

**IMO EXPERT WORKSHOP ON THE RELATIONSHIP BETWEEN ENERGY  
EFFICIENCY AND UNDERWATER RADIATED NOISE**  
Technical Workshop

hosted by:  
**International Maritime Organization (IMO)**  
location:  
**IMO Headquarters, London, UK**  
September 18 and 19, 2023

## WORKSHOP OBJECTIVES

The International Maritime Organization (IMO) will be hosting an international two-day workshop from September 18 to September 19, 2023 at IMO headquarters in London, UK, to assess the potential co-benefits and trade-offs that may exist between measures to increase a ships' energy efficiency and reduce its URN.

The main objectives of the workshop are to:

- explore the linkages between ship energy efficiency (EE) and URN, and whether methods being employed to comply with EE requirements are likely to also reduce noise, be neutral to noise reduction goals, or increase noise;
- identify, based on existing knowledge, methods and operational conditions that are likely to both improve EE and URN emissions, while maintaining safety and operational efficiency;
- identify approaches to EEXI/EEDI and CII compliance that are likely to be used in the short and long term, and the research needed to understand impacts on URN;
- share best practices and case studies from industry that have implemented technical and operational measures to increase EE and have also examined URN linkages
- provide a forum for networking and collaboration among experts involved in the shipping industry, with a focus on innovation and sustainability;
- Formulate recommendations to be considered in future work at the IMO to further advance the work on EE and URN and inform policy development.

## WORKSHOP AGENDA

Time	Agenda	Speakers
<b>DAY 1 September 18th</b>		
<b>9H30</b>	Opening Address (15 min)	<b>Mr Joseph Westwood-Booth, Senior Deputy Director in the Marine Safety Division, IMO</b>
<b>9H45</b>	Overview of the Format and Objectives (15 min)	<b>Chairs: Eric Baudin (France), Leila Hatch (United States) and Michelle Sanders (Canada)</b>
<b>Theme 1 REDUCING GHG AND NOISE EMISSIONS: Setting the Stage</b> <b>Chair: Leila Hatch, US</b>		
<b>10H</b>	Introduction and Overview of IMO Energy Efficiency Work (12 min)	<b>Sveinung Oftedal (Norway / Chair of ISWG-GHG)</b>
<b>10H15</b>	Introduction and overview of IMO URN (12 min)	<b>Michelle Sanders, Alternate Permanent Representative of Canada to the IMO</b>
<b>10H30</b>	GloNoise (10 min)	<b>Steven Reyersen &amp; Jose Matheickal, IMO</b>
<b>10H40 Health break (20 min)</b>		
<b>11H</b>	Presentation on the findings and recommendations on the GHG-URN matrix. (30 min)	<b>Rienk Terweij, VARD Marine</b>
<b>11H30</b>	Panel: perspectives on implementation of GHG and noise reduction strategies (1hr)	
		<b>Chris Waddington, International Chamber of Shipping (ICS)</b>
		<b>Sharad Dhavalikar, International Association of Classification Societies (IACS)</b>
		<b>Madadh MacLaine, Zero Emissions Ship Technology Association (ZESTA)</b>
		<b>Tom Smith, University College London</b>
		<b>John Maggs, Seas At Risk / Clean Shipping Coalition (CSC)</b>

