Clean Maritime Demonstration Competition Round 6

National Briefing Event

27th January 2025

Peter Holland
Knowledge Transfer Manager
Maritime

www.iuk.ktn-uk.org

Innovate UK | Business Connect

Agenda

10.30am	Welcome & Housekeeping - IUKBC
10.35am	Opening Speech - DfT
10.45am	Updates from DfT
10.55am	Updates from IUK
11.25am	CMDC6 Competition Process – IUK
12.25pm	Q&A
1.00pm	Lunch
2.00pm	Updates and overview – IUK BG
2.10pm	Pitch slides
3.00pm	Ad hoc pitches
3.15pm	Networking
4.30pm	Close

UKRI Innovate UK | Business Connect

Lola Fadina
Director - Maritime
Department for Transport

UKRI Innovate UK | Business Connect

Department for Transport

The Future of UK SHORE

CMDC6 Kick-off Event

Kate Drury
Head of UK SHORE R&D Projects
27 January 2025

UK Maritime Decarbonisation Programme

Fuels and Energy
Fuels strategy for maritime energy systems. Ensuring policies are robust for the transition to Net Zero, while drawing evidence from R&D initiatives.

GHG negotiations and pricing
Agreeing and implementing ambitious regulatory measures to deliver on the targets of the IMO GHG Strategy, while considering pricing levers such as Emissions Trading Schemes.

R&D and Strategy
Accelerating commercial technologies for decarbonisation (UK SHORE). Bringing strategy and R&D together to meet Net Zero goals, aligning with Government missions on Growth and being a Clean Energy Superpower.

UK SHORE Programme 2022 - 2025

TRL 1-3
Early Concept

- Transport Research & Innovation Grants (TRIG) - **£1.2m**
- Clean Maritime Research Hub - **£3.7m**

TRL 3-6
Testing of concepts in lab conditions

- Clean Maritime Demonstration Competitions (round 2-5) - **£105.6m**
- Smart Shipping Acceleration Fund - **£8m**

TRL 7-9
Testing in real world environment

- Zero Emission Vessels and Infrastructure (ZEVI) - **£80m**

Evaluation plays a key role in **UK SHORE**, with an ongoing, independent evaluation providing findings on the processes and impacts of UK SHORE competitions, which will support the design of any future competitions and policy.

Partnering with Innovate UK, the Engineering and Physical Sciences Research Council (EPSRC), the Connected Places Catapult and the wider maritime sector.

Clean Maritime Demonstration Competition (CMDC)

The CMDC targets the **low to mid Technology Readiness Level (TRL) section** of the R&D pipeline, supporting development of clean maritime solutions towards to commercialisation.

The CMDC has allocated over **£129m DfT match-funding to 138 projects** across five rounds addressing technology challenges in electric, shore power, hydrogen, ammonia, methanol and wind technologies.

CMDC1	CMDC2	CMDC3	CMDC4	CMDC5
A precursor competition to the UK SHORE programme. **£23m** to **55** projects in September 2021.	**£12m** - DfT funding **31** pre-deployment trials and feasibility studies Jan 2023 – Aug 2023 Showcased during London International Shipping Week 2023.	**£60m** - DfT funding **19** demonstrations April 2023 – March 2025.	**£33m** - DfT funding **10** demonstrations, **13** pre-deployment trials and **11** feasibility studies April 2024 – March 2025.	**£1.5m** for feasibility studies examining Green Corridor routes between the UK and international partners (the Netherlands, Norway, Denmark and Ireland).

CMDC1-4 Project Distribution Map

Key Achievements and Impact

Launched **nine** competitions since April 2022

Allocated over **£200m** to over **175** projects

Leveraged **£100m** in private investment

Supported over **350** organisations, including **200** SMEs

Funding provided to all **12** regions of the UK

UK SHORE has already progressed projects from feasibility studies to demonstrations and deployment through our wide range of schemes across **T**echnological **R**eadiness **L**evels.

Clean Maritime Demonstration Competition (CMDC6)

Based on industry feedback on CMDC3 and 4, we know that there is still appetite for lower Technology Readiness Levels funding, as many technologies are not yet ready for full scale demonstrations.

CMDC6 will maintain the momentum generated through the UK SHORE programme, supporting technologies to develop towards commercialisation, and laying the groundwork for larger demonstration and deployment at scale in the future.

CMDC6, will allocate up to **£30m** for pre-deployment trials and feasibility studies in clean maritime solutions between September 2025 and March 2026.

Thank You

Updates from Innovate UK

James Lovett

Innovation Lead – Future Maritime Technologies

UKRI Innovate UK

UK SHORE

Advancing the UK towards a sustainable maritime future.

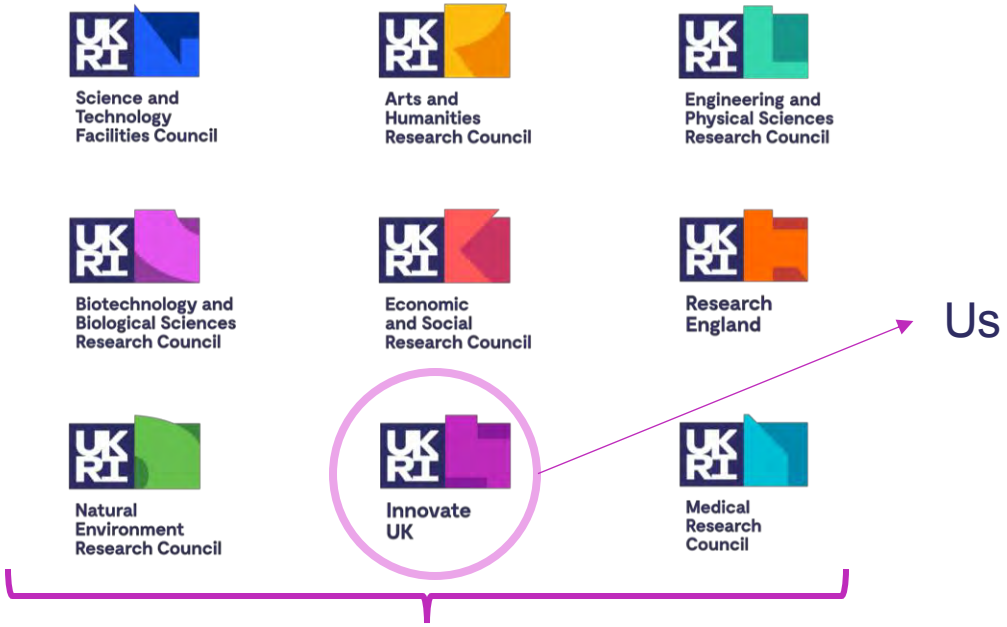
Innovate UK is part of UK Research and Innovation

- Launched in April 2018, UK Research and Innovation (UKRI) is a non-departmental public body sponsored by the Department for Science, Innovation and Technology (DSIT).
- Innovate UK existed prior to this, but now forms part of the nine councils which direct UK research and innovation funding.

Department for Science, Innovation, & Technology

UK Research and Innovation

- As part of the government's Spending Review UKRI submit an overview on how we plan to spend money to DSIT, which considers this within the department's overall spending plan that goes on to HM Treasury.
- UKRI also manages programmes on behalf of the department and delivers additional funding for other government departments.



- Our nine councils work together in innovative ways to deliver an ambitious agenda, drawing on our great depth and breadth of expertise and the enormous diversity of our portfolio

Innovate UK

Innovate UK is the UK's Innovation Agency

- Innovate UK works to drive innovation and productivity across the UK.
- Working with businesses, government, research, and the third sector (charities, social enterprises and voluntary groups), we provide facilities and a framework of funding, finance, support, and expertise to create the environments and opportunities for innovation to thrive.
- As an arm's length government body, we operate a 'cost recovery' model.

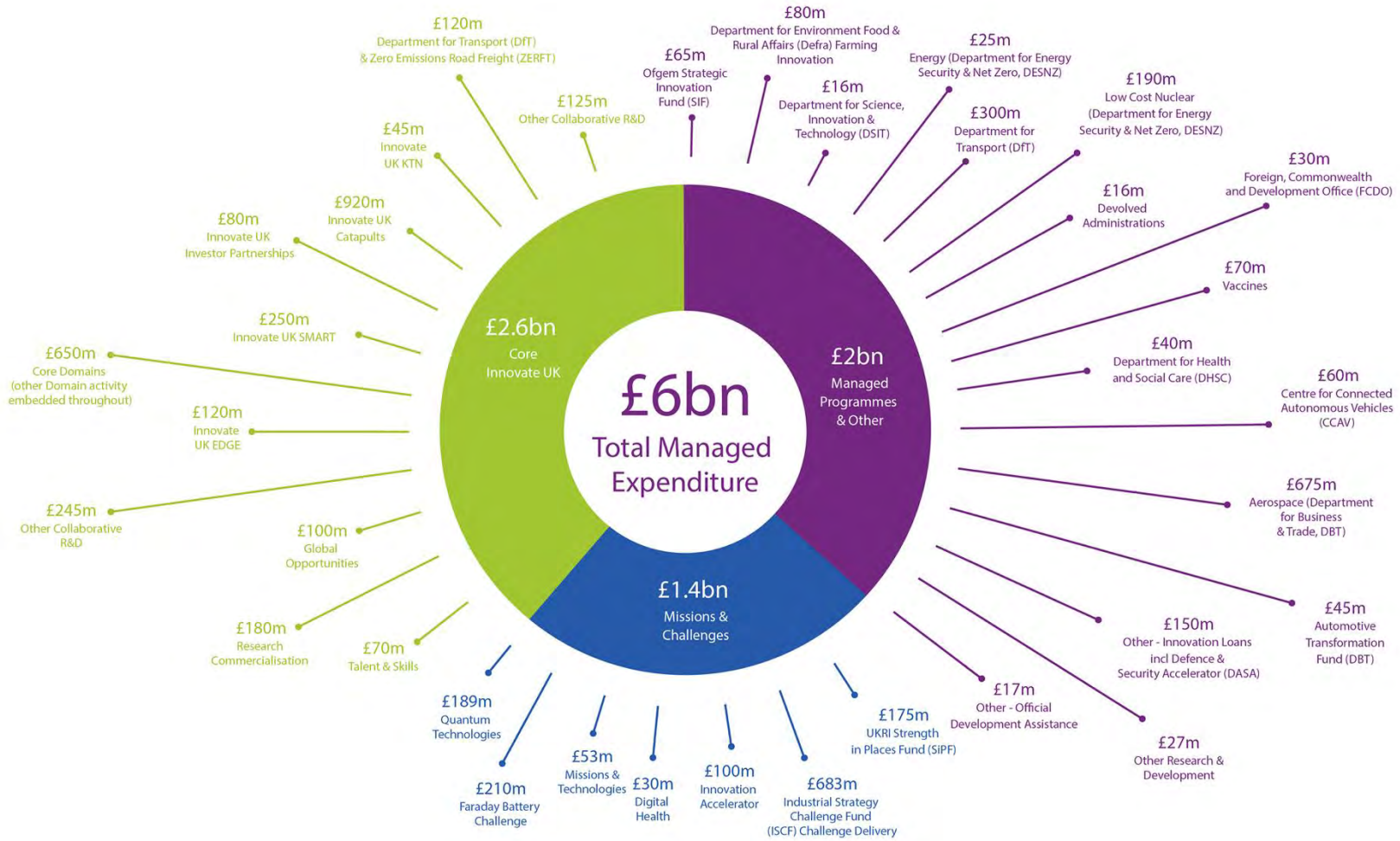
*Over a 7 year period.
**Based on our most recent independent evaluation

*Since 2007

*Considering wider impact on UK economy
**Excludes social impact

UKRI Innovate UK

Throughout 2022-2025 Innovate UK is investing over £6bn



We work across three main areas

We focus on achieving **net zero**, ensuring **healthy living and sustainable agriculture**, and leveraging **digital and technology**.

Working with partners, we are supporting regional development and international engagement, new skills and talent, and new collaborations.

Our world-class portfolio of products and services is evolving to meet the changing needs of businesses, research opportunities and communities.

UKRI Innovate UK

UK Transport Vision 2050 - Second Edition

Investing in the future of mobility

Scan to download the report

Innovate UK

Learn more about this significant report and download it
iuk.ktn-uk.org/perspectives/uk-transport-vision/

Key points for CMDC Round 6

- Innovate UK is a key delivery body for UK SHORE
- We are delivering CMDC Round 6
- The **£30m** funding is from the Department for Transport

Innovate UK

Department for Transport

UK SHORE technology and investment to date

Vessels

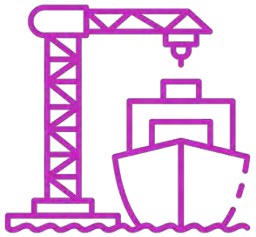
Ports and harbours

DfT investment

■ Total investment ■ Grant

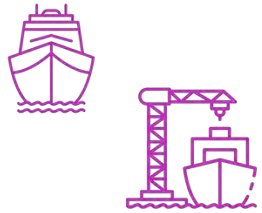
Vessel technology

£92m £63m



Infrastructure technology

£44m £30m



Vessel & Infrastructure system technology

£190m £132m

Smart shipping

~£11m £8m

Total

£337m

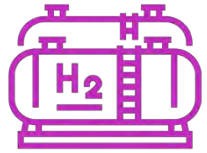
£233m

Innovate UK

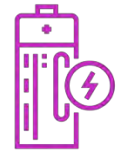
Department for Transport

- 179 funded projects
- 400 participants

Technology includes:

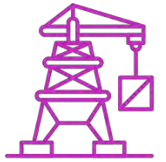


Alternative fuels

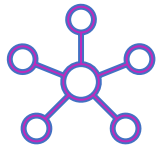


Battery and charging

Bunkering



Shoreside power



System innovation and green corridors

Autonomy and vessel / port efficiency

Maritime technology project locations

CMDC Case Study

Wind Propulsion Development and UK Manufacture Feasibility Study

Project Lead – GT Wings (gtgreentechnologies.com)

Partners – Manufacturing Technology Centre

Aims

- Accelerate the uptake of GT's Wingsail by global shipping end users and, working with MTC (High Value Manufacturing Catapult) to identify routes to manufacturing in the UK

- Initial research shows that the AirWing could reduce carbon emissions and fuel costs between 10% to 30% for retrofitted ships and up to 50% for new builds.

- GT Green Technologies are now installing their technology on a vessel, ready for at-sea demonstration

CMDC Case Study

Offshore wind on-turbine electrical vessel charging system

Project Lead MJR Power and Automation
(www.mjrpower.com)

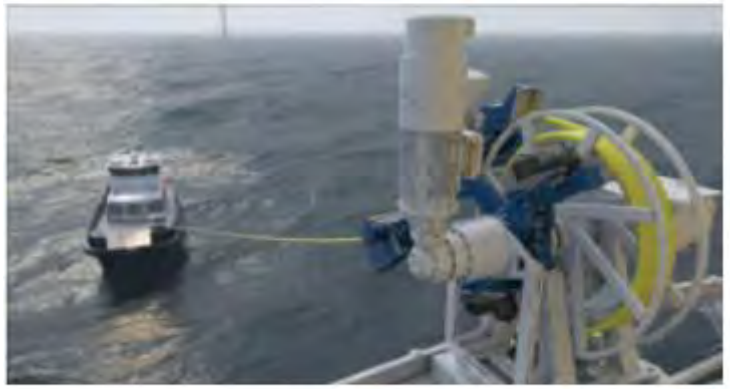
Aims

- Installing electric vessel chargepoints on an offshore wind turbine
- Remove barrier to vessel electrification
- Enable 10-20% reduction of lifecycle emissions of a wind farm project

Achievements

- Designed, built and tested a charging system that uses the infrastructure already in place on a turbine platform

- MJR have successfully demonstrated their technology at an offshore windfarm



Top - charging system in factory. Middle and bottom - computer renders of charging system in situ on wind turbine

Other support opportunities

Innovate UK

Upcoming international opportunity

Global Business Innovation Programme (GBIP) to United States focussed on Maritime Infastructure

- Funded by DfT, delivered by Innovate UK and Innovate UK Business Growth
- Intensive 3-stage GBIP will support 15 ambitious UK companies to get ready for the market, visit the U.S. to meet the country's leading innovators and explore innovation collaborations.
- For **port and infrastructure** technology innovators, digital and physical
- Applications will open later this week and close towards **end of February**
- In-market visit at **start of April**

Link to briefing event on 7 Feb

Horizon Europe – Zero Emission Waterborne Transport (ZEWT)

- UK is fully eligible to take part and be funded by the EU (we are an Associated Country)
- 8 Competitions, sharing €76m opening May 2025 for September 2025 submission deadline
- Not yet published but very early draft available
- Must be an international consortium of at least three different entities from three different eligible countries
- Competition scope has been drafted by members of the ZEWT Co-Programmed Partnership – you can join and be part of the team writing next year's competition scope AND be part of the team that delivers the projects
- Contact Louise.Mothersole@iuk.ukri.org (Horizon Europe UK National Contact Point for Mobility) for more details

UKRI Innovate UK

WATERBORNE

Clean Maritime Demonstration Competition
Round 6

Innovate UK

Welcome and Introductions

Jamie-lee Baker

Competition Manager, Competitions Team

James Lovett

Innovation Lead, Maritime

UKRI Innovate UK

Agenda

- Key Dates
- Competition Summary & Scope
- Eligibility Criteria
- Innovation Funding Service (IFS)
- Funding Rules
- Assessment
- Use of AI
- Additional Support

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Key Dates

Timeline	Dates
Competition Opens	**24-01-2025**
Submission Deadline	**16-04-2025 11am**
Applicants informed	**02-06-2025 by 5pm**
Project start and end dates	**Start by: 01-09-2025** **Finish by: 31-03-2026**

UKRI Innovate UK

Competition Summary & Scope

Innovate UK

Summary

Innovate UK, part of UK Research and Innovation, will work with the Department for Transport to invest up to **£30 million** in innovation projects to reduce greenhouse gas emissions from shipping.

These will be to carry out **innovative pre-deployment trials and feasibility studies** into clean maritime and Smart Shipping technologies that reduce greenhouse gas emissions and improve air quality.

UKRI Innovate UK

Important

If you are unsure about anything in this competition, always reach out to support@iuk.ukri.org

Innovate UK

Important - Strands

This competition has 3 strands:

Strand 1 – Pre-deployment trials

Strand 2 – Feasibility Studies

Strand 3 – Smart Shipping

If you are unsure which Strand to apply to, please email support@iuk.ukri.org

Innovate UK

Important – end date

Projects must end by **31 March 2026.**

This is a hard deadline due to budgetary constraints.

There will be no extensions so always be realistic with your project timelines.

Innovate UK

Important – end users

Projects must include at least **one representative end user** such as a vessel operator, port or harbour authority: the end user must show clear commitment to the project.

If there is no clear end user included**, the application will be out of scope.**

Innovate UK

Important - regulation

Projects must not plan to test technologies in the water as part of this competition.

Projects must still detail their plan for compliance with regulation and how they will work with relevant regulatory bodies for novel technologies.

Innovate UK

Important – new scope additions

For Strand 1 and Strand 2, the following are specifically in scope:

- retrofit readiness to accommodate future clean maritime technologies
- type approval of novel on-vessel equipment

Fishing and aquaculture vessels are specifically in scope of all strands

Training and skills feasibility studies are in scope of Strands 2 and 3

Innovate UK

Strand 1 – Pre-deployment Trials summary

The aim of Strand 1 is to fund **pre-deployment testing** of clean maritime technologies, without a focus on Smart Shipping.

Your proposal must design, develop and test novel clean maritime technologies focused for on-vessel technologies, infrastructure technologies or both.

UKRI Innovate UK

Strand 2 – Feasibility studies summary

The aim of Strand 2 is to fund **feasibility studies** of clean maritime technologies and skills without a focus on Smart Shipping.

Your project must undertake a technical and economic feasibility study associated with the development and real world demonstration of on-vessel technologies, infrastructure technologies, skills or a combination of each.

Innovate UK

Strand 3 – Smart Shipping summary

The aim of Strand 3 is to fund detailed **feasibility studies and pre-deployment projects** focused on using **digital technologies** to contribute to the reduction of greenhouse gas emissions and improve air quality in the maritime transport sector.

Your project must conduct either a technical and economic feasibility study or a pre-deployment project based on Smart Shipping technologies.

UKRI Innovate UK

All Strands requirements

Your project must:

- demonstrate a significant reduction in greenhouse gas emissions or air pollutants from the maritime transport sector
- underpin a future demonstration by delivering a meaningful technology, route to market, supply chain innovation, or, for Strands 2 and 3 only, skills initiative
- achieve market potential through a clear strategy for commercialising the technology and the products, demonstrating the potential for significant value to the UK
- include at least one representative end user such as a vessel operator, port or harbour authority: the end user must show clear commitment to the project
- bring together a team with the necessary expertise and experience to successfully deliver the project objectives

UKRI Innovate UK

All Strands deliverables

Please review the competition brief pages for what you must deliver by the end of your project.

This includes:

- detailed plans and resources required for future demonstrations
- quantifying lifecycle emissions and economic impacts in the future
- disseminating and sharing results
- detail of the barriers to market adoption

UKRI Innovate UK

All Strands types of vessel

Technologies for all sizes and categories of maritime vessel subject to the Merchant Shipping Act 1995 are in scope. Solutions can be suitable for one target size of vessel or multiple. Pleasure, commercial, fishing and aquaculture vessels are in scope.

Where your project intends to utilise a vessel, the vessel is expected to be a United Kingdom Ship, otherwise you must provide justification for use of a non-United Kingdom Ship in your application. United Kingdom Ship is defined in 85(2) of the Merchant Shipping Act 1995.

All Strands types of vessel

All ports and harbours are in scope, including infrastructure for freight, passenger, pleasure and commercial vessels. Offshore infrastructure is also in scope, such as wind farms.

All Strands previous applications

We encourage new projects and consortia that have not been part of previous rounds of the Clean Maritime Demonstration Competition (CMDC). You are not required to have been successful in previous rounds of the CMDCs to apply with an eligible project to Round 6.

Once your project is completed, you are expected to be at the point that you are investment and construction ready to fully demonstrate the solution and take it to market.

