



THE UNIVERSITY *of* EDINBURGH
School of Engineering

Policy and Innovation Group

Research & Innovation for Ocean Energy

How much funding is required?

Dr Donald R Noble, The University of Edinburgh



Co-funded by the European Union
& UK Research and Innovation



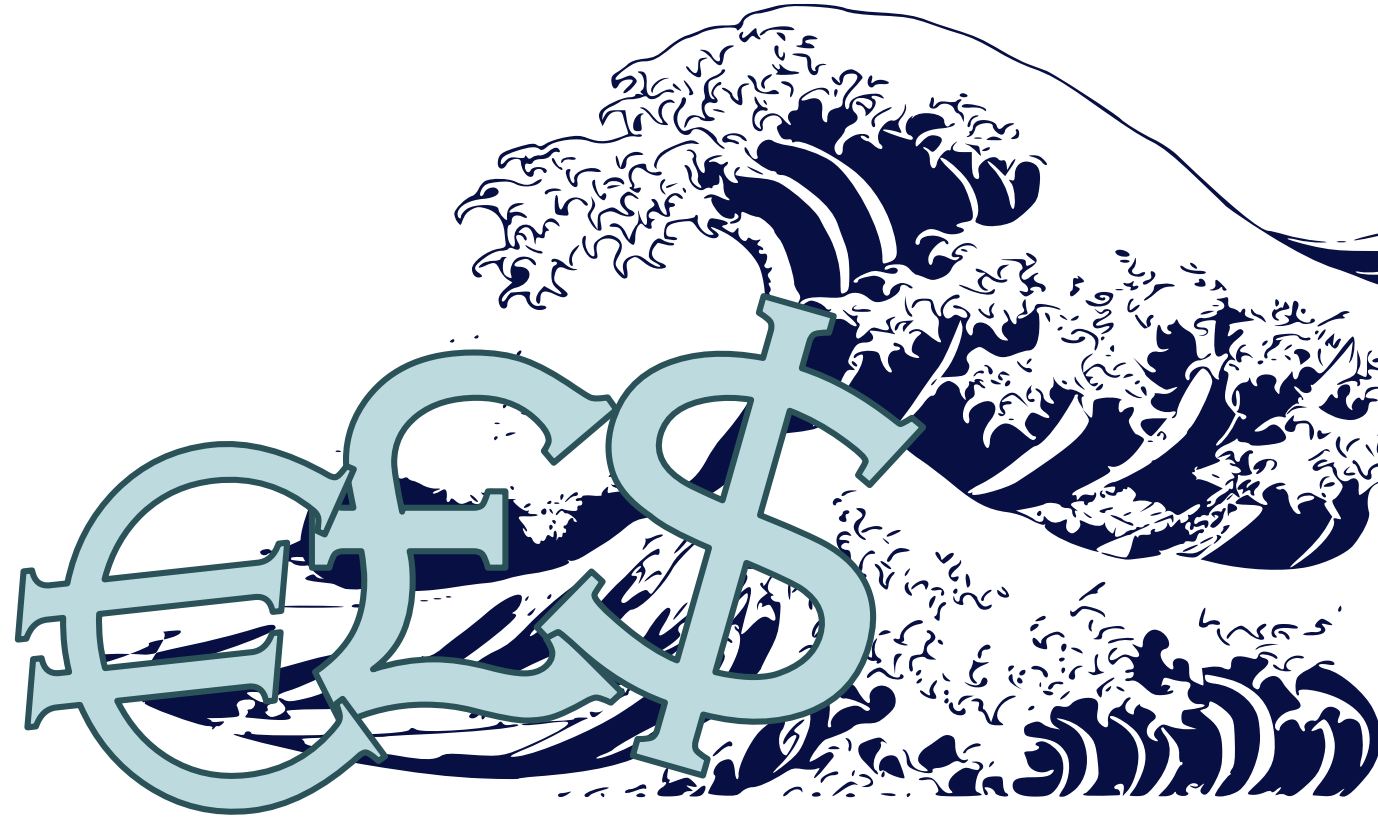
THE UNIVERSITY
of EDINBURGH

Research & Innovation for Ocean Energy

How much funding is required?

OUTLINE

- Strategic Research & Innovation Agenda for Ocean Energy
 - Challenge areas
 - Expected budgets
- Updating the SRIA
 - Review of R&I projects funded
 - Discussions with sector
 - Next steps



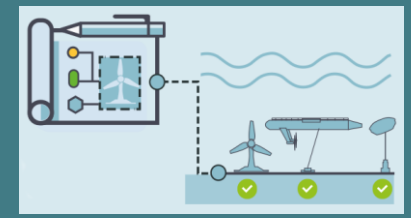
Strategic Research & Innovation Agenda for Ocean Energy

- Outlines priority **research, development and innovation challenges**
 - Expected to deliver the greatest cost reductions
- Defines specific objectives and actions towards **Ocean Energy commercialisation**
- Gives **guidance to all funders** of innovation: industry, EU, national and regional

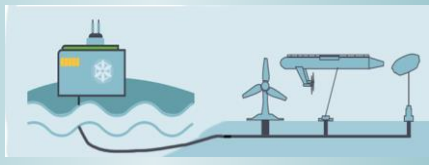


SRIA Challenge Areas

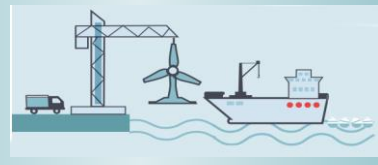
Design and Validation of Ocean Energy Devices



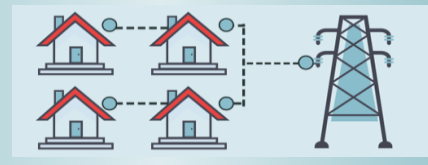
Foundations,
Connections
and Mooring



Logistics
& Marine
Operations



Integration
in the Energy
System



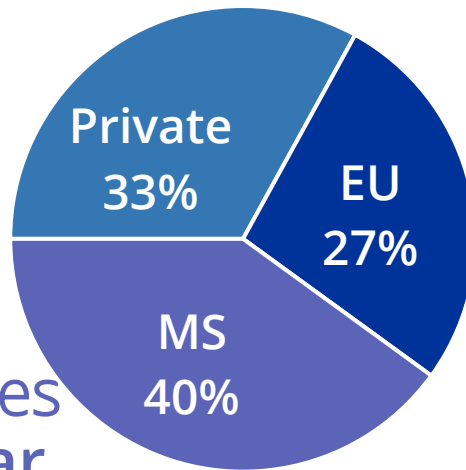
Data Collection
& Analysis and
Modelling Tools