<b>Lunch break 12H30PM-1H45PM (1H15)</b>		
<b>Theme 2 ENERGY EFFICIENCY BY DESIGN AND RELATED NEW SYSTEMS: What do we know about URN relationships?</b> Chair: Eric Baudin, France		
<b>1H45PM</b>	12 min x 8 presenters (2H)	<b>Lee B Kindberg, Maersk (remote)</b>
		<b>Yousef El Bagoury, CSL</b>
		<b>Frans Hendrik Lafeber, MARIN</b>
		<b>Lars Eikeland, Oscar Propulsion</b>
		<b>Mehmet Atlar and Cagatay Koksal, Gaters project</b>
		<b>Tomaso Gaggero and Michele Viviani, Life PIAQUO project</b>
		<b>Hongseok Jeong and Hanshin Seol, KRISO</b>
		<b>Kevin Reynolds, Glosten, naval architecture &amp; marine engineering</b>
<b>3H45PM Health break (30 min)</b>		
<b>4H15PM</b>	1H15 panel	all speakers under Theme 2
<b>5H30PM DAY 1 ENDING</b>		
<b>Day 2 September 19th</b>		
<b>9H30</b>	Welcome and report back from Day one to plenary (15 min)	<b>Chairs</b>
<b>9H45</b>	Opening Address (15 min) Indigenous knowledge & impacts of GHG-URN on their livelihood	<b>Lisa Koperqualuk, Inuit Circumpolar Council (ICC)</b>
<b>Theme 3 ENERGY TRANSITION, OPERATIONAL OPTIMIZATIONS AND RELATED SOLUTIONS: What do we know about URN relationships?</b> Chair: Eric Baudin, France		
<b>10H</b>	12 min x 7 presenters (1H45)	<b>Derek White, Port of Vancouver</b>
		<b>Chanwoo Bae, BC Ferries</b>
		<b>Kevin Bartoy, Washington State Ferries</b>
		<b>Mo Algermozi, GRAPHITE</b>
		<b>Arno Dubois, Silverstream Technologies</b>
<b>11H15 Health break (15 min)</b>		
<b>11H30</b>		<b>Stuart Sharp, PowerCell Group</b>
		<b>Gavin Allwright, International Windship Association</b>
<b>12H</b>	1H panel	all speakers under Theme 3
<b>Lunch break 1H-2H (1H)</b>		
<b>Theme 4: BRIDGING THE GAPS AND GOING TO SCALE: Building better information for integrated GHG and noise reduction</b> Chair: Leila Hatch, US		
<b>2H</b>	12 min x 5 presenters (1H15)	<b>Thomas Folegot, Quiet Oceans</b>
		<b>Charlotte Rose Findlay &amp; Christ de Jong, SATURN</b>
		<b>Bruce Anderson, Starcrest</b>
		<b>Charlotte Runzel, SailPlan</b>
		<b>Rene Taudal Poulson, Copenhagen Business School</b>
	45 min panel	all speakers under Theme 4
<b>4H Health break (30 min)</b>		

<b>4H30PM</b>	Plenary (45 min) <b>Chair: Michelle Sanders, Canada</b>	<i>Plenary</i>
<b>5H15PM</b>	Conclusion and Next Steps	<b>Chairs</b>
<b>5H30PM DAY 2 ENDING/WORKSHOP CONCLUDE</b>		

**OPENING REMARKS, IMO**



## Joseph Westwood-Booth, Senior Deputy Director in the Marine Safety Division, IMO

Host opening remarks

Mr. Westwood-Booth is a Senior Deputy Director in the Maritime Safety Division at the International Maritime Organization (IMO), a specialized agency of the United Nations. He is responsible for the Subdivision on Marine Technology and Cargoes, which manages three technical Sub-Committees tasked with the development of international maritime standards related to marine engineering, naval architecture and the carriage of hazardous cargoes.

**CHAIRS**



## Eric Baudin

Eric manages Innovation and Environment Global Service Line for Bureau Veritas Solutions Marine & Offshore. Graduated structural engineer and master from "Conservatoire National des Arts et Métiers" – Paris, Eric joined BV in 2000 as onsite measurement engineer during 7 years, then joined the research department, managing for BV, measurement related EU projects and other JIPs, covering different topics such as: ship hydroelastic structural behavior at sea, sloshing, noise and vibrations onboard, underwater noise radiated (URN) from ships and its impact on fauna. He carried on leading the measurements team during 5 years and is has been driving the innovation for BVS since 2020, the focus is mainly on environmental services and especially those falling under energy efficiency and energy transition axes. Eric is supporting the French delegation at IMO for underwater noise topic since 2013.



## Dr. Leila Hatch

Dr. Leila [Lee-la] Hatch is a research ecologist with the US National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries. Dr. Hatch serves as the national coordinator for underwater sound monitoring across the US national marine sanctuary system. She supports NOAA and US government science and policy efforts aimed at reducing the impacts of underwater noise from human activities on marine life and integrating sound-derived observations within broader marine life data collection, interpretation, management and access initiatives. Previous to her work at NOAA, she worked for the US Congress supporting ocean and coastal policy and participated in global research programs to study impacts to whale and dolphin populations associated with a wide range of human activities. She holds a Bachelors of Science from Yale College and a PhD in Evolutionary Biology from Cornell University.



