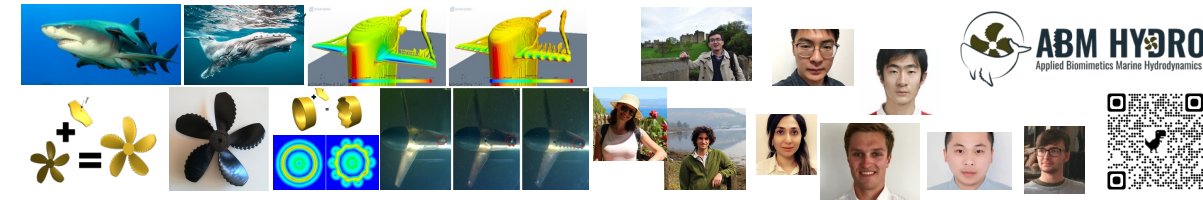


Mechanical Engineering and Marine Technology – Newcastle University

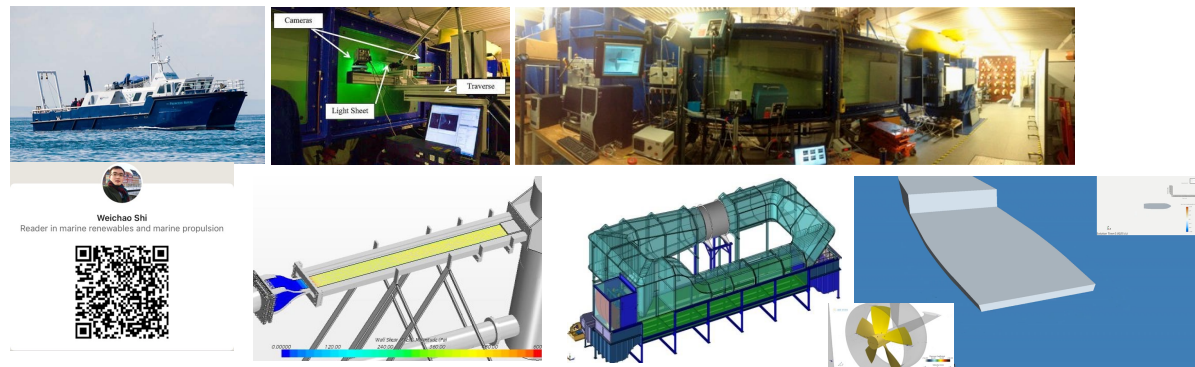
About us

- Weichao Shi, Reader in Net Zero Maritime Systems, Weichao.shi@newcastle.ac.uk
- Long-standing contributor to the development of zero emission ships. Project coordinator in RESHIP, TransShip projects
- Applied Biomimetics Marine Hydrodynamics Group: use our expertise in the **marine hydrodynamics** to develop the cutting-edge **applicable biomimetic technologies** to be enhance the performance



Capabilities we can offer

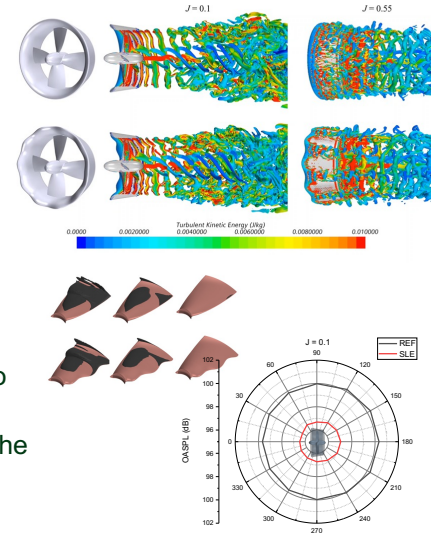
- Well equipped with the state-of-the-art **experimental and computational facilities**, including, High Performance Computer, the catamaran research vessel Princess Royal, the Emerson Cavitation Tunnel, the Fully Turbulent Flow Channel, the compared Wind Wave and Current tank.
- Ship design, hydrodynamic and hydrostatic evaluations, propeller and propulsion systems, CFD analysis, experimental testing.



About our proposed project

Energy efficient solutions for silent zero emission ships

- Energy efficiency is critical to zero emission ships, due to the weight and space requirement for the alternative fuel and the loss of energy in energy conversion
- IMO MEPC 80: Tackling climate change - cutting GHG emissions from ships - Including adoption of the revised IMO GHG Strategy; Energy efficiency of ships; Underwater noise.
- ESD Integration to achieve the maximum energy saving, zero emission and noise mitigation. Patented TAPs technology.
- Advanced CFD and EFD campaign to support the design of the ship.
- Demonstrator fabrication, sea trial and monitoring.



The partners/services we seek

- University as the research partner, contributing to ship design, analysis and testing.
- Organizing / joining a consortium to contribute our technology and capability.
- Contributing in proposal and project management.
- Organise project dissemination and communication activities.
- Work with Ship Designers, Owners and Operators, Shipyards, Investors, Class Society.

Clean Marine Shipping

• About us

Clean Marine Shipping CMS brings revolutionary, innovative hydrogen fuel cell technology to marine applications.

CMS enjoys exclusive technologies, services and maintenance are under exclusive license provided by collaborative partners.

CMS envisages using fuel cells starting with berthed vessels and integrated systems on lighter barges. The benefits are direct waste collection from ships, supplemented by shore base municipal solid waste to guarantee ongoing energy production.

• Capabilities we can offer

Waste to Energy (W2E) offers a low-cost competitive advantages, solving multiples problems with zero emission solutions and sustainability, developing circular economics and the competitive advantage, increasing as systems meet their ROI.

We are part of two tiers of companies:

- CME (Collaborative Manufacturing Enterprises): Responsible for manufacturing in partnerships.
- CPM (Collaborative Project Management): Energy marketing companies managing projects and operations.

We offer both manufacturing and project management.