Cross-cutting Challenges: Environmental and socio-economics

Expected budgets in SRIA

- Number & size of actions/projects suggested for each priority topic
 - Small/medium/large/array scale
 - **151 projects** in total
- Total budget of ~**1 €bn** proposed
- Between 5-10 countries around **20-40 €/year**
 - On ocean energy R&I



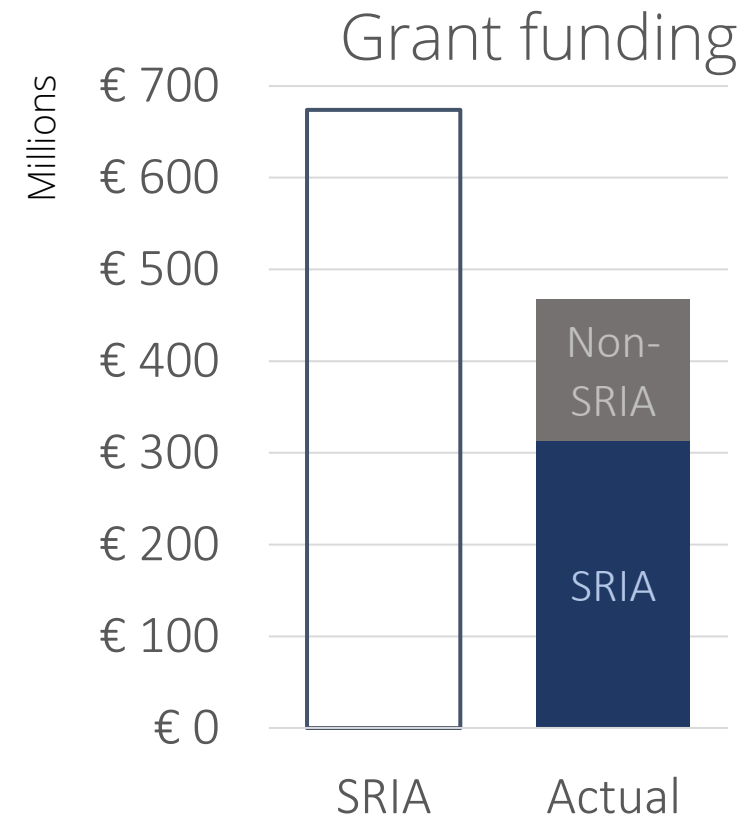
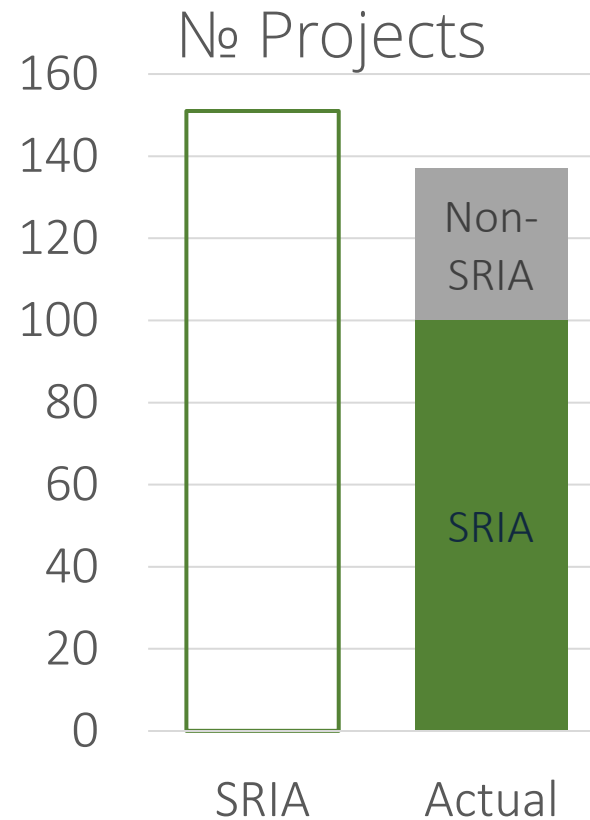
Challenge Areas	Priority Topics	No./size actions	Budget €m
1. Design and Validation of Ocean Energy Devices	=====	=====	700
2. Foundations, Connections and Mooring	=====	=====	85
3. Logistics and Marine Operations	=====	=====	80
4. Integration in the Energy System	=====	=====	86
5. Data Collection & Analysis and Modelling Tools	=====	=====	35
6. Cross-cutting Challenges	=====	=====	20
151 projects			1006 €m

