

Overview of climate change actions in the leisure marine industry

Edition 1: May 2022

The recreational marine industry recognises that it must play its part in addressing climate change and is taking actions to adapt its product offerings, promoting initiatives and is collaborating with governments and other partners where appropriate to reduce the carbon footprint of industry. These actions are also in anticipation of tighter legislation on carbon reduction and a number of governments have set strict targets to be carbon neutral by 2050 or in some cases significantly earlier.

In 2021, ICOMIA published its policy paper and a declaration letter (see appendix 2) on climate change where it identified the need for the recreational marine industry to take action and support the mitigation of climate change, and to follow up with tangible actions and recommendations where appropriate for industry. Following publication of the policy paper the ICOMIA Climate Change Working Group was formed. One of the actions of the group was to put together an overview of actions that are being taken across the ICOMIA membership to address climate change.

This overview is a *living document* which includes summaries of responses received from national marine industry associations (MIAs) in early 2022. Please feel free to send us more information on initiatives and activities in your area and we will be happy to update the summary by adding them.

Note that the input we received also included information on other noteworthy sustainability initiatives which are captured in appendix 1 to the document.

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Executive summary

There are significant actions underway in the marine leisure industry which are targeted to address climate change. These include activities in marina infrastructure and operation, vessel design and building, advances in engines and powertrains, vessel operation and maintenance.

There are several examples of members who see development and adoption of **sustainable practices in marinas** and supporting infrastructure in their region which optimise their carbon footprint and ensure marinas are resilient to the impact of climate change. Use of renewable energy is increasing as is recycling and several marinas are becoming “SMART” where the use of available resources (water, energy) is carefully managed through metering and is supplemented through development of locally generated renewable energy. Availability and use of moorings is optimised through digitisation. Members also report promotion and use of lower carbon materials in marina construction and are adapting to ensure resilience to the impact of effects of change is built in for the future. Several examples of hull cleaning services in marinas were reported which aids biofouling management – optimising fuel consumption, reducing emissions from motorised craft and reducing the risk of translocation of non-indigenous species into marinas which may become invasive.

Members report significant activity on **advocacy for the interests of the marine leisure industry with governments** as they define national strategies seeking to reduce carbon outputs and address climate change. Several members are actively engaged in lobbying for funding for research into next generation marine propulsion systems, projects which shore up supply chains for critical minerals, establish programs to install fast charging in marinas, expand development/distribution of biofuels and provide incentives to purchase more sustainable marine products and to make infrastructure investments. Several members are actively collaborating with governments on projects which provide smart energy and determination of the relative emissions from different types of marine engines, and the potential for alternative fuels and powertrains. Members are also participating in development of safety standards which will support changes in fuels, e.g. batteries. ICOMIA and its engine manufacturers association IMEC will begin a decarbonisation study in 2022 to evaluate a range of alternative fuel types in different boat categories. This will be useful in future advocacy efforts by members. There is also ongoing government advocacy for government policy, strategy and programs that responds to the challenges of future changes in sea level for our industry.

Many **climate change initiatives** were reported by members, either alone or in collaboration with partners. For example, a national ‘eco-label’ is being trialled by one member based on a points system in 2022. Many members also report introductions of numerous products from commercial companies that provide opportunities for carbon reduction across our industry. Several initiatives have developed Life Cycle Analysis (LCA) tools which can be used by the boating and superyacht industry to understand the relative carbon intensity throughout the lifecycle of a boat and will support development of a more circular industry going forward. Increased transparency of these tools and data used by them will facilitate greater adoption of an LCA approach and a quantification of carbon and greenhouse gas (GHG) emissions across the industry.

Several members are also actively engaged in internal and external **education programs** which raise awareness, share best practices and stimulate actions within the marine leisure industry to reduce their overall environmental footprint. These programs will generate positive publicity both inside and outside the marine leisure industry, identify focus areas for discussion in expert panels at public events, including training events for young boaters.

Summary of activities reported (March 2022)

Marinas / infrastructure

Maintenance of a clean hull is important to optimise fuel consumption and reduce greenhouse gas emissions from vessels. Several companies in **Sweden** and **Norway** are testing different solutions and business models in marinas to support biofouling management on leisure boats, such as drive in boat-washing stations to remove fouling from boat hulls which may complement or even remove the need for application of biocidal antifouling paints.