- Through its network of collaborators, we can offer expertise, licensing agreements, financial knowledge and operational experience, enabling the company to ensure security and successful delivery.

• About our proposed project

Principal objective: Accelerate the use of technologies in near-term ship propulsion applications.

Utilise bio-waste and bio-material as a resource for multiple purposes:

- Eliminate costly transport and remediation of waste.
 - Generate low-cost electricity.
 - Produce de-mineralised water.
 - Create non-pathogenic fertiliser.
 - Capture CO2 for agriculture growth acceleration.
 - Enhance soil fertility.
 - Generate heat.
- Methodology for remediation of waste oils, especially from lubricants.
- Implement bio-systems to reform waste oils providing new energy sources.
- Avoid contamination and cost, by burning waste oil.

• The partners/services we seek

Decarbonisation of shipping is a major issue internationally and domestically.

We seek port, suppliers, agents and shipowners looking to tackle two current problems:

- management of on-board ship's waste, its reception at ports.
- use the waste as a resource to provide energy to power berthed vessels.

Isabela Tatu

info@cms-ltd.co

M: +447971 476 386

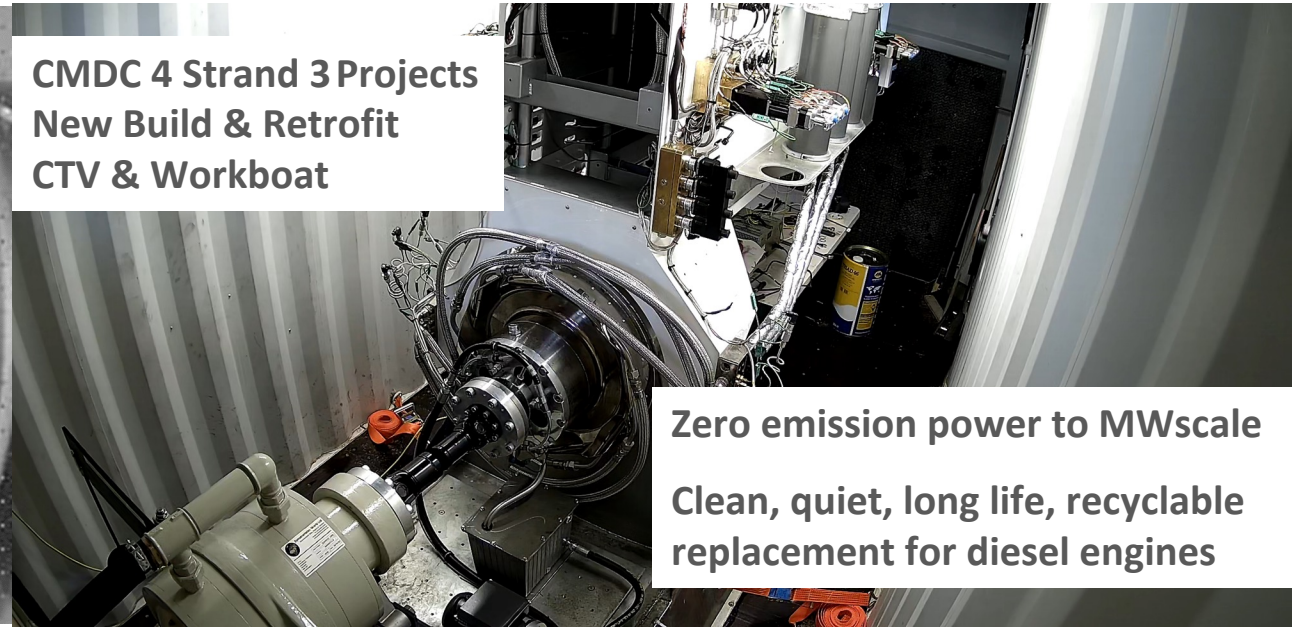


Steamology delivering zero emission power

matt.candy@steamology.co.uk

0 77 88 92 00 15

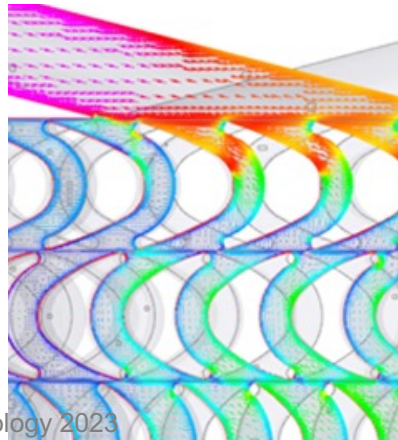
CMDC 4 Strand 3 Projects
New Build & Retrofit
CTV & Workboat



Zero emission power to MWscale
Clean, quiet, long life, recyclable
replacement for diesel engines

Design, build, test and development of quiet, clean, efficient,
energy dense, cost effective, long life marine power for
retrofit or new build vessels

Seeking
Owners, Operators,
Builders

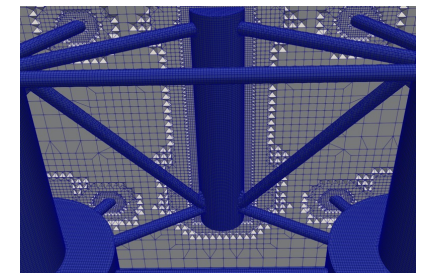


- About us
- Cranfield University: postgraduate only institution
- Lecturer in Marine Renewable Energy Systems
- 5 academics in our Centre for marine/offshore engineering
- 2 Research Assistant/Fellow
- 2 PhDs

- About our proposed project: Wave to Thrust
- Wave-devouring propulsion for green marine
- Reducing fuel consumption for ship
- Reducing fuel consumption for dynamic positioning
- Reducing mooring loads for floating wind and floating solar

- Capabilities we can offer
- **Marine lab testing - wave and towing tank**
- **Structure integrity lab testing**
- **Numerical modelling for marine structures**
- **3D printing**

- The partners/services we seek
- **Partners we seek: An industrial partner for wave-devouring propulsion used in ship transportation, floating wind & solar, and dynamic positioning.**
- Services we provided:
- hydrodynamics/structure analysis
- marine lab/structure integrity testing





About us

- Research-driven business spun out of Cambridge University over a decade ago
- Award winning, diverse team of technical specialists.
- Specialise in enabling data and software interoperability across multiple sectors.
- Key markets include automotive, maritime, materials, energy, environment, and infrastructure.

