

EVALUATION AND GUIDANCE FRAMEWORK FOR OCEAN ENERGY TECHNOLOGY

AN INTRODUCTION FOR FUNDERS

ENGLISH VERSION

WHY DO WE NEED AN EVALUATION AND GUIDANCE FRAMEWORK?

There are many standards and specifications¹ that guide technology developers through the detailed scientific and engineering processes required in the ocean energy sector, but there was no guidance available for public funders wishing to support this technology development activity. A project driven by the International Energy Agency's Ocean Energy Systems Technology Collaboration Programme (IEA-OES), has enabled funders to share their successful approaches to supporting wave and tidal technology development. This has evolved into a Framework document² with growing adoption across the world and

strong links to existing technical guidance³, such as that of the International Electrotechnical Commission (IEC).

The IEA-OES Evaluation and Guidance Framework helps funders to:

- Design effective programmes using a stage gate process
- Maximise the efficiency of public funding by enabling effective technology selection decisions
- Accelerate ocean energy development by focusing funding on the best technologies.

¹ e.g. International Electrotechnical Commission Marine Renewable Energy - www.iec.ch/tc114 and www.iecre.org/about/what-it-is.htm, DNV Certification - <https://www.dnv.com/Publications/wave-and-tidal-certification-23983>, IEEE - <https://www.ieee.org/>







² IEA-OES Evaluation and Guidance Framework is available [here](#).

³ A joint publication discussing the Framework's interaction with IEC and IECRE is available [here](#).

WHAT IS THE FRAMEWORK?

The IEA-OES Evaluation and Guidance Framework includes:

6 stages of technology development (aligned with IEC guidance), with defined Stage Activities to guide robust engineering projects.

Stage	Description	TRL
 Stage 0	Concept creation	1
 Stage 1	Concept development	2 3
 Stage 2	Design optimisation	4
 Stage 3	Scaled demonstration	5 6
 Stage 4	Commercial-scale single device demonstration	7 8
 Stage 5	Commercial-scale array demonstration	9

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Early (1-3)
Analytical and numerical models

Mid (3-6)
Experimental tests in controlled environment

Late (6-9)
Experimental tests in representative environment

A set of Evaluation Areas to specify the key characteristics that should be demonstrated by ocean energy technologies, with corresponding performance metrics to define how those key characteristics should be measured.



WHAT BENEFITS DOES THE FRAMEWORK BRING TO FUNDERS?

Overall, the IEA-OES Evaluation and Guidance Framework helps public funders, technology developers and private investors around the world to:

- Speak a common language
- Build consensus on the key requirements and characteristics of wave and tidal technologies
- Collaborate in an effective technology development process

The components of the IEA-OES Evaluation and Guidance Framework bring the following benefits:

A Stage Gate development process facilitates:

- Regular assessment of technical progress
- Disqualification of flawed technology early
- More rapid focus of funding on stronger technology
- Lower financial risk
- Lower reputational risk
- Increased project team motivation and collaboration

Evaluation Areas and Evaluation Criteria (performance metrics) **support:**

- Well defined requirements
- Objective comparison and selection of technologies which are at the same development stage
- Ability to run competitive programmes
- Technical risk identification and management
- Availability of relevant benchmark data and evidence to demonstrate outcomes/impact of projects and public funding

Stage activities ensure:

- Technology applicants are directed and funded at the appropriate stage (TRL)
- The right development activities are carried out in a project
- Metrics are quantified and validated through robust activities at key development stages, providing a feedback loop in the design process
- Alignment of funding scheme scope and budget
- Formation of consortia with a well-defined project scope

HOW CAN FUNDERS ADOPT THE FRAMEWORK?

Active adoption – use the IEA-OES Evaluation and Guidance Framework to design or improve national or international funding programmes by implementing Stage Activities and Evaluation Criteria.

Passive adoption – promote the value of the Framework alongside funding programmes, to benefit from improved project proposals from developers who use the guidance themselves.

TRANSLATIONS AND DISCUSSIONS

The IEA-OES Performance Metrics team are available for discussion with interested parties – please contact your national OES representative or jonathan.hodges@waveenergyscotland.co.uk.

Translation of OES documents is available on request.