## Michelle Sanders

Michelle was appointed as Canada's Alternate Permanent Representative to the IMO in August 2022. Prior to this, she was the lead Director responsible for, among other things, advancing Canada's efforts to address the impact of underwater noise from shipping on the marine environment, both domestically and internationally. She has held various positions within the Canadian government focusing on matters of environmental law and policy, including species at risk, oil spill response, environmental enforcement, and environmental assessments. She is the founding editor-in-chief and an Advisory Board member of the *McGill International Journal of Sustainable Development Law and Policy* and holds a Master's in Law in Global Sustainability and Environmental Law from the University of Ottawa.

## SPEAKERS

### Mo Algermozi, Graphite

Theme 3 Energy transition, operational optimizations and related solutions



### Gavin Allwright, International Windship Association (IWSA)

Theme 3 Energy transition, operational optimizations and related solutions

Gavin Allwright has been the Secretary General of the International Windship Association (IWSA) [www.wind-ship.org](http://www.wind-ship.org) since it was established in 2014, this not-for-profit grouping of over 150 maritime wind propulsion companies and projects supported by academia, NGO's and seafarers is working to promote and facilitate the uptake of wind propulsion solutions in commercial shipping. Alongside his work as association secretary, he also leads the policy work stream and heads the IWSA delegation at the International Maritime Organisation (IMO) where the organisation holds observer status, along with sitting on the European Sustainable Shipping Forum and until recently also on the IMO Maritime Technology Cooperation Centres (MTCC) stakeholder's advisory committee. He is also a non-executive board member at the World Wind Energy Association (WWEA). Gavin holds a Masters degree in Sustainable Development, specialising in small scale sustainable shipping and logistics in developing countries. He lectures on the development of wind propulsion and sustainable shipping as a visiting lecturer at a number of universities, including the UN World Maritime University, Malmo, Sweden. He is an advisor on a number of wind propulsion and decarbonisation projects and has contributed to numerous studies, books and articles on alternative propulsion solutions including acting as an expert reviewer on the first IPCC Special Report on 1.5C Global Warming.



### Bruce Anderson, Starcrest

Theme 4 Bridging the gaps and going to scale

Mr. Anderson is a founding Principal at Starcrest that focuses on air quality, greenhouse gases, and sustainability issues associated with ports and the maritime industry. His focus is on analyzing, developing, and implementing emission reduction strategies for ports through detailed technical analysis, development of technical scenario analysis to support policy decisions. He is the technical lead for the company's work related to ocean-going vessels and pioneered and continues to lead the evolution of detailed data-intensive emissions inventories for port sources that address policy drivers and document programmatic results. He led Starcrest's efforts on the approaches to quantify emission reductions from vessel speed reduction programs and other ship related studies. He continues to serve on IAPH's IMO MEPC delegation as a senior advisor, since MEPC 62 and has worked on numerous projects for the IMO Secretariat including the IMO Third GHG Study, consulted on the IMO Fourth GHG Study, the Comprehensive Impact Assessment – Stakeholder Analysis, IMO Project to improve transport cost data for Small

Island Developing States, and several capacity building projects for IMO GloMEEP and GreenVoyage2050.



## Dr. Mehmet Atlar, University of Strathclyde

Theme 2 Energy efficiency by design and related new systems

Mehmet Atlar, Professor (PhD, MSc, BSc, CEng, MRINA, MSNAME) – Mehmet Atlar is the Professor of Naval Hydrodynamics in the Department of Naval Architecture, Ocean and Marine Engineering at the University of Strathclyde. He has forty years of experience in experimental and theoretical hydrodynamics with special emphasis on ship powering, cavitation and URN. He has been participating in and coordinating many projects funded by the EU FP, H2020, UK EPSRC, MoD, Government and industry. He led the design and commissioning of Newcastle University’s catamaran Research Vessel “The Princess Royal” when he was the Professor and directing the Emerson Cavitation Tunnel until 2016. He is currently leading the H2020 Project GATERS with 18 partners to retrofit a novel gate rudder propulsion system for energy-saving, GHG reduction and URN mitigation. Prof Atlar published over 300 publications on Int’l refereed journals, conferences, and technical reports and received awards, including the most recent TRAVISION 2022 Senior Researcher award based on his activities in the GATERS project.



