OPIN Project Introduction

Patricia Comiskey
SEAI

Interreg North-West Europe
EUROPEAN UNION
OPIN
European Regional Development Fund

OPIN Project Partners

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Scottish Enterprise

CATAPULT Offshore Renewable Energy

sirris driving industry by technology

WEAMEC Research, Education & Innovation in Pays de la Loire FOR MARINE ENERGY

DMEC Dutch Marine Energy Centre

Fraunhofer IEE

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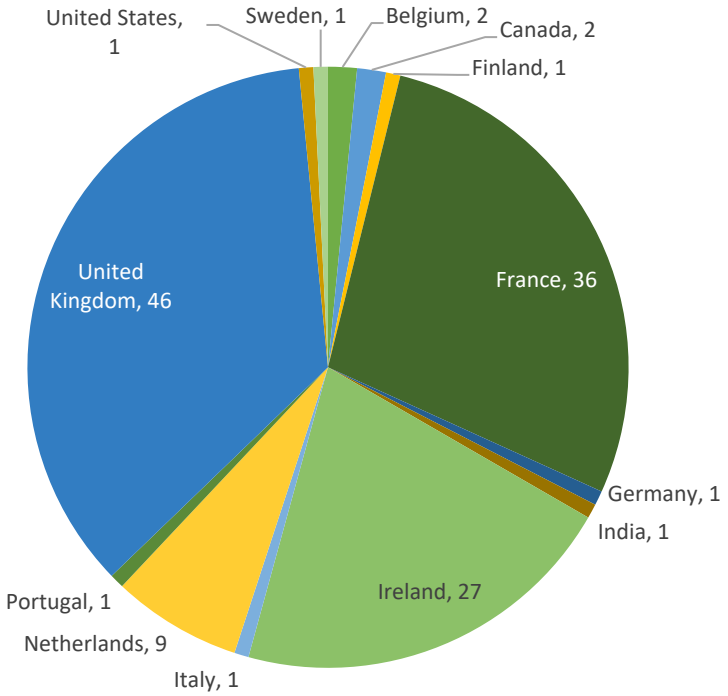
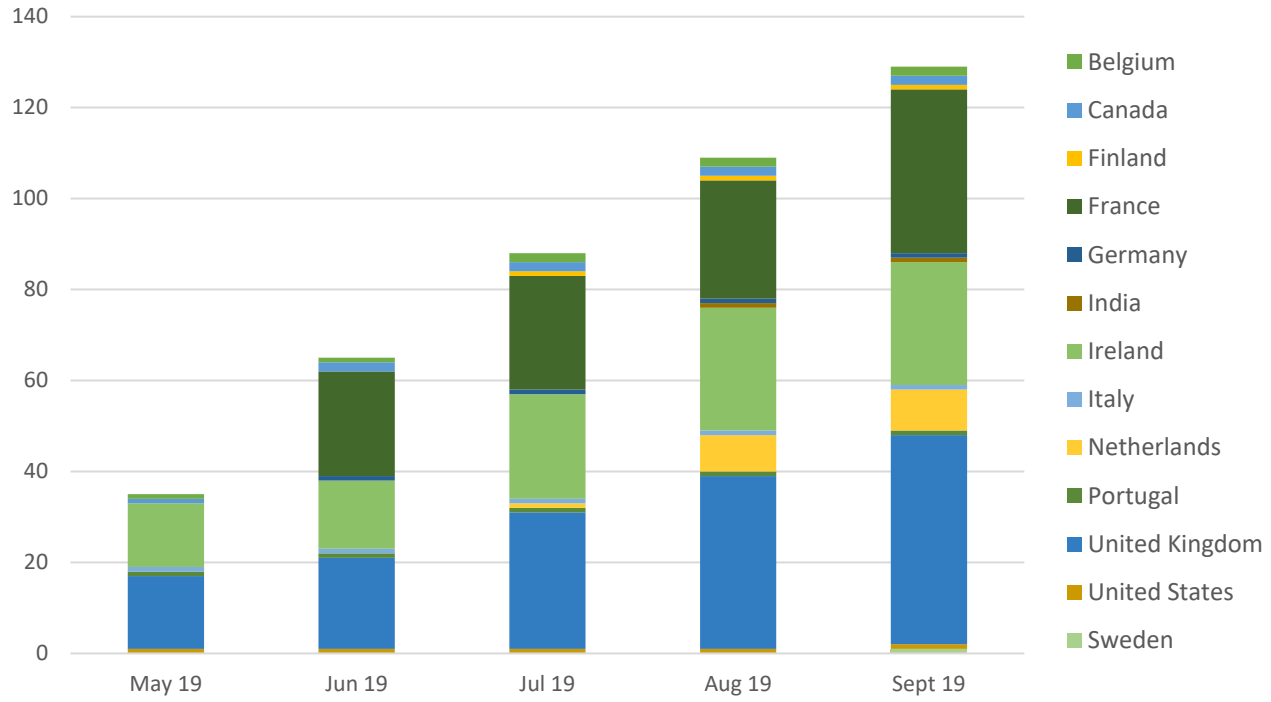
EUROPEAN UNION

OPIN Membership



Country of Origin



129 members from
13 countries

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OPIN Premise

To encourage both **cross-sectoral** and **cross-regional** collaboration for Offshore Renewable Energy SMEs

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OPIN Aims

- Support over 100 companies
- Develop a self-sustaining network providing a mechanism for the transfer of expertise between sectors in North West Europe

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OPIN Supports

- Annual Symposiums
- Workshops and Masterclasses
- Technology Assessment Processes (TAPs)
- Collaborative Innovation Groups (CIGs)
- Travel Support

OPIN Events

- Workshop: Energy Policy and Offshore Renewables State of the Nation,

  23 October, Blyth, UK

- Masterclass: Maritime solutions for offshore renewable energy,

  6 November, Rotterdam, Netherlands

- Workshop: Advanced Materials and Manufacturing,

  12 November, Nantes, France

- Masterclass: Installation and Mooring,

  February 2020, Nantes, France

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OPIN Innovation Support Scheme

Technology Assessment Process (TAP) Support

A high-level technology assessment allowing companies to benchmark their technologies, map structured development paths and identify potential collaborators

Collaborative Innovations Group (CIG) Support

Support for clusters of SMEs, working with research entities/large companies, solving issues identified as barriers to the ocean energy sector

Travel Support

Enabling SMEs to travel abroad either to take part in an OPIN workshop, masterclass or a CIG meeting or activity

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Symposium Schedule

15.15 – 15.30	**CIG Introduction and Challenges** Introduction to the CIG concept and discussion of different types of CIG (top down or bottom up). Including information CIG application process, eligibility criteria, cross regional requirements and selection criteria.
15.30 – 15.40	**Outline of the main challenges and opportunities for ocean energy**
15:40 – 16.15	**CIG Topics/Challenges** Presentations on three example CIG topics identified by OPIN Partners • 15:40 – 15:50 Case Study 1: Marine reliability (WEAMEC + OREC) • 15:50 – 16:00 Case Study 2: Remote monitoring (SIRRUS) • 16:00 – 16:10 Case Study 3: Finance (SEAI + DMEC) • 16:10 – 16:15 Instructions for break-out sessions (SE)

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Symposium Schedule

16.15 - 17.15	**Break-out Session** Tables will be available we attendees can discuss their specific interest in the topics and CIGs. The discussion will be guided by OPIN representatives with technical expertise from OPIN Partners.
17.15 - 17.30	**Question and Answers** This session will provide an opportunity for dialogue and consultation between OPIN members and the project coordinators.
17.30 - 17.45	**Future OPIN Workshops and Call for Applications for Support**
17.45 - 18.15	**Exhibition hall drinks reception**

Q&A

Any Questions?