Digitalisation and optimisation of operational processes in marinas decreases energy consumption in 'smart marinas' compared to traditional management approaches. A study in **Croatia** on application of smart technologies in Croatian marinas highlights benefits that can contribute to a climate change reduction <https://hrcak.srce.hr/file/375164>

In **Israel** partners in the MIA that have climate change related solutions are working to advance key issues which address environmental impact, including climate change:

- I. Preserving biodiversity around coastal infrastructures: EConcrete - EConcrete's low carbon technology has helped engineers, architects, and asset owners build stronger, greener, marine infrastructures. The company develops sustainable concrete for constructing ecologically active infrastructures in coastal and marine environments as well as in urban landscapes. It also adapts the concrete to the environment's particular fauna and flora, and its biological traits encourage biogenic build up. The concrete offers increased stability and longevity as well as a reduction in maintenance costs.
- II. Generating green power in the marinas: Using wave energy for power generation, Ecowave have developed smart and cost-efficient technology for turning ocean and sea waves into green electricity.
- III. Optimising marina operations: Through optimisation of marina operations 'Pick a Pier' enables marinas to accommodate more activity with the same infrastructure they have, improving communication with boaters, streamlining procedures and reducing operational burden.

In **Australia** there are examples of members who have taken pro-active steps to increase their environmental sustainability / carbon footprint such as:

- I. Reduce carbon footprint and increase resilience including use of photo voltaic cells
- II. Improved consumption metering
- III. LED lights to reduce power consumption
- IV. Rainwater capture to reduce water consumption
- V. Backup generators and Uninterruptible Power Systems for essential systems to give power resilience.

At a **global level** PIANC (the World Association for Waterborne Transport) Working Group 178 produced an introduction to the potential consequences of climate change and some of the challenges to be addressed for infrastructure. It includes a four-stage framework to help port, marina and waterway operators plan how best to adapt. [Draft version - e-Navigation on inland waterways \(unctad.org\)](#) ICOMIA are a 'sister association' of PIANC.

Government collaboration / advocacy (1)	Climate change adaption: The Adriadapt Italy-Croatia Project is developing and updating plans for local authority climate change adaptation, and is developing a multilingual web platform which will act as a support tool for any municipality in the Adriatic region wishing to align with the objectives set by the new European Climate Change Adaptation Strategy. A conference was held in June 2021 called "Knowledge for Local Resilience" for cities in the Adriatic region In Italy the "CocliCo" project aims to map coastal areas at risk of flooding in order to secure infrastructures. The project started in September 2021 and is financed by Horizon 2021 European funds. The data obtained will be used to develop forecasting models of sea level rise with particular attention to Italian ports. The potential impact of coastal flooding is of great concern for cities such as Venice, Naples, Genoa. https://cordis.europa.eu/project/id/101003598 A second project, "MACMAP", aims to study the evolution of climate in the Mediterranean and polar regions through the analysis of new and historical data. The final objective is to provide a contribution to the understanding of climate change including maritime waters. https://progetti.ingv.it/it/progetti-dipartimentali/ambiente/macmap#titolo A draft proposal for a Climate Change Adaptation Strategy in the Republic of Croatia has been released for the period 2040 – 2070. In addition, a group of scientists has issued a public letter underlining the importance of adopting an agenda and a specific action plan for the protection of the Adriatic Sea including reductions in greenhouse gas emissions. This is seen as vital for sustainable development of Croatian society. Their proposal was forwarded by the Eko Kvarner NGO. They are proposing an advisory taskforce be established to participate in defining the agenda for protective measures and underline the importance of developing IT Technologies to monitor changes in the marine environment and involving citizens in monitoring those changes. In Australia there is ongoing advocacy by the leisure marine industry for government policy, strategy and programs that accommodate current and future changes in sea level, especially regarding maritime infrastructure at the land/water interface; solar powered lighting solutions for maritime infrastructure such as marinas, wharves and navigation aids; planning for electric vehicle/ vessel recharge capability; water refill stations at public maritime facilities; improved waste capture and disposal solutions; and planning for coastal hazard adaption regarding maritime infrastructure.
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**Government
collaboration /
advocacy (2)**

In **Estonia** the MIA is participating in discussions building Estonian government strategy, including climate change related issues. Workstreams include; Green transformation in Estonian industry 2022 – 2032, government R&D & Entrepreneurship strategy - one of 5 key focus areas is “smart energy solutions”, automation and clean production investment programmes for industry. There is also a blue economy working group which is developing a blue economy policy paper which includes marina network infrastructure development and development of offshore wind parks.

In **Finland**, Finnboat participated in the Finnish government project (2020) "Carbon Neutral Finland 2035" which covered the entire transport sector. The report included initiatives in recreational boating. One recommendation was a subsidy for boaters to scrap old 2-stroke outboards (OB) when changing to a modern outboard engine. This was based on the recent US study (received from IMEC) which concluded that old 2-stroke engines representing 35% of engines in use and account for nearly 90% of the emissions of the recreational boating sector. In the end this was not adopted as it was not cost effective given recreational boating accounts for only 0.2% of GHG emissions in Finland, so the investment would have brought only marginal benefit.

Advocacy on EU climate change issues in Finland is funnelled through the European Boating Association (EBA) which represents boaters. EBA work closely with the European Boating Industry Association (EBI) on advocacy matters. Finnboat coordinate advocacy for the industry on a national level with the boaters' association.