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All Strands portfolio approach

We want to fund a variety of projects across different technologies, markets, technological maturities, themes and locations. We call this a portfolio approach.

Innovate UK

Strand 2 and 3 only – Training and Skills feasibility studies

If your proposal focusses on clean maritime training and skills, you must focus on the vocational or technical training infrastructure requirements to train the clean maritime design, manufacturing, maintenance or operational workforce.

Your clean maritime training and skills project must demonstrate:

- an ambitious and realistic idea, to meet a significant talent requirement for innovative clean maritime technology
- a clear focus on skills for significantly reducing emissions in the maritime sector
- that it is novel to the UK, a region or a specific group of people
- value for money and a credible, evidenced return on investment, in terms of trained, upskilled and reskilled people

Strand 2 only

Green shipping corridor projects

If your proposal focusses on a green shipping corridor, you must assess and develop a clear implementation plan for the real-world establishment of the corridor. To qualify as a corridor, plan for at least one zero-emission (well to wake) vessel to be transiting the route.

Both UK domestic and international green shipping corridors are in scope for this strand.

Please see the competition brief page for Strand 2 for more detail on deliverables for green shipping corridor projects.

Scope themes – Strand 1 and 2

Innovate UK

Strand 1 and 2 only

Prioritised themes:

- International ferries
- Vessels greater than 24 metres in length
- Ammonia solutions

Innovate UK

Strand 1 and 2 only

Vessel low and zero emission technologies:

- retrofit readiness to accommodate future clean maritime technologies
- vessel propulsion and auxiliary engines, for example: batteries, fuel cells, and internal combustion engines using low or zero carbon alternative fuels such as hydrogen, methanol, ammonia or multi-fuel combinations
- wind propulsion, including soft-sail, fixed-sail, rotor, kite and turbine technologies, targeting a range of ship types from small vessels to large cargo carriers, both as primary and auxiliary propulsion

UKRI Innovate UK

Strand 1 and 2 only

(continued) Vessel low and zero emission technologies:

- low carbon energy storage and management
- physical connections to shoreside power or alternative fuels, including fuelling lines
- enabling technologies such as motors, drives, sensor and power electronics
- energy efficiency technologies, where they significantly enhance the vessel range or lower alternative fuel usage to enable the fuel's viability
- type approval of novel on-vessel equipment

UKRI Innovate UK

Strand 1 and 2 only

Important note about battery electric vessel projects:

Projects developing **battery electric solutions for vessels 24 meters or less** need to show clearly how their project is novel and how it addresses limitations with existing electric vessel solutions. Applications for battery electric solutions that are not novel or innovative will not be sent for assessment.

Battery electric applicants are encouraged to contact support@iuk.ukri.org at least 10 working days before the competition closes to check whether your application is in scope.

Innovate UK

Strand 1 and 2 only

Infrastructure technologies including offshore solutions:

- shoreside storage and bunkering of low and zero carbon fuel
- charging infrastructure and management for electric vessels
- shore power solutions, such as enabling docked vessels to turn off their conventional power supply for ancillary systems
- physical connections to shoreside power or alternative fuels, including fuelling lines

UKRI Innovate UK

Strand 1 and 2 only

(continued) Infrastructure technologies including offshore solutions:

- shoreside renewable energy generation at the port to supply vessels
- low carbon fuel production, such as hydrogen, methanol, ammonia
- zero emission infrastructure, including stationary assets for freight handling and port operations within a port or harbour site
- zero emission offshore infrastructure for wind, oil and gas farms that support zero or low emission vessels

UKRI Innovate UK

Strand 1 and 2 only

Important note about infrastructure technologies

Projects focused on **shore power technology** need to show clearly how their project is novel and how it addresses limitations with existing shore power solutions.

Applications for shore power solutions that are not novel or innovative will not be sent for assessment.

Shore power applicants are encouraged to contact support@iuk.ukri.org at least 10 working days before the competition closes to check whether your application is in scope.

UKRI Innovate UK

Strand 2 only

Strand 2 other themes:

- Domestic and international green shipping corridors
- Clean maritime training and skills initiatives

Innovate UK

Strand 1 and 2 only

Projects we will not fund:

We are not funding projects that are:

- focusing on Smart Shipping, these technologies are in scope of Strand 3
- focusing only on increasing the efficiency of current conventional fossil fuels and fossil fuel powertrains of maritime vessels
- focusing on marine conservation and ecology
- focusing on on-vessel power generation to reduce greenhouse gases (GHG's), for example wind turbines and solar panels
- focusing on non-methanol biofuels, except for projects strictly focused on inland waterway vessels and Non-Road Mobile Machinery (NRMM), which includes port-side machinery
- focusing on Personal Watercraft (PWC)

UKRI Innovate UK

Strand 1 and 2 only

(continued) Projects we will not fund:

- focusing on the use and production of synthetic fuels, note: this exclusion does not apply to methanol, ammonia and hydrogen fuels
- focusing on submarines and submersible vessels
- focusing on military applications
- covered by existing commercial agreements to deliver the proposed solutions
- a duplicate of existing innovation

We cannot fund projects that are:

- dependent on export performance, for example, giving a subsidy to a baker on the condition that it exports a certain quantity of bread to another country
- dependent on domestic inputs usage, for example, giving a subsidy to a baker on the condition that it uses 50% UK flour in their product

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Scope themes – Strand 3

Innovate UK

Strand 3 only

Your project can focus on one or more of the following maritime transport themes:

- maintenance and inspection within the maritime transport sector
- improvements in port operations
- vessel design optimisation
- Smart Shipping safety and skills
- vessel operations optimisation
- vessel route-planning and scheduling for efficiency
- interaction with other transport modes, maritime being the clear focus
- assurance systems including establishing processes, measurements, systems and risk based approaches to assure the safety and operational competence of Smart Shipping systems

UKRI Innovate UK

Strand 3 only

In addition, one or more of the following Smart Shipping areas must be a core part of the proposed work:

- data: including using data captured in a novel way or as part of an innovative approach, solution or product
- Artificial Intelligence (AI): including the use of AI either as new AI development, or as a novel application of existing AI
- automated systems: including the development of automated solutions, both hardware and software
- connectivity and Position Navigation and Timing (PNT): including innovative use of telecommunications systems such as future networks, hybrid network systems and satellite networks. Innovative PNT devices and solutions, including quantum technology.
- Quantum Computing (QC): including using QC to improve existing solutions, products or to develop a new QC approach or solution
- sensing or monitoring solutions: including the use of innovative devices and systems to provide sensing capability or the ability to monitor a system or vessel, this includes quantum technologies
- digital twins: including creating digital models of real world systems or objects enabling bi-directional feedback

Strand 3 only

We are not funding projects that are:

- focusing on non-Smart Shipping technologies or skills
- focusing only on fossil fuel powertrains of maritime vessels
- focusing on marine conservation and ecology
- focusing on on-vessel power generation to reduce greenhouse gases (GHG's), for example, wind turbines and solar panels
- focusing on non-methanol biofuels, except for projects strictly focused on inland waterway vessels and Non-Road Mobile Machinery (NRMM), which includes port-side machinery
- focusing on nuclear technologies
- focusing on Personal Watercraft (PWC)
- focusing on the use and production of synthetic fuels, note: this exclusion does not apply to methanol, ammonia and hydrogen fuels
- focusing on submarines and submersible vessels
- focusing on military applications
- covered by existing commercial agreements to deliver the proposed solutions
- a duplicate of existing innovation

UKRI Innovate UK

Eligibility criteria

UKRI Innovate UK

Eligibility Criteria – Your Project

Strand 1: Clean Maritime Demonstration Competition 6: Pre-deployment trials

Your project must:

- have total costs of between £100,000 and £2 million
- intend to exploit the results from or in the UK
- start by 1 September 2025
- end by 31 March 2026

Strand 2: Clean Maritime Demonstration Competition 6: Feasibility Studies

Your project must:

- have total costs between £75,000 and £1 million
- intend to exploit the results from or in the UK
- start by 1 September 2025
- end by 31 March 2026

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Eligibility Criteria – Your Project

Strand 3: Clean Maritime Demonstration Competition 6: Smart Shipping

Your project must:

- have total costs between £75,000 and £1 million
- intend to exploit the results from or in the UK
- start by 1 September 2025
- end by 31 March 2026

Innovate UK

Eligibility Criteria – Lead Organisation

This is relevant for all 3 strands

To lead a project your organisation must:

- be a UK registered business of any size
- collaborate with other UK registered organisations

More information on the different types of organisation can be found in our Funding rules.

Academic institutions cannot lead or work alone.

Trust ports and Municipal ports will be treated as businesses.

Innovate UK

Eligibility Criteria – Project Team

This is relevant for all 3 strands

To collaborate with the lead, your organisation must be one of the following UK registered:

- business of any size
- academic institution
- charity
- not for profit
- public sector organisation
- research and technology organisation (RTO)

Each partner organisation must be invited into the Innovation Funding Service (IFS) by the lead to collaborate on a project. Once partners have accepted the invitation, they will be asked to login or to create an account in the IFS. They are responsible for entering their own project costs and completing their Project Impact questions in the application.

To be an eligible collaboration, the lead and at least one other organisation must apply for funding when entering their costs into the application.

UKRI Innovate UK

Eligibility Criteria – Partners/Subcontractors

Non-funded partners
Your project can include non-UK partners, including partners based in the EU, who bring their own funding. Non-UK partners are permitted to carry out project work from within their home countries and exploit results overseas. Their costs will count towards the total eligible project costs.

Subcontractors
Subcontractors **are** allowed in this competition.

Subcontractors can be from anywhere in the UK and you must select them through your usual procurement process. You can use subcontractors from overseas but must make the case in your application as to why you cannot use subcontractors from the UK.

You must provide a detailed rationale, evidence of the potential UK contractors you approached and the reasons why they were unable to work with you. We will not accept a cheaper cost as a sufficient reason to use an overseas subcontractor.

All subcontractor costs must be justified and appropriate to the total project costs.

Eligibility Criteria – Number of applications

Number of applications

- A business can only lead on **one application across all three strands** of this competition.
- If leading an application, a business can also be included as a collaborator in two further applications across all three strands of this competition.
- If a business is not leading any application, it can collaborate in any number of applications.
- Other organisations can collaborate on any number of applications.
- If you are involved in more than one application, you must clearly state how all projects can be resourced and delivered if successful.
- If Innovate UK have concerns about your ability to deliver multiple projects successfully, we reserve the right to award funding based on evidence of capacity to manage them.
- If you are involved in other Innovate UK funded projects, you must show you have the resources in place to deliver further projects funded by this competition.

UKRI Innovate UK

Previously submitted applications

This competition **does** allow you to submit a previously submitted application.

Previously submitted application	Not a Previously submitted application
A previously submitted application is an application Innovate UK judges as not materially different from one you have submitted before (but it can be updated based on the assessors' feedback). If you have previously submitted an application that reached our assessment stage, you can re-apply once more with the same proposal.	A brand-new application, project or idea that you have not previously submitted into an Innovate UK competition. or A previously submitted or ineligible application which: • has been updated based on assessor feedback • and is materially different from the application submitted before • and fits with the scope of this competition

UKRI Innovate UK

Innovation Funding Service (IFS)

How to apply

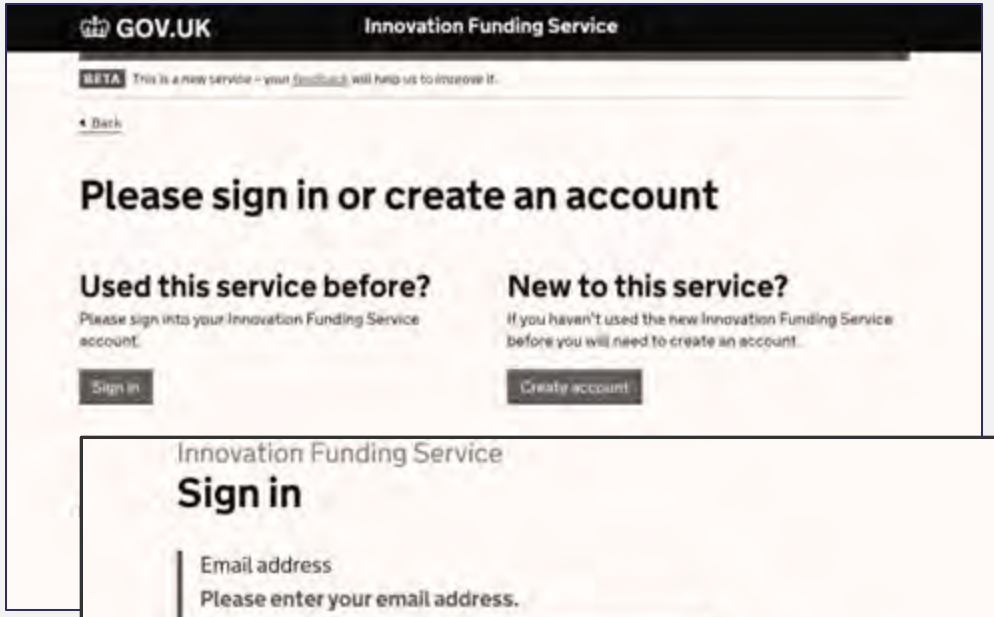
The lead applicant must create an account:

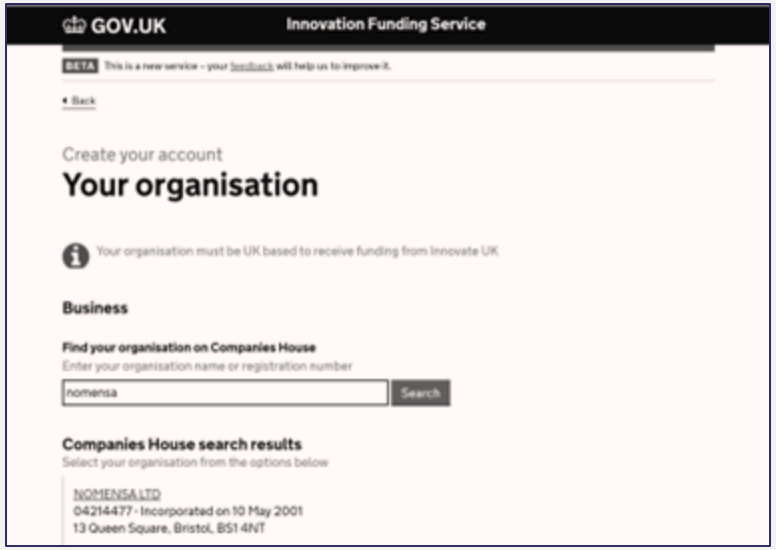
UK registered businesses

Use Companies House lookup as it speeds up our checks by providing your company number. You are unable to enter this at a later date.

Research organisations, academics and universities

To avoid being listed as a business and to ensure you receive the correct funding, enter your information manually on IFS





Innovate UK

Application Questions

Detailed guidance available on IFS

Application Form		Word Count	Appendix inc. number of pages
Question 1	Applicant location (not scored)	400	No
Question 2	Animal testing (not scored)	Multiple choice	No
Question 3	Permits and licences (not scored)	Multiple choice	No
Question 4	Need or challenge	600	No
Question 5	Approach and innovation	600	Yes- optional (up to 2 a4 pages)
Question 6	Team and resources	400	Yes- optional (up to 2 a4 pages)
Question 7	Market awareness	400	No
Question 8	Outcomes and route to market	600	No
Question 9	Wider impacts	400	No
Question 10	Project management	600	Yes – mandatory (up to 2 a4 pages)
Question 11	Risks	400	Yes – mandatory (up to 2 a4 pages)
Question 12	Knowledge sharing and clean maritime market development	400	No
Question 13	Added value	400	No
Question 14	Costs and value for money	400	No

Project Impact questions

- Each organisation in your application will complete the Project Impact questions within the ‘Supporting information’ section
- The Project Impact questions ask for data about your business and innovation and its contribution to the UK economy, society, and the environment
- Visit the Project Impact guidance page for more information, the types of questions you will be asked and how to get further support
- By providing this data, you are enabling us to better understand the impact of our support. It will help us identify success stories and provide evidence to government and the public of the value of supporting innovative businesses

For more information:

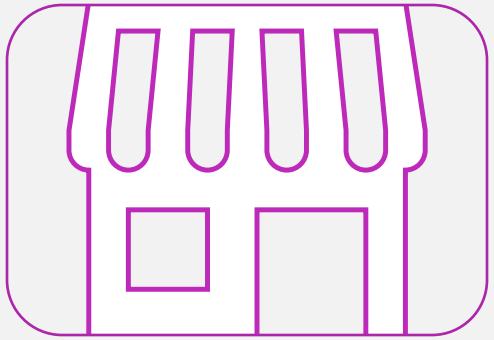
- Watch Our Impact Management Framework video
- How is the Project Impact data collected? video

UKRI Innovate UK

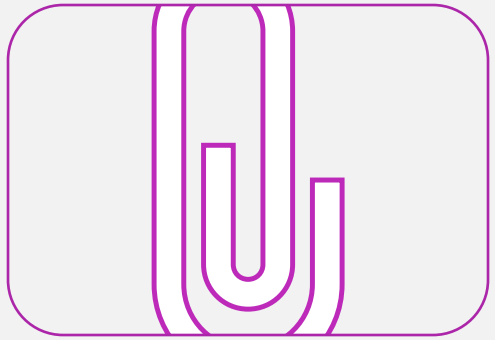
Your Project Cost Categories

View our Application Finances Instructional Video

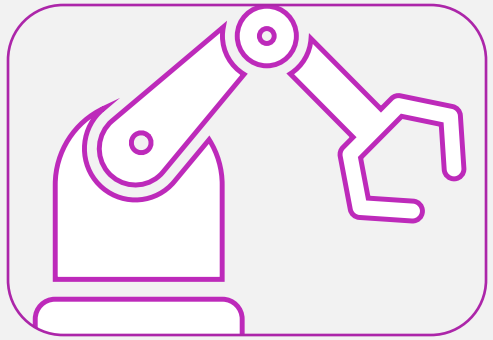
Labour



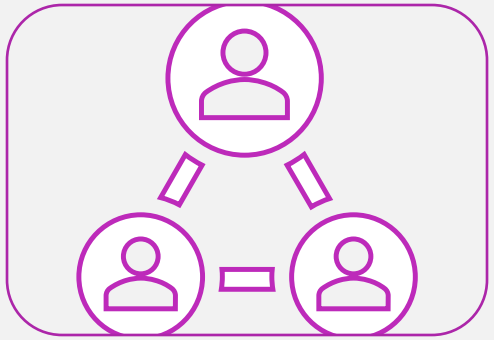
Overheads



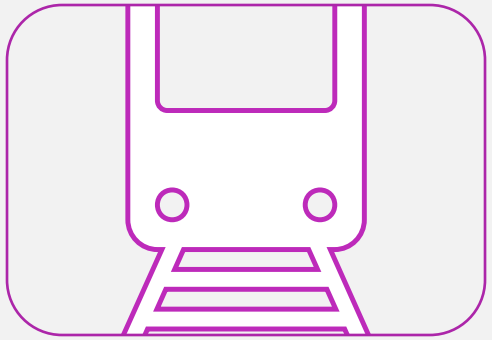
Materials



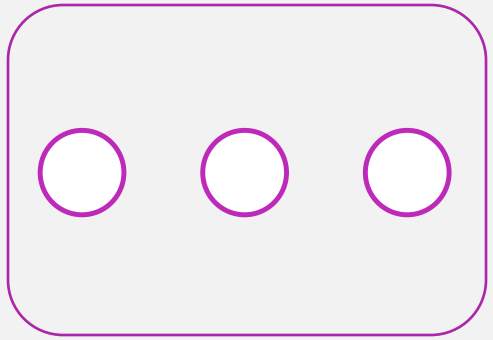
Capital Usage



Subcontractors



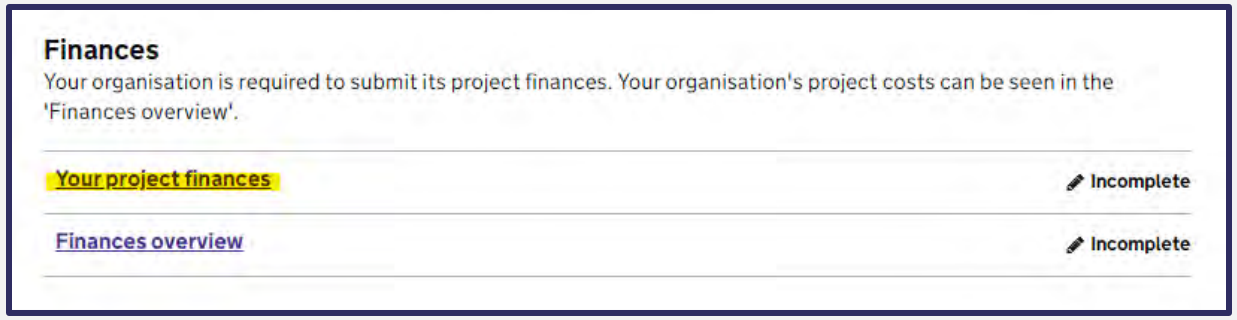
Travel & Subsistence

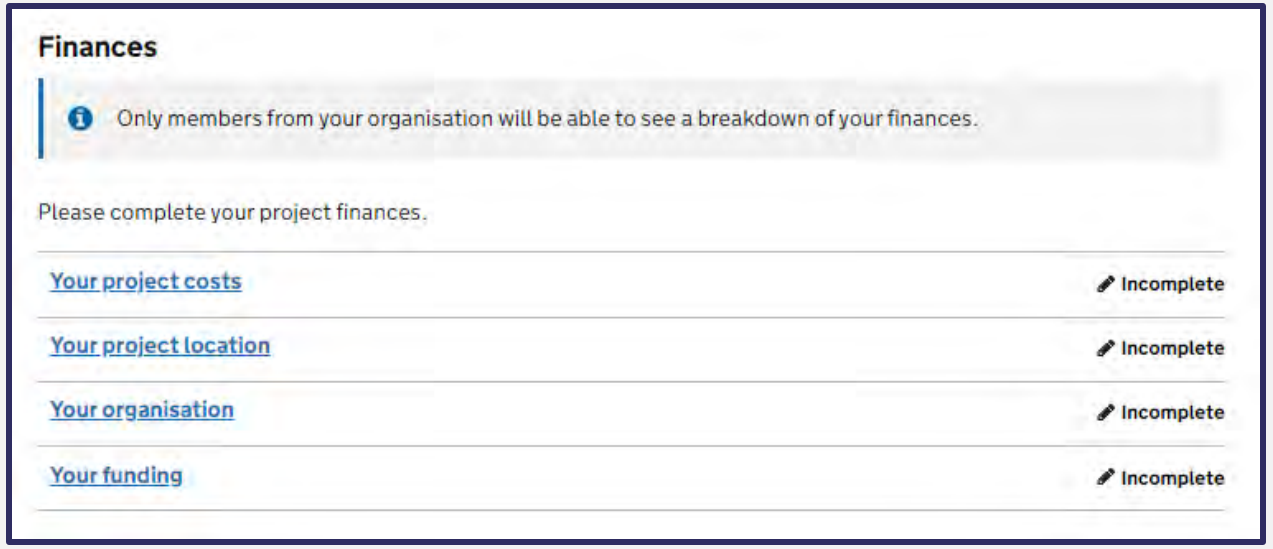


Other

Innovate UK

Your project finances





Your project costs
Add your project costs by category – refer to previous slide for link to instructional video