OPIN CIG Introduction and Challenges

Karen Fraser
Scottish Enterprise

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Collaborative Innovation Groups (CIGs)

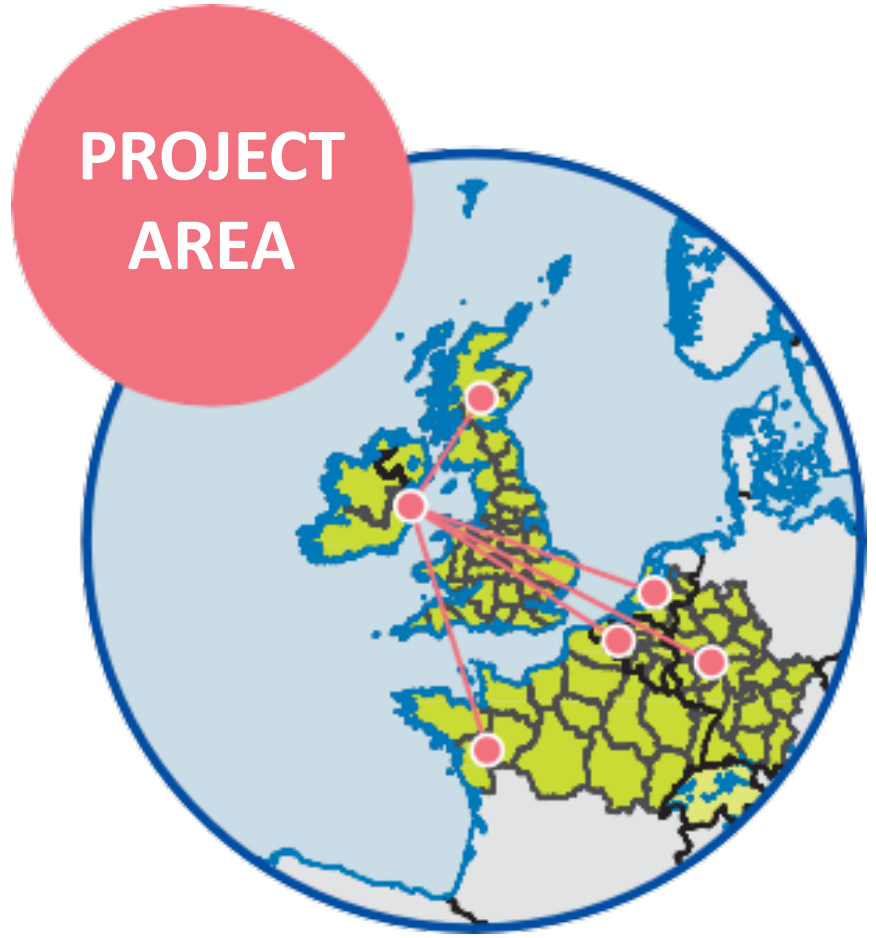
- Clusters of SMEs, with research / large companies
- Working on an identified challenge or “bottom-up”
- Work up an idea, product, process, funding application
- Defined project objectives and outputs
- Flexible but focused support
- Gateway to other support

Why Collaborative Innovation Groups?

- Solve specific problems
- Explore opportunities for new products, services, markets
- Develop the value chain
- Challenges which cannot be solved by one SME alone
- Complementary skills and expertise
- Opportunities for cross-sector learning

CIG Eligibility

- Must be **led by an SME** from an OPIN region
- **Minimum of 2 SMEs**
- Large companies and research organisations may participate
- Cross border – members from **minimum of 2 OPIN regions**
- Cross sector - recommended



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CIG Supports

CIG Support

- OPIN partner facilitation of the CIG
- Assistance with Action Plan
- Technical / Business Support: value up to €20,000 per CIP
- Travel support

CIG Technical / Business Support

- From an OPIN technical partner and/or from an external expert, procured by OPIN value up to €20,000
- De minimis aid, split between companies on CIG
- No financial contribution required from companies
- Ensure company staff / resources are available for tasks

CIG Support – Business / Finance - Examples

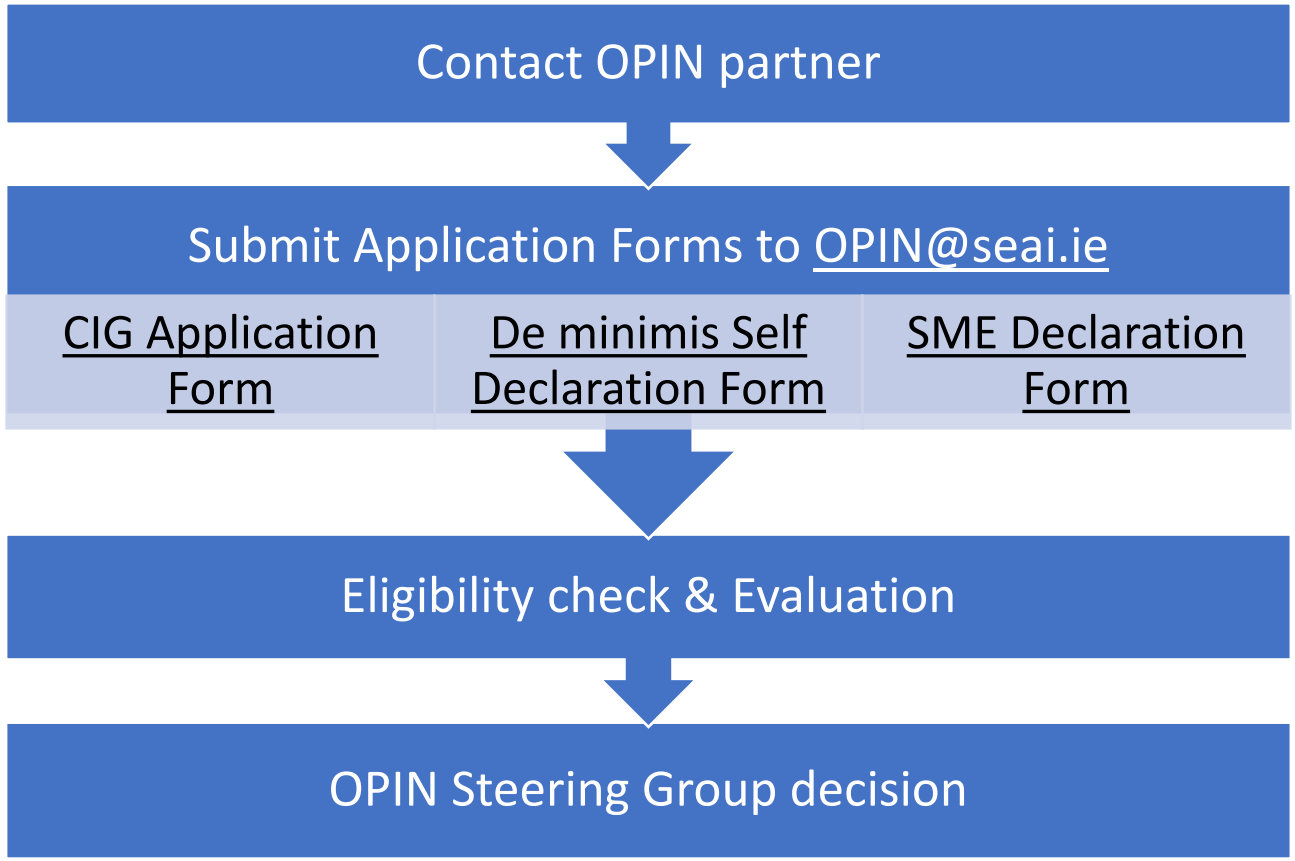
- Market research / analysis
- Financial analysis (e.g. LCoE)
- Business models
- Business Plan
- Funding / investment proposal
- Intellectual property management