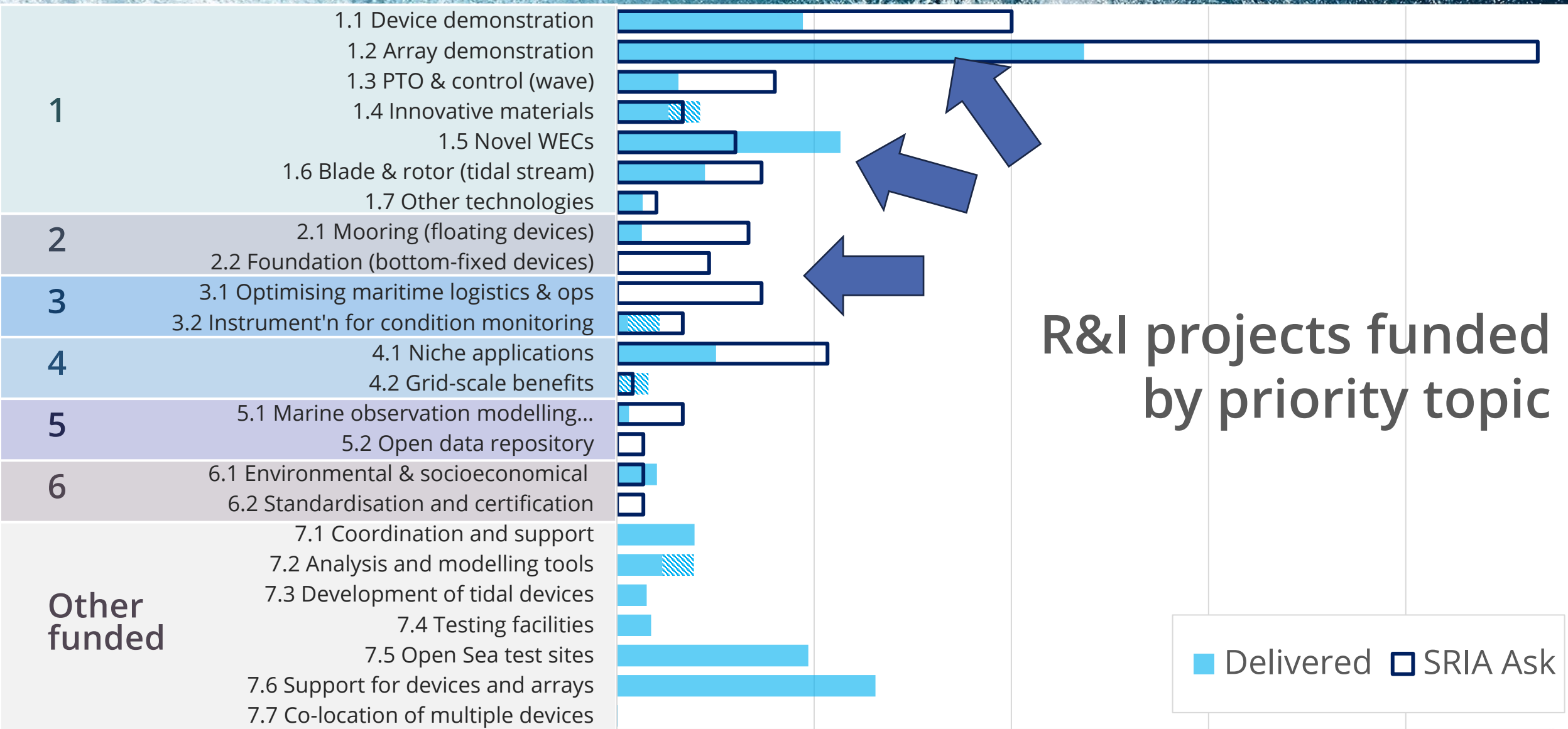
Updating the SRIA

- 1) Review of R&I funding in Europe
- 2) Consult with ocean energy stakeholders
- 3) Update R&I challenges
→ publish updated SRIA next year



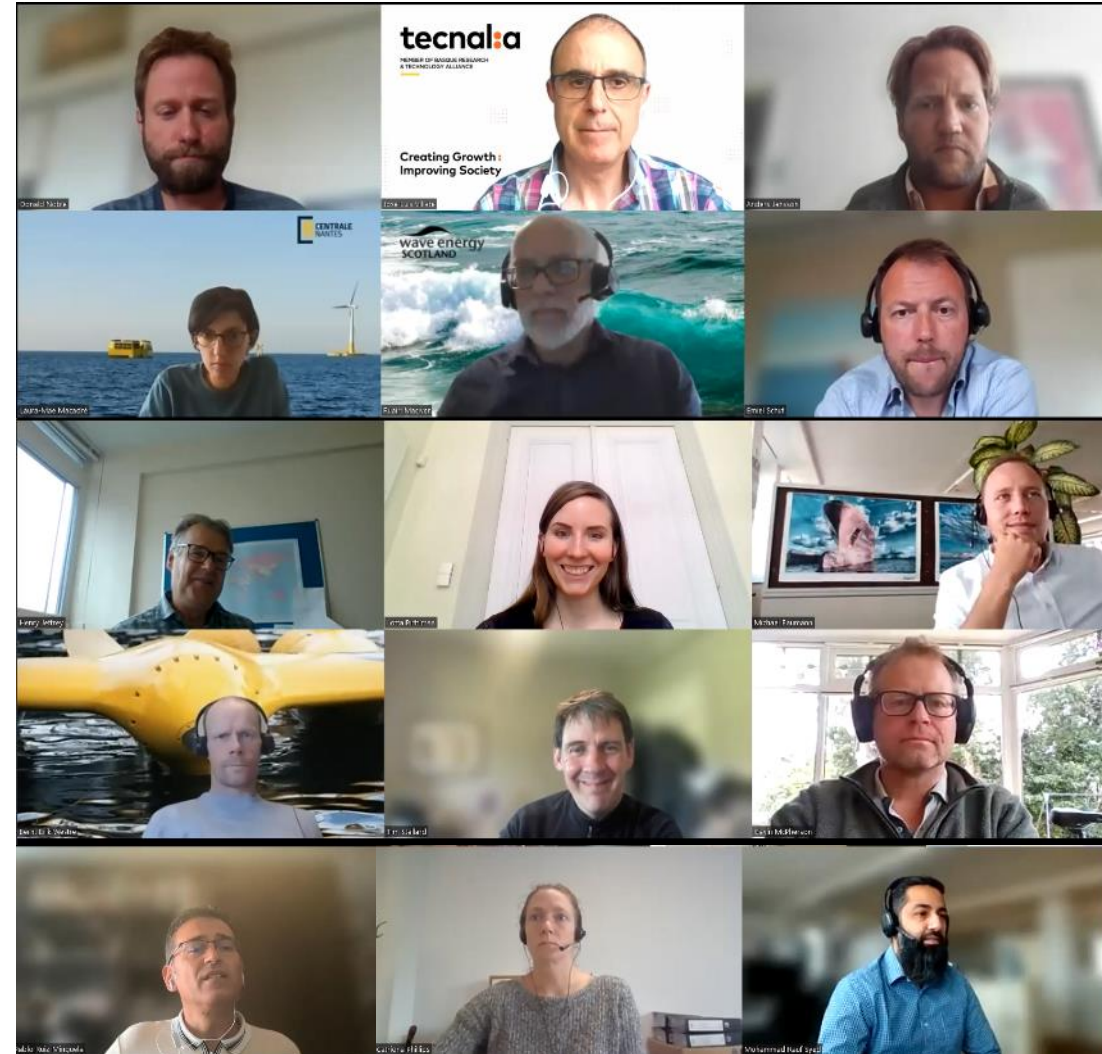
Review of R&I projects funded





Discussions with the sector

- Technical Working Group + OEE2023
- Reviewed projects funded to date
 - As a starting point
- Discussed groups of linked topics – what should we **add/adjust/remove**
 - Address sector challenges to meet 2030 targets
 - Actions required in future projects
- Questionnaire to rank progress, importance and timescales



Next steps to update the SRIA

- Key findings
 - Topics areas still priorities
 - Add/adjust topics to include other areas identified
 - Consider linkages between topics
- Updated SRIA due summer 2024
- Already being used to inform funding