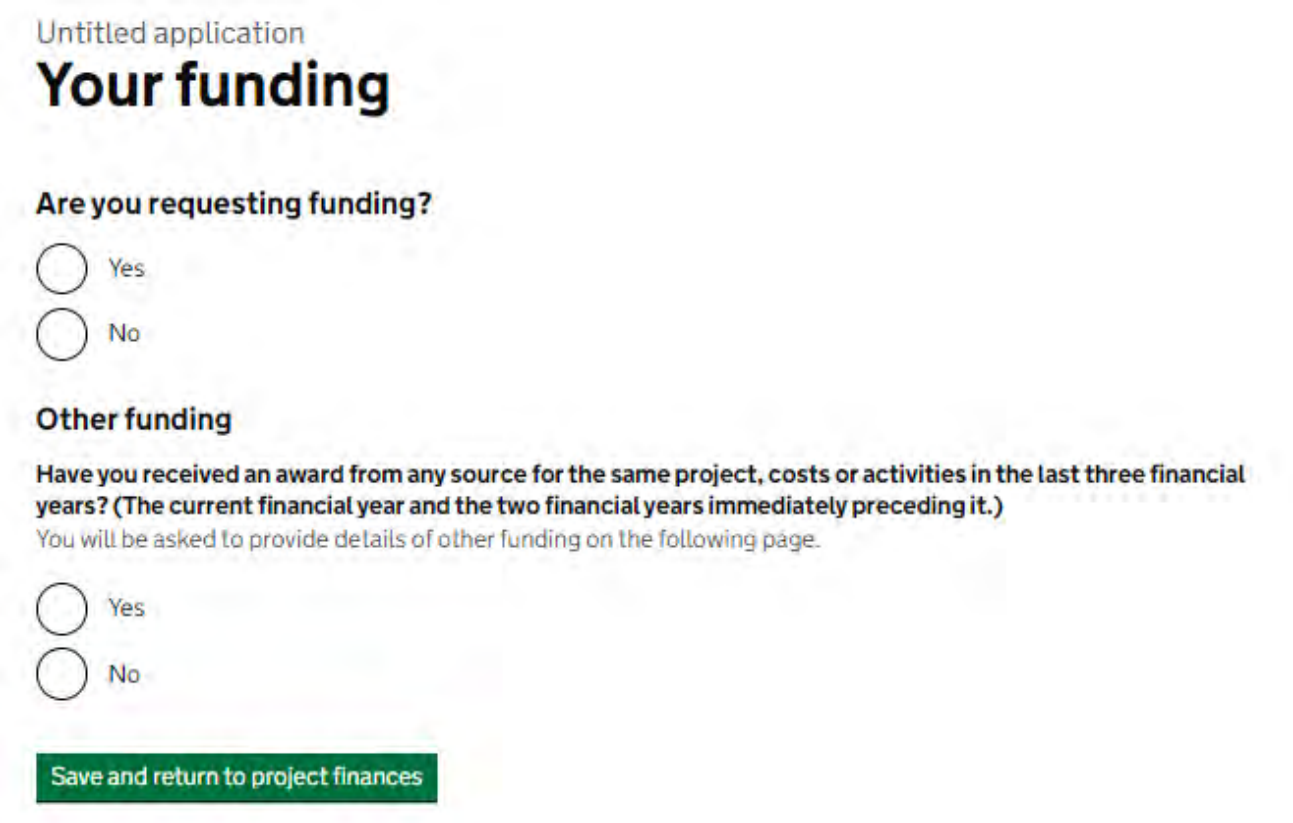
Your project location
Enter postcode for where most of the project work will take place.

Your organisation
Add details of your organisation including size, turnover and number of employees

Your funding
Include your funding level percentage according to the competition's funding rules. Only declare Other Public Sector Funding here if you have previously received public money for **exactly** the same activities

UKRI Innovate UK

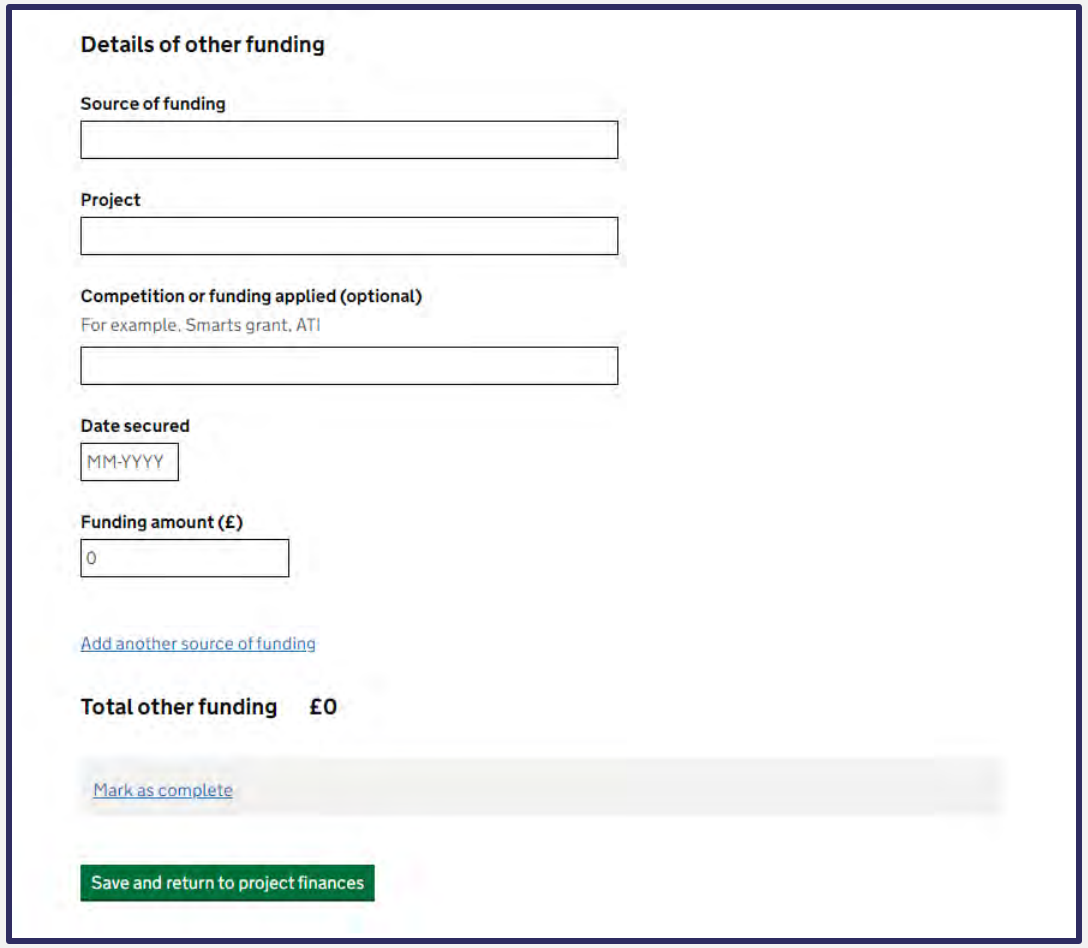
Your funding

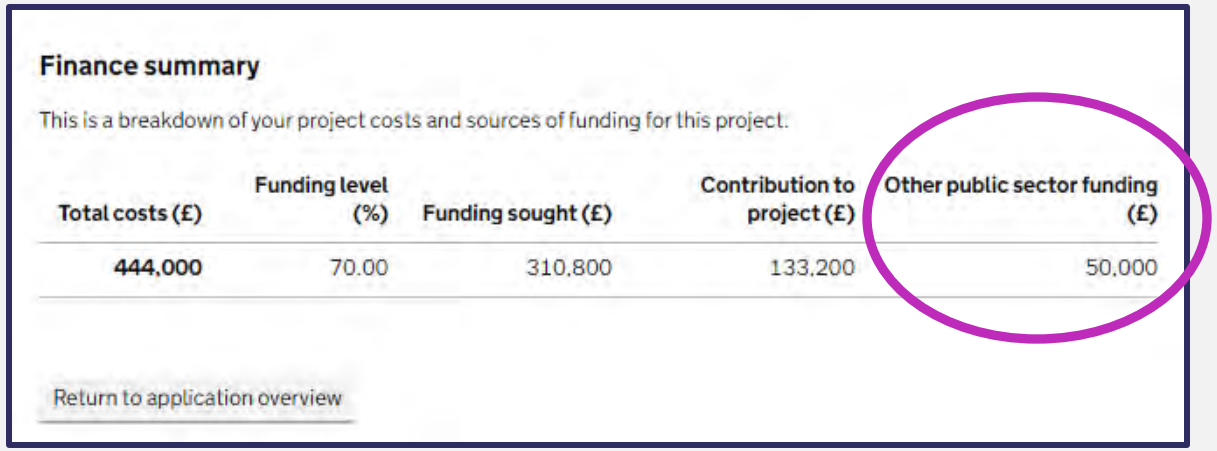


- Other funding - answer Yes if you have received funding FOR THE SAME project activities. We cannot fund the same project activities twice.
- Anything that you declare in the Other funding field will be deducted from your Funding sought total.
- This will NOT be visible to you in the Finance Summary in IFS.

Innovate UK

Your funding





IMPORTANT:

Above is an example of the Finance summary.
If you declare Other public sector funding, as circled in purple, it does not deduct from your Funding sought total in IFS.

However, this amount will be deducted from your funding request by Innovate UK and may make you ineligible.

UKRI Innovate UK

Checking your finances are complete

Finances summary

These organisations have not marked their finances as complete:

- Ludlow
- EGGS

This application cannot be submitted until all items in the finances section have been marked as complete by all partners.

		Total costs (£)	Funding level (%)	Funding sought (£)	Contribution to project (£)	Other public sector funding (£)
Empire Ltd Lead organisation	✔	**200,903**	30.00	57,803	140,632	2,468
Ludlow Partner	⚠	**200,903**	30.00	57,803	140,632	2,468
EGGS Partner	⚠	**990**	100.00	990	0	0
Total	⚠	**£402,796**		116,596	281,264	4,936

The lead must ensure that all partners have marked their finances as complete.

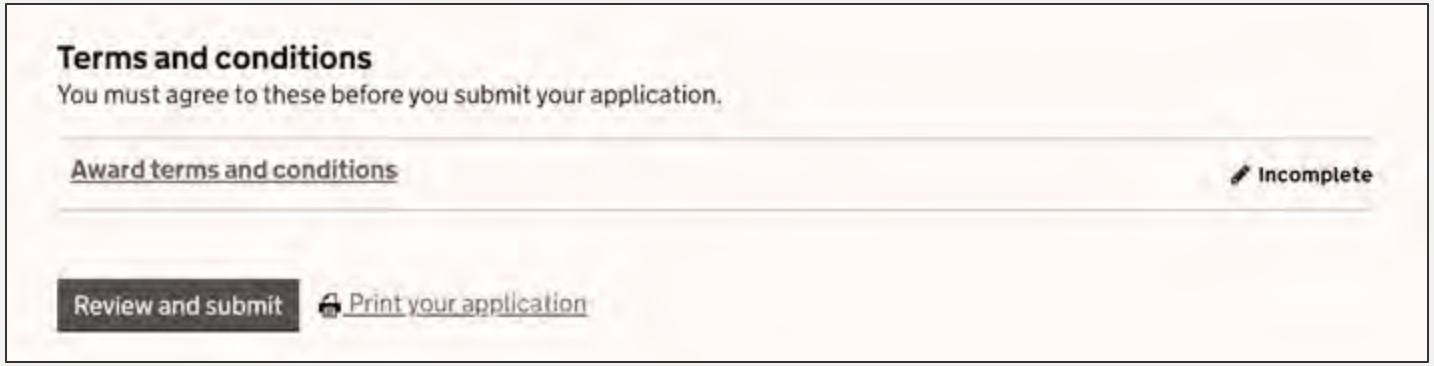
Research organisation participation is no greater than 30% of the total project costs for strand 1 and 50% for strands 2 and 3.

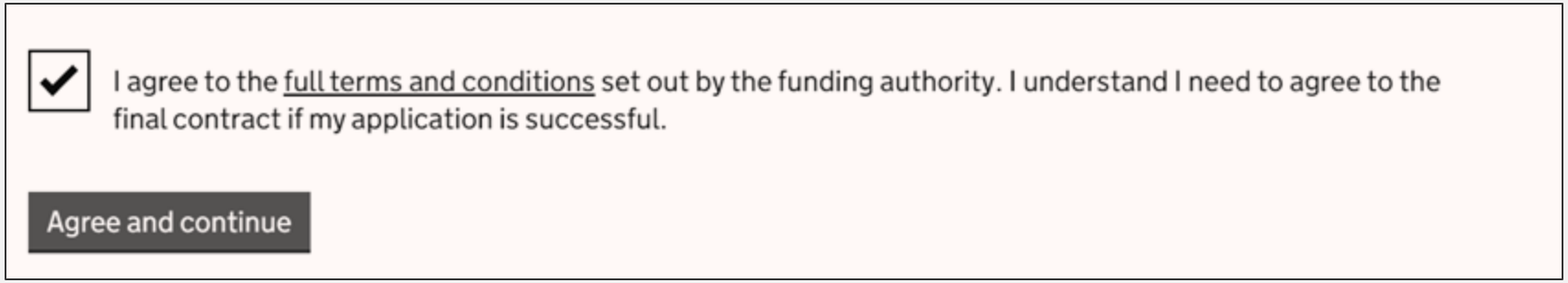
IFS DOES NOT VALIDATE TOTAL PROJECT COSTS

UKRI Innovate UK

Terms and Conditions

Before you can submit your application, **all** organisations in an application must agree to the draft terms and conditions for this competition. Please ensure you share the T&Cs with your legal team at the earliest possible opportunity.



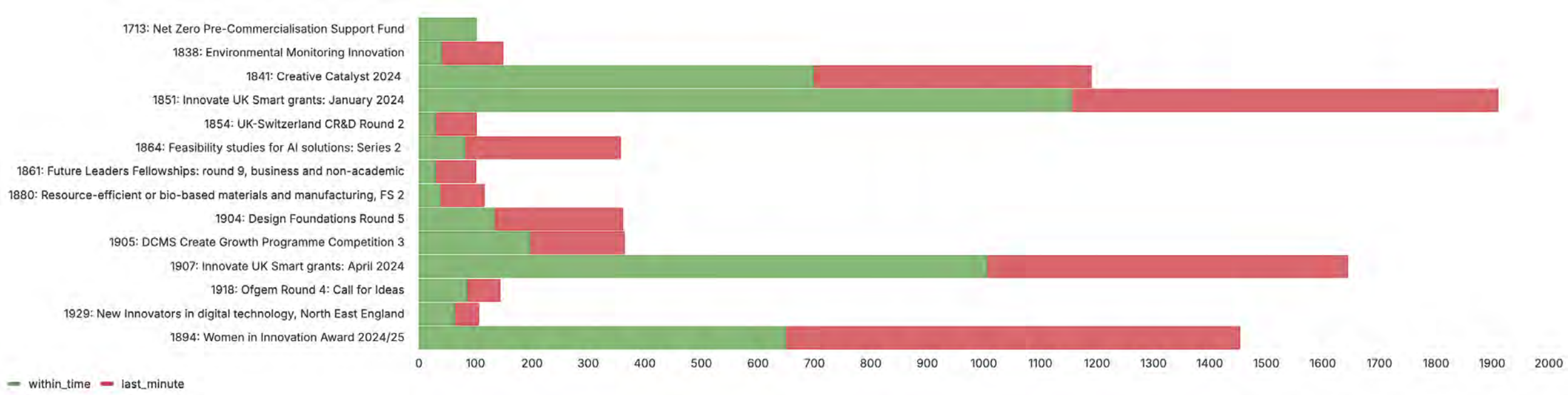


Innovate UK

Submitting your application

Customer Support can help resolve any issues you might have when submitting **but only if they are contacted before the deadline**.

Once the deadline has passed, your application cannot be submitted.



Innovate UK

Pros & Cons of using AI to support you

With the advances in AI technology, it is only natural to use technology to support you in applying to our competitions. Whilst we don't recommend or advise against it, we would like to make you aware of the following which could potentially impact your project.

Pros

- Removes barriers for people with disabilities and non-English speakers
- Allows you to rephrase your content to meet the word count in a question
- Ensures all aspects of a question are answered
- Can aid a better understanding of:
  - intended/wider market
  - best practice in project management
  - complementary technologies and advances in the industry
  - expected project impacts

Cons

- It is not always accurate in its assumptions and can get things wrong
- AI learns from the information you give it as well as what it has already learnt
- May provide a generic response meaning your application could use similar phrasing to others
- AI can be detected as non-human as it lacks expression and insight because it relies on logic to summarise information based on the question asked

Whilst AI offers many benefits, it is important you are aware that **you are potentially sharing your idea with the world,** so be careful what you share as you have no control over how it is shared on once you do.

UKRI Innovate UK

Funding Rules

UKRI Innovate UK

Other Innovate UK projects

If you have an outstanding final claim or Independent Accountant Report (IAR) on a live Innovate UK project, you will not be eligible to apply to this competition, as a lead or a partner organisation.

We will not award you any further funding if you:

- applied to a previous competition as the lead or sole company and were awarded funding by Innovate UK, but did not make a substantial effort to exploit that award
- applied to a previous competition as the lead or sole company and failed to comply with grant terms and conditions.

UKRI Innovate UK

Compliance with the UK Subsidy Control Regime

On 4th January 2023, the Subsidy Control Act 2022 came into effect.

This provides a framework for public authorities to design and award subsidies in a compliant way, whilst minimising any negative effects of subsidies both within the UK and Internationally.

Innovate UK offers funding in line with the UK's obligations and commitments to Subsidy Control. To ensure that Innovate UK remains compliant with the UK's international Subsidy Control duties in respect of:

- the EU-UK Trade and Cooperation Agreement;
- the subsidy control act 2022
- Article 10 of the Windsor Framework (successful applicants which are affected by the Windsor Framework will be funded in line with EU State aid regulations)
- Article 138 of the Withdrawal Agreement (some Union law applicable after 31 December 2020 in relation to the UK's participation in Union programmes and activities)
- the Subsidies and Countervailing measures within the WTO (ASCM)
- any other Free Trade Agreements active at the time of award

All awards will be conditional on compliance at all times with the UK's international obligations on Subsidy Control - this will be reflected in the terms and conditions of any award.

UKRI Innovate UK

Subsidy Control (and State aid where relevant)

The Subsidy Control Act 2022 definition of a ‘subsidy’ means financial assistance which:

1. is given by a public authority. This can be at any level: central, devolved, regional or local government or a public body.

2. makes a contribution (this could be a financial or an in-kind contribution) to an enterprise, conferring an economic advantage that is not available on market terms.

3. affects international trade.

For awards made from 4 January 2023, the majority are subject to Subsidy Control Act 2022. EU State aid rules now only apply in certain limited circumstances.

Financial viability and eligibility
Innovate UK is unable to award funding to organisations that are considered to be in financial difficulty. All applicant organisations are subjected to financial viability and eligibility checks to ensure they are suitable for public funding.

General guidance on Subsidy control (and State aid where relevant).

UKRI Innovate UK

Article 10 of the Windsor Framework

The EU and the UK formally adopted the Windsor Framework on 24 March 2023.

The Windsor Framework replaces the Northern Ireland Protocol, providing a new legal and UK constitutional framework.

Article 10 provides that European Union State aid rules will continue to apply to the UK in respect of measures which affect trade in goods or the electricity market between Northern Ireland and the EU.

Article 10 does not directly apply to subsidies for services and such subsidies will need to comply with the UK's subsidy control regime.

Undertakings in difficulty
In the unusual circumstance of an award having to be made under the EU GBER regulation (State aid), the applicant must pass **'undertaking in difficulty' checks as defined by GBER (2014)**.

Guidance on Article 10 of the Windsor Framework.

UKRI Innovate UK

Research, Development and Innovation Streamlined Subsidy Scheme

- Designed by Government to award subsidies to enterprises if they met defined criteria contained within the Scheme

- 3 categories available please check the competition you are applying for applicable categories
  - Feasibility Studies
  - Industrial Research and Experimental Development
  - Small and Medium Sized Enterprise (SME) Research, Development and Innovation Support

- When submitting an application as part of our due diligence you will be asked to declare any previous awards made in the ‘applicable period’ to ensure limits are not breached.
  - The applicable period is made up of:
  - (a) the elapsed part of the current financial year
  - (b) the two financial years immediately preceding the current financial year

UKRI Innovate UK

Category 1: Feasibility Studies

For feasibility studies projects, you could get funding for your eligible project costs of:

- up to 70% if you are a micro or small organisation
- up to 60% if you are a medium-sized organisation
- up to 50% if you are a large organisation

Eligible costs please refer to the competition to which you are applying.

For a detailed definition of feasibility studies see guidance document section 13.1.