CIG Support – Technical – Examples

- Specification of needs
- Identification of possible solutions / solution providers
- Feasibility study
- Technical specification of new product
- Advice on technology innovation

OPIN CIG Applications

CIG Application and Approval Process



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CIG Evaluation Criteria

Scientific/Technical Approach:

1. the **innovativeness** of the idea and the approach/concept
2. the significance of the scientific or technical **challenge**
3. the thoroughness of the (concept) presentation

Ability to carry out the project/development:

1. qualifications of the key staff
2. methods, equipment and facilities required
3. soundness of the **development plan**

Impact:

1. significance of the **technical and/or economic benefits** of the concept, if successful
2. likelihood that the development of the concept could lead to **a marketable product or process**
3. likelihood that the concept/approach could attract **development funding** and/or **investments**

CIG Application Deadlines

Apply any time, decisions quarterly:

- Call 1 deadline: 31 October 2019
- Call 2 deadline: 31 January 2020

Selected CIPs

- Feedback to applicants
- OPIN lead partner – based on location / expertise
- Action Plan – OPIN support and other activities
- CIG Support Offer
- CIG Support Agreement
- Implementation
- Final Report

Information and Contacts

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Ocean Energy Challenges and recommendations: desktop analysis of studies and reports

Jochen Bard
Fraunhofer IEE

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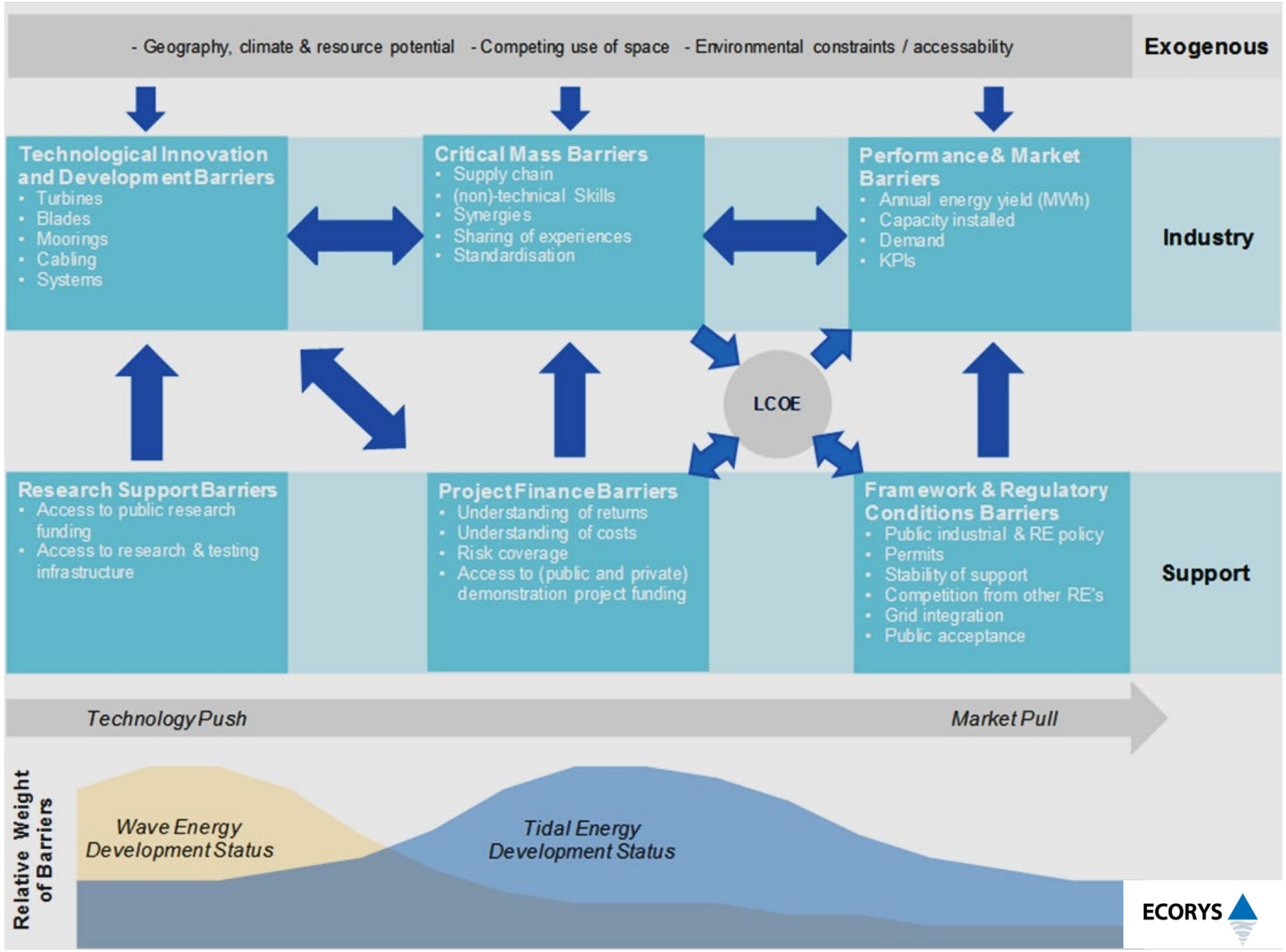


Critical Barriers: Overview

- Technological innovation and development
- Critical mass
- Performance and market
- Research support
- Project finance
- Framework and regulatory conditions

Ways forward

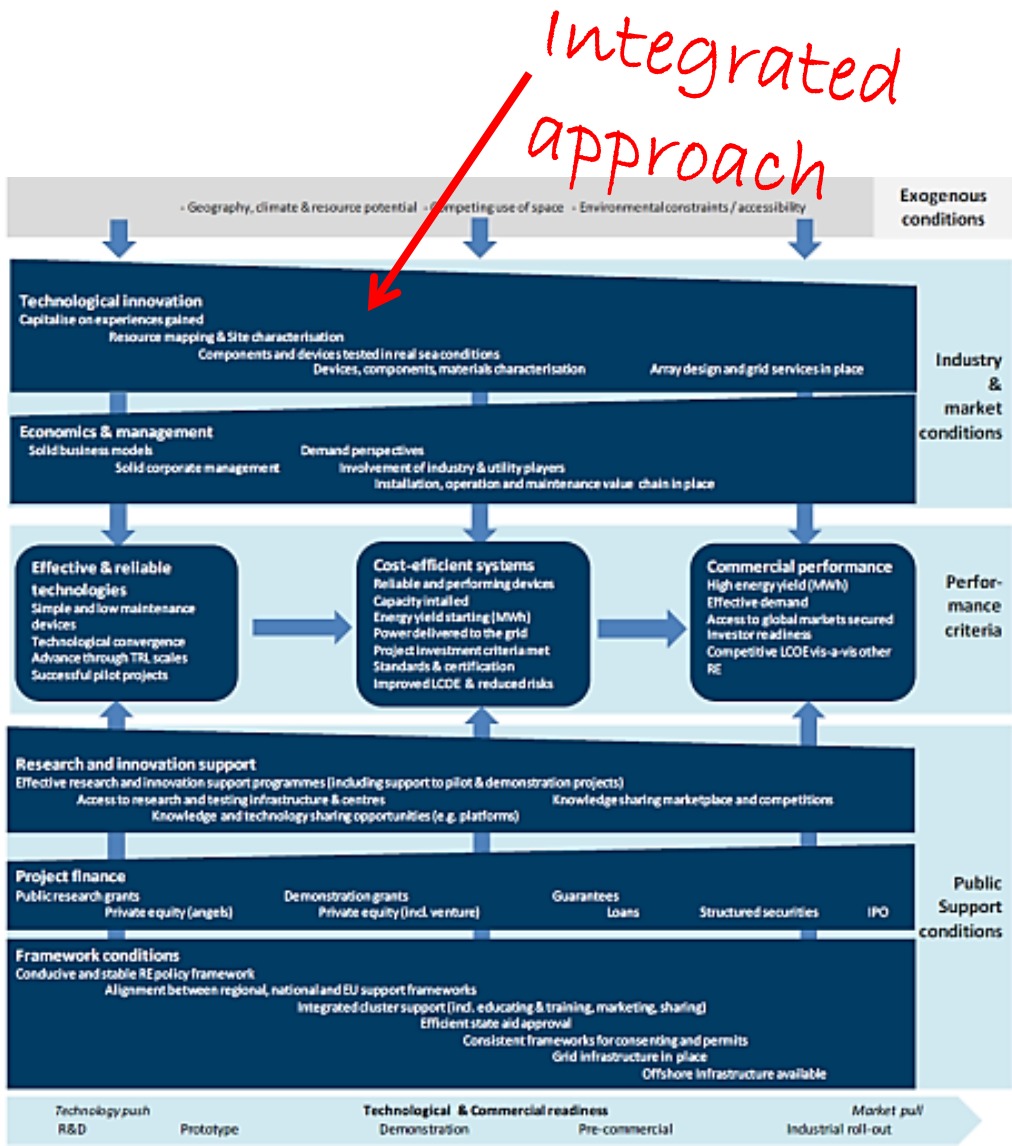
- A need for a more prudent approach with regard to promises
  → performance management and monitoring