Backing the Planet ...
one deal at a time

WES Annual Conference
Nov 16th 2023

Innovation Funding Mechanisms

Who & Where We Are



Robert Hokin
 Founder/Mng Director
 Glasgow, UK



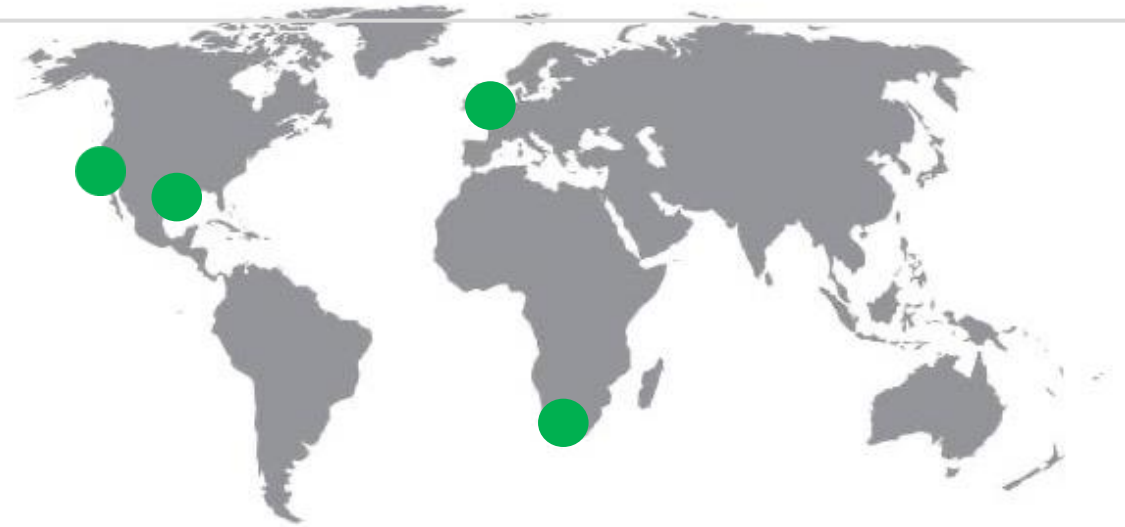
Andrew Smith
 Executive Director
 Glasgow, UK



Mark Hannigan
 Executive Director
 Houston, USA



John Steedman
 Advisor
 London, UK



Annika Borrmann
 Associate
 Glasgow, UK



Anton Themen
 Associate
 Glasgow, UK



Sharon Leslie
 Digital Design & Content
 Capetown, SA



“Greenbackers is all about catalyzing the investment needed to build a more sustainable society. By connecting disruptive technology providers to our network of climate focused investors, we’d like to think that we’re helping save the planet – one deal at a time”
 Robert Hokin – Managing Partner

Our Mission



(2 minute video)

'About Us' video



Corporate Services

Glasgow, UK (1 June, 2023) – Greenbackers Investment Capital (Greenbackers), a specialist Climate Tech advisory firm announces contract award for technology scouting services from TechnipFMC (NYSE: FTI) a leading technology provider to traditional and new energy industries.

Through this collaboration, Greenbackers will provide technology scouting services to TechnipFMC's Open Innovation Team to increase their engagement with relevant early-stage technology ventures. Additionally, TechnipFMC will benefit from access to Greenbackers market leading position at the heart of the early-stage Climate Tech eco-system.

"Greenbackers is delighted to formalize its partnership with TechnipFMC and for the opportunity to leverage our market leading insights in the early-stage Climate Tech sector to help them achieve their goals. Large companies like TechnipFMC are seeking to engage at an earlier stage than ever with the emerging technologies, which will enable our net zero future. Greenbackers can increase the efficiency and effectiveness of that engagement," said Robert Hokin, Managing Partner, Greenbackers Investment Capital.



Corporate Services: Technology Engagement

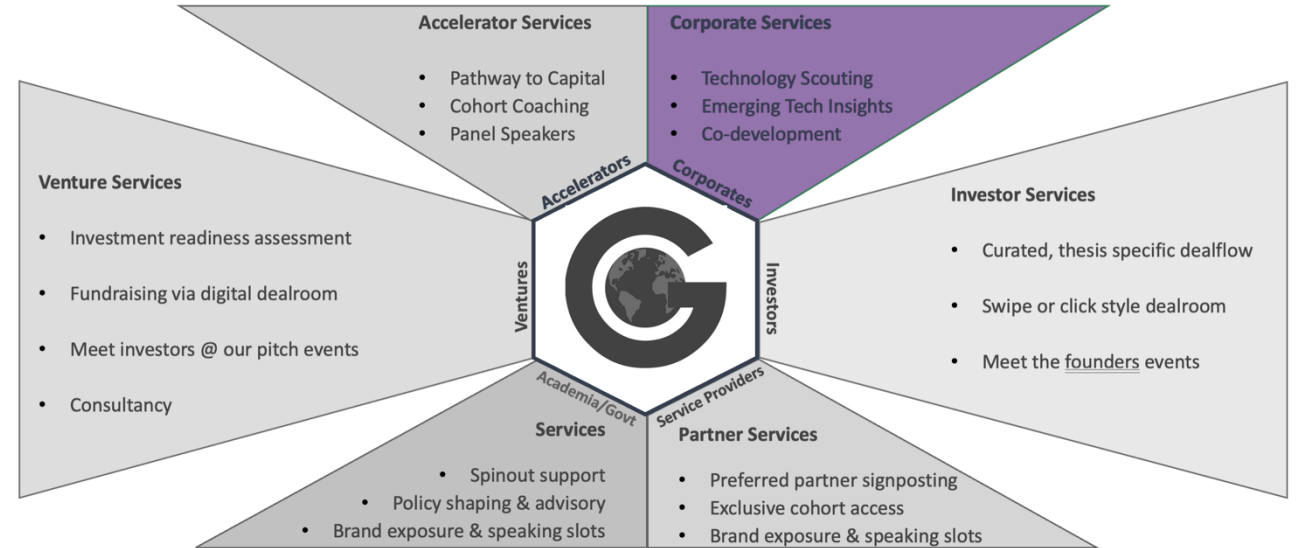
1. Technology Scouting

Large industrial corporation with binding net zero targets



Small startup with enabling technology for net zero

...it usually doesn't end well for the butterfly!



2. Emerging Tech Insights

- Conference calendar takeaways
- Proven thought leadership
- Pulse of the industry

3. Co-development Opportunities

- JIP quarterbacking
- Demo project participation
- Exclusivity & IP licensing

- Grant – but the need for a match
- Equity – but the right sort of equity
- Venture Debt – do you understand it
- Debt – can it be shaped around a project
- Go to Market Partners – a key part of the narrative
- The ” Investor” – there is no such thing
- Narrative - essential