## Chanwoo Bae, BC Ferries

Theme 3 Energy transition, operational optimizations and related solutions

He embarked on his career at a shipyard in South Korea following his completion of a master's degree in Computational Fluid Dynamics (CFD) field. Over the course of six years, he worked as a naval architect, primarily focusing on the hull form and propeller design of large commercial vessels such as tankers, bulk carriers, and container ships and so on. After relocating to Canada, his design portfolio expanded to encompass a broader spectrum of marine craft, including custom yachts, tugs, barges, and coastal ferries. Prior to joining BC Ferries, he also contributed his expertise by teaching naval architecture at a maritime college in Newfoundland, Canada.

Within his role at BC Ferries, he takes on a multifaceted approach, involving himself in the day-to-day ship operation supports while also engaging in planning for the new ferries. His passion lies in building environmentally-friendly and highly efficient ships. He is actively involved in numerous projects related to hull fouling prevention, harnessing Big Data for enhanced ship operation, and advanced multi-physics computational techniques.





## Yousef El Bagoury, The CSL Group Inc.

Theme 2 Energy efficiency by design and related new systems

Yousef El Bagoury is a Senior Naval Architect and registered Professional Engineer at The CSL Group, in Montreal, Quebec. Yousef graduated from Glasgow and Strathclyde Universities with a B.Eng (Hons) degree in Naval Architecture and Marine Engineering, before embarking on career at sea as a Marine Engineer on refrigerated cargo vessels and cruise ships sailing up to the position of 2<sup>nd</sup> Engineer before coming ashore. Yousef started his CSL career as a Marine Systems Designer before becoming a Superintendent for CSL. In January 2018, Yousef took the position of Naval Architect, heading the development of CSL's Innovation Research and Development with a focus on improving safety and reducing CSL's environmental footprint. Yousef was promoted to Senior Naval Architect in 2022 and transitioned to the Environment, Social and Governance team in November 2022. He is the Technical Lead for CSL's URN work amongst other projects.



## Kevin Bartoy, Washington State Ferries

Theme 3 Energy transition, operational optimizations and related solutions

Kevin Bartoy has worked for the Washington State Department of Transportation (WSDOT) since 2009, and Washington State Ferries (WSF) (a division of WSDOT) since 2016. Kevin is the first Chief Sustainability Officer for WSF and recently helped to establish the Office of Sustainability and Environmental Services within WSF. Kevin's work includes being lead author of WSF's first Sustainability Action Plan, published in 2019. Kevin's work in establishing a sustainability program at WSF and leading WSF's efforts to help recover the critically endangered Southern Resident Killer Whale was recognized with the Washington State Governor's Leadership in Management Award in 2021.

As Kevin has helped lead WSF's sustainability journey, he has connected the organization with ports and other maritime operators along the West Coast of the United States and Canada as well as in Europe. These connections have led to the formation of working groups, which Kevin facilitates, for the Puget Sound and the West Coast of North America focused on environmental issues as well as the implementation of the Institute for Sustainable Infrastructure's Envision Framework for maritime infrastructure. Kevin also leads WSF's continuous improvement efforts within Green Marine, and participates in a leadership role within that organization on advisory committees and work groups to try to improve the environmental performance and sustainability of the North American maritime industry.

Kevin holds a BA in history from the University of Oregon, an MA in anthropology with an emphasis in historical archaeology from the College of William and Mary in Virginia, and a PhC in anthropology from the University of California at Berkeley.

## Sharad Dhavalikar, International Association of Classification Societies (IACS)

Theme 1 Reducing GHG and noise emissions



## Dr. Arno Dubois, Silverstream Technologies

Theme 3 Energy transition, operational optimizations and related solutions

Dr. Arno Dubois is Lead Hydrodynamicist at Silverstream Technologies. He is responsible for oversight and delivery of research-based projects aimed to analyse, understand, and improve the Silverstream® System. He deploys research techniques and practices in the fields of fundamental experimental research, computational fluid dynamics, underwater radiated noise, cavitations, execution of sea trials, and various performance measurement methodologies. His previous experience includes working as an Application Engineer for a simulation software company, specialising in computational fluid dynamics and heat transfer, and numerical and experimental research of hydrodynamic systems as part of his education and PhD research, which has been presented at several international conferences and published in various industry-leading journals.