About our proposed project

- Creates a Connected Digital Twin to optimise port cities and maritime trade.
- Employs ontologies to enable cross-domain interoperability: ships, port infrastructure, multi-modal transportation and urban planning.
- Conducts "what-if" analysis for diverse decarbonisation strategies and holistic asset optimisation.
- Investigates impacts of port operations on surrounding areas, e.g. air quality, economics, etc.

Capabilities we can offer

- Advanced Dynamic Knowledge Graph technology and Semantic interoperability provided via our technology, **The World Avatar**.
- Representation of real-world physical aspects and IoT aiding scenario analysis, cross-domain decision-making.
- Comprehensive knowledge management considering the context and meaning of data.
- Expertise in modelling chemical processes and marine propulsion for both traditional and alternative fuels.

The partners/services we seek

- Collaboration with port management and fleet management entities.
- Partnership with research institutions and environmental agencies for enhanced R&D and environmental impact analysis.
- Government bodies for regulatory support, potential funding, and project collaborations.



Innovate UK
KTN

- Global leader in applied maritime research and education at all levels from cadets to PhDs
- UK's largest digital shipyard, maritime simulation centre, and specialist ship handling facility
- Centre for Marine Sustainability - insight, innovation, and knowledge for safe, sustainable seas
- Warsash Maritime Autonomous Surface Ships (MASS) Research Centre maritime autonomy and human elements

- Development and deployment of ammonia engine system for tender vessel or small craft
- Associated ammonia fueling system (potentially onboard parent vessel)

- Seeking other projects where we can bring our expertise and offering

- Digital twins and maritime simulation
- Autonomous vessel testing
- Life Cycle Assessment
- Naval architecture and design
 - Hydrodynamic testing
 - Human elements and training solutions

- Vessel owners / operators seeking to implement novel low-carbon propulsion technologies
- Naval architects / designers
- Shipyards
- Ports developing fueling solutions
- Technology developers (particularly with interests in ammonia systems)



Rux is an advanced MOF materials and packaged-H₂ scaleup:

- > doubling the volumetric density
- > halving the cost of dispatchable H₂ storage for bulk distribution, marine, refuelling, mobility and aviation
- Multi-international award winning, patented materials

- Rux provides bulk storage solutions for both ambient temperature high pressure and cryo-compressed low pressure H₂ storage systems.
- Our MOF-cch₂ 40ft ISO container is anticipated to store nearly >2.3 tonnes of H₂ without losses, and much more energy efficiently compared to LH₂.
- Rux also builds supply ecosystems by orchestrating next-gen supply chains, co-design partnering with governments, and regional partners, leveraging existing infrastructure, to minimize capex investment for end-users.
- Rux has 80+ industrial partners across 12 countries.

Proposing world first MOF-enabled H₂ storage bulk pack storing 200kgH₂ (4000L) to 2300kg (40ft ISO).

The project targets:

1. **Shore-to-Ship power** (>53 MWh – agile power unit) Stream 1 or
2. **Shore-to-Ship power AND on-vessel storage** (Stream 2) as our ISO bulk boxes of hydrogen are dual use (clicking into H₂ICE, H₂FCs and direct injection for gas blending at 200 bar consistent pressure output.

Rux is already collaborating with Cranfield University (supply chain) and Carnot Ltd (H₂ ICE power units)

We seek addition CMDC4 partners:

- **Ship builders**
- **Engineering groups (marine specialist)**
- **Ports seeking to build Shore-to-Ship power revenue streams**
- **UK Certification specialists for H₂ pressure vessels**



Breakthrough new MOF materials for H₂ storage

Goal US\$1 per kg H₂ for dispatchable storage

End-to-end solution, high efficiency, high density

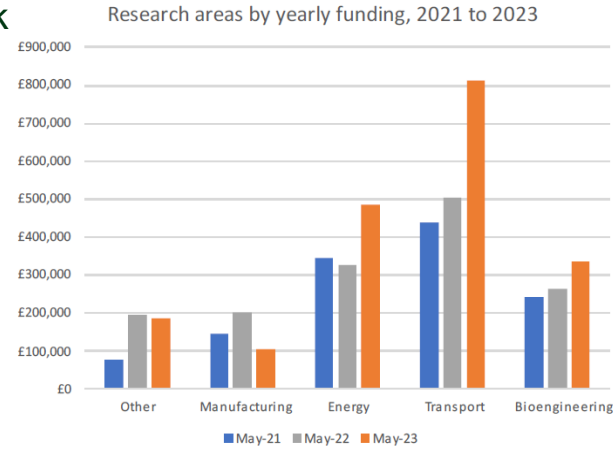


Innovate UK KTN

Dr. Vikas Sharma

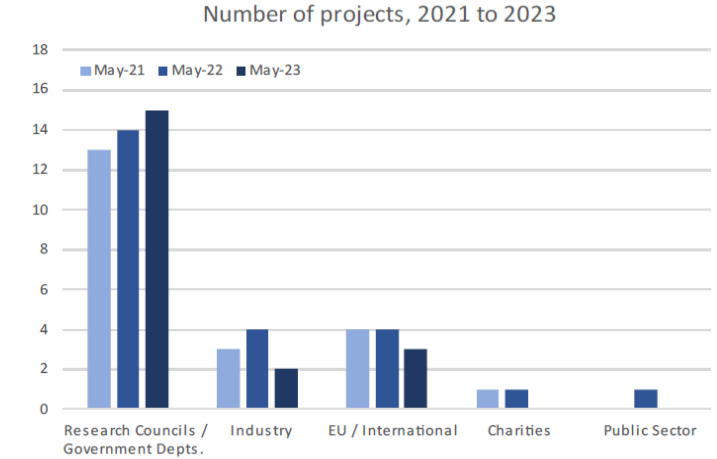
About us

- 30+ academics with track record of research in thermofluids applied to: Energy and Transport.
- Highly published (>750 papers on Pure).
- Experienced team of a dozen, PIs and Co-Is, to help problem solve TRL 'low to high' challenges.