Robert Hokin

Managing Director

robert.hokin@greenbackers.com

Direct: +44 (0)7957 201 203

Andrew Smith

Executive Director

andrew.smith@greenbackers.com

Direct: +44 (0)7947 722 057

Mark Hannigan

Executive Director, Americas

mark.hannigan@greenbackers.com

Direct: + 1 713 210 9508





IEA-OES Stage Gate Metrics

Jonathan Hodges

WES Annual Conference, 16th November 2023

Technology Collaboration Programme

by **iea**

Contents

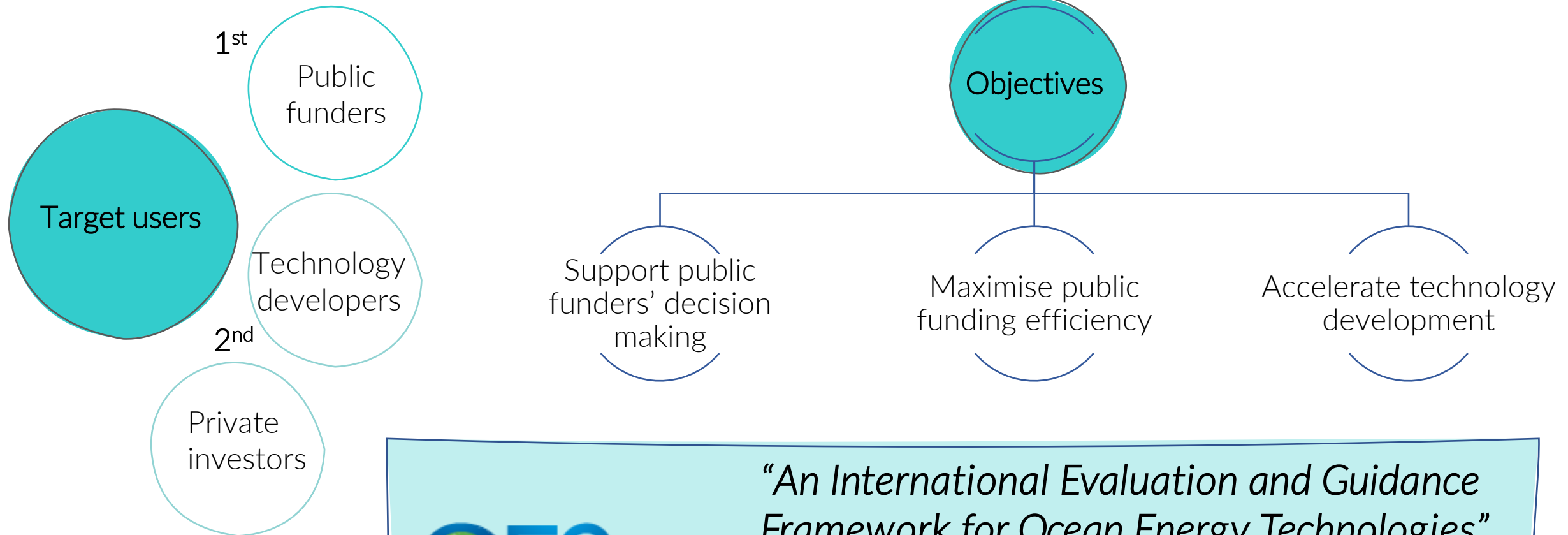
- Stage Gate metrics
- Publications
- OES Framework 2nd Edition
- Adoption and benefits



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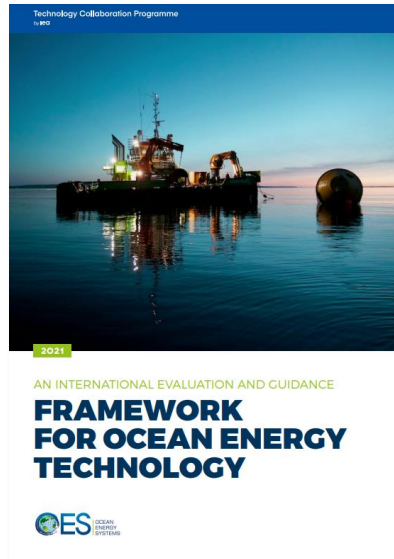
Stage Gate Metrics and IEA-OES



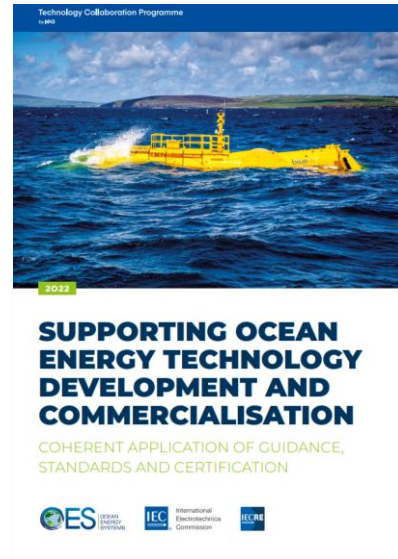
“An International Evaluation and Guidance Framework for Ocean Energy Technologies”

Common language
Stages & stage activities
Evaluation areas & criteria

Publications



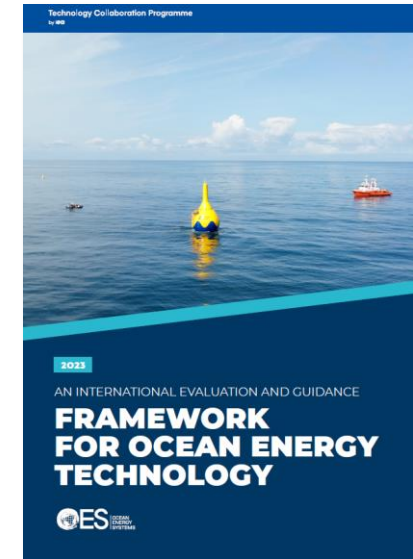
1st Edition –
Published
January 2021



Complements
other guidance
(IEC, IECRE etc.)