## Lars Eikeland, Oscar Propulsion

Theme 2 Energy efficiency by design and related new systems

Lars Eikeland joined Oscar Propulsion in 2018 as a non-executive director and is responsible for the development of the marine vertical within Oscar Propulsion. Prior to this he spent twelve years in various leadership positions within Rolls-Royce Marine, which is now part of the Kongsberg Group.

Lars has broad international experience, having more than thirty years' leadership experience from ABB Ltd and Rolls-Royce Holdings plc and private equity owned companies. He is currently also involved in three other companies as a non-executive director and investor.

Born in Norway, Lars was educated at the Norwegian School of Economics and Business Administration, graduating with a Master's degree in International Business in 1989. He resides in the UK.



## Dr. Charlotte Rose Findlay, SATURN

Theme 4 Bridging the gaps and going to scale

Dr. Charlotte Findlay is a Postdoctoral Research Fellow in the Marine Bioacoustics Lab at Aarhus University in Denmark. Charlotte's research focuses on understanding and assessing the impacts of human-made underwater noise pollution on marine life, to better inform policies and management decisions. Her work within the European Union SATURN (developing solutions to underwater radiated noise) project aims to assess shipping noise impacts to marine mammals and the efficacy of potential noise mitigation solutions.



## Dr. Thomas Folegot, Quiet Oceans

Theme 4 Bridging the gaps and going to scale

Dr. Thomas Folegot received an M.Sc. in Physical Acoustics in 1995 from the Ecole Centrale de Lyon and a PhD in Physical Acoustics in 2003 from the University of Paris. He has worked for the French Military Centre of Oceanography on ocean acoustic tomography. He earned his Ph.D. at the University of Paris on time reversal techniques applied to the ocean and spent 5 years at the NATO Undersea Research Centre in LaSpezia (Italy) in the fields of high frequency acoustic propagation and harbour protection. After an Executive Master in Business Management from HEC in Paris, he founded Quiet-Oceans in 2010 to bring ocean sound modelling and sound mapping into the emergent field of environmental noise. Since 2010, he has been an active member of the EU/Technical Group Noise appointed by the European Commission.



## Dr. Cagatay Koksal, GATERS Project

Theme 2 Energy efficiency by design and related new systems

Dr Cagatay Koksal (BSc, MSc, PhD) is a Naval Architect with a PhD in Hydromechanics. He is working in the Department of Naval Architecture, Ocean and Marine Engineering at the University of Strathclyde as the GATERS Project Manager and Research Associate Responsibilities. His expertise is in experimental and numerical hydrodynamics, with hands-on experience in cavitation tunnel and towing tank tests, sea trials, and underwater noise measurement techniques.



## Hongseok Jeong, KRISO

Theme 2 Energy efficiency by design and related new systems

Hongseok joined Korea Research Institute of Ships and Ocean Engineering in 2019 and has been working as a senior researcher in the Advanced Ship Research Division. He has been involved in many research projects that are related to underwater propeller noise from commercial ships as well as naval vessels. His research interests are experimental analyses of propeller cavitation and its noise, which includes correlation between model and full scale measurements, acoustic modelling of propeller cavitation as well as structure-borne noise.



## Dr. Christ de Jong, SATURN

Theme 4 Bridging the gaps and going to scale

Dr. Christ de Jong is a senior consultant in the Acoustics and Sonar department of TNO in The Hague, Netherlands. He has been active in the fields of underwater sound and ship acoustics since 1986. His main focus is on the measuring and modelling underwater sound due to human activities at sea, in relation to the impact on marine life, advising industries and government. He is an active member of the ISO/TC43/SC3 working group responsible for the development of measurement standards for underwater radiated noise of ships.