- Critical barriers are partly technological and partly non-technological

  → a set of interconnected barriers holds back development

- A need for orchestrated involvement of various private and public actors
  → an integrated approach

- Move from technology push to market pull



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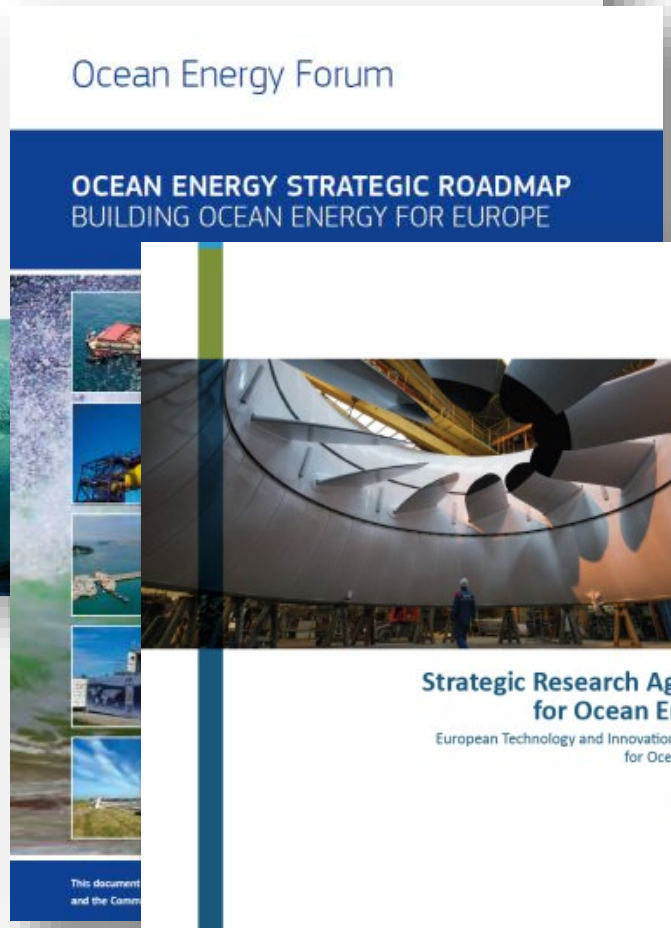