Innovate UK

Category 2: Industrial Research

For Industrial Research projects, you could get funding for your eligible project costs of:

- up to 70% if you are a micro or small organisation
- up to 60% if you are a medium-sized organisation
- up to 50% if you are a large organisation

Eligible costs please refer to the competition to which you are applying.

For a detailed definition of these research categories see guidance document section 14.3.

Innovate UK

Assessment

Innovate
UK

Assessment

[YouTube Playlist]

1 

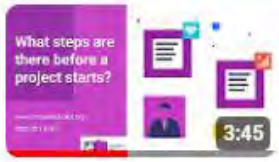
How do our assessors assess?

Innovate UK • 8.1K views • 2 years ago

2 

How are successful applications selected for funding?

Innovate UK • 17K views • 2 years ago

3 

What steps are there before a project starts?

Innovate UK • 7.7K views • 2 years ago

4 

How are successful projects monitored?

Innovate UK • 4.1K views • 2 years ago

5 

How successful applicants receive their funding.

Innovate UK • 4.6K views • 2 years ago

UKRI Innovate UK

Project setup

If you pass the technical assessment, you will have a further eight steps detailed in your notification to complete in Project Setup before being able to start your project.

These are:

- Project details
- Project team
- Documents
- You will be allocated a Monitoring Service Provider (MSP)
- Bank details
- Finance checks
- Spend profile
- Grant Offer Letter

Please share the T&Cs with your legal team at the earliest possible opportunity to avoid any delays.

You are expected to complete all the steps above within 90 calendar days of receiving your notification. Failure to do so may result in funding being withdrawn.

Work can only commence on your project once you have received your Go Live email.

UKRI Innovate UK

Additional Support

Innovate
UK

Innovate UK Business Growth

https://iuk.ktn-uk.org/business-growth/

Innovate UK Business Growth (previously Innovate UK EDGE) is a key part of the UK innovation agency's deep investment in the pioneering businesses that drive economic growth. It is a publicly-funded service available to all high potential small to medium sized innovation-driven companies, including Innovate UK grant winners.

Exploit Innovation:
Grow your business by protecting your IP, improving innovation management and accessing the innovation ecosystem globally through us.

Source funding:
Grow and scale your business by accessing the right finance and funding for you and becoming investment ready.

Enter new markets:
Helping you to make connections to partners and leverage insights to expand into vertical and international markets and achieve scaling ambitions.

Ready to scale?
The Innovate UK Scaleup Programme helps the highest potential businesses realise their ambitions.

UKRI Innovate UK

Useful Information

- UKRI's General Guidance
- Innovate UK Business Connect's Good Application Guide
- Who we fund
- Collaboration Agreement Guidance: Lambert Toolkit
- Innovate UK: Shaping the Future

Funding opportunities

To find out more about the competitions currently available you can visit either the **Innovation Funding Service (IFS)** or the **funding finder** on the UKRI website. Through these links, you can review the competitions available and decide which ones may be right for you.

You can **sign up to our newsletter** to receive all the latest information on our competitions straight to your inbox or **register for email alerts** to get page updates from Innovate UK.

The government also offers **other opportunities for businesses to get finance and support**.
Innovate UK reserves the rights to host competitions on a needs basis and will adjust each competition criteria and scope accordingly. We may occasionally run closed competitions that are for invited applicants only. These are run based on the challenge requirement or need.

UKRI Innovate UK

Contact

Customer Support Services

0300 321 4357 (Monday - Friday 9am-12pm and 2pm-5pm)

support@iuk.ukri.org

Innovate UK

ukri.org/councils/innovate-uk

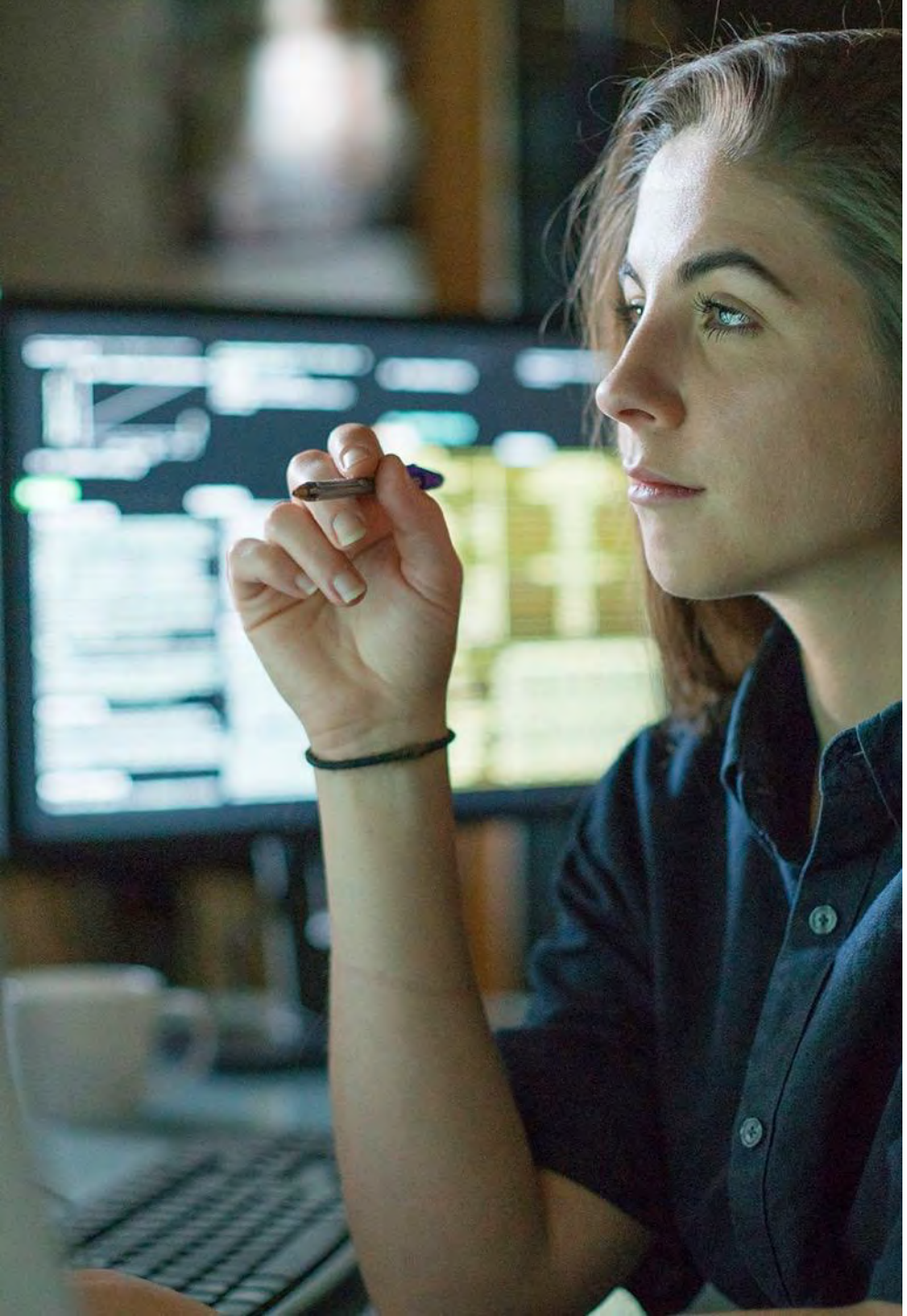
Innovate UK Business Connect

iuk.ktn-uk.org

Innovate UK Business Growth

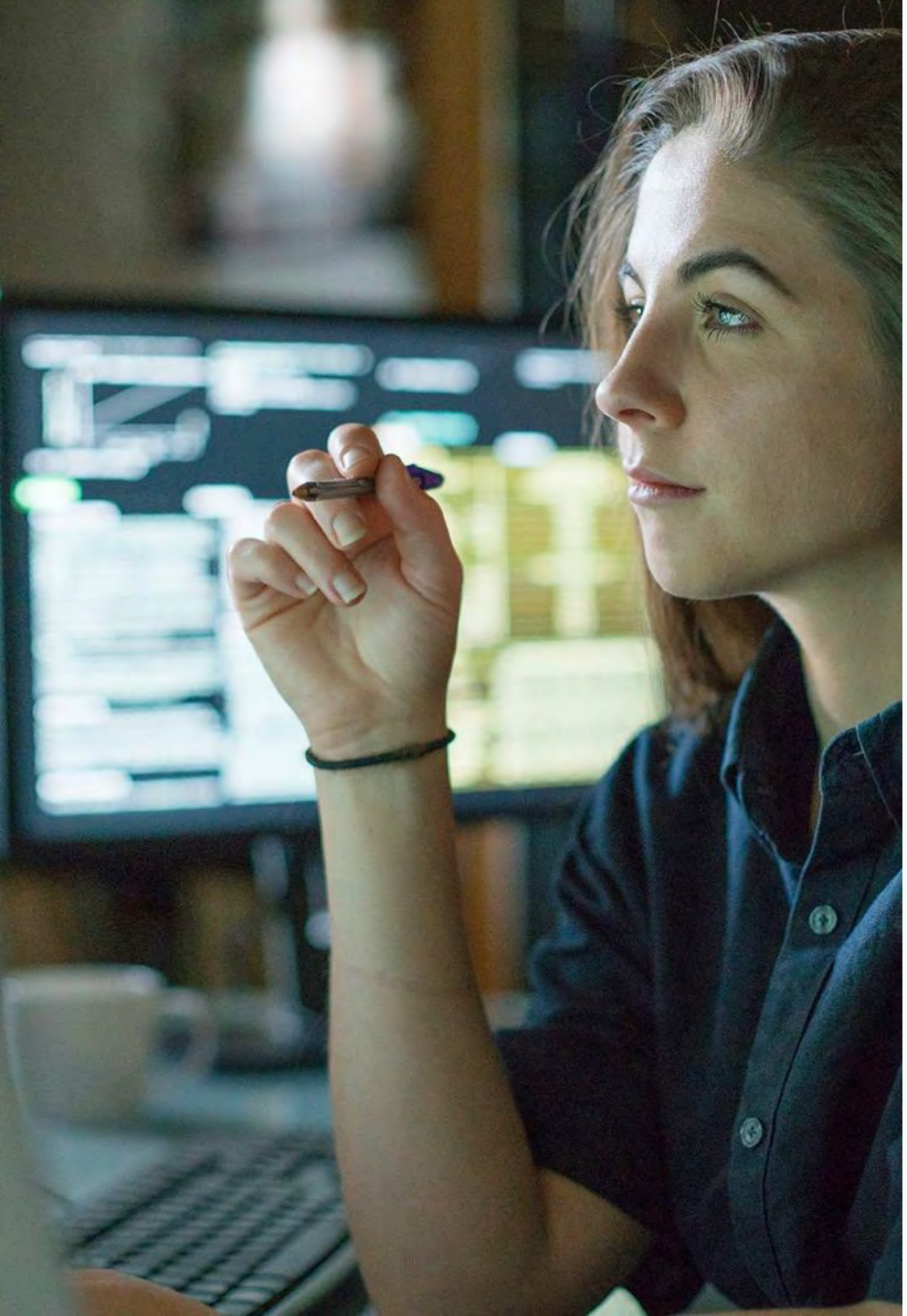
www.iukbg.ukri.org

UKRI Innovate UK



Q&A

Innovate UK | Business Connect



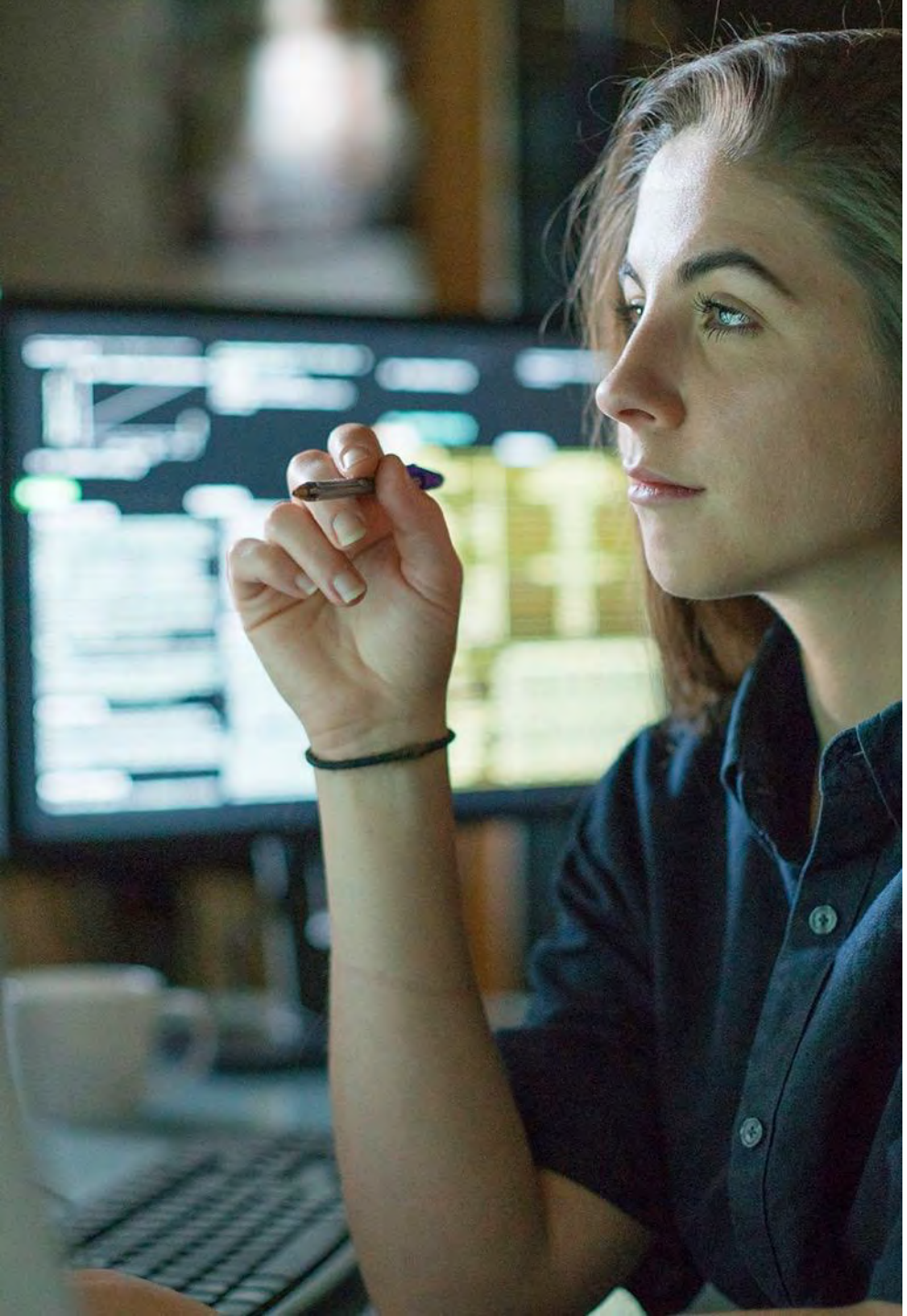
Lunch

Innovate UK | Business Connect

Introduction to

Innovate UK Business Growth

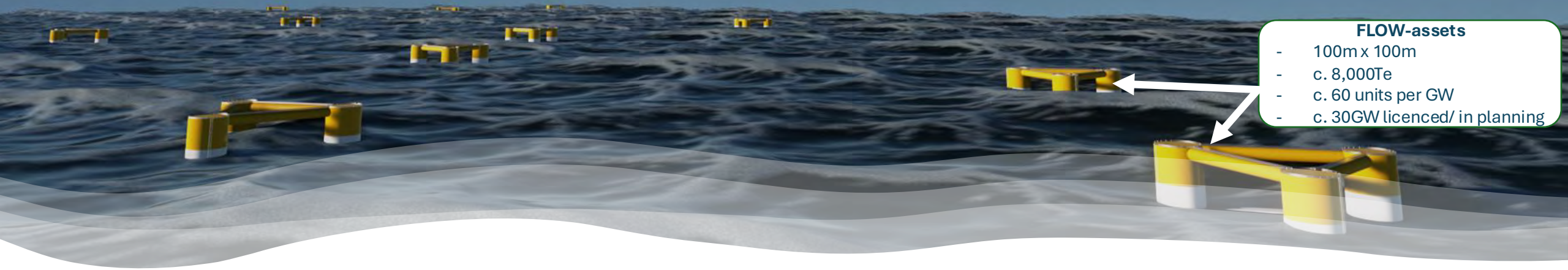
UKRI Innovate UK | Business Growth



Elevator Pitches

Innovate UK
KTN

- Large floating wind (FLOW) projects require more ‘parking’ space than ports can provide
- Efficient and de-risked logistics & project delivery requires effective marshalling of multiple FLOW assets
- FLOW assets are unmanned, have no marine propulsion and are high value complex assets
- You need a dedicated and safe location/facility to ‘wet store’ or park FLOW assets
- Known as ‘*safe anchorage*’ or ‘*wet storage*’, we call these a **FLOW-Park**



OSG is the **UK’s only independent FLOW-Park Developer**

Developing the UK’s first FLOW-Park

Secured exclusive agreements & licences

New **critical infrastructure asset** supported by Govt

Multiple follow-on FLOW-Park developments

Additional international enquiries

Anchor investment by UK national bank*

Transparent development & commercial model

Equity & Debt (CLN) options in DEVEX phase, secured against lease/licences

Structured equity/debt options in Construction backed by use contracts (revenue)

De-risked infrastructure investment

>5yrs of development history

First mover advantage

Unique Intellectual Property

Active Governmental support

Supported by FLOW industry

Highly experienced management team

OFFSHORE SOLUTIONS GROUP

FLOW-Park

Delivering critical infrastructure to support FLOW industrialisation

** Subject to contract finalisation*

USV PIONEER

EXPERIENCES

- UK is the world leader in maritime robotics and autonomous systems but gap is closing
- Less commercial financing available for demonstrations and pilots - customers seeking higher TRL7-9 solutions

OPPORTUNITIES

- Major shift in emphasis from sustainability to capabilities such as Nested Robotics and modular payloads
- Interest in zero emission solutions from offshore operators and short-sea shipping

CHALLENGES

- Regulations struggling to keep pace with tech
- Slow development of zero emission infrastructure

ACUA OCEAN

REVOLUTIONISING OCEAN MONITORING AND DATA COLLECTION

Funded by UK Government

Uncrewed Survey Solutions – Experts in Marine Data

USS acquires, processes and delivers high-quality marine data using innovative Uncrewed Surface Vessels (USVs).

- Greener, Safer, Economical Data Solutions
- >95% Carbon emission savings compared to crewed vessels
- Enhanced safety by reducing personnel in the field
- Over the horizon 24/7 operations
- Proven Capability, Reliability & Customer Need

Future requirements for a larger vessel:

- Increased weather limits
- Longer endurance
- Additional payload capabilities
- Future fuels

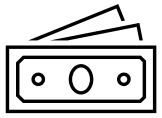
+44(0)7980 282 018
james@unmannedsurveysolutions.com
unmannedsurveysolutions.com

USS uncrewed SURVEY SOLUTIONS

Delta H is seeking to support projects decarbonising maritime fuels

DeltaH
CHANGING ENERGY

- Expertise in hydrogen and green chemicals
- >€500m of UK and EU grant funding won for clients
- Support for project management, strategy, analysis, and communications

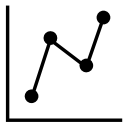


Funding and financing

Drafting funding applications, developing financing strategy, and understanding policy need & impact

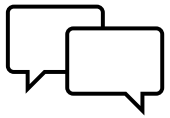
Project and consortium management

Developing project concepts and coordinating delivery for complex multi-partner projects



Techno-economic analysis

Modelling of business case for multiple technology options, risk & sensitivity analysis



Communication of results

Development and delivery of dissemination strategy, stakeholder management

NeuralShipper™

World's First Generative AI Tool for Maritime Asset Design, Simulation, and Optimisation

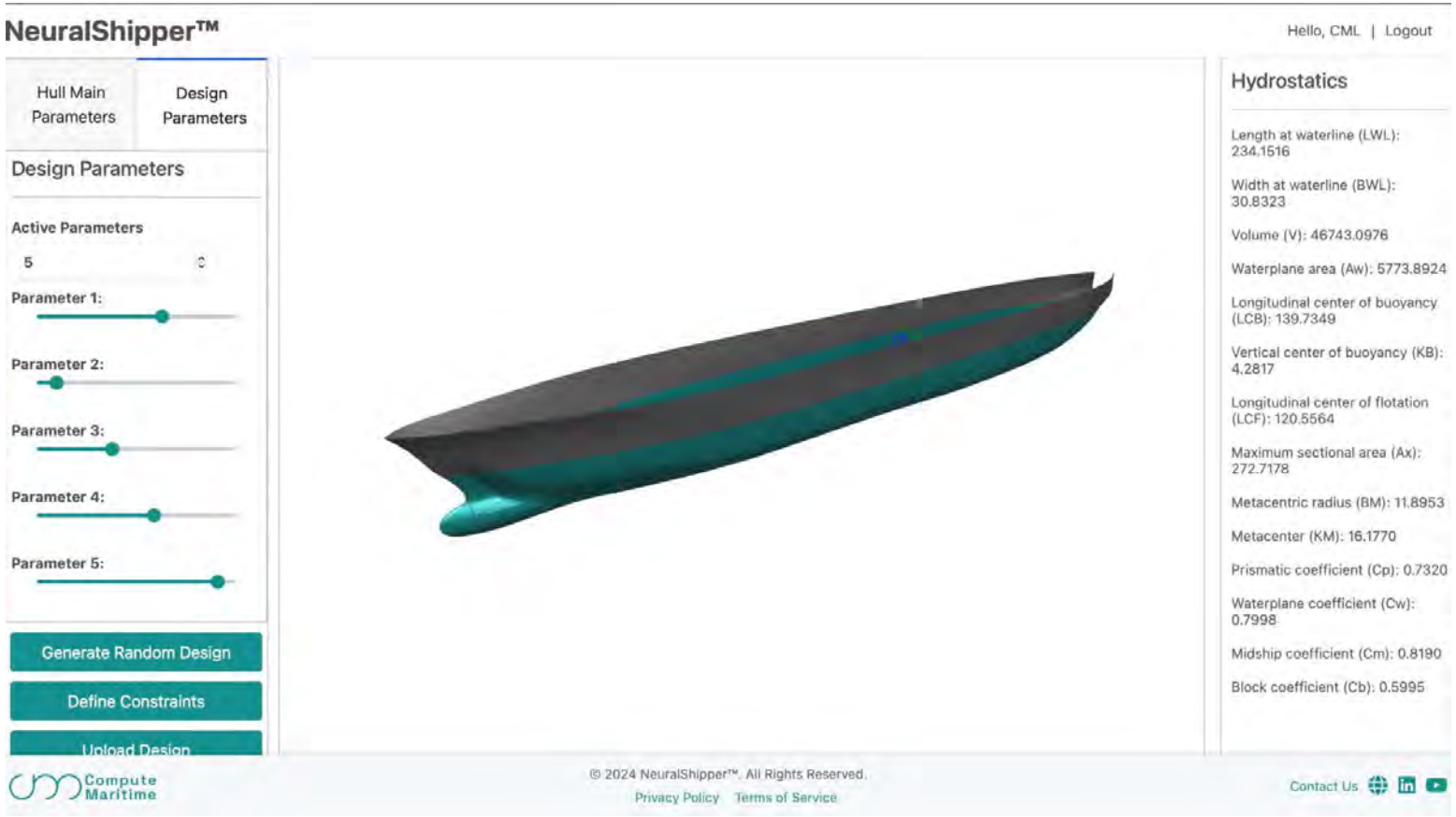
Start exploring thousands of novel designs within minutes using only preliminary design requirements and constraints.

