



IEA-OES Evaluation and Guidance Framework

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Technology Collaboration Programme

by **iea**

Contents



- Technology development funding
- Stage Gates

- International collaboration
- Funder guidance & consensus

- Standards
- Technical guidance & consensus
- 3rd Party Verification
- Risk management

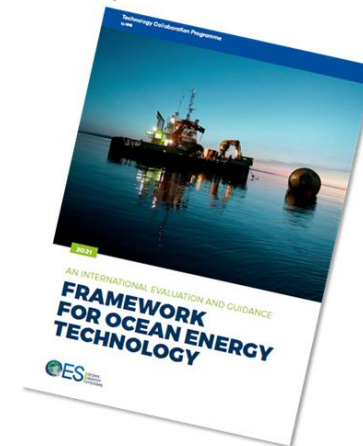
WES and IEA-OES



- Objectives:
 - Developing cost competitive wave technology
- Method
 - Scottish Government funded research, development & innovation programmes
 - Stage Gate process

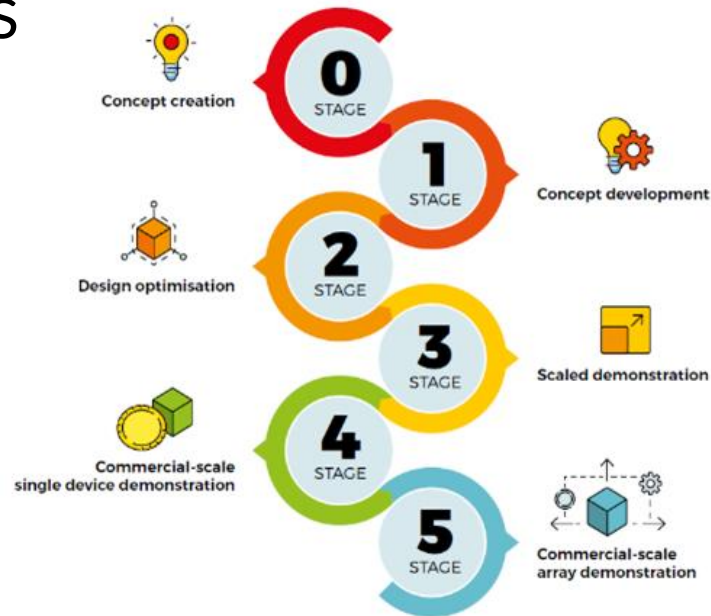


- Ocean Energy Systems Technology Collaboration Programme (OES)
 - Intergovernmental collaboration between 25 countries
 - Advance research, development and demonstration of conversion technologies
 - IEA-OES Evaluation and Guidance Framework
 - Target audience – public funders



IEA-OES Framework – Content

- Stages



- Evaluation Areas

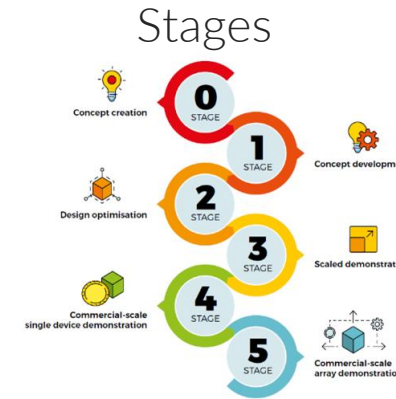


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- Stage Activities
- Evaluation Criteria

Benefits to funders



- Design a funding programme
- Provide clear expectations to applicants
 - Technology background
 - Expectation of data and outcomes
 - Key areas of technology attractiveness
- Evaluate and compare technology using a consistent dataset
- Monitor progress, risks and impacts



Evaluation Areas



Stage Activities

Stage	Stage Activities
 Stage 0 Concept creation	<ul style="list-style-type: none"> • Definition of technology requirements and challenges associated with Power Conversion (the problem statement) • Concept definition and identification of physical/ functional characteristics and fundamental operating principles of PTO, including: <ul style="list-style-type: none"> - suitability of the PTO to the fundamental operating principle and force of damping requirements of existing devices - suitability for implementation of control systems to maximise performance - potential benefits of control systems - degree of reliance on control systems to achieve functionality • Energy transformation behaviour and efficiency expectations defined based on (or derived from) existing, more mature technologies
	<ul style="list-style-type: none"> • Development of a numerical model to estimate commercial-scale Power Conversion efficiency and validation against test data • Physical, laboratory or bench testing of main components or subsystems at an

Evaluation Criteria

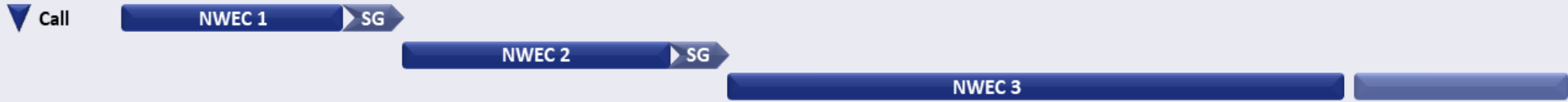
Evaluation Criteria	Units	Format
Range of acceptable environmental conditions Wave height - H_{m0} and H_{max} Wave period - T_p Wind speed - U_{10} Tidal current Tidal range or tidal water depth	m s m/s m/s or kt m	Numerical values, upper and lower limits or combinations of conditions
Mean Time to Repair (MTTR, or to maintain) Measure of the time from the start of maintenance - when all resources are available and environmental conditions are within limits - until the system is returned to operation. Mobilisation and transit to site are excluded to remain site independent.	Hours	Numerical values (with minimum and maximum to quantify variance and its impact on availability)
Cost to Repair (or maintain)		

Underpinned by Standards



Wave Energy Scotland example

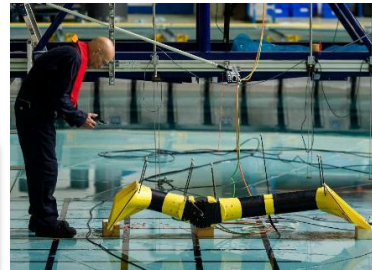
Novel Wave Energy Converters



8 projects



4 projects



2 projects



- 3rd Party Verification of tank test results

- Confidence
- Decision making
- Programme impact
- Investability

Summary



Thank you

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