## Dr. Lee B Kindberg, Maersk

Theme 2 Energy efficiency by design and related new systems

Dr. Lee Kindberg is Head of Environment and Sustainability for Maersk in North America. She serves on the Marine Board of the National Academies of Sciences, Engineering and Medicine, the Transportation Research Board's Standing Committee on Marine Environment, and has recently accepted a position on the National Academies' new Climate Crossroads Advisory Committee. She served for six years on the US Environmental Protection Agency's Clean Air Act Advisory Committee and co-chaired the EPA Ports Workgroup. She is also active in Clean Cargo, a global group dedicated to assessing and improving the environmental impact of shipping.



## Lisa Koperqualuk, Inuit Circumpolar Council (ICC)

Opening Address Indigenous knowledge & impacts of GHG-URN on their livelihood

Lisa Qiluqqi Koperqualuk was born in Puvirnituq, Nunavik. With a Bachelor's degree in Political Science from Concordia University, she holds a Master's degree in Anthropology from Laval University. Lisa served as ICC's Vice President of International Affairs in the Canada office from 2018-2022 before being acclaimed as President of the ICC Canada office at the 14th General Assembly on July 18, 2022. As VP International Affairs, Lisa focused much of her work in the areas of international shipping regulations successfully leading the ICC to receive provisional consultative status to the International Maritime Organization (IMO) where Inuit are the first Indigenous People to be represented under their own status. In Lisa's current role as President of ICC (Canada), she also serves as Vice Chair of ICC internationally. She works for Inuit interests in self-determination advocating Inuit political and economic autonomy, social justice and protection of the environment, culture and language.



## Frans Hendrik Lafeber, MARIN

Theme 2 Energy efficiency by design and related new systems

Frans Hendrik Lafeber started in 2007 at MARIN – Maritime Research Institute Netherlands – as project manager within the Ships department. In this position, he dealt with the propulsive performance of ships with a focus on cruise ships. Since then he has been involved with the measurements and analysis of propeller-induced pressure fluctuations and underwater radiated noise. Since 2014, Frans Hendrik is team leader of the Ships Analysis & Prediction Team. However, he is still involved in most projects dealing with underwater radiated noise, especially those including model tests. These projects can be either for MARIN's customers, for MARIN's own background research or for EU-funded projects such as SONIC and SATURN.



## Madadh MacLaine, Zero Emissions Ship Technology Association (ZESTA)

Theme 1 Reducing GHG and noise emissions

Madadh MacLaine is a visionary entrepreneur working in sustainability and the maritime sector. She is the Founder and CEO of Zero Emissions Maritime Technology Ltd (ZEM-Tech) Secretary-General of the Zero Emissions Ship Technology Association (ZESTAs), co-founder of the International Windships Association (IWSA), as well as Founder Director of the sustainable development NGO, Fair Winds Trust. She has a background in hydrogen water electrolysis and maritime systems, having represented ITM Power, plc, in the maritime industry.

Madadh has been working in zero-emissions shipping since she began designs for a ZE multi-access cargo ship in 2000. Frustrated by the lack of available technology, she set off on a course to bring ZE Ship Technology to the market. She founded ZESTAs to promote the interests of the Zero Emissions Ship Technology Industry in 2019. The goals of ZESTAs are to support ZE Technology development, represent its interests in the international shipping industry and regulatory bodies, and ensure a level playing field for Zero Emissions Ship Technologies, as well as shipowners, who are coming under increasing pressure to decarbonize their fleets. ZESTAs has recently been granted consultative status at the IMO.



## John Maggs, Seas At Risk / Clean Shipping Coalition (CSC)

Theme 1 Reducing GHG and noise emissions

John has worked for over 30 years representing civil society in multi-lateral processes aimed at the protection of seas and oceans. During this time he has covered issues as diverse as tanker safety, overfishing and marine protected areas, and in the process participated in numerous EU, regional seas, and UN level processes. At present his work is focussed on the climate impacts of international shipping including the impact of ship-source black carbon on the Arctic. John is responsible for the shipping file at the Brussels-based ocean campaigning organisation Seas at Risk, where there is a special focus on short-term ship climate action, and is part of the core team managing the Clean Arctic Alliance's work on black carbon and underwater noise pollution. He is the current President of the Clean Shipping Coalition, and under that flag is a long-standing and active participant in IMO processes.



