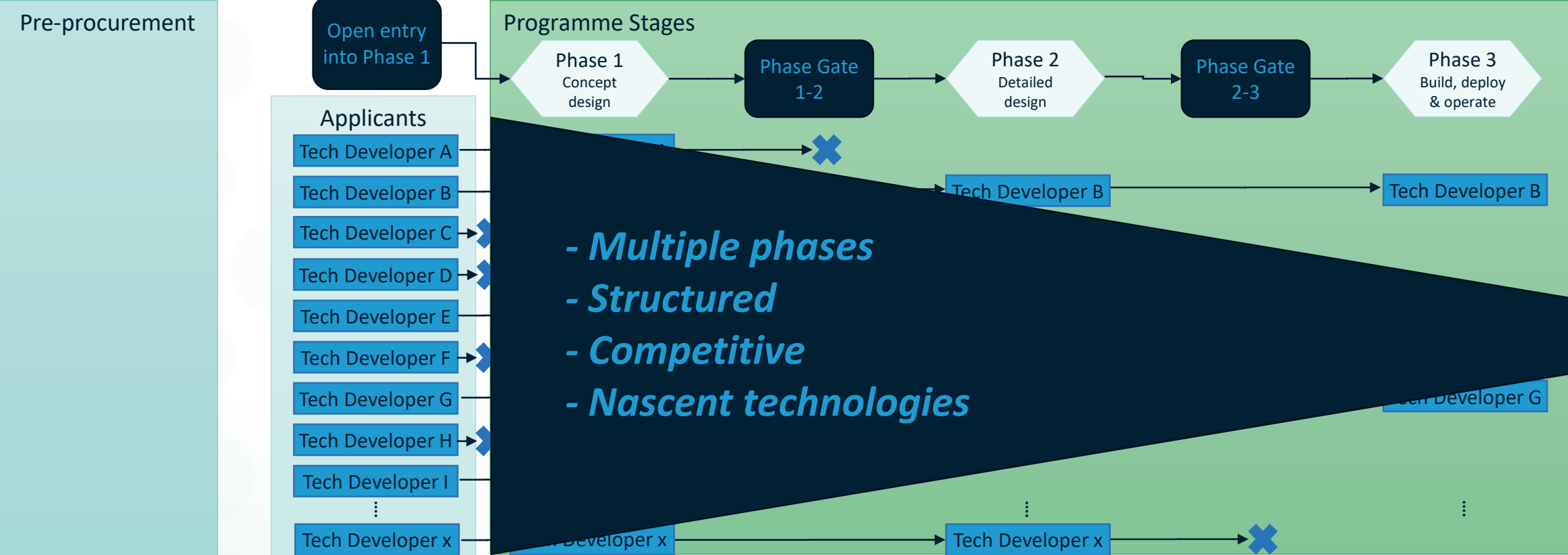


# EuropeWave: Overview of the procurement approach OEE

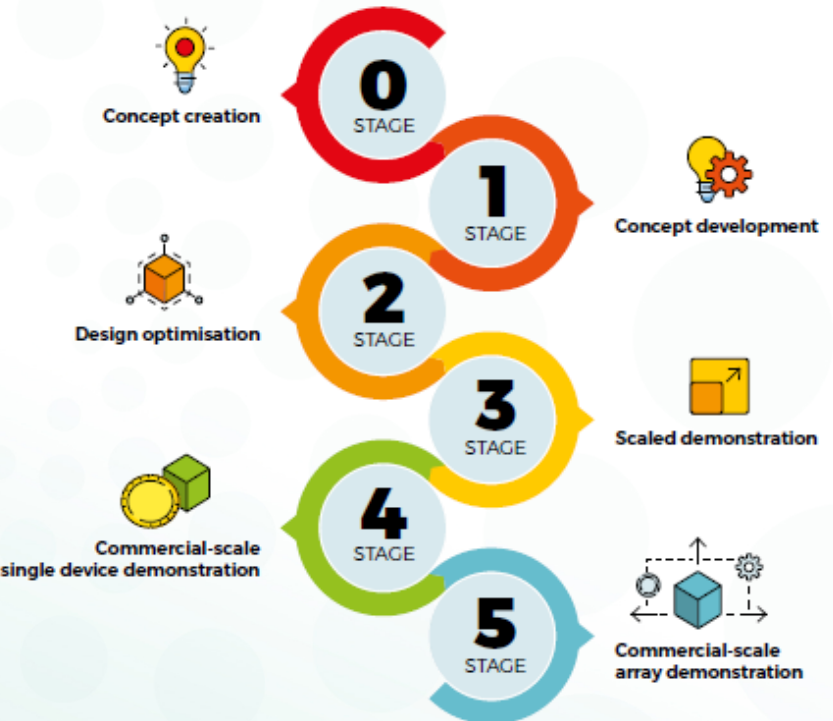
*25 October 2023*



# Pre-Commercial Procurement Approach



# IEA-OES Framework









**Table 13: Evaluation Criteria for Reliability (wave and tidal stream)**

Evaluation Criteria	Units	Format
<b>Mean Time to Failure (MTTF)</b>	Hours	Numerical value
<b>Failure Rate</b> (probability of failure per unit time)	Non-dimensional	Numerical value

**3.4.3 STAGE ACTIVITIES**

Stage	Stage Activities
<b>Stage 0</b> Concept creation	<ul style="list-style-type: none"> <li>Definition of technology and market requirements and challenges associated with Reliability (the problem statement)</li> <li>Selection of high-level reliability targets, appropriate to the technology</li> <li>Evaluation of the reliability of comparable technologies and applications. This evaluation should be based on the conceptual understanding of the technology and identification of physical and functional characteristics that impact reliability or the requirement for a specific level of reliability, including:                             <ul style="list-style-type: none"> <li>near/ far from shore</li> <li>deep/ shallow water</li> <li>floating/ surface piercing/ bottom mounted</li> <li>suitability for implementation of supervisory monitoring and control systems</li> </ul> </li> <li>proposed structural material considered, with respect to scale and loading scenarios and suitability for expected environmental conditions</li> <li>concept mode of operation, moving parts, potential exposure, perceived susceptibility to damage</li> </ul>