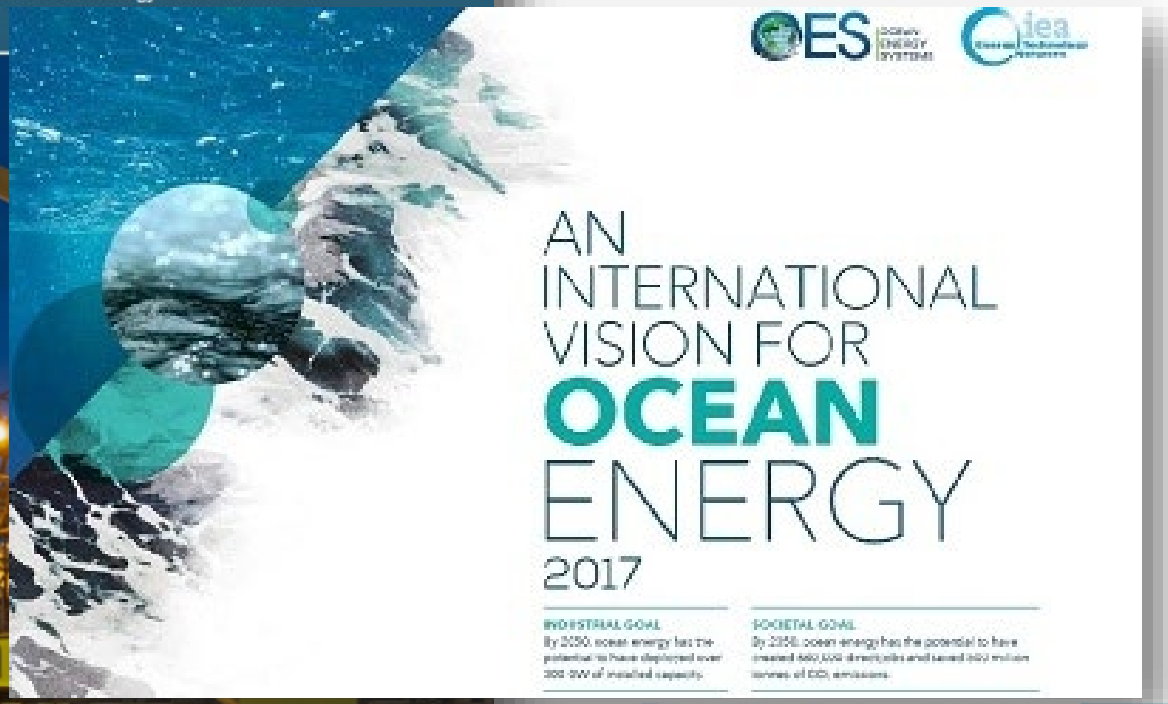

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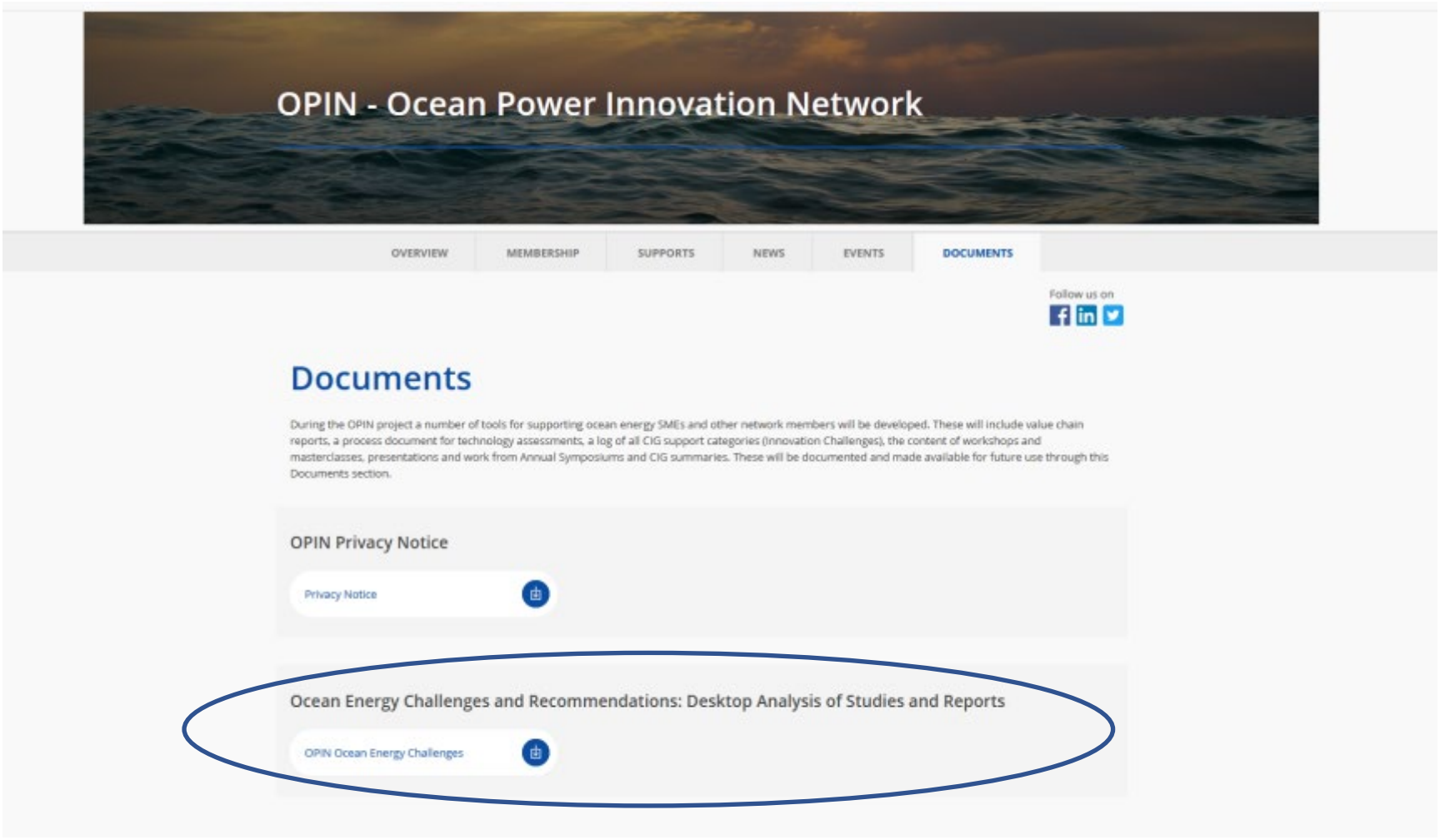

OPIN - Ocean Power Innovation Network
OVERVIEW
MEMBERSHIP
SUPPORTS
NEWS
EVENTS
DOCUMENTS
Follow us on
Documents
During the OPIN project a number of tools for supporting ocean energy SMEs and other network members will be developed. These will include value chain reports, a process document for technology assessments, a log of all CIG support categories (Innovation Challenges), the content of workshops and masterclasses, presentations and work from Annual Symposiums and CIG summaries. These will be documented and made available for future use through this Documents section.
OPIN Privacy Notice
Privacy Notice
Ocean Energy Challenges and Recommendations: Desktop Analysis of Studies and Reports
OPIN Ocean Energy Challenges

Ocean Energy Challenges and recommendations: desktop analysis of studies and reports

Study/Report	Technological	Economical/Supply chain	Regulatory/Environmental	Infrastructure and Support	Link
Ocean Energy Status Report 2014	Device and System Demonstrators • Installation & recovery methods • Low-cost O&M techniques Sub-Components • Control systems • Energy extraction technology (e.g. blades, interaction surfaces) • PTO • Device structure • Foundations and mooring systems • Offshore umbilical & wet mate connectors Infrastructure and Enablers • Offshore grid system design and demonstration • Array electrical systems • Onshore grid system development Sub-sea electrical system equipment				https://setis.ec.europa.eu/sites/default/files/reports/2014-JRC-Ocean-Energy-Status-Report.pdf
Ocean Energy Forum	Testing and modelling Reliability and		Improving planning, consenting and	Insurance and Guarantee funds	https://webgate.ec.europa.eu/maritimeforu

Ocean Energy Challenges and Opportunities

Technology challenges

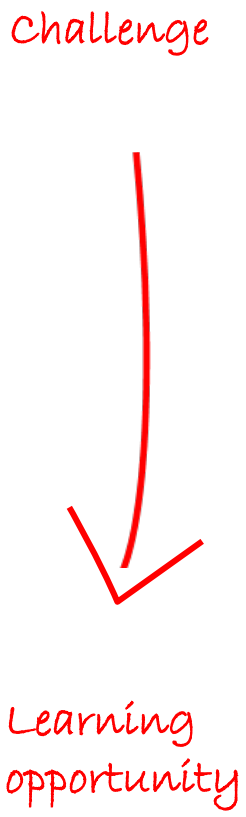
- Modelling, testing and demonstration
- Materials, components, sub-systems and systems
- Structures, foundations and moorings
- Installation, logistics and infrastructure
- Power transmission, grid connection and integration

Economic & supply chain

- LCoE analysis and cost reduction strategies
- Scaling and arrays
- Industry and supply chain development
- Synergies with other sectors
- Insurance and finance

Regulatory / environmental

- Standards
- Health & safety
- Environmental impact assessment and monitoring



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CIG Case Study – Reliability data

Laura-Mae Macadré
WEAMEC

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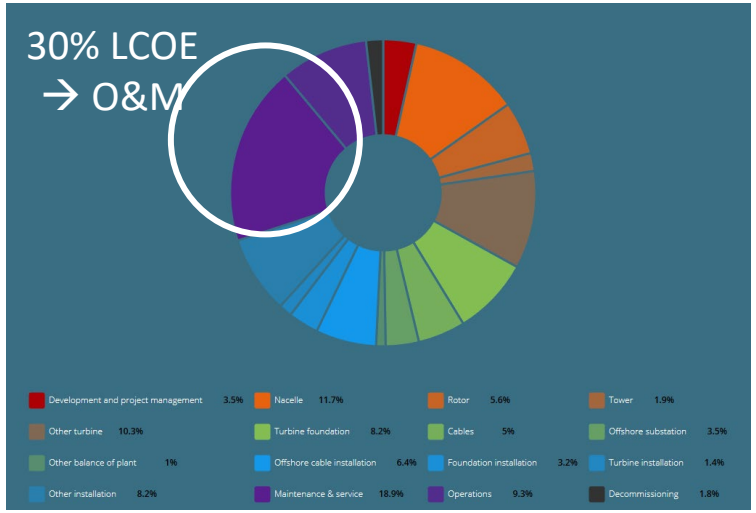
O&M costs have a significant impact on LCOE

Failures and maintenance activities impact significantly the LCOE

- Maintenance team cost
- Logistics cost (boat, etc.)
- Spare part cost
- Electrical production loss



Wind farm costs– OREC, BVGA
https://guidetoanoffshorewindfarm.com/wind-farm-costs

Modelling O&M costs for Marine Renewable Energy (MRE) is challenging:

- Lack of input data from operational experience
- **Lack of reliability (failure and repair) data specific to the ocean energy sector**

Other sectors have developed dedicated reliability databases:

- OREDA - *Oil & Gas*
- MIL-HDBK-217F – *Military Electronic Equipment*
- CCPS PERD - *Chemical process safety*
- Windstats, Reliawind, etc. – *Onshore wind turbines*

Some initiatives in offshore renewables:
WInD-Pool, SPARTA, Redapt, RealTide, RiaSor, Marine Energy Component Analysis, etc.

CIG Challenge: How to collect reliability data for the MRE sector?

What is reliability data?

- Failure rates
- Average down times
- Typical repair durations

The CIG will not work on the data, but on the reporting methodology

- Not **what** is failing but **how** to report it in case of incident.
- Case study on **generic** components (not device specific)

- Who reports the incident?
- Who should be informed?
- What should be in the report?
- Which level of details?
- How to store the data?
- How to make it usable to prevent this failure in the future?
- Etc.