Inputs

- Vessel Type
- Capacity
- Length
- Beam
- Draft
- Constraints

Output

- Conventional, Unconventional, or Multipurpose vessel designs.
- .igs & .stl design files
- Complete Performance Profile



Compute Maritime
Data-Driven Maritime Sustainability

01 pixii
2023
Pixii Ltd
Electric Leisure Boats

02 LD LYTE DRIVE
2025
Lyte Drive Ltd
Electric Propulsion

03 HIPPO
2027
Hippo Commercial Ltd
Electric Work boats

NEVA

Dream Big
Design, Make, Repeat
Fund Fearlessly
Prototype to Perfection
Commercialise for Success
Expand Horizons

Pixii's SP800 heralds a new era in the electric boat market, combining advanced battery capacity, streamlined design,–making it a true game-changer for sustainable marine travel.

LD LYTE DRIVE

Through **Winning** two key grants– **TRIG 24** and **Innovate UK** – and investment in Lyte Drive Ltd, we are driving transformative solutions in the transport sector.

Our strategic partnership with Lead **investment** in Lyte Drive Ltd means accelerates next-generation propulsion technologies for a cleaner, more connected future.

Future Forecast: In Three Years, a Battery Breakthrough Will Unlock the Industry

Solid-state battery technology is poised to deliver a seismic leap in performance, safety, and longevity, with commercial breakthroughs likely within the next three years. If we fail to prepare for this revolution now, you risk being left behind in a rapidly evolving market.

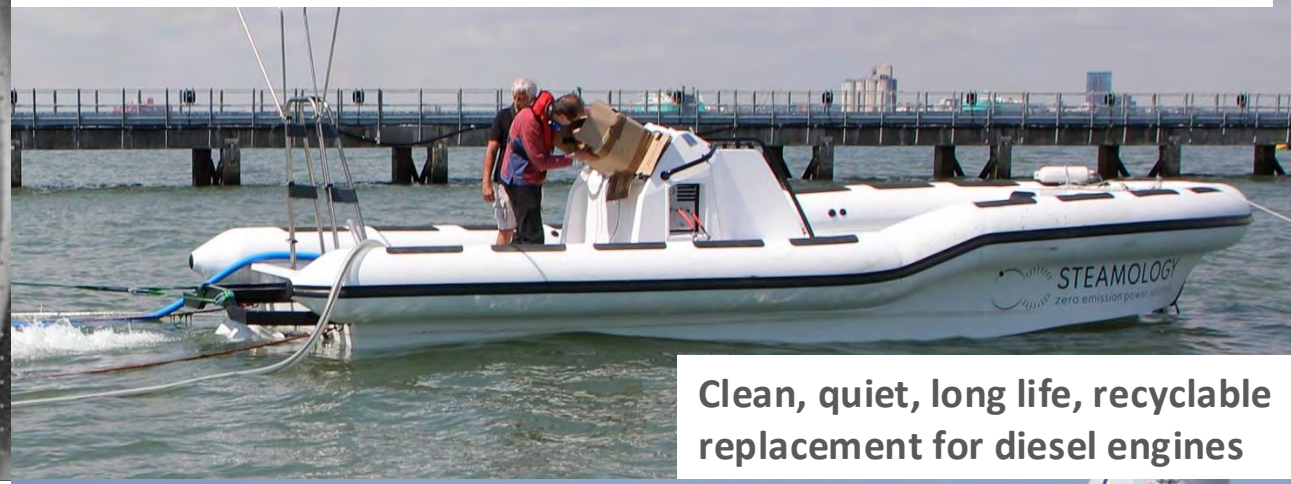
STEAMOLOGY®
zero emission power solutions

Innovate UK
KTN

Steamology: delivering zero emission power

matt.candy@steamology.co.uk
0 77 88 92 00 15

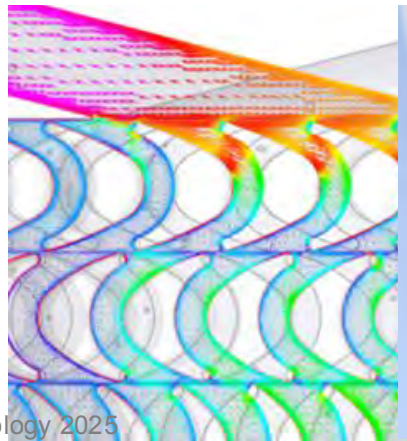
CMDC & IUK projects delivered world first zero emission hydrogen steam turbine vessel, 130 years after world's first steam turbine ship



Clean, quiet, long life, recyclable replacement for diesel engines

Design, build, test & development of zero emission, efficient, energy dense, cost effective, long life marine MW scale power for retrofit or new build vessels, mechanical or electrical drive

Seeking: Owners, Operators, Naval Architects & Builders, Installing zero emission power, auxiliary power, hotel power, steam or heat




UNICHIP
MARINE
ECONOMY.
SAFETY.
POWER.

John Garner -“Carbon Loop” Fuelling – Zero Emissions Propulsion

Approach: Green Corridor - Innovative Carbon Loop technology to provide a new genre of zero emission propulsion for ro-ro, ro-pax and container ships

Project Idea: Develop a longer distance Green Shipping Corridor to provide a new genre of zero emission propulsion for new and existing ro-ro, ro-pax and container ships utilising innovative carbon loop technology.

Problem: Insufficient renewable methanol, insufficient green carbon dioxide, challenging shipboard storage arrangements and longer residence time of liquid carbon dioxide onboard the ships.

Solution: Use of renewable methanol in an onboard fuel power cell system to release hydrogen for fuel cells to power electric motor propulsion and capture released carbon dioxide. The captured carbon dioxide is returned as feedstock to the land-based synthesis plant to make more e-methanol creating a “Carbon Loop.” Use of a pre-FEED (Front-End Engineering Design) stage project to finalise the selected concept.

Organisational Capabilities

We have:

- Renewable energy development
- Project management
- Pre-deployment trials
- Regulatory compliance
- Stakeholder engagement
- Strategy development
- Techno-economic modelling
- Green Corridor experience
- Maritime & engineering experience

We need:

- Ro-Ro/Ro-Pax/Container ship operators
- End Customer Trading companies
- Terminals for e-methanol plant sites
- E-fuels fuel producers

Experience – Our core team comprises

B9 Energy Ltd - Renewable Energy provider, Power-to-X and E-methanol/Carbon Loop Project developer
DFDS Seaways – Ro-Ro and ro-pax ferry operator actively researching green technologies and their deployment.
JG Maritime Solutions Ltd - Rules for alternative bunker fuels & development of net zero carbon strategies
Net Zero Industry Innovation Centre – (Teesside University) Carbon capture and CO2 liquefaction. Aspen+ modelling, techno-economic modelling.
Mutual Energy Ltd - Owner/operator of natural gas pipeline and power interconnector to Scotland.
Port of Larne – port owner/operator providing the site for pre-deployment trials & potential e-methanol plant

Administrative Information

Contact :

- **John Garner**
- john@jgmaritimesolutions.com

- **David Surplus**
- d.surplus@b9energy.co.uk

Advanced manufacturing for net zero applications

Unrivalled insight and facilities to take manufacturing further and quicker

Accelerating real-world solutions

- Combining industry-leading equipment with pioneering engineering minds under one roof
- De-risking projects utilising cross-sectoral engineering and industry expertise
- Supporting and enabling the hydrogen and electrification sectors at every stage of the value chain
- Experience in privately-funded industrial projects, UK government and EU-funded programmes



World-leading capabilities

- Design for manufacture
- Prototype build and testing
- Supply chain assessment
- Scale-up and factory optimisation
- Skills development
- Manufacturing process and materials development
  - Additive manufacturing
  - Laser processing
  - Net shape processing
  - Automation for assembly
- Electrification and Hydrogen-related componentry under active R&D:
  - Liquid hydrogen fuel distribution line components
  - Power trains and electrolysers
  - Electric power trains and batteries
  - Balance of plant and system design

About us

- Independent RTO
- Progressing innovation into industry
- Part of High Value Manufacturing Catapult in Ansty, Coventy
- c.1,000 staff
- Nationwide coverage

Get in touch to accelerate your project or collaborate

Chat with Huw, our hydrogen lead
enquiries@the-mtc.org

- removes airborne pollutants from engine exhaust gases

Proposed Approach/Project idea

Project Idea: Elimination & collection & controlled disposal of airborne pollutants from ships engines. The products of combustion are neutralised and collected for disposal in port. Dry system technology means sea water is also kept clean and untouched.

Problem: Solid particulates such as soot, sulphate clusters and heavy metals plus gaseous pollutants nitrous oxides sulphur oxides and organic compounds are generated during the fuel combustion phase. Existing solutions treat only one group of pollutants.

Solution: Puremissions Ltd brings proven, robust and known technology to treat all pollutants in one step. Can be used onboard on barges and on land minimising cost and space requirements whilst delivering highest emission standards and reliable and unparalleled levels of pollutant removal.

Organisational Capabilities

We have: Puremissions is a start up company with excellent and proven technology. Targeted at the maritime sector. Capability to design and build and operate equipment

We need: Financial and commercial partners to facilitate roll out of the technology.

Experience – Our core team comprises

3 main partners each contributing many years of experience of design and engineering and operation of pollution control equipment. Flexible ability to utilise the best technology to solve problems.

Global multi-national experience across a wide range of industry sectors. Business development professionals.

Our Customers are ship owners fleet operators cruise ships research vessels and the desire to achieve the smallest environment footprint.

Administrative Information

Contact : gary.elliott@puremissions.org

www.puremissions.org

Find us on LinkedIn.

Previous CMDC and ZEVI experience in large and small proposals, varying degrees of complexity. Led and partnered. Always applied and seeking to work in collaboration with business partners to solve problems – not create them!

UNIVERSITY OF PORTSMOUTH
CENTRE FOR ENVIRONMENTAL AND RENEWABLE ENERGY SOLUTIONS

Battery Systems

Digital Twins & AI

Renewable Energy generation

Data Science

Integrated systems solutions

Environmental Modelling & Monitoring

Energy Systems

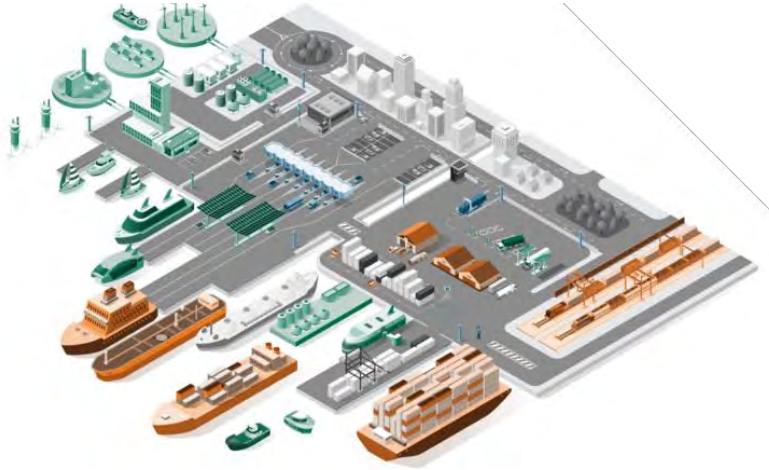
Logistics

David.Hutchinson@port.ac.uk
Victor.Becerra@port.ac.uk

port.ac.uk/ceres

Connected Places Catapult

The UK's innovation accelerator for cities, transport & place leadership.



Maritime & Ports Strategy

Vision / Mission:

"CPC will be a key delivery partner in the success of **coastal region innovation hubs** through ports.

This will drive the adoption of new technologies and ways of working, creating new, cross-sector opportunities for UK solutions providers in a globally growing market."

Find out more on our website:

Building commercial confidence in future technologies

Regional engagement and support

Stimulating live demonstrators and trials

Accelerating the growth of SMEs in maritime

Increasing private investments in solutions

Innovation programme investment

Recent maritime & ports activity:

Contact Callum Stone, Maritime & Ports Sales Engagement Manager for follow up - callum.stone@cp.catapult.org.uk

MARINE RESEARCH & DEVELOPMENT:

BERTHS & SHORESIDE OFFICES/WORKSHOPS

Shoreham Port, South Coast, UK

UNLOCK POTENTIAL

We offer a unique opportunity for businesses at the forefront of maritime technology to lease both commercial units and adjacent vessel berths. Perfect for marine research, development and testing, our facilities provide a controlled marine environment and unparalleled access to associated services driving your project forward.

ABOUT US

Shoreham Port is a thriving commercial Trust port on the south coast with excellent access to London and the surrounding areas. Certified as an EcoPort for the last decade, our Port is amongst the most sustainable in the UK. Shoreham Port has a track record of facilitating high-level research and development projects.

WHY CHOOSE US?

Proximity

Our range of offices and light industrial spaces are adjacent to the nearby impounded basin, with easy access to quayside and berths. Parking options also available. Commercial units vary from 94 sq ft to 6,800 sq ft, with units suit all budgets.

Non-Tidal berths

Ideal for research and development, our 1.4 nautical mile long impounded basin offers safe, non-tidal conditions for controlled testing. Berths are available in a variety of sizes. All activity in our basin is subject to the Port Marine Safety Code (PMSC) and Shoreham Port General Directions, ensuring the safety of your team and equipment while working in conjunction with the Port's commercial traffic.

Additional Port services

Access to a full range of associated services including:

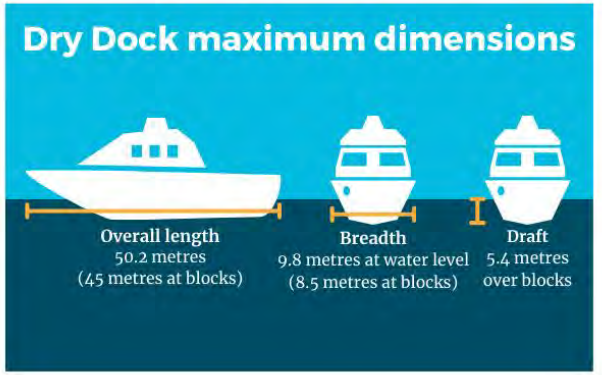
- Dry/Wet dock with adjustable water levels and workshop space. Perfect for testing vessels/equipment in dry and submerged conditions.
- Open compound space
- Shore power and Bunkering
- Commercial Dive Team
- On-site Chandlery
- Ships Agency & Customs Clearance
- Freight forwarding / Haulage
- Bookable meeting rooms

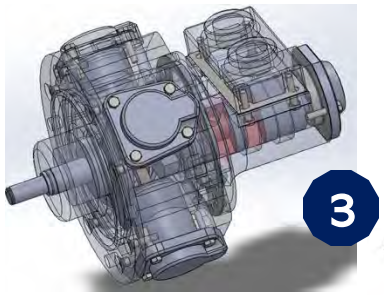
Accessibility

24/7 site accessibility, plus connectivity to road and rail.

Get in touch: commercial@shoreham-port.co.uk

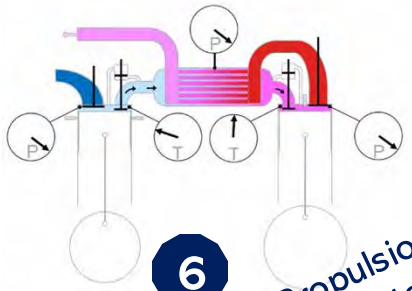
shoreham port





3

Waste Heat Recovery?
Energy Recovery Expanders!
Heat 2 Cool, Heat 2 Power!



6

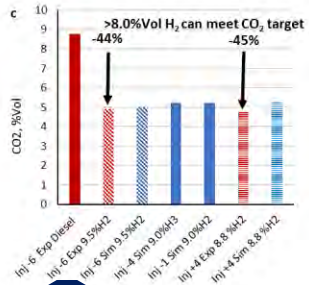
New Propulsion Technology?
Higher fuel-to-power conversion!
Control Emissions via Kinetics!
Whilst being fuel agnostic!

Radical (4-5 Yr.)
Find 2050 Solutions

	Properties
1	Storage method
2	Storage temperature (°K)
3	Storage pressure (kPa)
4	Costa (US$/l)
5	Formula
6	Ratio Carbon:Hydrogen
7	Lower heating value (MJ/kg)
8	Flammability limits min., gas in air (vol. %)
9	Flammability limits max., gas in air (vol. %)
10	Flame speed (m/s)
11	Autoignition temperature (°C)
12	Minimum ignition energy (MJ)
13	Flash point (°K)
14	Octane
15	Fuel density (kg/m3)
16	Energy density (MJ/m3)
17	Latent heat of vaporization (kJ/kg)

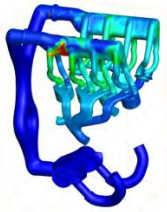
1

Techno-Economic Fuel Evaluation?
Methanol, Syngas, Methane, Hythane!
Hydrogen, Ammonia!



2

Real World Impact?
40% CO2 Target!
Fumigated H2!

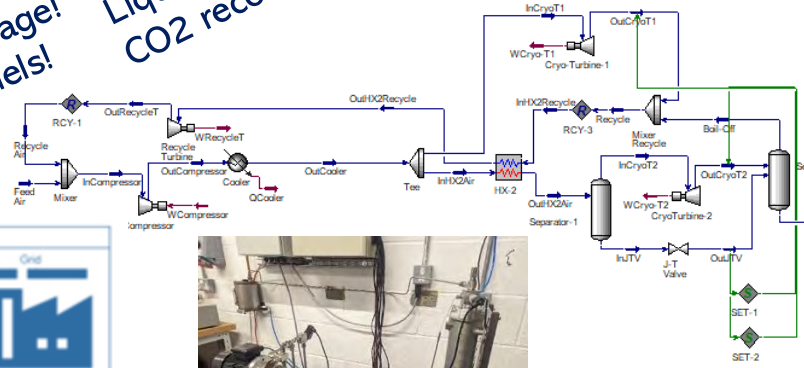


Disruptive (2-3 Yr.)
Find 2040 Solutions

Bridge the Gap in Concept to Demonstration: Coupled Experimental and Digital Twin Approach for Systems Level Solution

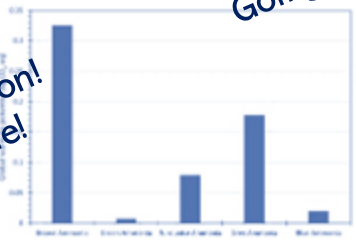
7

New Process Engineering for Fuel/Carbon?
Waste to fuel production!
Liquefaction of gaseous fuels!
CO2 recovery and use!



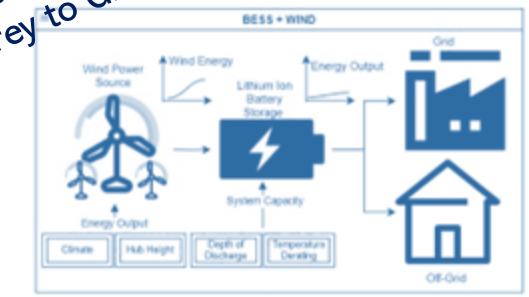
5

Port as Energy Hubs?
GHG Reduction with Renewables, Storage!
Going Grey to Green Zero Carbon Fuels!



4

Life Cycle Analysis?
Source to Propulsion!
Back to a New Life!