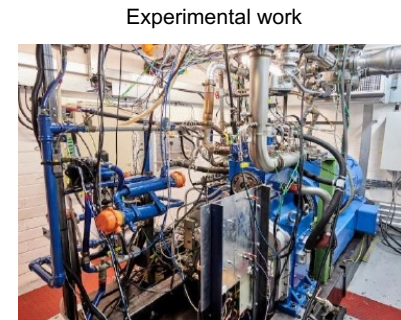
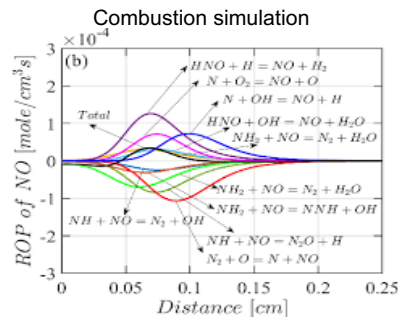
About our proposed project

- Combustion focused approach on alternative fuels (Hydrogen, Ammonia, Methane).
- Work packages can cover: safety, storage, utilization, emissions for Marine.
- Aligned to meet industry and government needs.



Capabilities we can offer

- Highly collaborative and multidisciplinary team, with industrial experience.
- Alternative fuels, from simulations to experimentations.
- Validated by complete heavy duty engine testing facility.



The partners/services we seek

- Are you seeking answers in efficient combustion for Hydrogen, Ammonia, Methane (Simulations and Experimentations)?
- Do you require feasibility studies to solve your near-term and long-term road map challenges.
- Are you considering experimental development to improve TRL.



University of Brighton



Innovate UK
KTN

ABOUT US

- Spaera is a technology start-up aiming to accelerate the transition of the maritime industry to net zero harmful emissions
- We believe that utilising wind power to its full effect will enable the economics and operation of renewable energy based, zero harmful emission vessels - providing a path to the elimination of fossil fuels from maritime

CAPABILITIES

- Vessel efficiency optimization for fossil fuel reduction
- Logistical and operational efficiency optimization
- Industry leading fluid dynamics expertise
- CFD simulation, analysis and guidance

PROPOSED PROJECT

- A physical prototype to validate our proprietary, scalable, wind propulsion system
- Virtual tools to better predict performance and optimize ship design for wind propulsion
- Route optimization tools to maximize the benefit of wind propulsion, and reduce uncertainties for ship owners/operators on possible emission reduction/vessel performance and cost savings

PARTNERS/SERVICES

- Ship owners/operators interested in fossil fuel reduction through wind propulsion and route optimization
- Port operators interested in wind propulsion effects on operation
- Engineering & fabrication service providers
- Data science, programming and machine learning service providers





R3Energise

Recycle Reuse Repower

R3Energise supports operators of existing vessels to modernize their fleet to current, green credentials

- Assessment of operational profile of existing vessel
- Feasibility study of most suitable arrangement with minimal impact:
 - Safety
 - Operability of the vessel
 - Environment

CTV Buzzard

2x QSM11 - 6 cylinder 11L Diesel
2500L diesel capacity
Operational speed: 22 knots



CTV Buzzard – R3Energised

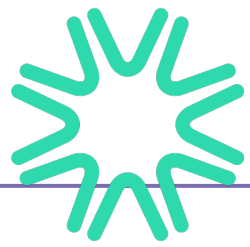
~1,000 kWh Battery
22 knots
Annual CO2 saving: ~300.000 kg



- Design & Engineering
- Shipyard collaboration & Build oversight
- CAPEX & OPEX assessment
 - Including ETS costs
- Monitoring Services for competitive advantage

- Partners:
 - Power management systems
 - On/Offshore Charging
 - Vessel Operators





SUNBORNE SYSTEMS

- Sunborne Systems are focused on developing state-of-the-art, tunable ammonia crackers that transform ammonia into a combustible mixture of ammonia and hydrogen:
 - World leading catalyst technology
 - World leading heat exchange technology
 - Integrated to make zero-carbon fuel a reality.

- Building from a CMDC2 feasibility study using:
 - Ammonia as a clean fuel source
 - A **Sunborne Systems** ammonia cracker to provide a combustible ammonia-hydrogen blend;
 - A **Cummins** high-speed marine engine to burn the fuel blend and provide power;
 - All packaged into an **Ocean Infinity** vessel for deploying ROVs.

- Next steps:
 - A shore-based demonstrator is the logical next step using Sunborne's cracker and Cummins' marine engine with Ocean Infinity's requirements.
 - Once the technology and integration has been demonstrated, then the next step will be to integrate into the ship itself.



CMDC4 PROJECT

PROFESSOR CHRIS SMITH



University
of Exeter

Centre for Future
Clean Mobility



Vessel Infrastructure & Demonstration.