No confidential information to be provided within the CIG

CIG members and their benefits

CIG members (examples)

- Technology developers
- Project developers
- O&M service providers
- Test site operators
- Reliability assessment providers
- Investors
- Insurers
- Others…

Benefits

- Standardized reporting process
  Developers can better capitalize experience across multiple projects/sites
- Improved MRE device design
  Components selection, redundancy, etc.
- Improved MRE farm design
  Layout, electrical architecture, etc.
- Better planification of O&M operations
- O&M costs estimation
- AEP and associated revenue estimation

CIG inputs

OPIN partner support

- Meeting organisation and facilitation
- Expert support (up to 20k€)
  - State of the art study
  - Development of templates for CIG members to provide feedback
  - Information collection and analysis
  - Intermediate and final reports

CIG members support

- Meetings participation
- Inputs provided through the templates
  - Existing good practices in MRE sector
  - Existing good practices in other sectors
  - Specifications for reliability/O&M model inputs
- Review of the reports

Collaborative Innovation Group

3 face to face meetings in Europe:

- 1 Kick-Off Meeting
- 1 intermediate meeting
- 1 conclusion meeting

Bi-weekly calls (1h)

6 months

CIG outputs

1) State of the art of reliability databases (MRE and other related sectors)	2) Good practices from existing failure/maintenance reporting processes
3) High level specifications for reliability / O&M cost modelling	4) Template report for reliability data collection

OPIN CIG – Remote Monitoring

Bart Teerlinck

Sirris

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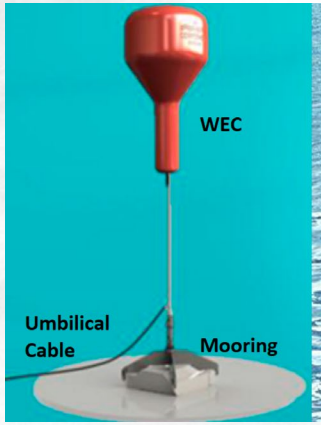
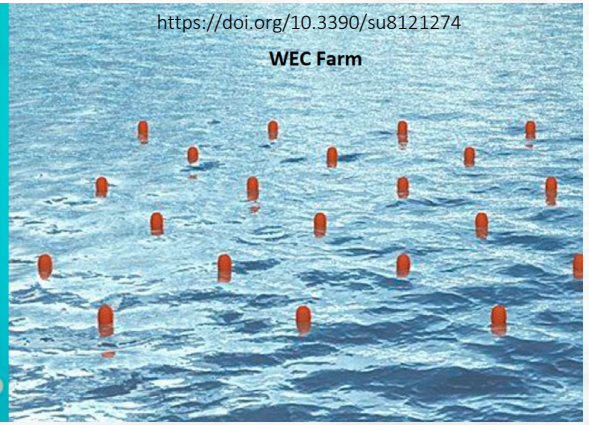
Challenge

Remote monitoring to support **Design Optimisation, Asset Management and O&M** of remote and difficult to access assets.

- Loads, environmental parameters and corrosion
- Mooring lines and power cables
- Cathodic protection
- Structural Integrity
- Management of a larger array of devices (Fleet Leader & Digital Twin Concept)





Learn from Offshore Wind

Identify benefits and requirements

Move forward

Potential activities

OPIN Expert support

- State-of-the-art study
- Market study of available sensors
- Write technical specifications
- Collect and analyse partner input (templates)

Work meetings

- Identify potential economic/technological benefits of remote monitoring
- Discussion on technical requirements to be able to implement sensors
- Define challenges related to sensors integration
- Define future steps
- Take the first next step to a follow-up project

Potential Partners

- Project/Technology developer
- Sensor manufacturer/supplier
- System integrator
- O&M service provider
- Asset Management service provider
- Research Organisations

Required input

- Presence at meetings (in-person/Skype)
- Provide technological input
- Share information about challenges faced and previous experiences
- Review of meeting and activity reports
- Active involvement in definition of follow-up project

CIG Outputs

- ✓State-of-the-art report
- ✓Requirements for remote monitoring in wave and/or tidal arrays
- ✓Identification of potential economic/technological benefits of remote monitoring
- ✓Specifications for a standardized monitoring set-up and strategy
- ✓Preparation for a case specific demonstration project

Preparation phase | *After the CIG*

Remote Monitoring
OPIN CIG

CIG Members

Call for project
(H2020, Interreg, OCEANERA-NET, etc.)

European consortium

sirris
driving industry by technology

OPIN CIG – Remote Monitoring

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OPIN CIG – Innovative Financing Mechanism

Mehdi Faraji
DMEC

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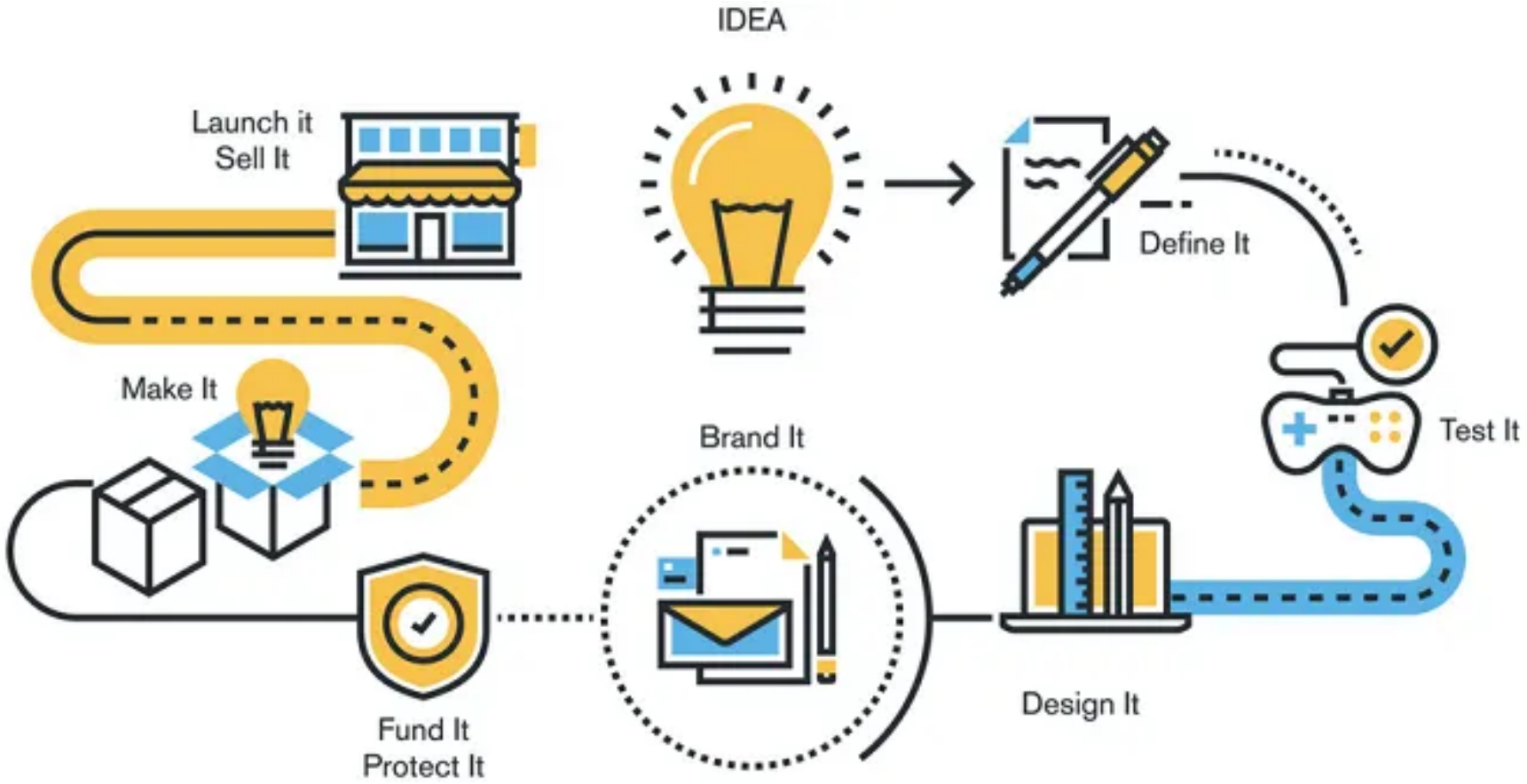
Challenge: push in technology



Need?
Clients?
Market?