New
Emerging
Existing
Technology

Possibilities

Existing
Emerging
New

Don't be Disrupted, be the Disruptor: Maritime Decarbonisation

We do Energy Conversion, Storage, Recovery. We do Power, Propulsion, Fuels.
Collaborate & Innovate Together. Dr. Angad Panesar a.s.panesar@brighton.ac.uk

STEP Lab
Sustainable Technology and Engineering Projects

University of Brighton
Advanced Engineering Centre

Clean Maritime Research at the University of Birmingham

Professor Pietro Tricoli, Professor of Power Electronics Systems, p.tricoli@bham.ac.uk

1. Project ideas

- Increase the range of low-emission vessels using novel battery concepts
- Rapid in-route charging of batteries
- Mobile and flexible onshore power supply
- Combination of grid connection and local generators running on low-carbon fuels

2. Innovative technologies

- Integration of swappable battery containers with new LMFP (Li-Mn-Fe-Po) batteries
- Modular design of DC/DC silicon carbide converters
- High-voltage DC switchboards
- Integration of hydrogen fuel cells within marine powertrains for manoeuvring in port

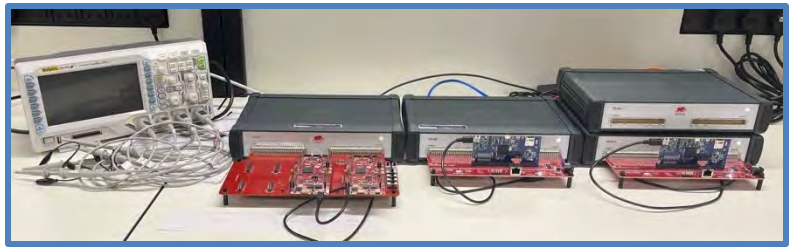
3. Partners/services sought

- Shipowners/ship operators willing to demonstrate new technologies on vessels
- Port operators willing to demonstrate new shore power solutions for full-scale trials
- Partners willing to work collaboratively with other UK/EU partners

UNIVERSITY OF BIRMINGHAM

4. Services offered

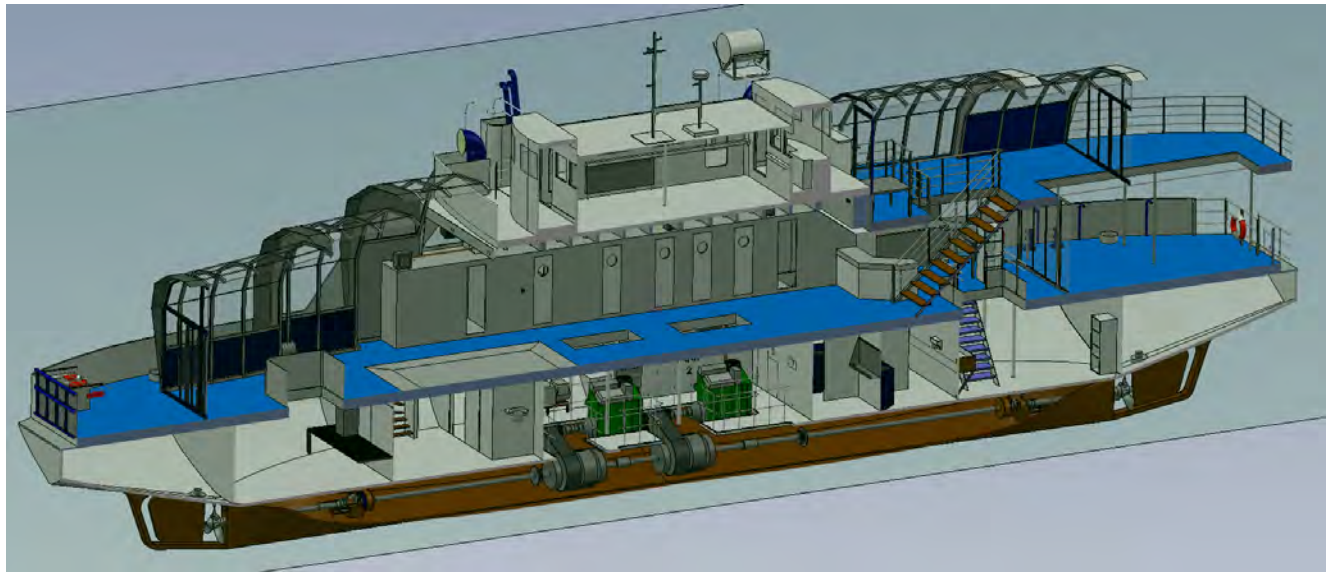
- Expertise on marine electrification
- Modelling and HiL simulation of electrical power systems, converters and energy storage
- Hybrid propulsion systems with energy storage
- Testing of bespoke lab prototypes



Nithin Rai | nithin@octoply.co.uk

octoply

SME with an interest in developing floating fluid storage solutions and a floating bioreactor (flo-ra) for taking raw sewage and other societal waste to generate biomethane.



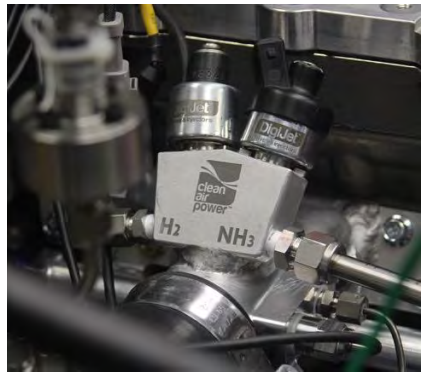
We have

- a static vessel moored on the Thames.
- A workshop close to that vessel.
- Conducted a feasibility study on the concept of a shipboard algal bioreactor - sabre.
- An intent to build or modify a small workboat to test innovative concepts such as ours and to partner with others.

clean air power™

Carbon-free fuel injection

- UK based **SME**
- **Versatility** in application, performance and fuel options
- **Fuel-flexible** - H2, ammonia, biomethane, biomethanol etc
- Mono-fuel, multi-fuel or blended, **ICE or FC**
- Port, prechamber and direct injection (**PFI, PCI and DI**)
- Successful **project track record**
- FOAK, SMART, RDR, **CMDC**, DoE experienced



Looking for sustainable powertrain providers who require carbon-free fuel injection for CMDC6

clean air power™

Dan.Skelton@cleanairpower.com
Managing Director
07551 154 926

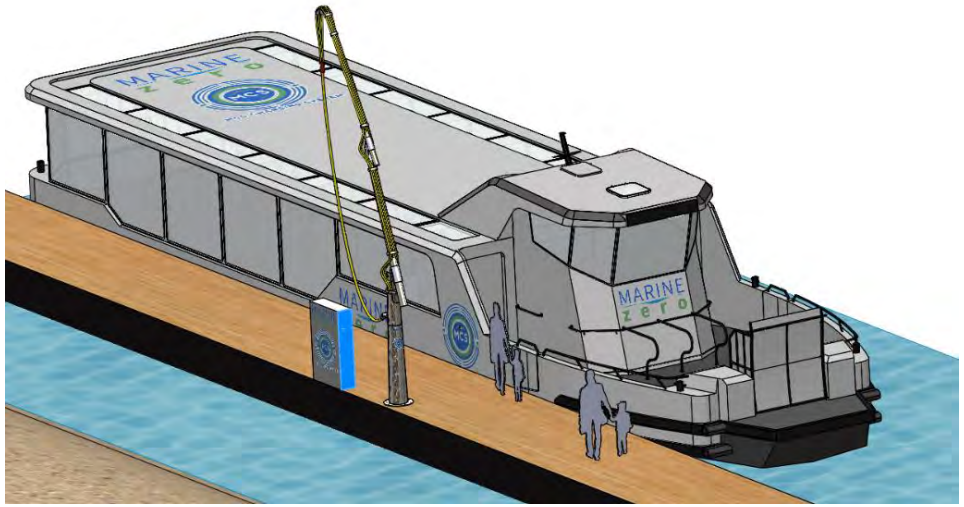
LinkedIn

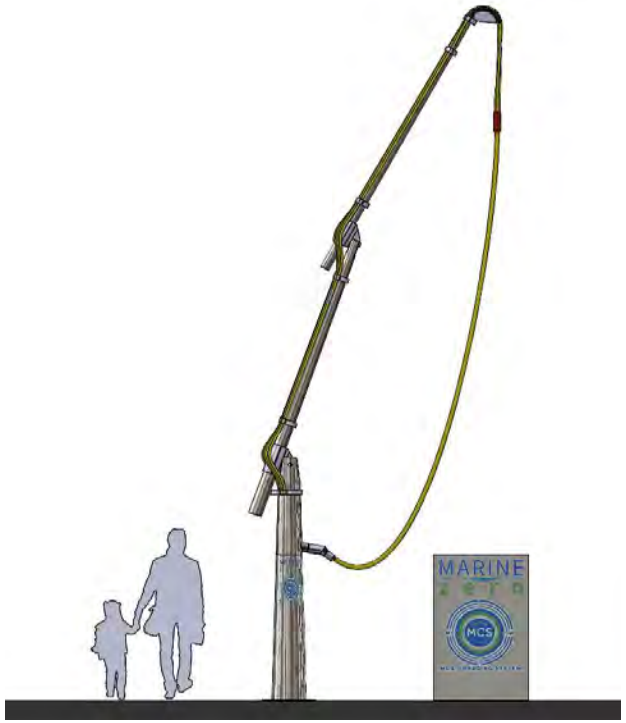
Marine Zero MCS Charger ongoing development within CMDC 6

MARINE® zero

Leading the clean maritime energy transition

We are seeking a vessel operator who requires a Mega Watt Charging solution, to further develop and potentially demonstrate the product.





Scan to access our website

+44 (0)7786 521302

andy@marinezero.com

marinezero.com

Innovate UK

IMPERIAL

Bringing the power of HYDROGEN AUVs to long-endurance offshore survey.

Eager to collaborate with industry.

InX Tech

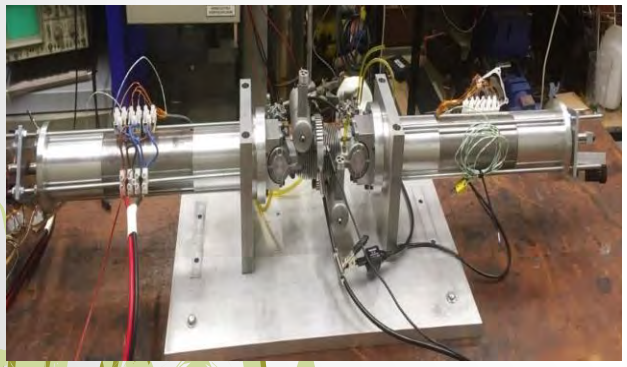
Prototyping a hydrogen-fuelled resonating free piston generator for auxiliary marine power applications

Julian Dunne – Professor of Mechanical Engineering

j.f.dunne@sussex.ac.uk

What is it?

A patented design of free piston generator, that operates through mechanical resonance which appears to be well-suited for use with hydrogen fuel. Can be linear or rotary.



What are its advantages?

- Significantly higher efficiency [1].
- Better gravimetric and volumetric energy densities.
- Total dynamic balance – lower NVH.
- Scalable to high powers.
- Variable compression - giving fuel flexibility.
- Easier to control [2].

What are we looking for?

Project partners to build and test a 15 kW rotary prototype to assess its suitability for in-land waterway and river craft.

University of Sussex
Engineering & Design

octoply

Technology Innovations

[1] J. F. Dunne (2024) A numerical procedure to obtain ideal piston trajectories and key design parameters for a hydrogen-fuelled resonating free piston generator, *International Journal of Hydrogen Energy,* 63, 18 April 2024, Pages 618-634.

[2] T. N. Kigezi, and J. Dunne (2017) A model-based control design approach for linear free-piston engines' *Journal of Dynamic Systems, Measurement and Control,* 139 (11).

Marine biofouling increases hydrodynamic drag, reducing fuel efficiency and increasing GHG emissions

- More than **80%** of world trade carried by ships
- GHG emissions from international shipping worldwide in 2022 was over **707mt CO2**
- Ship hull cleaning and inspections are vital to **climate change**, ensuring **efficiency** and maintaining **safet**y
- Current solutions **expensive** and **dangerous**
  - Dry Dock
  - UWILD
- Limited by **Functionality** or **Operation**
- **Environmental** concerns

Amphibian – Specifically designed for '**splash**' zone.

Revolutionising the **inspection** and **maintenance** of critical infrastructure in **extreme marine environments**.

Technical & Economical Feasibility for the development and implementation of:

- **Launch & Retrieval System**
- **Debris Management System**

Reduce downtime, with absolute safety and zero risk to human lives.

Expertise	Role in the project
Engineering	Development of LARS & DMS systems
Operation & Maintenance	Test, Validate, Demo, Route to market

Shahid Mughal
Innvotek Ltd.
shahid.mughal@innvotek.com

innvotek.com

CMDC 6 PROPOSITION

- European leaders in Integration of electrical and fuel cell systems in marine, rail, automotive and other industrial sectors
- Looking for collaborative project partners around application of hydrogen systems in marine
- We products in development covering
  - Marine fuel cell system (with Honda)
  - Hydrogen power system integration
  - Hydrogen pressurised gas storage management
  - Hydrogen system interfacing and communication with vessel control and command
  - Remote monitoring and optimisation of hydrogen power systems using AI data analytics
- Talk to us if hydrogen power and propulsion is on your agenda

Graham Hodgson

Steve Carroll

cenex Lowering your emissions through innovation in transport and energy infrastructure

Not-for-Profit Research & Technology Organisation

20 Years helping organisations decarbonise transport

40 Employees

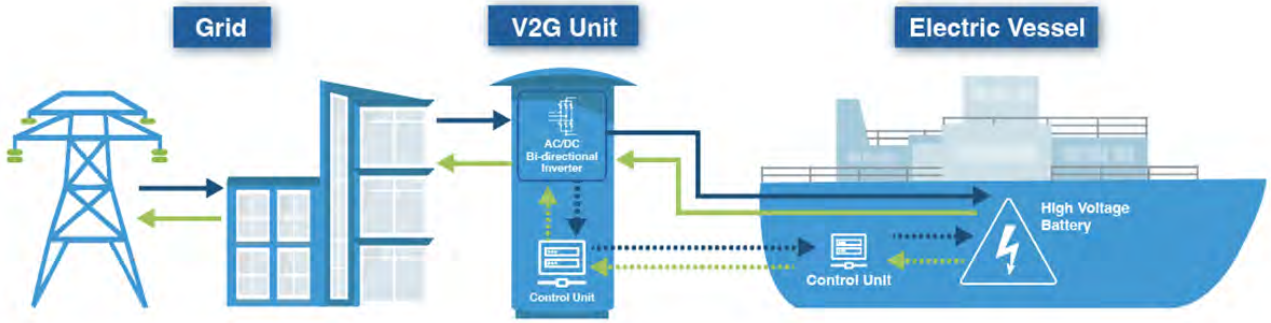
38 Funded R&D projects won since January 2020

23 Innovate UK funded Collaborative R&D projects

10 Active Collaborative R&D projects

Study Areas

- Voice of the Customer & Use Cases
- Modelling Optimal Usage Scenarios & Business Case
- Demonstration Trials
- Market, Barriers & Opportunities
- Implementation Tools & Training
- Life Cycle Analysis
- Dissemination
- Behavioural & Equity



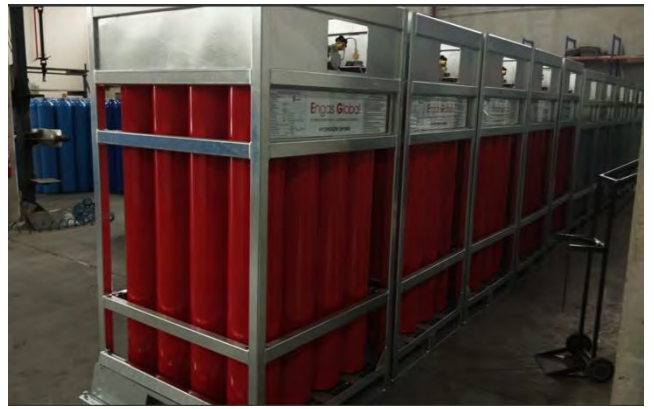
Offering a complete solution

Engas Global
an electrolyser and H_2 compressor company

Hydrogen production, compression, bunkering, refuelling & safety compliances

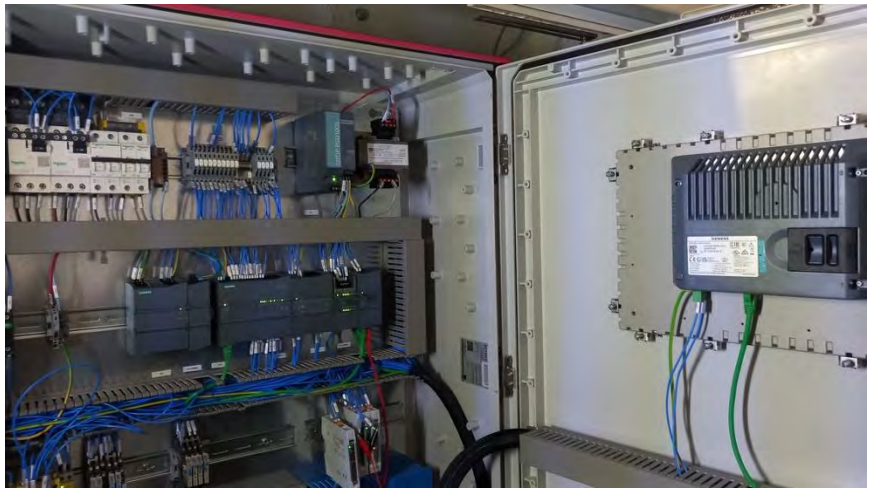
Electrolysers

Hydrogen compressors

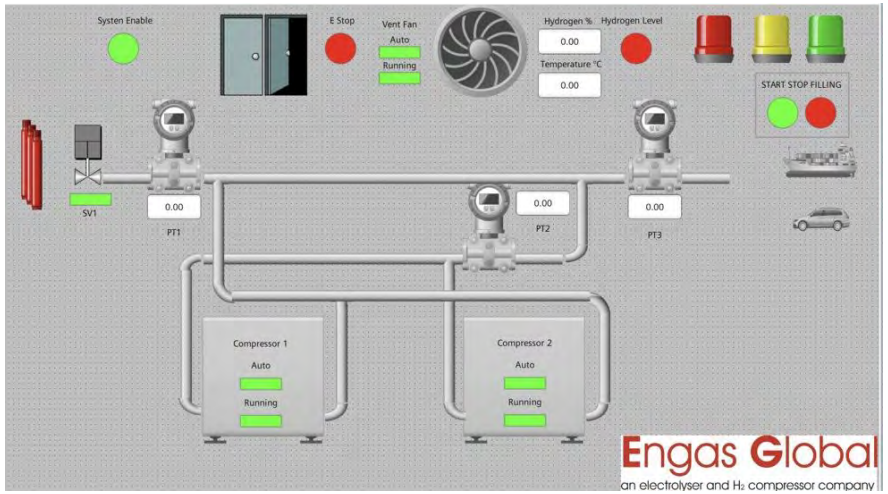


Hydrogen smart cylinders

PLC controller

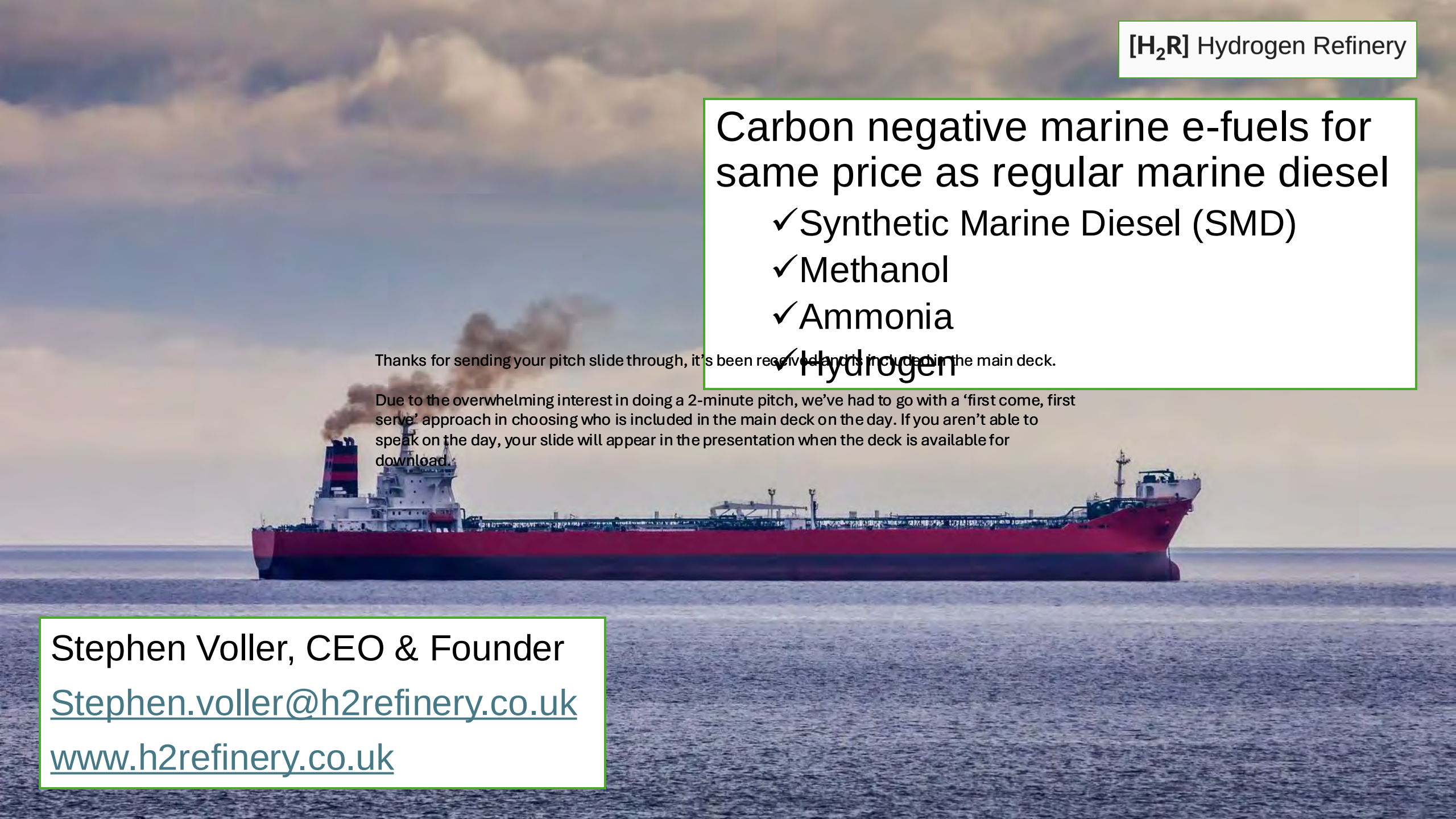


Hydrogen refueller-dispenser



Hydrogen delivery

Dr Amit Roy, CEO, Engas Global Ltd, www.en-gas.com, 074 269 04 789, aroy@en-gas.com



[H_2R] Hydrogen Refinery

Carbon negative marine e-fuels for same price as regular marine diesel

- ✓Synthetic Marine Diesel (SMD)
- ✓Methanol
- ✓Ammonia
- ✓Hydrogen

Thanks for sending your pitch slide through, it's been received and is included in the main deck.

Due to the overwhelming interest in doing a 2-minute pitch, we've had to go with a 'first come, first serve' approach in choosing who is included in the main deck on the day. If you aren't able to speak on the day, your slide will appear in the presentation when the deck is available for download.

