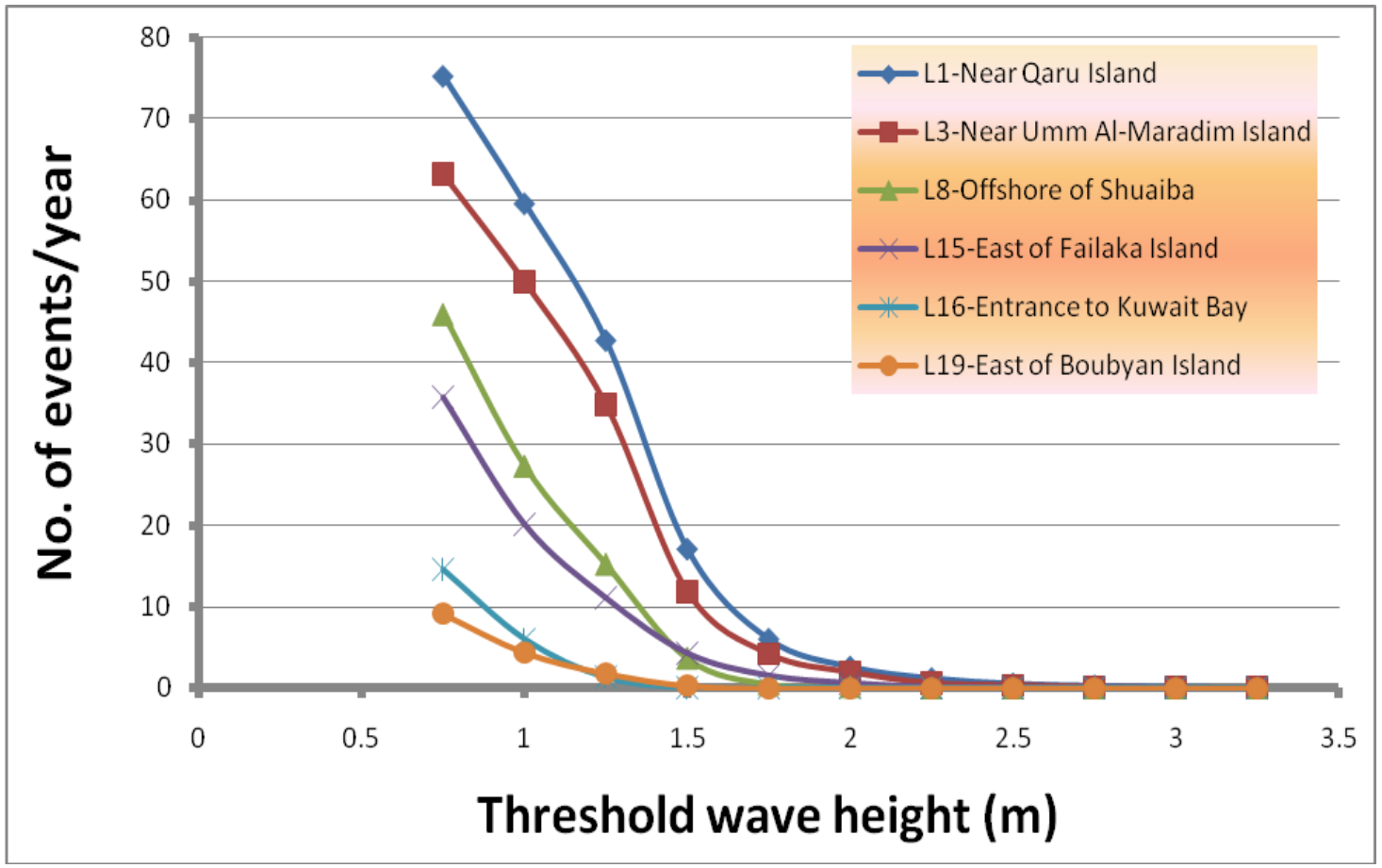


Tapered channel wave energy converter (Source: Google web)