## Sveinung Oftedal, Norwegian Ministry of Climate and Environment

Theme 1 Reducing GHG and noise emissions

Specialist Director in the Norwegian Ministry of Climate and Environment with focus on international negotiations on environmental requirements for the maritime sector. He has been heavily involved in negotiations on the hot topics at the IMO such as Greenhouse Gas Emissions, Air Pollution and other issues addressed in MARPOL, Ship Recycling, Ballast Water Management, Antifouling Systems and other environmental issues for over two decades. Chairman of the IMO BLG and PPR Sub-Committee (2010 – 2019) and is currently Chairman of the IMO Working Group on Greenhouse Gas emissions.



## René Taudal Poulsen, Copenhagen Business School

Theme 4 Bridging the gaps and going to scale

René Taudal Poulsen is Associate Professor at Copenhagen Business School. His research concerns processes of environmental upgrading in international shipping and the factors, which contribute to them. Focusing on the reduction of maritime air emissions abatement, he has conducted studies on energy efficiency, cargo-owner's and port authorities' greening measures, and the mandatory disclosure of ship's emissions data. His research is informed by political economy, economic geography, and business and environmental history, and has appeared in journals such as Global Environmental Change, Marine Policy, Transportation Research Part D, Journal of Cleaner Production, and Global Environmental Politics.

## Steven Reyersen, IMO

Theme 1 Reducing GHG and noise emissions

Steven Reyersen works at IMO, in the Department of Partnerships and Projects, where he coordinates the preparations for the GloNoise Partnership project



## Kevin Reynolds, Glosten

Theme 2 Energy efficiency by design and related new systems

Kevin Reynolds is a marine engineering principal and the director of research and development at Glosten, a premiere naval architecture and marine engineering firm headquartered in the United States. Prior to joining the firm in 2001, Kevin gained hands-on maritime experience as an unlimited chief engineer and a shipyard new construction project engineer. For two decades, he has led Glosten's marine environmental engineering efforts, specializing in aquatic invasive species, energy efficiency, reducing vessel emissions, and alternative fuels. Kevin is a chartered engineer in the UK and a professionally licensed engineer in Washington State. He is also an IMarEST Fellow, and provides advisory support to Washington State, California, the US Environmental Protection Agency, and the US Coast Guard.



## Charlotte Runzel, SailPlan

Theme 4 Bridging the gaps and going to scale

Charlotte is an experienced policy professional with expertise in maritime and environmental policy. She is currently Head of Government Affairs at SailPlan, previously advised United States Senator Blumenthal's Commerce, Science, and Transportation Committee work, and was a Policy Analyst for the National Audubon Society's coastal conservation program. Charlotte received a Master of Public Policy at Georgetown University and a Bachelor of Arts in Marine Sciences at UC Berkeley.



## Hanshin Seol, KRISO

Theme 2 Energy efficiency by design and related new systems

Hanshin joined Korea Research Institute of Ships and Ocean Engineering in 2005 and been currently in charge of the director of naval ship engineering research center of KRISO. His research interests are focused on the propeller design and noise reduction technology. His experience includes development of numerical methods to predict propeller noise, performing model and sea trial test. He has been leading many research projects that are related to propeller from commercial ships and naval vessels.



## Stuart Sharp, PowerCell Group

Theme 3 Energy transition, operational optimizations and related solutions

Working with PowerCell group based in Sweden globally, supplying the maritime, aviation and power generation markets with hydrogen fuel cell systems and technology. Stuart joined PowerCell in January 2023 after a long career working with other, Swedish companies active in the marine and oil and gas industries.



## Tom Smith, University College London

Theme 1 Reducing GHG and noise emissions

Tom Smith is a Research Fellow in the Marine Research Group at University College London. He has a PhD in Mechanical Engineering, where he focussed on computational modelling of flow-induced noise. His research now focuses on how to reduce flow-induced noise and underwater radiated noise. Primarily looking at the physics of how particular acoustic sources are generated, he aims to develop low-noise designs and technologies that can be applied across a range of sectors and applications. Tom also teaches Ocean Engineering and Naval Architecture to undergraduate and postgraduate students as well as teaching the propulsion and signatures components of UCL's Submarine Design & Acquisition Course.



