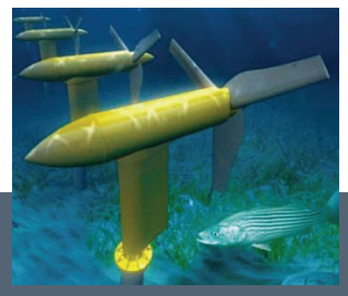

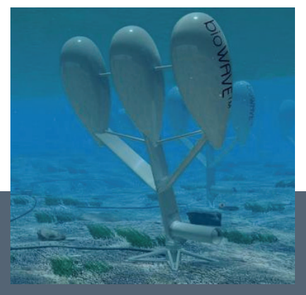

Marine Energy

Designing a Regulatory Framework for an Abundant Renewable Energy Resource

Resource

The waves, tides, currents, heat and salinity of the ocean are stores of potential energy.

Theoretical global resource potential:
142,000 Terawatt hours.

Current global primary energy production:
20,000Terawatt hours.

While the economic resource may be much smaller, marine energy can play an important part of a balanced low carbon energy future.

Developing Technologies

Ocean current turbines harness the flow of the ocean.

Wave energy converters generate electricity using the motion of the waves.

Tidal ranges combine traditional hydro-electricity concepts with tidal cycles.

Ocean Thermal Energy Conversion utilizes the difference in water temperature at varying depths.

Salinity gradient technology uses the salinity in seawater to generate energy.

Barriers to Development

Technical barriers
- R&D
- Manufacturing

Non-technical barriers
- financing
- logistics
- **regulatory/legal**

Unsuitable regulatory frameworks can add delay, uncertainty, cost and risk.

The development of an appropriate regulatory framework for these emerging technologies is essential.

Regulatory & Legal Barriers

How should marine energy be regulated?

Permitting

How should marine energy projects be permitted?

Must developers apply for permits, or should government periodically tender for development?

Should new regimes be created, or can marine energy be incorporated into existing regimes?

How is a lease over the seabed obtained? From which authority/authorities?

What lessons can be learned from the regulation of offshore wind, oil and gas?

Grid Connection

In many jurisdictions, transmission upgrades are needed to deliver the energy produced.

Who should pay for transmission line upgrades?

Should third party companies be allowed to operate transmission infrastructure?

Should developers pay the 'shallow' costs of augmentation only, or also the 'deep' costs?

What policies can be implemented to ensure that transmission infrastructure is built in a timely and efficient manner in resource dense areas?

Environmental Impact

The environmental impacts of marine energy and are not yet well understood and differ between technologies.

How should the precautionary principle and environmental impacts be balanced with the need to innovate and mitigate climate change?

Should governments be responsible for conducting strategic assessments, or should developers be required to produce detailed impact assessments for each project?

Incentives

How should marine energy development be encouraged? Feed-in tariffs, deployment/generation targets, innovation funds?

What is the relationship between incentives and innovation? What level of incentives is necessary to drive innovation?

What impact have existing measures to encourage the development of marine energy had?

How will incentives adapt as marine energy transitions to large-scale commercial projects?

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