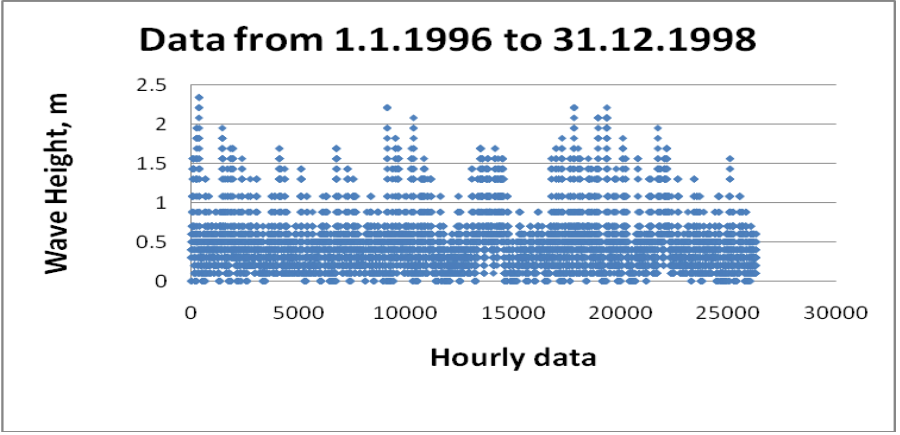


The Indian wave power pilot plant of 150 kW capacity in Arabian Sea

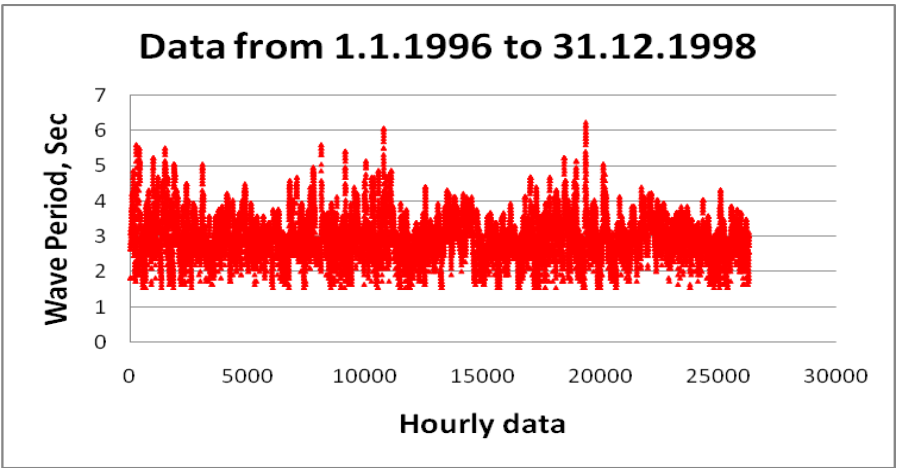
FEASIBILITY OF WAVE POWER FOR KUWAIT



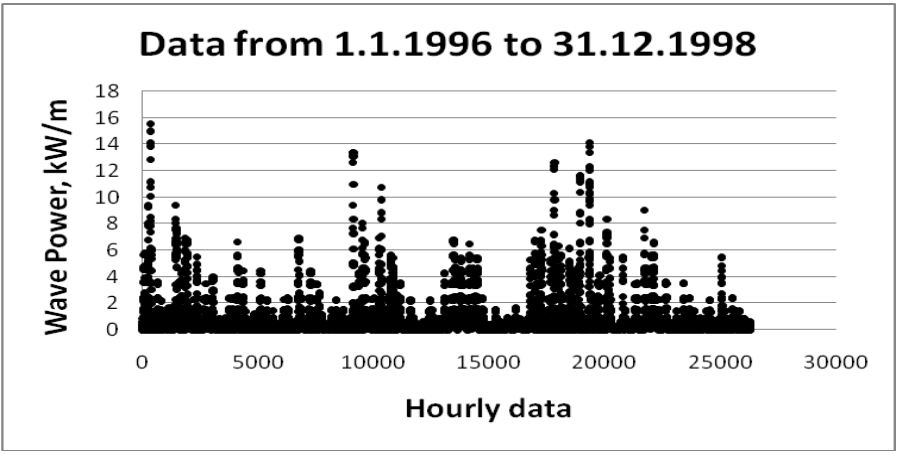
The threshold wave height and No. of occurrence of waves more than threshold values at few locations in Kuwait



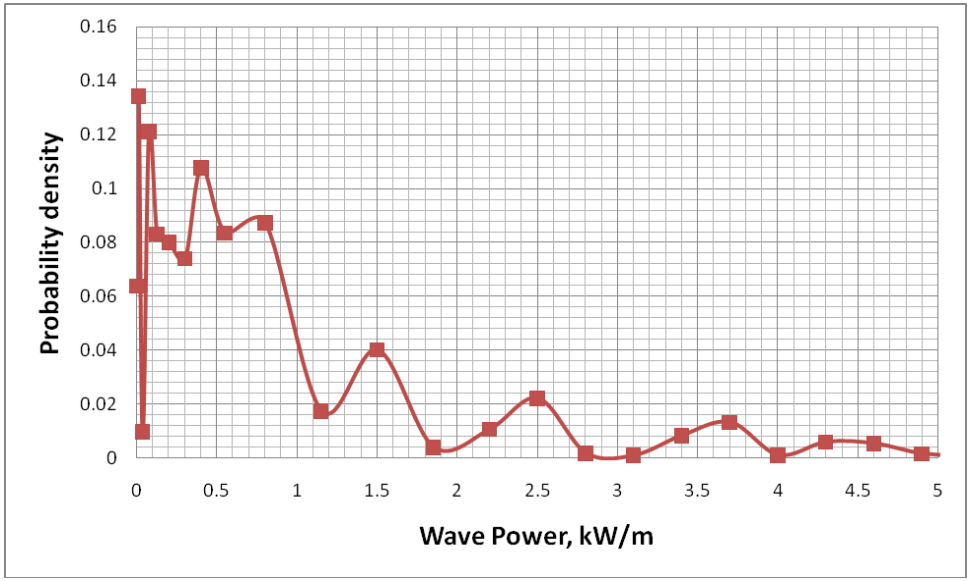
The hourly variation of wave height around Qaru island for 3 years (1.1.1996 to 31.12.1998)