CFCM have the capability in delivering large scale projects with excellent links to Supply Chain

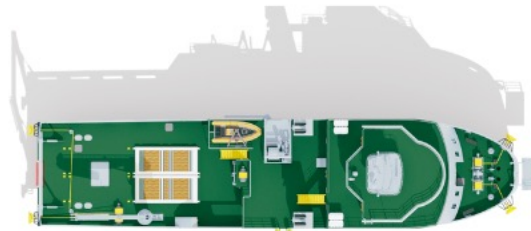
Vessel Retrofit



CMDC3 TransShip II project led by OS Energy

Powertrain Design

- Capability to design multiple MW powertrain system
- Deliver from powertrain design & test to the Vessel

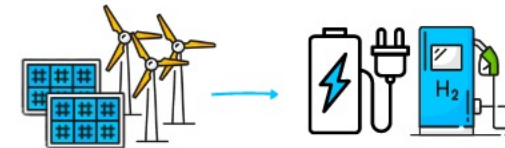


Areas of Interest

1. Zero Emission Short Sea Shipping Vessels



2. Infrastructure for supply of clean fuels



Driven X Performance

About Us

Proven expertise deploying **F1 approaches & techniques** to maritime sector

Delivered CHAMP1 vessel in <8 months (CMDC1)

Lead partner for CHAMP2 project (CMDC3)



Our Projects

We are looking for **collaboration opportunities** & evaluating potential CMDC4 projects:

- **Green conversion** of existing marine powertrains for retrofit to legacy vessels.
 - Sustainable fuel (Methanol)
 - Electrification
- Vessel **energy recovery** via active control.

Our Capabilities

- **High-performance team** of innovators, engineers & delivery experts sharing **motorsport derived expertise** to accelerate NPI & Operational Excellence
- **F1 techniques & processes** enable **rapid** prototype design, product development & build
- Deep **ICE & HV electrification** knowledge & expertise
- Data based maritime duty cycle understanding
- **Virtual product engineering, simulation & data analytics** experts

We are Seeking

- Potential clean maritime vessel builders / operators / customers
- Marine engine developers / suppliers
- Marine regulatory compliance experts
- Maritime & powertrain development research / academic institutions



Unitrove Innovation Limited

- About us



Zero-Emission Solutions Provider

- Specialist in liquid hydrogen (LH₂) fuelling technologies
- Built the World's First LH₂ bunkering facility (COP26)
- CMDC2 ZEMFS & CMDC3 HI-FIVED winners
- Plan to supply liquid hydrogen into the market

- About our proposed project

Zero-Emission Multi-Fuel Station (ZEMFS) for Hydrogen and Electric Vessels (CMDC Strand 2)

- Building the World's First Zero-Emission Multi-Fuel Station (ZEMFS) for fuelling ships with liquid hydrogen (LH₂), compressed gaseous hydrogen (CGH₂) and electricity

- Capabilities we can offer

Zero-emission fuelling infrastructure-as-a-service

- Liquid hydrogen fuelling stations
- Expertise on International hydrogen standards and regulations (e.g. ISO/TC 197 on hydrogen)

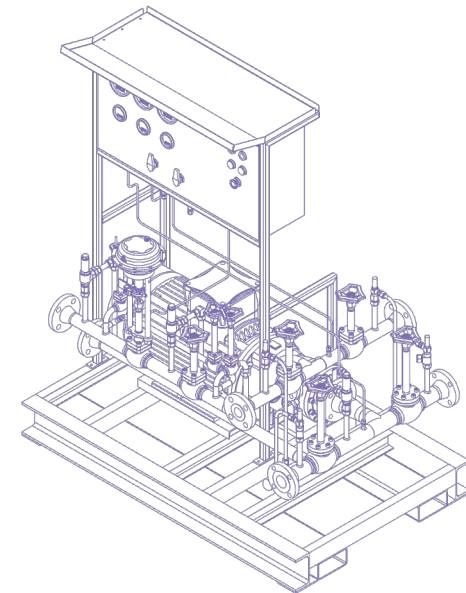


- The partners/services we seek

Consortium requirements for ZEMFS

- Liquid hydrogen vessel (e.g. ACUA Ocean)
- Compressed gaseous hydrogen vessel
- Battery electric vessel

- Port authorities (e.g. Port of Tyne)
- Academic partners (e.g. Strathclyde Uni)
- Consultants (e.g. ZEMTech)



FORESHIP

About us

- Independent Ship Design and Engineering Company
- Naval Architects, Marine Engineers and Sustainability Specialists
- Formed 2002, 80 employees, located in nine offices worldwide
- Leader in Passenger Vessel Consulting Services
- Leader in Sustainability Solutions for all ship types
- Located in Southampton, UK

About our proposed project

- Future Vessel Concept Designs
- Existing Vessel Conversion, Retrofit Solutions
- Future Fuel Feasibility Studies
- Novel Clean Maritime Technology Applications
- Decarbonisation Planning, Analysis & Monitoring
- Green Corridor Development Support



Capabilities we can offer

- Novel and innovative vessel design concepts
- Energy Efficiency, Energy Storage & Fuel Cells Analysis
- Energy Modelling, System Verification & Validation
- CFD and Hydrodynamics Modelling
- Future Fuel Impact Assessments
- New Technology Concept & Feasibility Studies
- Project Management

The partners/services we seek

- CMDC Strands 1, 2 & 3
- Ship Owners
- Shipyards
- Technology Providers
- Research and Development Institutions
- Fuel and Energy Solution Providers
- Regulation and Classification Providers

Sinclair Energy Partners Ltd

About us

- Ammonia SOFC technology, IP and fabrication capabilities
- Development of new technologies in energy sector
- Experimental facility based in Cambridge and production facility in Scotland
- Significant experience of developing new products and technologies for offshore and underwater environment

About our proposed project

- Demonstration of ammonia SOFC (solid oxide fuel cell) system on a marine vessel
- Certification and qualification for fuel transfer, bunkering, safety and controls for the ammonia derived power generation systems
- Black-box hardware and fully automated system installed on vessel to eliminate HSE risks from human entry
- Strong commercialisation potential

- Capabilities **we can offer**
- Novel and proven ammonia SOFC technology; eliminated NOx emissions by design and no ammonia slippage
- End-to-end SOFC fabrication capabilities in the UK
- Offshore and marine engineering expertise

The partners/services we seek

- Build a consortium with vessel operator, port, certification agency, academic partner and ammonia SOFC provider
- Vessel operators/ owners with an interest in scaling ammonia and hydrogen based propulsion systems
- Industry collaborators and academic partners with experience of building systems for high safety applications and automated operation