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Opportunity: pull by solution development

Tidal Solution (Water2Energy) in Port of Antwerp (and soon in Port of Vlissingen)

Wave energy solution (NEMOS) in Port of Ostend

Feasibility of wave energy solution (EcoWavePower) at Port of Amsterdam

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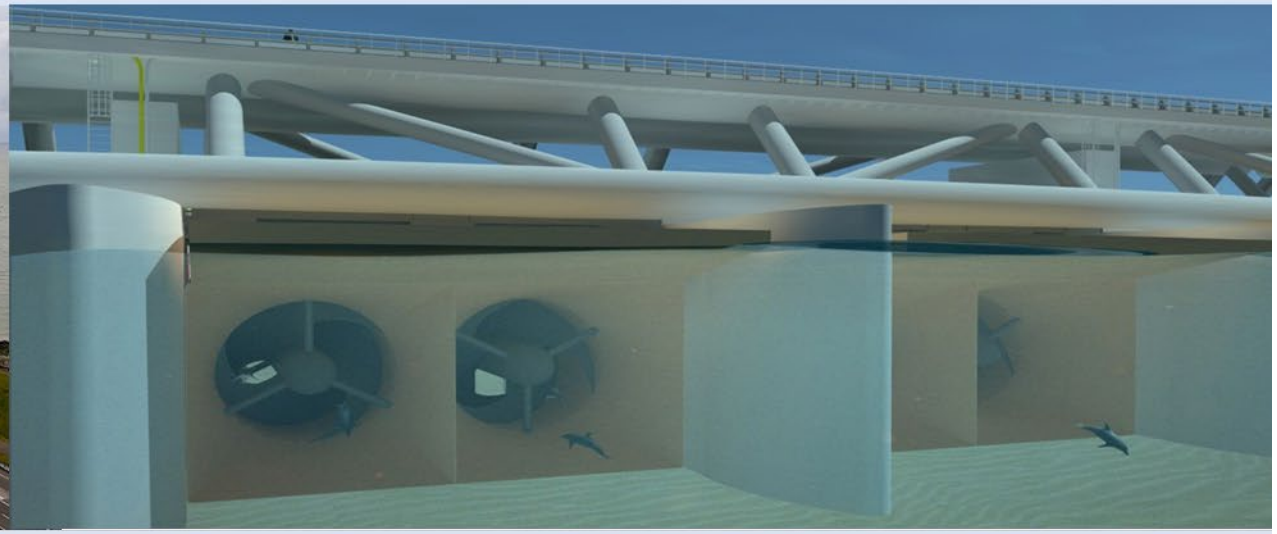
Opportunity: pull by solution development

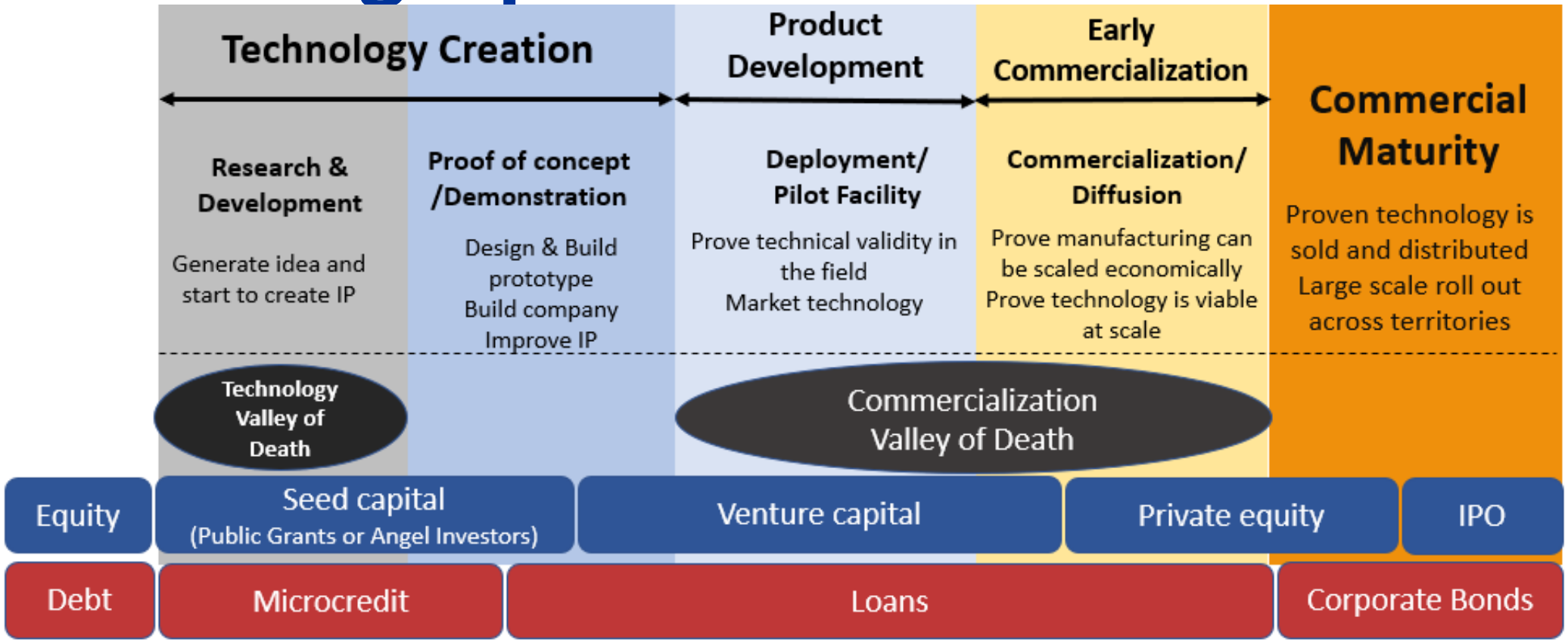
Tidal array from Tocardo in EasternScheldt

Salinity gradient plant from REDstack in Afsluitdijk



Tidal Bridge Indonesia (Flores Timur)

Challenge: push for investment



Investors are looking for bankable solutions rather than a particular technology

Financing barriers

Lack of Long-Term Financing

Marine energy projects have high up-front capital costs , and the absence of long –tern financing is furthering biased toward more mature renewables.

Lack of Project Financing

Marine energy projects are more exposed to the limited availability of project financing, as the share of capital costs in their total cost is much greater.

Lack of Equity Finance

Linked to both the need for long-term project financing and limited access to pre-investment financing is the challenge posed by the lack of equity finance available for many if not most marine energy projects.

High and Uncertain Project Development Costs

Marine energy projects tend to suffer from slow, costly, and uncertain project development and approval processes.

Small Scale of Projects

The small scale of many marine energy projects creates significant problems in obtaining private financing. Economies of scale in due diligence are significant, and many larger financial institutions will be unwilling to consider small projects.