Stephen Voller, CEO & Founder
Stephen.voller@h2refinery.co.uk
www.h2refinery.co.uk

SailLink

LAUNCHING IN APRIL

12 Pax + 1t cargo

4.5 hr crossing time

ASAP new boat, new routes → Partners needed

Saillink.co.uk

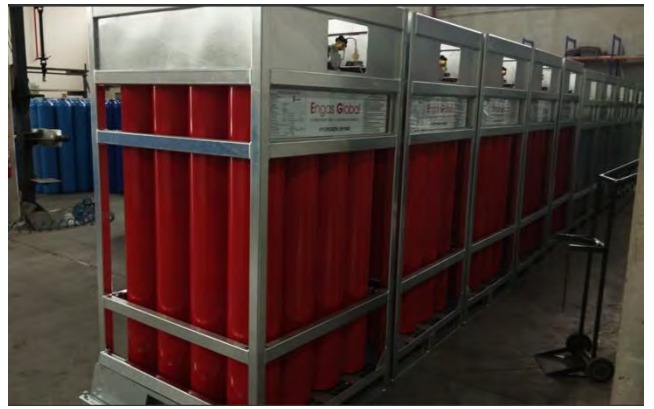
Offering a complete solution

Engas Global
an electrolyser and H_2 compressor company

Hydrogen production, compression, bunkering, refuelling & safety compliances

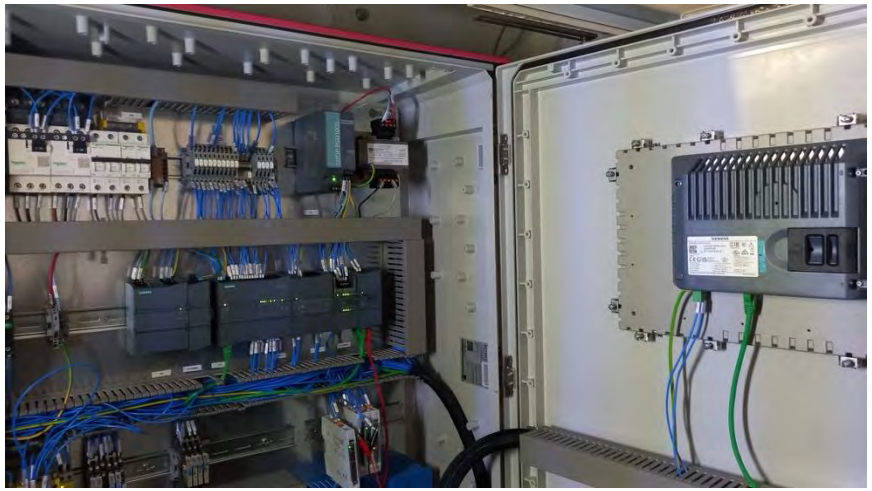
Electrolysers

Hydrogen compressors

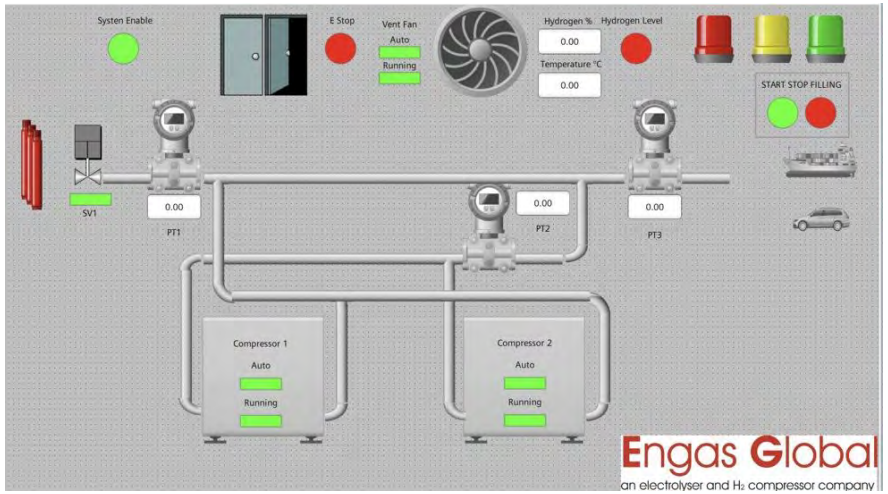


Hydrogen smart cylinders

PLC controller



Hydrogen refueller-dispenser



Hydrogen delivery

Dr Amit Roy, CEO, Engas Global Ltd, www.en-gas.com, 074 269 04 789, aroy@en-gas.com

Non-causal Control and Optimization for Marine Automation

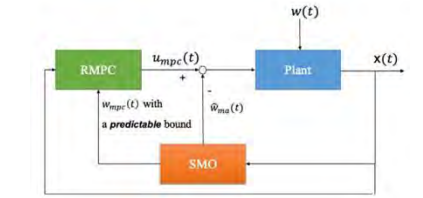
Dr. Yao Zhang, Lecturer in Marine/Maritime Digitalization and Automation
Yao.Zhang@ucl.ac.uk

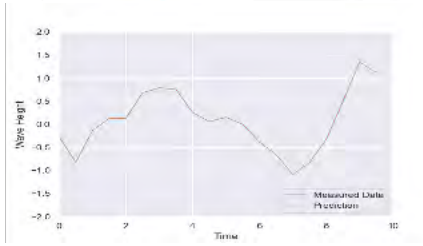
UCL MECHANICAL ENGINEERING

The Future of UK SHORE: Shaping the Future of Maritime

Any Autonomous system is a **CONTROL** system

Marine System is a **NON-CAUSAL** system





Non-causal Control achieves

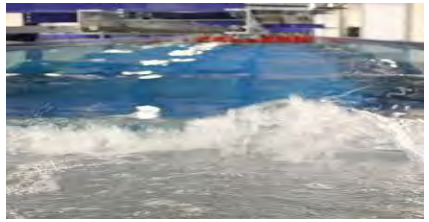
1. Fast implementation
2. Strong robustness
3. High precision operation
4. Enhanced Reliability
5. Improved Optimality
6. AI-embedded Control for model dependence reduction

We cover

- Autonomous Vessels and Navigation
- Path Planning
- Collaborative Control for Multi-agent System Formation
- Structure/Control Parameter (co-)Optimization
- Energy Efficiency Optimization for Hybrid Vessels
- Station Keeping Control system
- Environmental Monitoring and Sensor Networks
- High Precision Marine Operations (Launch and Recovery System)
- Fault Detection and Fault-tolerant Control

UCL Facilities

dSpace



Water tank

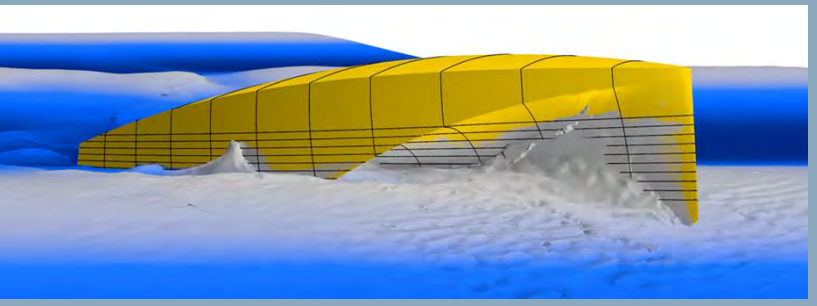
Advanced Propulsion Lab

Yao's group: 6 funded EPSRC, Royal Society, and industry-funded projects, 30+ publications, 5 PhD students

Completed CMDC1, 2 and 4
Developing the most energy-efficient electric vessels
Range up to 150 NM

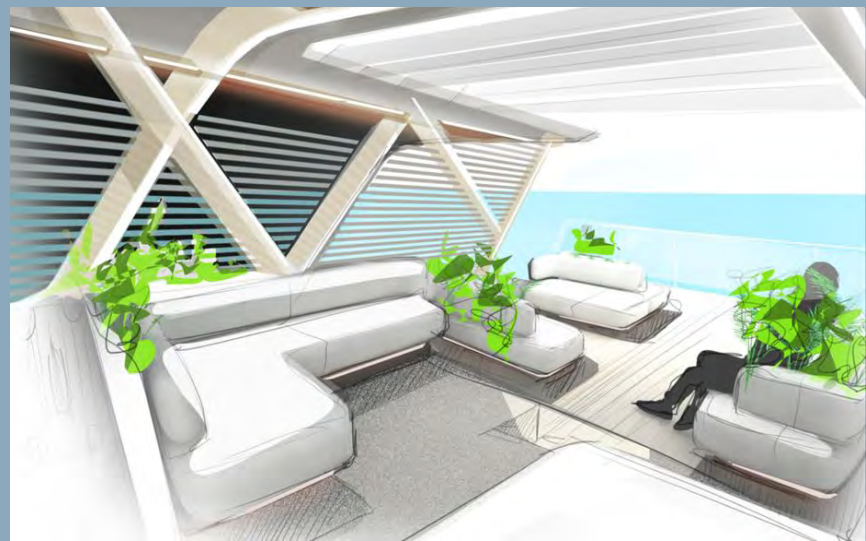
optima e-yachts

David Kendall CEO +44 7774 887037
David.Kendall@optima-projects.com
www.optima-yachts.com



Built & tested 10m prototype
Leisure Yachts, Water Taxis, Hotels & Resorts
100% electric & zero-emission
Developing 14m version

14m luxury taxi for 12pax
Enquiries for larger versions ~ 20m 50pax
Investment needed for final development
& to start production in the UK



Enerkem

Market leader in Waste-to-Methanol

Enerkem Technology: Commercial, Scalable and Sustainable

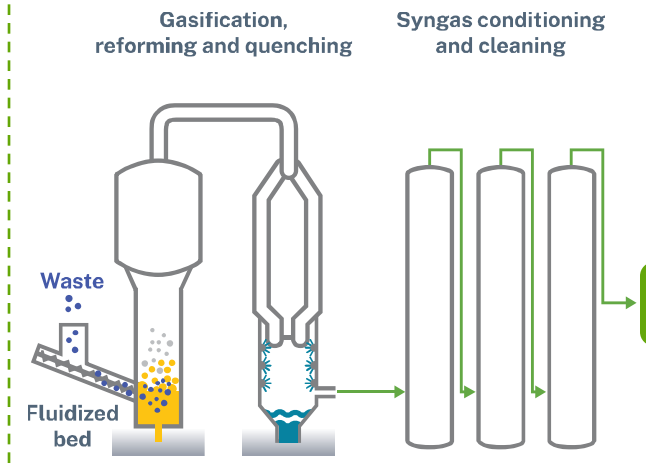
WASTE

Mixed municipal waste

Industrial wastes (ICI), Construction wastes (C&D)

Biomass residues

PROPRIETARY ENERKEM TECHNOLOGY



3rd PARTY

- Fischer-Tropsch
- Methanol to Jet
- Methanol to Olefins
- Methanol to DME

TARGET MARKETS

- **Aviation** (SAF)
- **Maritime** (Methanol)
- **Chemicals** (Ethylene, Propylene, MeOH, EtOH)
- **LPG substitution** (Dimethyl Ether (DME))

Commercial roll-out underway in multiple regions

World's first commercial-sized waste-to-biofuels and circular chemicals facility

- 15,000 hours of operation
- Production of syngas, ethanol and methanol
- Technology validated by Shell and Repsol

First fully commercial projects producing sustainable methanol

Partners: PRO MAN, Shell, SUNCOR

Partner: REPSOL

HIXAL

‘Imagine a world where you’re no longer held back by grid limitations’

Efficient Hybrid decentralised power with multiple charge heads :

- Unlocks 500kW EV charging everywhere.
- Bi-directional central power hub.
- Smaller than a car park space.

Superior Efficiency, protected by a Patent Pending:

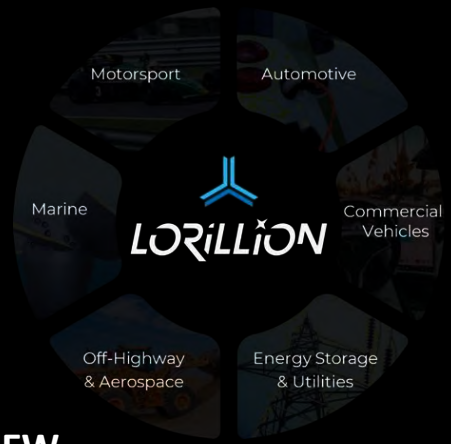
- Up to 12% higher efficiency compared to other hydrogen generators.
- Up to 10% greater efficiency in cold climates.

Contact: IanPJ@Hixal.net
Website: Hixal.net
Telephone: +44 (0) 7866515216

ABOUT LORILLION

LORILLION is the engineering services subsidiary of a wider product group, specialising in Product Development, Engineering & R&D Services. Working with clients on both a commercial basis as well as partnering on grant funded programmes.

We develop bespoke, sustainable electrification solutions for clean technology sectors.



WHAT WE DO

Core Know-How

- Powertrain Control
- Battery Management
- Transmission Control
- Thermal Management
- Energy Management
- Charge Control
- Telemetry

MOBILITY

STATIONARY

Core Product Development

- Power Electronics
- EE Distribution
- DC Chargers
- Energy Storage Systems
- Telematics
- Battery Management Systems

Partner Capabilities

- Cloud Services
- Transmission
- Motor
- H_2 Fuel Cell
- Generators

ENGINEERING CAPABILITY OVERVIEW

Control Systems & SW

- Data Analysis
- Simulation
- Software Development
- Software Architecture
- Bootloader
- Full Stack Development
- Real-Time Control
- MIL / SIL Modelling
- Embedded Applications
- Continuous Integration
- Unit / Integration Testing

Electrical System

- Circuit & Harness Design
- Power Distribution
- LV & HV Design
- Fusing & Grounding
- Circuit Simulation
- Component Specification
- Product Drawings
- Process Instructions
- Harness Testing

Electronics

- Circuit & PCB Layout Design
- Power Electronics
- Low Power
- SiC & GaN
- Simulation
- Firmware
- EMC Design & Test
- Thermal Design
- Reliability Analysis
- Testing

Mechanical Design

- 3D Design & Packaging
- 3D Routing
- Battery Module Design
- Battery Pack Design
- FEA Simulation
- Production Drawings
- Process Design
- Component Release
- BOM Management
- Testing

Systems Engineering

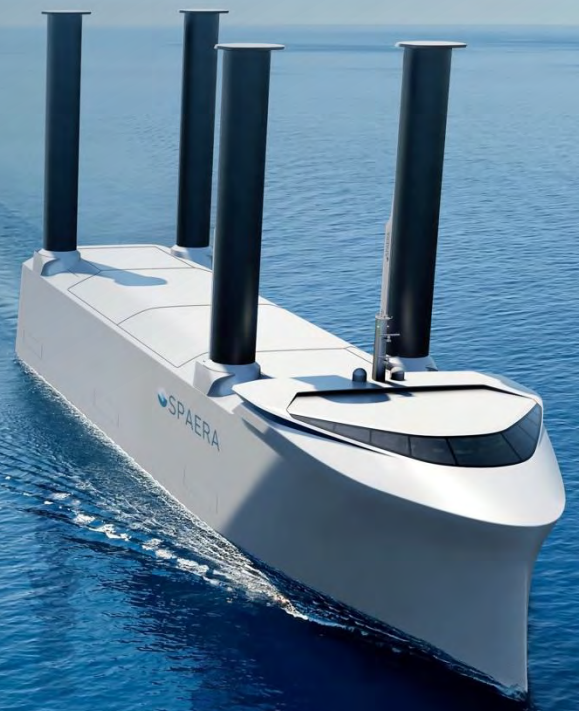
- Feature & Attribute Decomposition
- Requirements Capture & Analysis
- System Specification
- Component Specification
- Architecture Design
- Systems Integration & Testing
- Product Lines
- Coverage & Traceability
- MBSE

FuSa & Cyber Security

- IEC61508
- ISO26262
- Functional Analysis
- Functional Safety Architecture
- SOTIF
- Process Management
- Cyber Security ISO21434
- Software Update Management
- ISO24089

For more information, contact us at sales@lorillion.com

NET-ZERO EMISSION SHIP



PROJECT

- Advancing the SPAERA net-zero emission ship concept
- Optimised hull, rudder and propeller design for the integration and effectiveness of Wind Propulsion Technology
- Next generation powertrain and emissions capture integration
- Technology integration & efficient design applicable to majority of vessel use cases
- Optimised for maximum net present value

CONSORTIUM

SPAERA

- Technology start-up pioneering the next generation of maritime transportation
- Resolving a truly zero emission ship design, leveraging next generation tools & systems to maximise efficiency
- Advanced Digital modelling of the maritime ecosystem

TBD

CONTACT

spaera.eco

info@spaera.eco

LEVISTOR

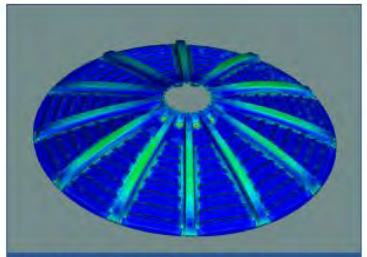
- Packaged flywheel plus battery energy storage & rapid electric chargers.
- Sits between grid and charge-point to overcomes grid limitations.
- Fast to deploy or move.
- Scalable from 100kW to multimegawatt
- Being trialled by National Highways Q1 2025

Tom Andrews

07740195562

t.andrews@levistor.com

www.levistor.com



ADVANCED STRUCTURES

- UK registered company
- Founded in 2016
- Weight critical structures

HIGH SPEED LIGHT CRAFT

- Marine design
- Low TRL projects
- Material agnostic

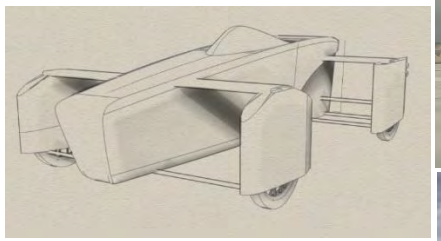
PROTOTYPING

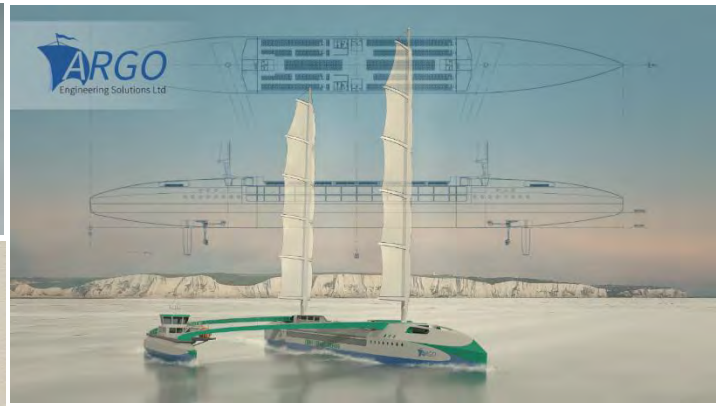
- Design and build
- Over 250 projects completed

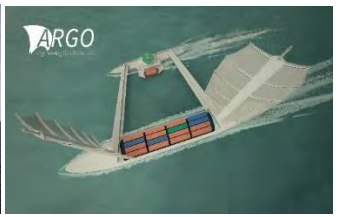
WIND PROPULSION SYSTEMS

- Windships
- Electric Boats
- Autonomy

HOVERCRAFT & ACB'S







Bringing the power of HYDROGEN AUVs to long-endurance offshore survey.

Eager to collaborate with industry.

InX Tech

aryanshah@inxtech.org
inxtech.org






Dr Mamadou Ndiaye

Dr Taaha Hussain

One of the world's leading mobility technology companies for development, simulation and testing in the automotive industry, and in other sectors such as rail, **marine**, and energy.
Based on extensive in-house research activities, we deliver concepts, technology solutions, methodologies, and development tools for a greener, safer, better world of mobility and beyond.

AVL UK is currently leading the Smart Electrification of Short Straits Ferries feasibility study from the Smart Shipping Acceleration Fund on the future deployment of e-vessels across The Channel.

We can support all 3 strands of CMDC6 by providing consortia with expertise in the following areas:

- Powertrain development: Simulation, Design, Integration, Controls and Testing

  Battery, Fuel Cell Systems, PEMD, ICE with alternative fuels (H2, CH3OH, NH3)

- Autonomous systems development
- Digital twin development
- Data Science and AI

UK National Clean Maritime Research Hub

Research and Innovation to support a sustainable maritime sector

Collaboration between 18 UK universities and over 80 industrial and civic partners to decarbonise the maritime sector

Harnessing 76 researcher staff and benefitting from participating in over £70m UKRI investment in related research areas


ABL
An ABL Group Company

ALPHA MARINE
CONSULTING P.C.