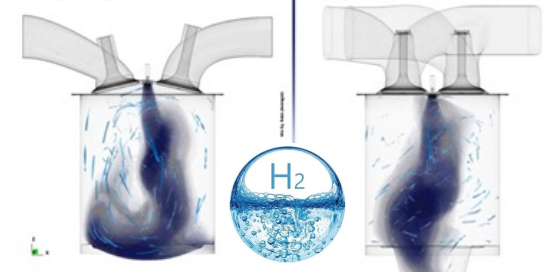
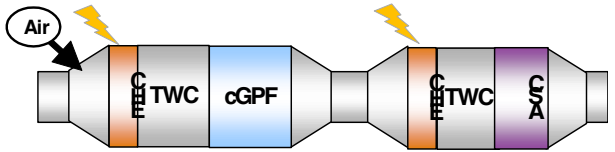
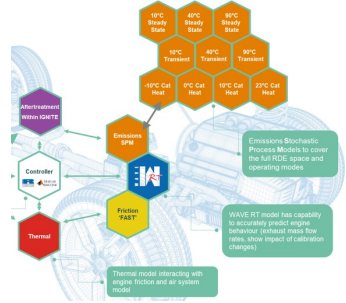
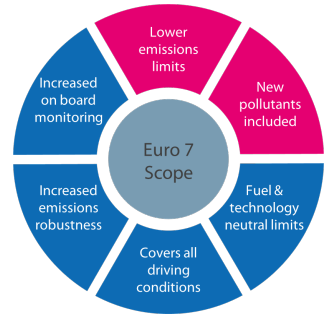


Engine Expertise

 **Air Quality Improvement**

 **Low-Cost Electrification**

 **Sustainable Fuels**



Ricardo supports readiness for future emissions compliance

Ricardo develops Dedicated Hybrid Engines for electrified propulsion

Ricardo has a future fuels vision for sustainable propulsion

Strategy & Advice

Design & Analysis

Development & Validation

Product Launch

Production & Compliance

Ricardo is a multifaceted engineering service provider and leading energy and environmental consultancy with over 100 years' experience working with clients across the globe. Globally Ricardo employs over 3000 people, including many internationally renowned technical experts and consultants across many disciplines.

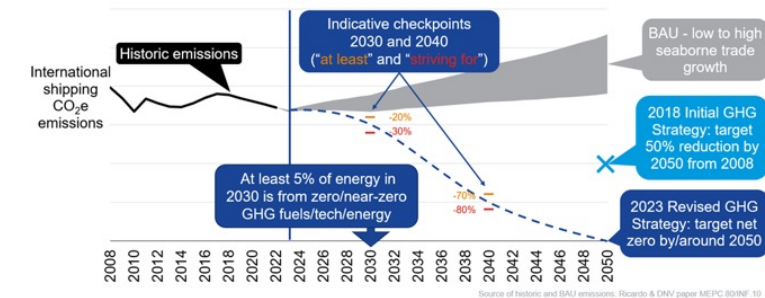
Vision for 2030 - Ricardo is seen as the 'go to' partner and recognised leader at the heart of the transition to a sustainable maritime sector

The partners/services we seek

- Engine manufacturers
- Vessel owners/operators
- Ports
- NRMM equipment OEMs

Capabilities we can offer

- Engines (new/retrofit)
 - Fuel selection
 - Design and development
 - Validation
 - Production
- Fuel cell systems
 - Containerised systems for auxiliary power or shore power
- Energy systems
 - Shore-power systems
 - Port-side energy storage
 - Networking planning with DNO
- Policy support
 - Technical roadmaps
 - Emission modelling
 - Impact assessments
 - Market review

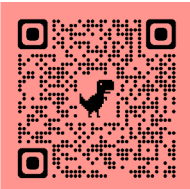


M • LE

- Just park and get charged up!
- MOLE is an automated, underbody charging solution ([ACD-U](#)). A simple, inexpensive installation on the vehicle enables most vehicles to park above a MOLE ground unit and charge. Charging is achieved by physically docking any approved charging connector (Type 1, Type 2, CCS, ChAdeMO, MCS). Instructions to dock and undock (at the end of the charging session) can be given through a mobile App or a physical switch.
- Connecting to a charger could not be easier, quicker or safer than using the MOLE without the need to handle cables or plugs, leaving your depot and site clean, safe and clutter free.

- We have developed automated docking and charging solution suitable for a wide range of surface transport vehicles (LCVs, HGVs, cars, shuttles, AGVs, GSEs, special vehicles).
- Our technology can be used to automate charging of EVs operating in the port areas.

- Our technology can also be adapted to automate refueling operations for other clean fuels (e.g. H2, biofuel, green CNG) for surface vehicle and to charge or refuel vessels autonomously.



- The maritime and port sector lies at the heart of a dynamic and multi modal transport system.
- Different transport modes interconnect and goods and people interchange within the maritime and port system.
- Our vision is a seamless, optimized and scalable autonomous charging and refueling platform for all vehicles operating in this environment.
- We seek to make charging and refuelling easy, efficient and scalable through automation so that the transition to clean mobility can be scaled without operational friction.
- Our technology saves space, time, and money for operators through better efficiency, higher safety and lower operational risk.

- We seek partners from the following parts of the value chain:
 - Port operators
 - Logistics fleet operators
 - Port services companies
 - Maritime engineering companies with special expertise in infrastructure and vessel electrification and support.

AVL Powertrain UK Ltd

- About us
- UK division of a global powertrain consultancy
- 75 years of engine development
- 15 years of battery development
- 20 years of fuel cell development
- Marine development experience
- Including marine fuel cell

- About our proposed project
- Providing support services for
 - Marine application of e Drive, fuel cells or battery
 - Clean ICE and aftertreatment
 - Alternative fuels

- Capabilities **we can offer**
- Simulation and modelling including AVL toolsuite
- Testing of propulsion systems (up to 4MW)
- Design, build and test of full or part systems
- HV and hydrogen capable

- The partners/services **we seek**
- Looking for partners to deploy global developments from our marine engine, battery and fuel cell centres here in the UK.
- We are looking to develop AVL in the UK as a engineering partner.