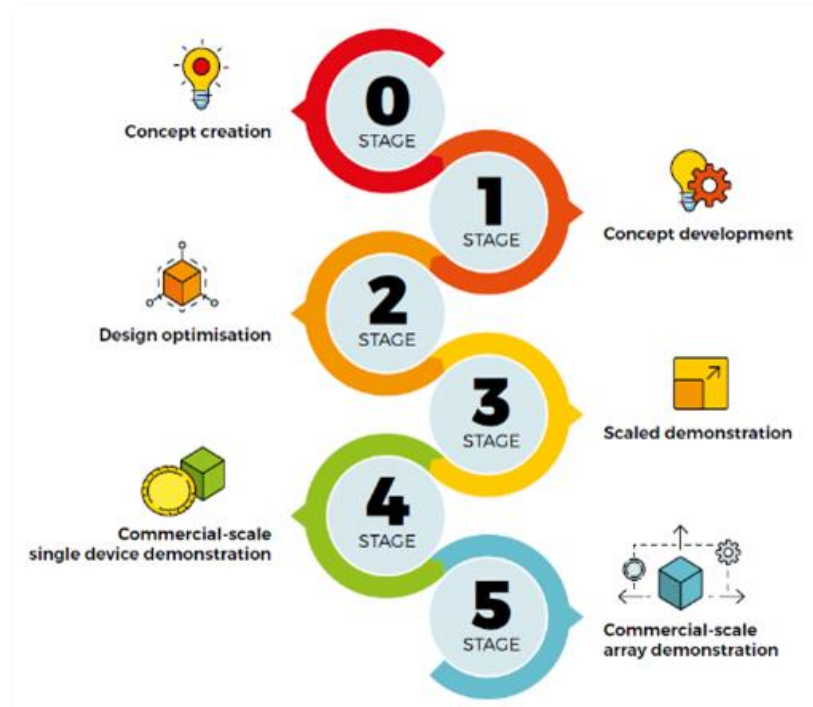
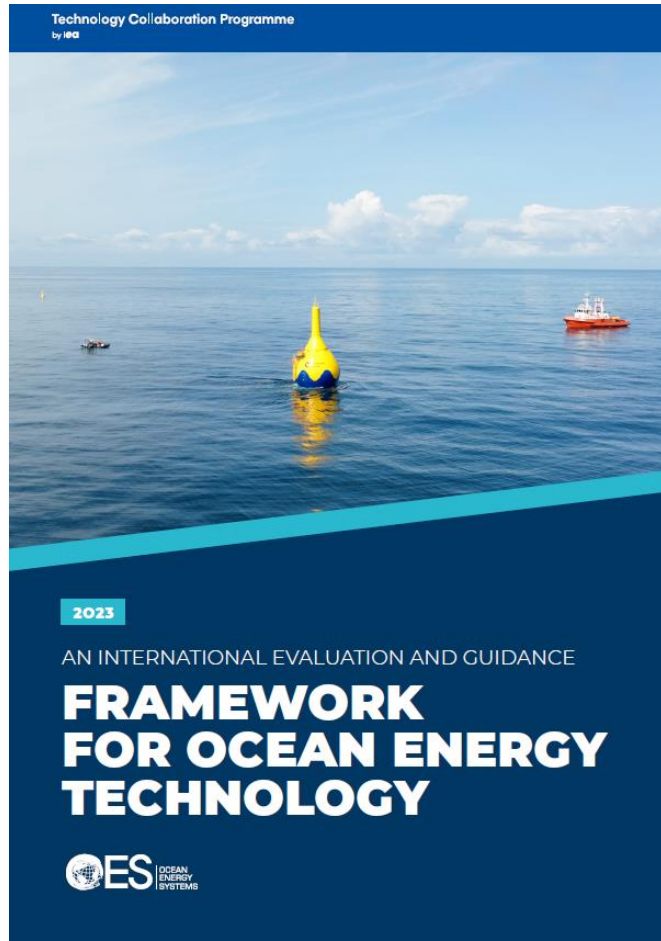


Promoted
internationally
–English, Chinese,
Spanish, French



2nd Edition –
Published
October 2023

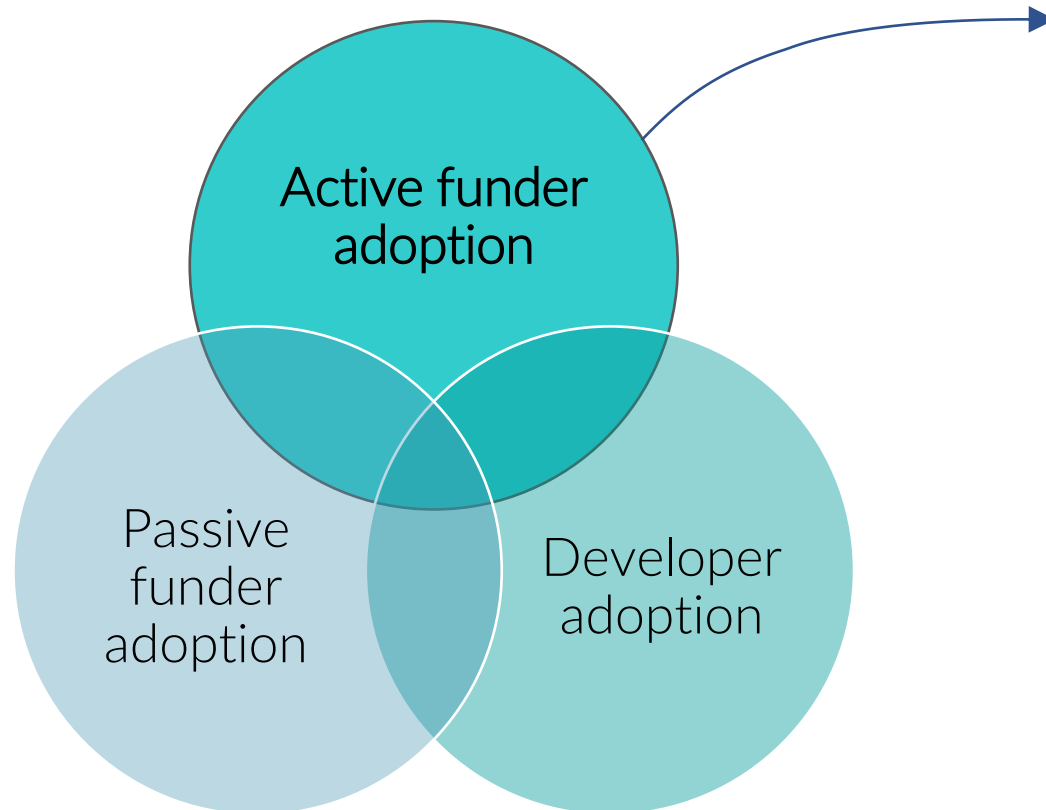
OES Framework 2nd Edition



- + Stage Activities & Evaluation Criteria
- + Alignment with complementary guidance, e.g. IEC standards

Adoption and benefits

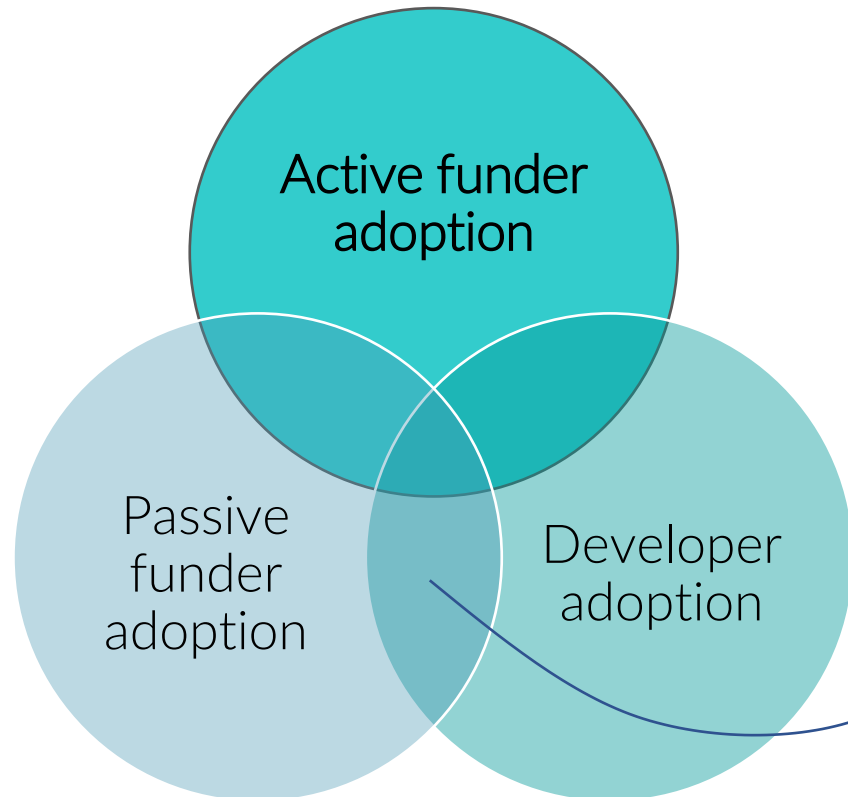
- Types of adoption



- Benefits shared by funders:
 - Design a funding programme
 - Provide clear expectations to applicants
 - Technology background
 - Expectation of data and outcomes
 - Key areas of technology attractiveness
 - Definitions and common language
 - Evaluate and compare technology using a consistent dataset
 - Monitor and report progress, risks and impacts