## Rienk Terweij, VARD Marine

Theme 1 Reducing GHG and noise emissions

Rienk Terweij graduated from the University of Haarlem with a Bachelor's degree in Naval Architecture in 2001. And received his Master's degree in Social Sciences at the Vrije University of Amsterdam in 2004. He has over 20 years of experience in ship design, project management and hydrodynamics. Rienk worked for various engineering firms and various shipbuilders. His technical skills consist of ship hydrodynamics; resistance & propulsion, sea keeping, manoeuvring, sea trials, and ship acoustics; noise and vibration on board of vessels.

More topic related; Rienk has led projects for large North American ferry operators where one of the key design elements was energy efficiency in combination with reducing underwater radiated noise levels. He has experience in the prediction (and measurements) of propeller induced Underwater Radiated Noise levels. Furthermore, he was the project manager for a 4-year program with Canadian Coast Guard in which various alternative fuelled designs and other means to reduce the environmental impact of Canadian Coast Guard vessels were studied.





## Michele Viviani, Life PIAQUO project

Theme 2 Energy efficiency by design and related new systems

Michele Viviani was born in Genoa, Italy, in 1975. Michele Viviani received the M.Sc. degree in Naval Architecture and Marine Engineering and the Ph.D. degree in Ship and Leisure boat design from the University of Genoa, Italy, in 2000 and 2004, respectively. From 2001 to 2005 he worked in Fincantieri Naval Vessel Business Unit with various roles, starting with the ship hydrodynamic design and moving later to ship basic design. Since 2005, he has been with the University of Genoa, Dept. of Electrical, Electronic, Telecommunications Engineering, and Naval Architecture (DITEN) as a Researcher. In 2014 he was appointed Associate Professor in Naval Architecture and in 2020 he became Full Professor. He has been responsible for the Cavitation Tunnel of the University of Genoa from 2010 to 2021. He has been Deputy Director of the DITEN Department from 2018 to early 2020. He has been President of the Sea Study Centre of Genoa University from 2020 to 2021 and since November 2021 he has become Director of the DITEN Department. His research interests are in the areas of ship manoeuvrability (techniques for prediction and simulation of ship manoeuvrability characteristics, interaction between manoeuvrability and propulsion system, system identification, safety, autonomous navigation), ship and leisure boats propulsors (experimental campaigns on conventional and non-conventional propellers and propulsors induced flow, cavitating behaviour, induced pressures and radiated noise, propeller design with conventional methods and by means of multiobjective optimization), computational fluid dynamics, hullform optimization. He has been involved in many research projects, funded by the European Union, several national agencies and many industrial companies, both as investigator and as principal investigator. He is author of more than 180 scientific papers (about 65 published in international journals). He has been member of the ITTC Specialist Committee in Hydrodynamic Noise and he is member of the Hydro Testing Forum.



## Chris Waddington, International Chamber of Shipping (ICS)

Theme 1 REDUCING GHG AND NOISE EMISSIONS

Chris Waddington is Technical Director at the International Chamber of Shipping (ICS). He is responsible, in conjunction with the Nautical Director for the development and implementation of ICS policy on technical, operational and environmental regulatory risks affecting international shipping. He actively participates in IMO Committees and industry associations, to represent the interests of ICS Members, shipowners and operators.

The first 23 years of his career has been founded in the shipping sector, working on the design, construction and operational support of various vessel types, including passenger ferries and research ships. For the subsequent 15 years he has focused on the floating production sector of the Oil and Gas industry, project managing design work, supporting field developments, and supervising procurement of floating production vessels. He is a chartered engineer, a Fellow of the Royal Institution of Naval Architects, and a member of the Society of Naval Architects and Marine Engineers.



## Derek White, Vancouver Fraser Port Authority

Theme 3 Energy transition, operational optimizations and related solutions

Derek White is a Senior Project Manager with the Enhancing Cetacean Habitat and Observation (ECHO) Program at the Vancouver Fraser Port Authority. In his role, Derek focuses on research projects aimed at better understanding and mitigating the effects of underwater shipping noise on endangered whales. Prior to joining the port authority, Derek spent 20 years working on underwater bespoke design/build projects for scientific, military and oil and gas applications as well as providing operational work for deepwater geotechnical evaluation. Derek holds a Bachelor's of Applied Science in Engineering Physics and a Master of Mechanical Engineering.