— **IPG Energy has a low capex renewable generator that runs on *any* fuel, without the pollutant emissions.**

— **We're searching for partners interested in real-world trials of our product for decarbonising shore and on-vessel auxiliary power at scale.**

Get in touch

INFO@IPG.ENERGY | WWW.IPG.ENERGY

Switch between any fuel to access cheap, green and reliable power at scale today, with no risk of stranded assets tomorrow.

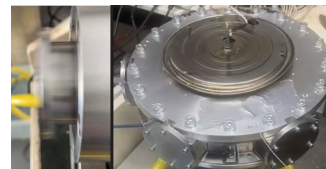


- Patents Granted in UK, EU and USA on game changing improvements to the free piston stirling engine
- Just successfully completed Fast Start Project to build prototype stirling engine and three test rigs
- We're a small team of highly talented engineers: - mechanical, electronic, systems and test

- We propose to produce a free piston stirling engine that generates electricity from the exhaust flue from a ship's engine

- We have proven ability to develop working innovative ideas in very short time scales.
- We are developing a stirling engine that can generate electricity from waste heat at relatively low temperature differential.
- www.stirlingworks.co.uk

- We are seeking collaboration from International Ferry Builders/operators.
- We also are seeking collaboration from a university that can support with simulation and/or test facilities.



Who are we...?

We are an Engineering and Technology Consultancy driven by our vision to “change the world by unlocking the potential of innovative technology”. Our core focus areas are:

- Decarbonisation
- Digitalisation
- Disruption

Who we want to talk to...?

- Previous UKSHORE projects/bids (including CMDC round 2 feasibility studies looking to move to demonstration)
- Vessel owners
- Shipyards and systems integrators
- Technology providers within the scope, including adjacent markets/sectors
- Research and Development Institutions
- Fuel and Energy Solutions Providers
- Projects seeking support in assurance and regulatory aspects

What we offer...?

- Strong foundation in systems engineering
- Extensive knowledge of the Clean Maritime landscape, including leading the Maritime and Coastguard Agency's (MCA's) Maritime Future Technologies (MFT) team, specialising in novel technology certification and assurance
- Successful track record in guiding industry applicants through complex assurance processes to mitigate risks and navigate uncertainties
- Expertise in bid management and writing, familiar with competition processes and priorities
- Robust project and program management skills
- Well-established network within the maritime and adjacent sectors

By partnering with us, you gain access to our comprehensive expertise and network, enabling you to navigate the challenges of the Clean Maritime Demonstration Competition successfully.

Phone
07584 039 085

Email
ashley@stehrconsulting.co.uk

Find out more here ►





Your Partner for a successful CMDC bid



About us

- 5700 strong team, 200 offices, 70 countries (500 U.K.)
- Established 1861, leader in Pax vessels, Highest growth IACS Class*
- UK: H², High Voltage, Material, Failure analysis laboratories
- Markets : Energy, Renewables, Marine, Offshore, Rail, Aerospace, Defence, Certification, infrastructure, Decarbonisation, Digital, Academia/ Industry funded project collaborations
- EU Horizon 2020 2nd largest funded project winner
- Key Partner in HiMET Orkney H² project
- EMSA COI certified for cross internal depart project



* Clarksons Dec 2022

Our Decarbonization key factors

R&D and Technology Scouting
Various projects on H₂ and CO₂
Best Innovation Award by FCH JU

**Certification Market Leader
With Own Laboratories & Facilities**

- ΔH Laboratory
- Combustion Laboratory
- Full Scale Testing capabilities for H₂ and CO₂

On & Off-shore Assets

- Implement a technology transfer aimed at overcome the Hydrogen and CCUS challenges:
- HSE
 - Project Management Consulting
 - Asset Integrity
 - Repurposing assessment for transport and storage



Multisector Green Economy

Supporting the supply chain in different Markets:

- Maritime
- Hard to Abate
- Renewables
- Industry
- Banks & Insurers
- Rail & Road Transport
- Multi-utilities
- IFIs
- Infrastructure

Global footprint

Global presence mainly linked to Marine & Energy sectors
70+ Countries

Renewables

- 20+ Environmental, permitting and biodiversity studies
- 1,350 MW Grid connection support for offshore wind energy in Europe and Asia
- Electrical design for a 476 MW offshore wind farm
- Solar & Smart Grid advisory
- Power to X

Proven Experience & Capabilities

- 210+ Industrial Innovation related Regional, National and EU funded projects, delivered in the past 10 years
- 300+ M€ Global Value of Industrial Innovation related EU funded projects, delivered in the past 10 years
- 4th Top Industrial Participant in FP7 across EU based on the number of Participations *
- 2nd Top Industrial Participant in H2020 across EU based on the number of Participations **
- 187 H2020 Participations and 47+ M€ Net EU Contribution
- Around 20% success rate in H2020
- 5000+ Partners in Industrial Innovation related funded projects
- Green finance PNRR, Horizon Europe, IPCEI, CEF

Opportunities we seek

- CMDC (strand 1, 2, 3, 4), ZEMFS & ZEVI partners
- Consortia comprising of
 - Vessel – infrastructure designers / owners / operators
 - Port Operators / developers
 - Technologists
 - Innovators
 - SME's,
 - Start-ups,
 - Shipyards



#keepitsimple #keepitrina

Contact : David.lynch@rina.org

* RINA / AIDA Cruise Methanol fuel cells

Proposed Approach/Project idea

Project Idea: We are involved in an already fully developed consortium who would like to adapt our super energy dense double acting piston engine to run on ammonia for auxiliary power on ships

Problem: Ammonia produces NOX and is heavy to store.