<b>Stage 1</b> Concept development	<ul style="list-style-type: none"> <li>Development of a numerical model or structural calculations to estimate commercial-scale loads in subsystems and devices (see section 3.1.4.1 for discussion on device scale and size)</li> <li>Identification of likely design limit states</li> <li>Identification of structural strength of proposed structural materials and high-level evaluation of safety factors of key structural components</li> <li>Use of experience from similar technology in a comparable environment and application to identify key failure modes and to estimate failure rates. High-level evaluation of the sufficiency of the identified failure modes and rate.</li> <li>Evaluation of the potential for control system actions to be implemented and consideration of:                             <ul style="list-style-type: none"> <li>potential benefits to Reliability</li> <li>level of reliance on control to maintain Reliability</li> </ul> </li> <li>Physical, laboratory or bench testing of key components at appropriate scale to evaluate life (or cycles) capability and failure rate</li> </ul>
<b>Stage 2</b> Design optimisation	<ul style="list-style-type: none"> <li>Development of numerical model to estimate structural loads on a commercial-scale device, validated to the extent possible using physical testing</li> <li>Quantitative assessment of likely loads (including fatigue) on a commercial-scale device in representative conditions (see section 3.1.4.2 for a set of recommended wave energy sea-states) from tank test, rig test and validated numerical modelling</li> <li>Development of an FMEA based on FEED (Front End Engineering Design) activity for Stage 3 open-water test device, tank-test &amp; modelling data, and Reliability experience from similar technology in a comparable environment and application</li> </ul>

# The Vision – Bringing wave energy to commercial-scale with innovative procurement

Stage	TRL	
 Stage 0	1	<b>Early (1-3)</b> Analytical and numerical models
 Stage 1	2 3	
 Stage 2	4	
 Stage 3	5 6	<b>Mid (3-6)</b> Experimental tests in controlled environment
 Stage 4	7 8	
 Stage 5	9	<b>Late (6-9)</b> Experimental tests in representative environment



Next...