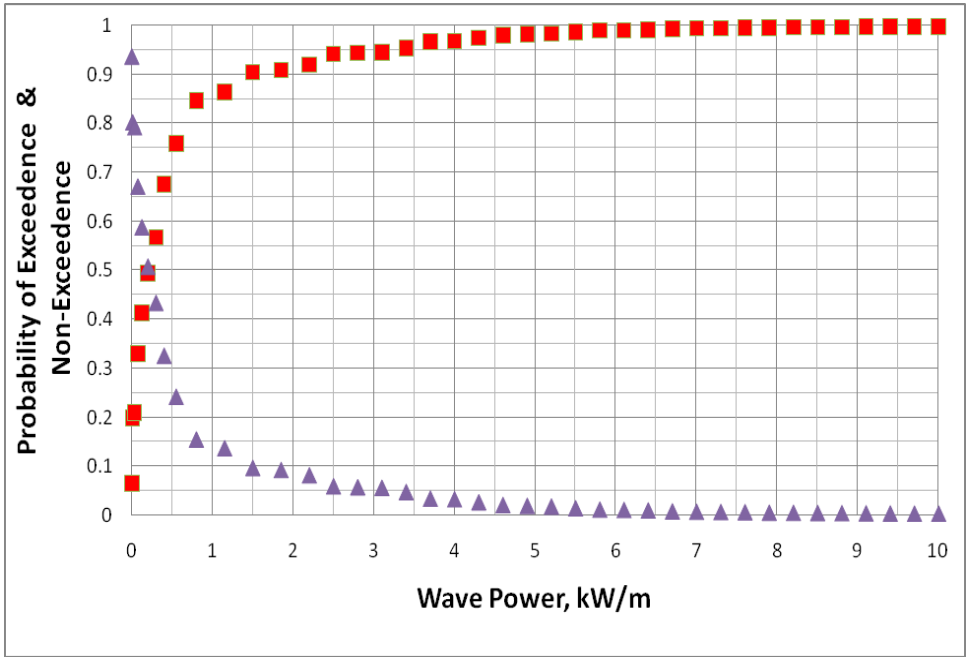
The hourly variation of zero crssing period, T_z around Qaru island for 3 years (1.1.1996 to 31.12.1998)



The hourly variation of Incident wave power around Qaru island for 3 years (1.1.1996 to 31.12.1998)



The probability density of wave power around Qaru island



Probability of exceedence and Non-exceedence of wave power around Qaru island

CHALLENGES

- **Random Input Power**
- **High Wave Forces**
- **Stability**
- **Sensitivity of the Pneumatic Efficiency for Change in Structure Dimension**
- **Site Selection**
- **Construction Technique and the Associated Problems**
- **Quality of Converted Power and Overall Power Conversion Efficiency**
- **Effective Utilization of Input Power**
- **Other Major Problems like** human resource problem, erosion around the caisson, corrosion of metal parts etc

WAVE POWER ECONOMICS

- Design life of the wave power conversion systems
- Wave power potential
- Wave power conversion efficiency of the device and hence the expected annual power generation
- Design environmental condition
- The local demand for power
- Prevailing cost of power generation through the conventional power plants
- Total initial cost of construction
- Annual operation and maintenance cost
- Nominal interest rate and inflation rate
- Other benefits from wave power plant.

CONCLUSIONS

- Technology development for commercial wave power plant is still a challenge.
- Many different types of pilot plants were tried around the world and lessons learned.
- Though wave power conversion is technically feasible, the economics of wave power generation is still unacceptable.
- R&D work systematically solves some of the technical challenges.
- It is always better to think of multiple purpose device rather than stand alone for power generation.
- The wave climate around Qaru island in Kuwait is suitable for installing a multi-purpose floating wave power plant.
- 100 m floating wave energy device can generate about 60,000 kWh of power every year and the device can also protect the Qaru island against erosion.
- It is worth trying such a system in Kuwait.