Solution: The USP of our engine is, it is approximately half the size and weight of any conventional engine for the same power output for any piston engine cycle. i.e. occupies half the engine room capacity on ships. Thus, perfect for ammonia. Engine room reduction is very attractive in shipping and not to mention lucrative

Organisational Capabilities

We have: Design, IP management, project management and exploitation management.

We have been successful in previous smart bids, which I have put together as project initiator and lead as project manager.

We need: as this call is only 12 months, I am looking at finding a potential new piston engine builder and engine developer who has the resources and can deliver a complete ship's engine build in the time. Happy to share step drawing of our 100kw prototype for further development and build. So not starting from scratch. Ideally active in the shipping sector with large shipping client list.

Also looking for a ship vessel partner(s) for strand 3, if you can help, please advise.

All partners would need to self-fund their own funding shortfall.

Experience – Our core team comprises

Hydrus brings design, direction, IP, project/risk and exploitation management expertise.

My academic partner is the University of Birmingham who specialise in Ammonia combustion optimisation. i.e. Nox reduction, Injectors development etc.

UoB(University-of-Birmingham) bring expertise in:

Ammonia:
combustion optimisation,
engine optimisation
injector flow/spray simulation
Engine optimisation/strategies
tail-pipe emissions aftertreatment mitigation
latest engine-simulation and noise/vibration reduction software
world-class industrially used testing facilities.

They conduct research and testing for validating production readiness.

Administrative Information

Contact :

Georg Deeke
Director
Hydrus Ltd
Oxford

Email: georgdeeke@btinternet.com



Methanol coaster demonstrator



• About us

MarRI-UK is collaborating with Intrada on a methanol coaster proposal.

Maritime Research & Innovation UK (MarRI-UK) is an industry-led initiative that drives the global competitiveness of the UK maritime through extensive partnerships in identifying, developing, and leveraging emerging technologies.

Intrada Ships Management Ltd (ISM) looks after technical, crewing and administrative management of the vessels operated by various owners, including Scotline.

• Capabilities

With eight maritime leading research Universities, MarRI-UK members offer full range of research capabilities from naval architect, to cyber security. If anyone needs an academic partner, please do reach out through info@marri-uk.org

ISM offers the complete range of ship management service. It hold full International Safety Management certification to certificate, control and audit.

• Proposed project

We aim to establish a live demonstrator vessel (about 3,500 DWT, under 90 metres LOA, roughly 15 metres beam and about 5 metres draft), be retrofitted to electric final drive powered by a bank of generators fuelled by methanol. The vessel would operate in a green corridor, an existing route used by Intrada, transport forest products/timber between the west coast Sweden and the south-east UK.



• What do we seek:

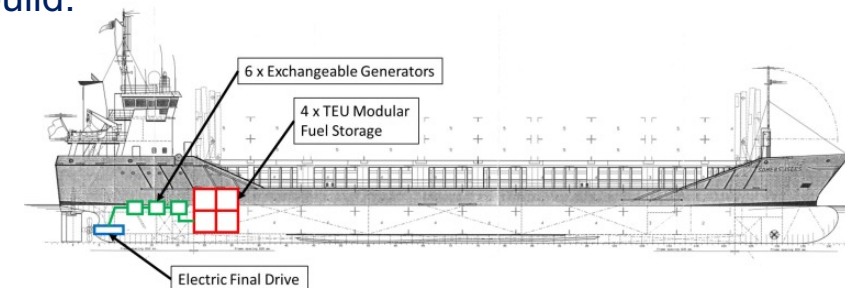
System designer – design and integrate with modular interface;

Methanol generator supplier – provide and integrate new plant with batteries, control system, physical integration;

Shipyard – retrofit/build.

Contact:

info@marri-uk.org



Proposed Approach/Project idea



Project Idea: Safeguard is a privately owned specialist consultancy with extensive experience across the Maritime Sector

Problem: The rapidly changing legislative landscape coupled to the speed of technological is a challenge against tight timelines in this exciting adventure.

Solution: Utilise the unique and extensive experience of Safeguard's team to support the development of the artefacts to support your project be it in compliance, safety and environmental assessment and reporting through to hazard recording, reporting and certifying.

Experience – Our core team comprises

Experienced practitioners from Ship Masters and Engineers through to Naval Architects and Environmentalists, including the first Defence Maritime Regulator, Safeguard has experience across the sector from Commercial and Defence Shipping to oil and gas and infrastructure.

Organisational Capabilities

We have: Planners, Engineers, and Operators.

We need: Cyber Security expertise

Administrative Information

Contact : **Steve Pearson Principal Consultant,**

steve.pearson@safeguardengineering.co.uk

Engine Design and Manufacture

Proposed Approach/Project idea

Project Idea:

We plan to modify our current hydrocarbon engine to run on pure hydrogen or ammonia. Retrofit the hydrogen and/or ammonia engine to a vessel, along with a hydrogen fuel storage solution.

Problem:

Large ribs, jet tenders, fast rescue vessels, and small commercial vessels cannot use conventional compression ignition engines due to size and weight constraints. In this market segment we see our engine as the only viable hydrogen and/or ammonia solution.

Solution:

We have an ultra lightweight true compression ignition engine, we calculate that we can replace a current hydrocarbon system like for like with a complete hydrogen and/or ammonia system with the exact same mass (including the tank).

Organisational Capabilities

We have:

- Rapid prototyping capabilities for both mechanical and electronics
- Dynamometer and real time fuel consumption monitoring

We need:

We are looking to form a consortium to deploy a fully operational hydrogen and/or ammonia vessel.

Experience – Our core team comprises

Weslake has over 100 years of experience designing and building specialist engines.

- F1 and Le Mans race winning engines
- Ultra lightweight compression engine at TRL4
- Advanced gear design
- Control system design and interfacing, real time engine monitoring

Administrative Information

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