Adoption and benefits

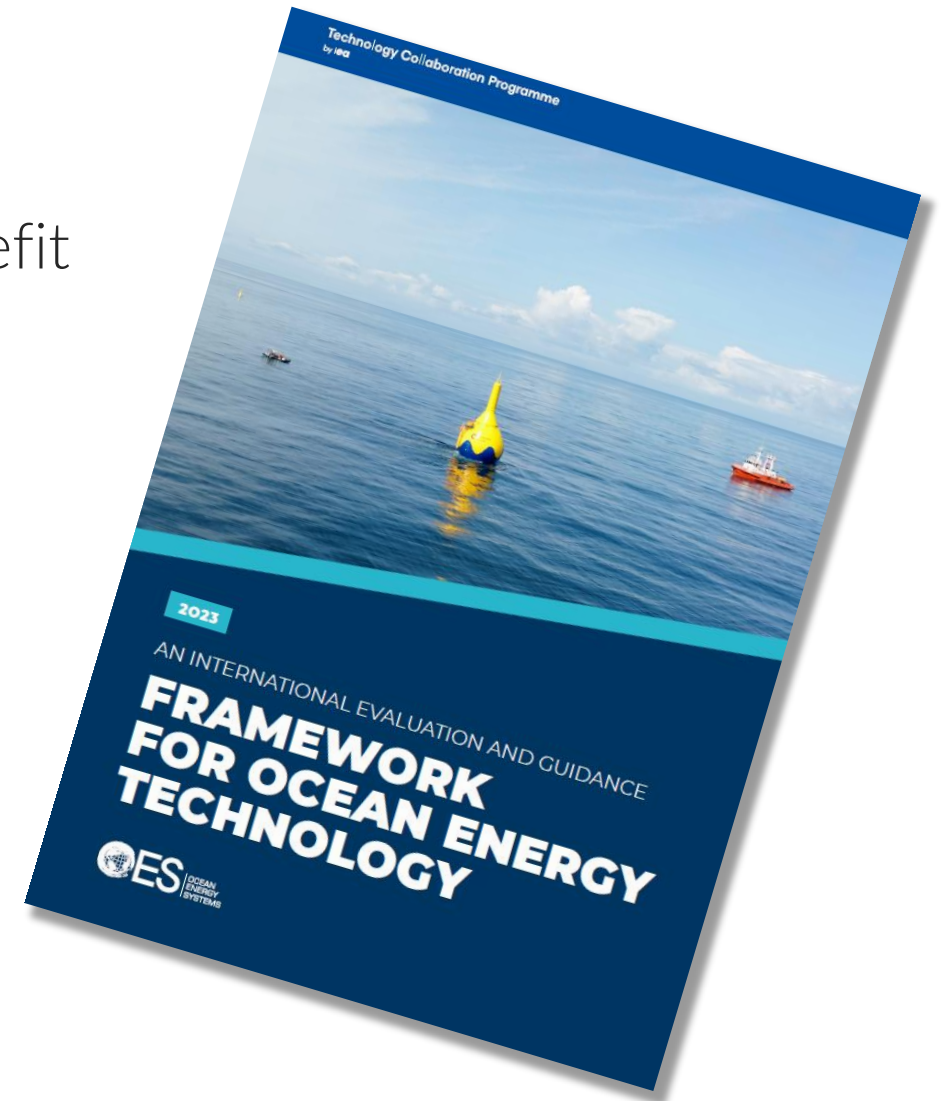
- Types of adoption



- Benefits shared by other users:
 - Understand funder expectations
 - Build a clear narrative
 - Demonstrate technology performance
 - Common language and data
 - Easy to adopt

Further adoption

- Wider adoption further increases the sector benefit
- Adoption is EASY for funders
- Feedback is always welcome



Thank you

jonathan.hodges@waveenergyscotland.co.uk

Technology Collaboration Programme

by **iea**

Funding Sources for Wave Energy Innovation in the UK

Energy Innovation Funding Landscape

Global Business Innovation Programme

- Innovate UK Smart Grant
- Targeted Innovate UK/BEIS Calls
- EIC Accelerator



- Scottish Enterprise SMART Grant
- Scottish Enterprise CETP Grant
- Enterprise NI Grants
- Wales SMART Partnerships funding

- Targeted Innovate UK/BEIS Calls
- Horizon Europe
- Eureka Eurostars
- OFGEM Strategic Innovation Fund
- Innovate UK Smart Grant

- Innovate UK Innovation Exchange

Innovate UK Innovation Loans

Innovate UK Smart Grant

Open to all technologies.

UK registered organisations can apply for a share of up to £25 million for game-changing and commercially viable R&D innovation that can significantly impact the UK economy.

If your project's duration is 6 to 18 months, it must:

- have total project costs between £100,000 and £500,000
- be single or collaborative

If your project's duration is 19 to 36 months, it must:

- have total project costs between £100,000 and £2 million
- be collaborative



Innovate UK Innovation Loans

- UK registered businesses can apply for loans for innovative projects with strong commercial potential to significantly improve the UK economy.
- You can apply for a loan of between £100,000 and £2 million to fund your project's eligible costs. Projects can last up to 5 years, including both the R&D and commercialisation phases.