ANEMOI

ONTIPOLLUTION
ENVIRONMENTAL PROTECTION SERVICES

ASG
SUPERCONDUCTORS

AURIGA energy

BALLARD

BMT

CALCULUS ENERGY

CARISBROOKE SHIPPING

cea

ceres

clean
air
power

CMAL

COWES HARBOUR
COMMISSION

COX

CATAPULT
Connected Places

Cummins

DFDS

DOVER
HARBOUR
BOARD

FREEPORT
EAST
Felixstowe
Gateway 14
Harwich

GLOBAL SHIP LEASE

HADLAND
MARITIME
LIMITED

•HELMEPA•

hynamics
GROUPE EDF

HYUNDAI
MOTOR GROUP

INSTITUTE OF
MARINE
Engineering, Science & Technology

INERIS
maîtriser le risque
pour un développement durable

Infineum

innospec

JM Johnson Matthey
Inspiring science, enhancing life

kellas
MIDSTREAM


KONGSBERG

Liverpool
City Region
Freeport

MAHLE

MERSEY
MARITIME

MIDLANDS
ENGINE

MIDLANDS
INNOVATION

MOL 商船三井
Mitsui O.S.K. Lines

New Ship Evolution

Ørsted

PD PORTS

PEEL PORTS
GROUP

Persee
smarter energies

HUTCHISON PORTS
PORT OF FELIXSTOWE

Portsmouth
INTERNATIONAL
Port

PRIME

REPSOL

RUX
energy

SAPIENZA
UNIVERSITÀ DI ROMA

sharp
composites


skeleton

SMD

SPOTSHIP

Steller
Systems

SUSTAINABLE
MaritimeSolutions

SSI
Sustainable Shipping Initiative

SUTTONS
Delivering life's essentials safely

TEES VALLEY

TEIGNBRIDGE

TOYOTA
TECHNOLOGICAL INSTITUTE

TU Delft

ULEMCo

UC
UNIVERSIDAD
DE CANTABRIA

U.PORTO

USN
University of
South-Eastern Norway

University of
Zagreb

ZEM
zero | emissions | marine

zizo

UK National Clean Maritime Research Hub

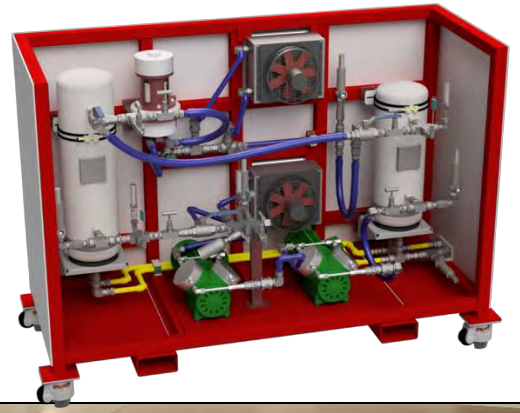
Research & Innovation

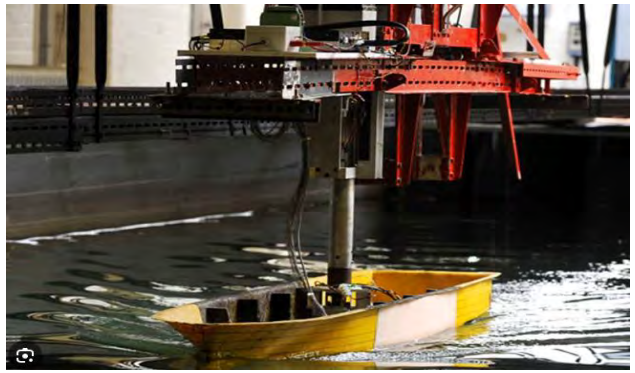
Our research and innovation focuses on 5 key themes:

- Advancing the scale up of marine fuels & their safe use.
- New and efficient low-carbon power & propulsion systems.
- Decarbonised energy systems, port & infrastructure.
- Reducing energy demand through advanced vessel design and increased efficiency.
- Advances in maritime operations, exploitation of digitisation and green finance.

UK National Clean Maritime Research Hub

World-class test facilities





UK National Clean Maritime Research Hub

Contact

Engineering and Physical Sciences Research Council

Funded by UK Government

Vast array of expertise and facilities across the Hub relevant to all potential CMDC6 projects – please get in touch

Professor Tony Roskilly
Director, UK National Clean Maritime Research Hub

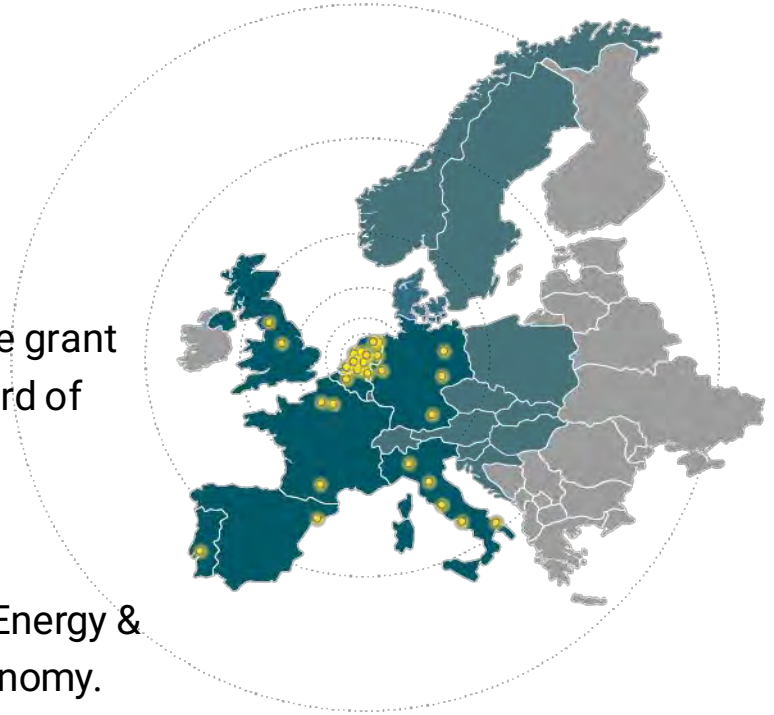
anthony.p.roskilly@durham.ac.uk

www.clean-maritime-research-hub.org

info.clean-maritime-research-hub@durham.ac.uk

PNO Consultants

- ✓ **European market leader in innovation funding services**
- ✓ Strong track record of helping UK SME's and large companies to secure grant funding for R&D and product development activities. 18 year track record of working with UK funding bodies such as Innovate UK, DSIT, NIHR, and European Schemes such as Horizon Europe, Innovation Fund
- ✓ Active across all industry sectors including Maritime, ICT, Clean Tech, Energy & Environment, Cybersecurity, Life Sciences & Healthcare, Agro & Bioeconomy.
- ✓ Service across the entire grant acquisition process from the identification and qualification of available grants through to a flexible writing support service. PNO can also support post award reporting activity once a grant has been awarded.
- ✓ In the context of Innovate UK programmes, we have experience of both open (e.g. Smart) and thematic calls submitting on average 90 -100 Innovate UK submissions per year (average success rate of >65%)



For further information please contact:
Dr Dorian Parker
Senior Innovation Consultant
07539 946 061
dorian.parker@pnoconsultants.com

Follow us:
https://www.linkedin.com/company/pno-consultants-uk/

Plastic-i: Innovating Clean Maritime Solutions

Plastic-i

Plastic-i is an Earthshot-nominated technology company that uses satellite images and AI to deliver actionable insights for maritime operations and ecosystem management. Our mission is to enable cleaner, safer, and more sustainable oceans.

Capabilities:

- Satellite-Derived Bathymetry: Supporting nearshore navigation and hazard mitigation.
- Sea Ice & Iceberg Detection: Ensuring safe passage in polar regions.
- Disaster Response: Monitoring oil spills, plastic nurdle spills, and other maritime emergencies.
- Offshore Emissions Monitoring: Tracking and reducing emissions for cleaner operations.
- Ecosystem Auditing: Effective management of coastal and marine ecosystems.

The Solent: Precision water depth measurements.

Seeking:

- Partners and collaborators: To advance solutions and provide access to ground truth.
- End Users and Stakeholders: From maritime and ports to deploy technology.

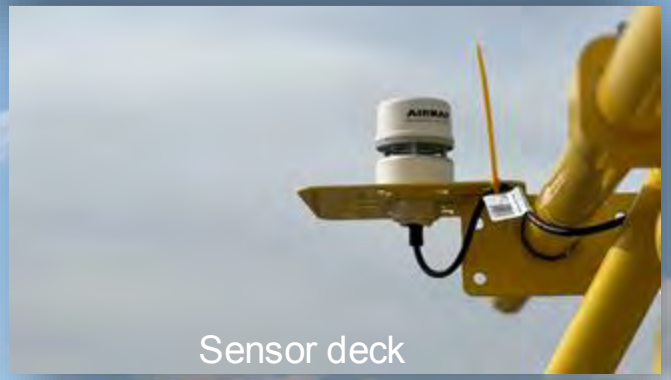
Contact: james@plastic.com | www.plastic-i.com

JET CONNECTIVITY
Extending Horizons

Our Offshore Platform

Control Room

Long range antenna



Sensor deck

Our offshore platforms are self powered by solar for year-round connectivity for safety and operations at sea. They also have a range of decks for adding sensors

James Thomas
CEO & Founder
james@jet-eng.com

Internet of Things ISO/IEC JTC1/TC41

Maritime & Internet of Underwater Things

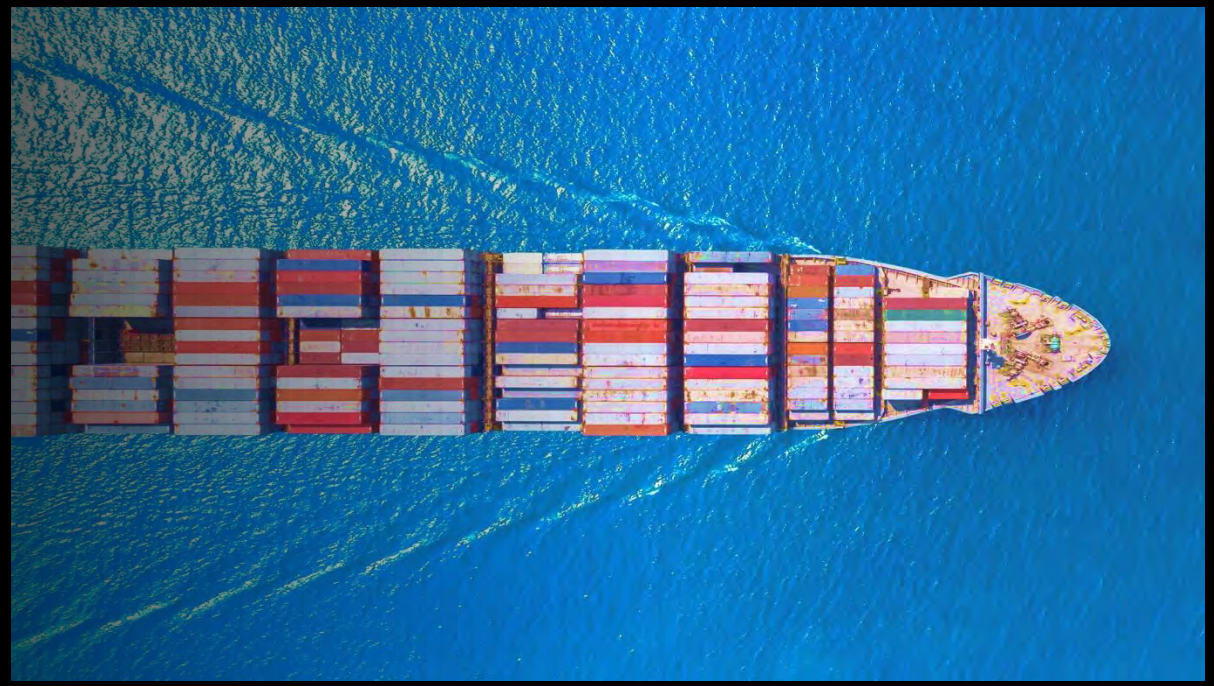
Ground breaking connectivity that can change the way we think about the Maritime Domain

Iain Shepherd, MARCOM
Iain@marcomdef.co.uk

University of Brighton

School of Business and Law

Decarbonisation Potential towards Automation, Optimisation, and Economic Assessment of Maritime Logistics



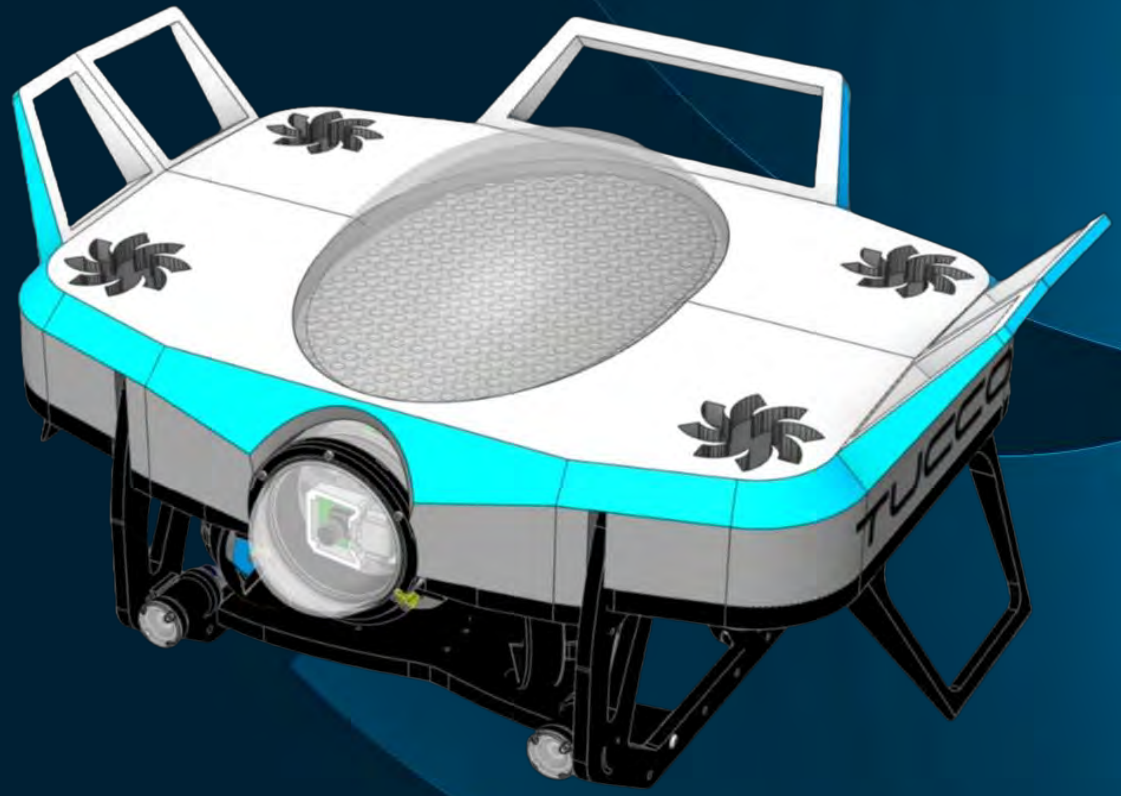
Dr Murat Aymelek

Lecturer in Logistics & SCM

University of Brighton

- Maritime Autonomous Surface Shipping
- Just in Time Arrival
- Ship-Port Interface
- Technoeconomic-Socioeconomic Analysis
- Logistics Optimisation and Supply Chain Simulations

Biofouling prevention by application of UV-C radiation via AI-navigated underwater robots



POWERING SMALL CRAFT WITH A NOVEL AMMONIA ENGINE

A radically different fuel may require a novel approach to engine architecture

Osprey, in partnership with Pascoe International and Solent University, are completing a feasibility study into such a novel architecture

The engine is very compact, lightweight and scalable and could be either a prime mover or part of a hybrid drive

Solent and Pascoe are exploring what the use of NH3 as a fuel means to the design and efficiency of a small craft

Our next phase will be to install this engine into a small craft to develop the performance characteristics of using this fuel as well as creating a safe fuelling strategy

Southampton Solent University

Osprey Research

www.ruxenergy.com

Proposed Approach/Project idea

Project Idea:
Further development of low-cost hydrogen fuel tanks for
- Powering mobile shoreside cold ironing
- Propulsion onboard vessels
- Powering portside NRMM

Problem:
1.H&S concerns in the maritime sector regarding hydrogen storage at high pressures on vessels.
2.NRMM is are easier to decarbonise with hydrogen than battery (and increasing availability in / around ports
3.Space on board vessels and an quayside is at a premium

Solution:
Our solution can store hydrogen at lower pressures 100 bar and below and is released by pressure swing (ie no capex needed) and our MOFs are recyclable
Our Solution can store nearly 3 times as much hydrogen in a given space than the standard 350 bar

Organisational Capabilities

We have:
- Patented MOF's
- Secured over £10 million of innovation funding in UK & Australia
- UK Engineering Integration office in Harwich , Essex
- Intellectual Property around Type V composite tank designs for Hydrogen Storage
- A team of 33 in Sydney and since July 2024 3 in the UK

We need:
- Collaborators who interested in partners offering standalone or integrated hydrogen tanks as part of their solution

Experience –

Development of low-cost hydrogen storage tanks based around our MOF solutions based

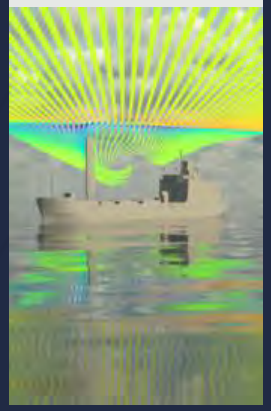
We are also a consortium partner on the CMDC4 SPOHL and the UK- Australia Renewable Hydrogen Innovation Partnership

Administrative Information

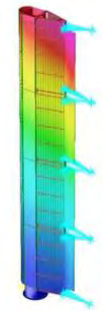
Contact : Robert Edge
Business Development Manager
Robert.edge@ruxenergy.com
07534 286116

SMART GREEN SHIPPING

FastRig design



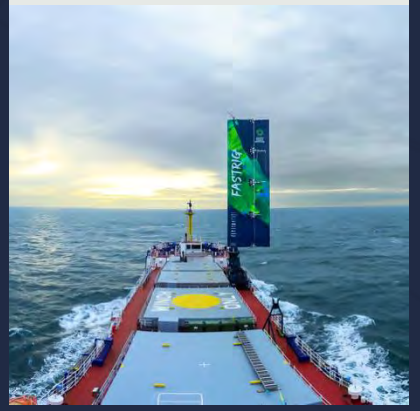
Aerodynamic analysis



Structural design & build

Performance prediction

Installation



Sea trials

Customer proposition

WINDS OF CHANGE

Scottish Enterprise · MOL Drybulk · University of Southampton Wolfson Unit · Humphreys Yacht Design · Malin Group

ARGO · drax · CALEY · NTS Nuclear Transport Solutions · HOULDER · Funded by UK Government · Lloyd's Register

CMDC6: Interests and Capabilities

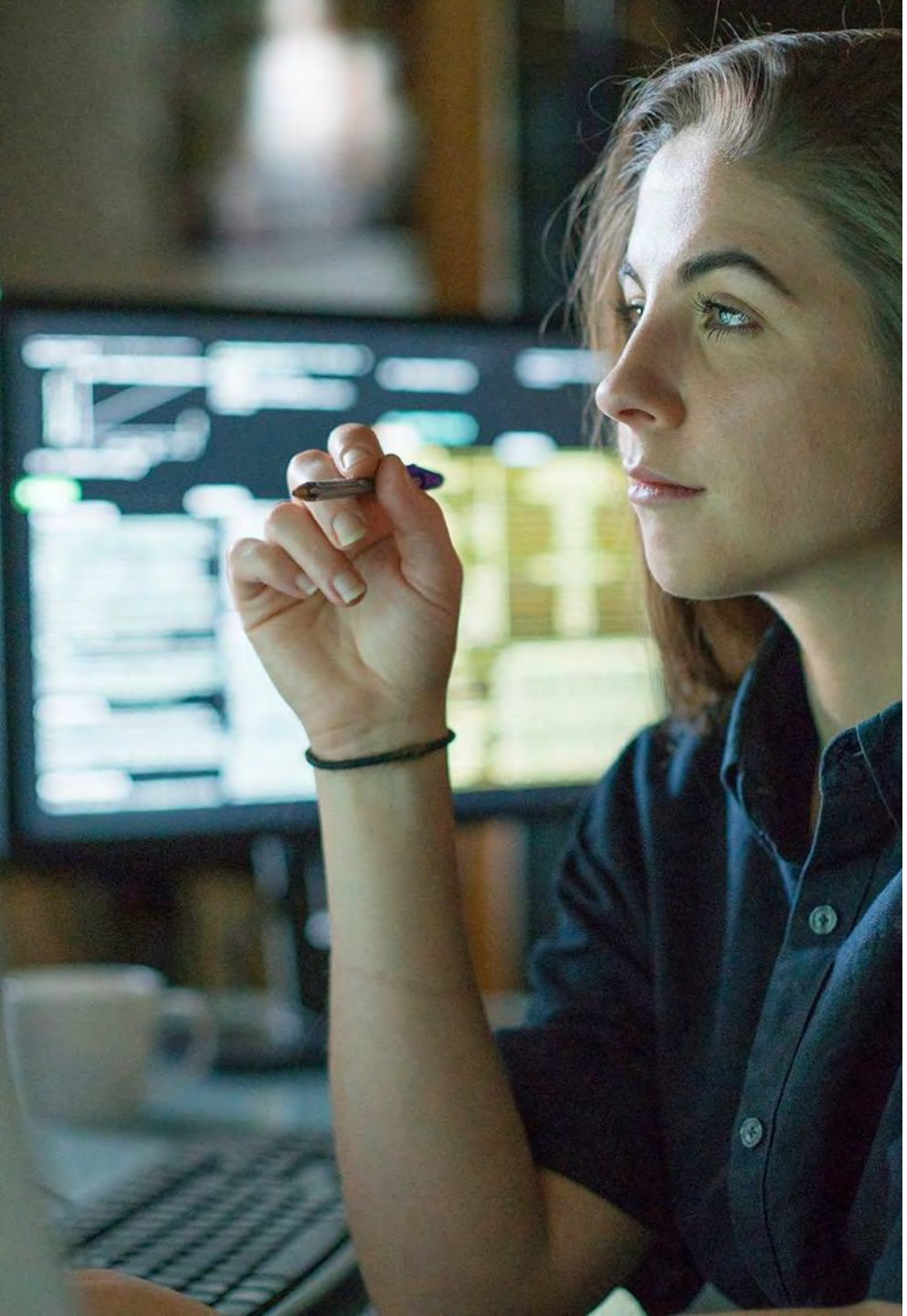
smmi@southampton.ac.uk

University of Southampton

SOUTHAMPTON MARINE & MARITIME INSTITUTE

- **Energy Efficiency Technologies**
  - Wind assisted propulsion
  - Wave augmented propulsion
  - Air lubrication
  - Voyage energy demand/system evaluation
- **Digital/SMART Shipping**
  - AI/ML optimisation
  - Data-centric engineering
  - Cyber-security, trust
  - Autonomy, lean crewing technologies
- **Energy Storage and Future Fuels**
  - Cryogenic fluids – materials / H_2 testing
  - Fuel cells, batteries, novel fuel combustion
  - Transport system emissions modelling

Hydrodynamic & Aerodynamic test facilities, High Performance Computing



Wrap up

Innovate UK | Business Connect