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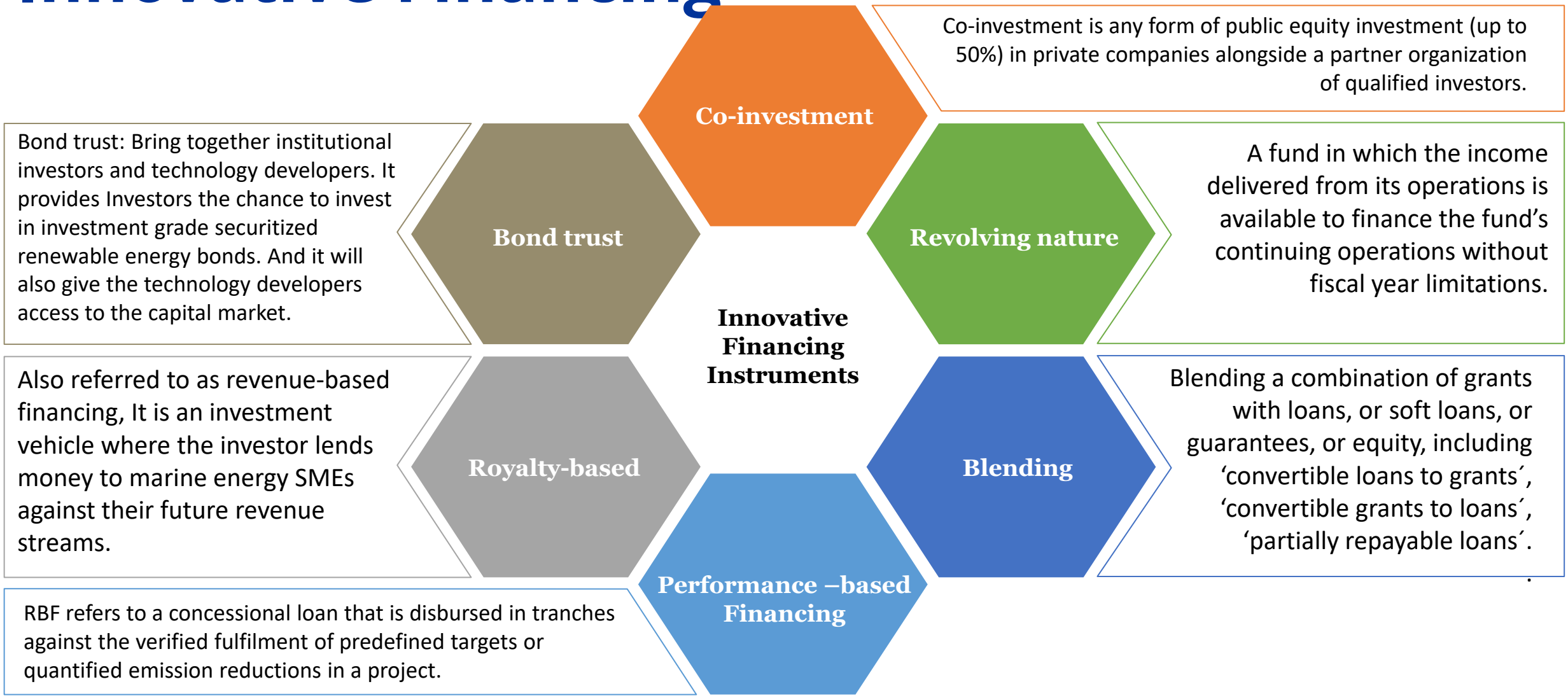
Innovative Financing



CIG challenge: how to pull investment to solutions?

Potential Partners

- Technology companies
- Project developers
- Financial Institutions
- Investment banks
- Venture capital firms
- Angel investors

Required input

From tech company / project developer:

- Share information about financial challenges faced
- Review applicability of different finance mechanisms

From investors

- Investment decision criteria

CIG Outputs

Output for CIG members:

- Piloting different innovative finance mechanisms to solve financial challenges of tech companies & project developers

Output for the broader sector:

- Summary of innovative finance mechanisms and their pro/con's
- Investor checklist of different type of investors

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Future OPIN Workshops and Call for Application for support

OPIN Team

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OPIN Events

- Workshop: Energy Policy and Offshore Renewables State of the Nation,

  23 October, Blyth, UK

- Masterclass: Maritime solutions for offshore renewable energy,

  6 November, Rotterdam, Netherlands

- Workshop: Advanced Materials and Manufacturing,

  12 November, Nantes, France

- Masterclass: Installation and Mooring,

  February 2020, Nantes, France

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23/10/2019 - Energy Policy and Offshore Renewables State of the Nation

A half day workshop that will discuss the **UK policy and emerging markets for Offshore Renewables** (offshore wind, floating wind, wave and tidal stream energy).

The UK's Industrial Strategy and Place based growth initiatives will be used to set the scene followed by descriptions of market potential, build out and opportunities to get involved.

The event will provide an **open forum discussion**, a look at a number of **use cases**, **meetings** with device developers and supply chain companies.

The day will include the opportunity to view the **world class test facilities** at the ORE Catapult's Blyth site.

23/10/19 – 1PM to 6PM

Blyth, UK

Free registration for OPIN members

23/10/2019 - Energy Policy and Offshore Renewables State of the Nation

Draft Agenda

10:00 Welcome and coffee
10:30 OPIN and intro to ORE Catapult – Simon and (SEAI)
11:00 Marine Energy Policy in UK and Rest of the world developments, including technology innovation requirements – Simon Cheeseman
11:45 Coffee
12:00 Predicting failure of dynamic cables – ORE Catapult (David Young)
12:20 eGrid – Grid emulator and business support (Michael Smailes/Ravneet)
12:45 Tidal Stream energy project (TIGER) – ORE Catapult (Robbie Brady)
13:00 Lunch
13:45 PPE for site tour
14:00 Site Tour: Blade Test2, Blade Test1, Nautilus, Marine Energy Test Centre, Charles Parsons HV Elec Lab
15:30 Depart

06/11/2019 - Maritime solutions for offshore renewable

10:15	Introduction by chairman	Mr. Reinder Jorritsma. Project developer DOT BV
10:25	The future of generating energy offshore	Mrs. Britta Schaffmeister. Director Dutch Marine Energy Centre
10:50	Generating sustainable energy by wave energy in ports	Mr. Yair Rudick. Business Development Manager Eco Wave Power
11:10	A vision on vessels for installation of wind farms offshore	Mr. Wouter Dirks. Manager R&D and Innovation Van Oord Offshore Wind BV
11:30	Designing and operating the newest service operation vessels	Mr. Stephen Bolton. CEO Bibby Marine Services Limited
11:50	Discussion	
12:20	Closing / Final remarks	

Hosted by: Rotterdam Ahoy, Maritime Technology, DMEC
Location: Rotterdam Ahoy Hall 6 (Ahoyweg 10, 3084 BA Rotterdam)
Date: 6 November 2019

Interested to join this workshop? Please send an email expressing your interest to Astrid Groot, Dutch Marine Energy Centre (astrid@dutchmarineenergy.com).

Free attendance on a first come first serve basis for 15 OPIN members.

12/11/2019 – WS Advanced Manufacturing and Materials

This workshop, organised by WEAMEC, will provide an update on the **latest advances** in materials and manufacturing, with a particular focus on **composites**.

The program will cover **industry needs, latest news on academic research, ongoing R&D projects, future collaborations**, etc.

12/11/19
Just before the Composites Meetings on 13-14/11/19

Nantes, France

Free registration for OPIN members

Online registration here

Networking opportunity, international audience

Short presentations
- Sabella
- Bureau Veritas
- IRT Jules Verne
- University of Edinburgh
- ICAM
- Ecole Centrale de Nantes
- Université de Nantes
- Others speakers tbc

Technical visits
- IRT JV – composite hall
- LoireTech

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Thank you!