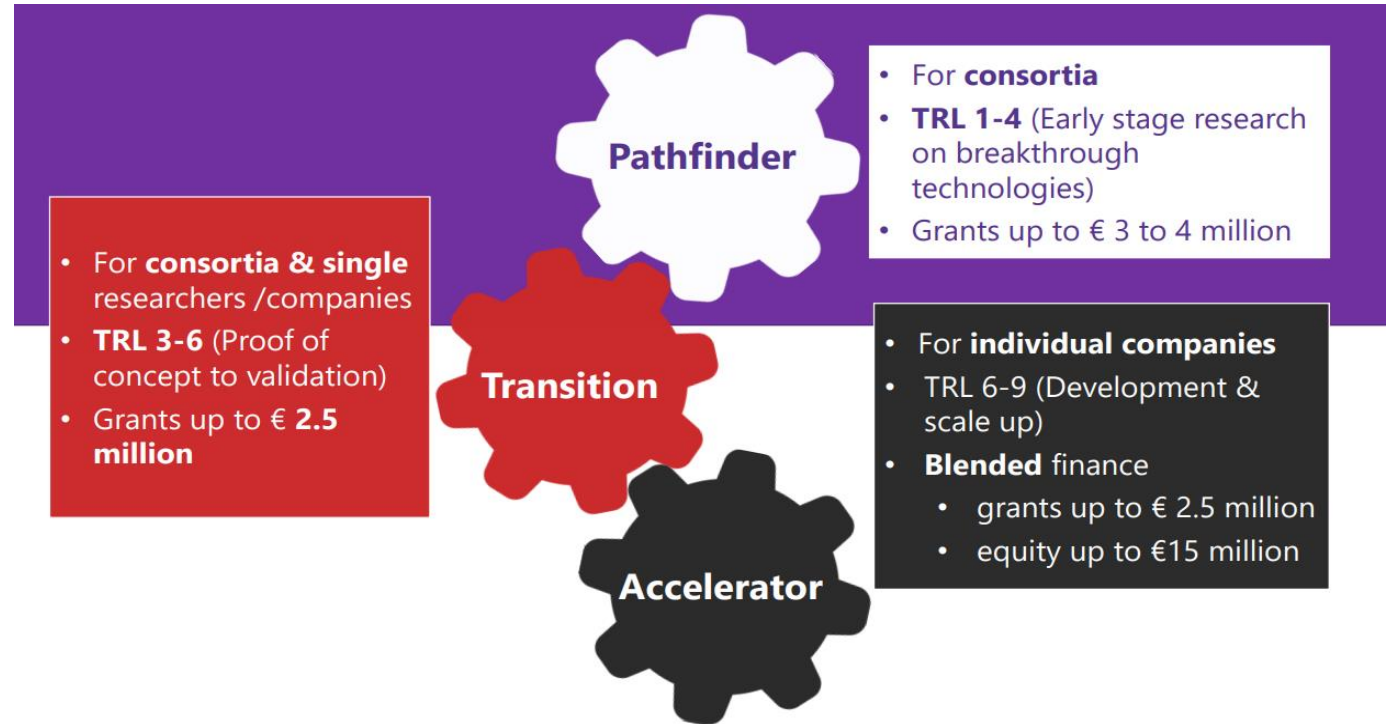
Knowledge Transfer Partnership

- Knowledge Transfer Partnerships is a UK-wide programme that has been helping businesses for the past 40 years to improve their competitiveness and productivity through the better use of knowledge, technology and skills that reside within the UK Knowledge Base.
- The academic partner (known as the knowledge base) will work with a business to:
 - develop the project
 - provide academic input
 - recruit a suitable graduate, known as an associate.
- They will act as the employer of the associate, who then works at the business for the majority of the project.
- A typical KTP project delivers a package of support valued at around £80,000 – £100,000 per year.



Energy Innovation Council

- Europe's flagship innovation programme to identify, develop and scale-up breakthrough technologies.
- Split into EIC Pathfinder (early-stage research), EIC Transition (Technology maturation), EIC Accelerator (Development and scale-up)
- Unique feature – provides funding for individual companies
- Work underway to define Work Programme for 2024



Net Zero Innovation Portfolio – Energy Entrepreneurs Fund

- Operates in phases (9 phases so far)
- A competitive funding scheme which supports the development and demonstration of state of the art technologies, products and processes in the areas of energy efficiency, power generation and heat and electricity storage.
- Seeks the best ideas, irrespective of source, across these energy technology areas from the public and private sector.
- The scheme particularly aims to assist small- and medium-sized enterprises, including start-ups



Collaborative Funding

Eureka Eurostars

- Eurostars is open to UK organisations. To apply, you must fulfill seven eligibility criteria:
 - The project consortium is led by an innovative SME from a Eurostars country.
 - The project consortium is composed of at least two entities that are independent from one another.
 - The project consortium is composed of entities from at least two participating countries with a minimum of one organisation from an EU or Horizon Europe Associated Country.
 - The budget of the SMEs from the participating countries (excluding any subcontracting) is 50% or more of the total project cost.
 - No single participant or country is responsible for more than 70% of the budget of the project.
 - The project duration is 36 months or less



Collaborative Funding – Horizon Calls

Wave & Tidal

Call Title	Topic ID	Deadline	Type of action	Budget (€)	Number of projects to be funded
Demonstration of sustainable wave energy farms	HORIZON-CL5-2024-D3-01-08	16-Jan-2024	IA	18-20m	2
Critical technologies for the future ocean energy farms	HORIZON-CL5-2024-D3-02-04	05-Sept-2024	RIA	4m	2

Demonstration of sustainable wave energy farms

- Budget €18-20m
- Deadline 16/01/2024
- Number of projects to be funded: 2
- Scope:
 - Demonstration of sustainable wave energy pilot farms (minimum 2.0 MW installed capacity and at least 4 devices) in full operational conditions for long periods of time is essential to advance this sector.
- It is the way to bridge the gap from technology development to market development while reducing costs, reducing risks and attracting investors for future commercial projects. The farms should be composed of several devices of the same type.
- The wave energy farms have to be connected to the electricity grid.

Scotland-only Funding

Clean Energy Transition Partnership

- New European funding competition only open to applicants in Scotland
- This new transformative research, development and innovation programme will support transnational collaborative projects in the renewable energy sector (offshore renewables, heat pumps and heat networks), fuels (green hydrogen), the systems and storage solutions which optimise their use, as well as Carbon Capture and Storage (CCUS).
- **22 November 2023 — pre-proposal submissions date**
- **27 March 2024 — Stage 2 full proposal submission date**



CETPartnership

Scottish Enterprise SMART Grant

- Aims to support high-risk, highly ambitious projects.
- It covers conducting feasibility studies.
- Can support up to 70% of the eligible costs for a small enterprise and up to 60% of the eligible costs for a medium enterprise.
- Studies must last between 6 and 18 months
- The maximum grant is £100,000.
- Feasibility is paid with a third of the grant in an upfront instalment and the rest is quarterly in arrears.



What's next?

- DESNZ are starting considering the R&D needs ahead of the next Spending Review starting on 1 April 2025, including for tidal stream and wave.
- EPSRC continue to fund wave energy within academia
- Recognition of need for higher TRL activity to further develop wave sector
- Please register for [Horizon Europe Newsletter](#)
- Please reach out to ncp-rules@iuk.ukri.org with any queries