In a study of emissions of CO₂ and harmful substances from leisure boats in **Sweden**, the Swedish Transport Agency came to a conclusion that old type of 2 stroke OB engines in Sweden represent 18% of engine population but 65% of the total HC release and 16% of total CO₂ releases (where 4-stroke OB are 22% of population and HC/CO₂ release 7%/16%)

In **Singapore** the Association monitors national policy and distributes relevant information to members. There is a comprehensive whole-of-government approach to climate change. As a small island state with significant low lying areas, serious budget is being allocated to coastal protection in particular. <https://www.nccs.gov.sg/singapores-climate-action/coastal-protection/>

In **USA**, in its white paper “The Recreational Boating Industries Commitment to Protecting Our Environment”. [NMMA-Conservation-Environment-White-Paper-Jan-2021.pdf](#)

NMMA highlights work done with federal and state policymakers to address climate change in recreational boating and suggests actions for policymakers to address it and the need for coastal resiliency. Climate change related actions include advocacy to fund research into next generation engines and powertrains, establish programs to facilitate installation of electric charging stations at docks and marinas, expand the use of alternative fuels and introduce tax incentives to expand the use of renewable energy resources.

Climate change Initiatives (1)

At the **global level**, ICOMIA and its engine manufacturers association IMEC will begin a decarbonisation study in 2022 with a reputable independent third-party contractor who will evaluate a range of alternative fuel types and powertrains on 10 different boat categories. The project will deliver in 2023.

In the superyacht industry, the Water Revolution Foundation (WRF) are coordinating a number of activities which address climate change including: i). promotion of a Yacht Assessment Tool – to enable more sustainable choices to be made when designing, building and refitting a yacht, ii). a Yacht Environmental Transparency Index (YETI) – a systematic life cycle analysis (LCA) approach which compares superyachts based on their environmental credentials. Both initiatives are supported by a sustainable yacht design taskforce which holds roundtables with naval architects, interior and exterior yacht designers to progress towards a sustainable yachting sector. [Home – Water Revolution Foundation](#)

In **Norway**, as part of development of standards for electric powertrains for boats, work is underway to develop battery safety standards. As a consequence of the lack for a harmonized ISO standard for the use of Lithium batteries in boats, Norboat has taken the initiative for a Norwegian Guideline while we wait for the harmonized standard to be released. The Norwegian guideline is based on the Technical Specification ISO / TS 23625, and the aim of producing this guideline is to help the Norwegian leisure boat industry navigate safely. They are currently looking to participate in the development of the new ISO standard for electric propulsion.

In **Estonia** member enterprises initiated several climate-friendly product development projects. For example, low carbon / sustainable boat construction - <https://e44.ee/et/eng/> . Some projects are targeted towards environmentally friendly power sources and optimisation of power consumption, and hydrogen power usage. While other Estonian industry sectors seem to be interested in automatization of the production processes, the industry has little opportunities there. The leisure marine industry production remains relatively labour-intensive and energy-consuming, as the volumes are low, not mass produced and products are typically customised.

In **Germany** the association has established a working group, “the Clean Sailing Initiative” which has been working for over a year. The aim is to make sailing more environmentally friendly and less carbon intensive. For example, a process of developing a system where sailors can return old sails to be recycled is being developed. To do this, partnerships have been formed with companies that make bags, clothes and shoes from old sails. At the same time, one of their members who is the largest sailcloth manufacturer in the world, has launched the first climate-neutral sailcloth with bio-based “Dyneema fibres”. In **Germany** the MIA is also working on a system to award an eco-label for member companies. The first requirement is an energy audit according to DIN 16247, followed by a catalogue of questions about heating, insulation, heat recovery, green electricity, electric vehicles, compensation for air travel, written sustainability concepts, solar panels etc. The answers are linked to a points system and the awarding of the label depends on whether the minimum number of points has been achieved. The first trial will take place in 2022.

Climate change Initiatives (2)

In **Thailand** the 'Ocean for All foundation' has several activities which promote reduction of CO2 emissions, including a CO2 emissions calculator for boaters. The foundation promotes cleaner oceans and has recently acquired a recyclable Coastal Cleaner from Wawa Creations, Phuket. <https://www.oceansforallfoundation.org/en/>

In **Japan** some member enterprises are developing electric and hydrogen fuel cell systems to reduce GHG. Japanese distributors are now also importing electric outboards, Torqeedo, e-Propulsion, etc. Japan MIA is collecting sales data of electric outboards from 2021 onwards.

In **Poland** the law office WP LAW has joined the MIA POLBOAT as a supporting member whose task will be, among others, support for the systematic implementation of real changes in the market offering of the companies - new products / services, change of essential features of the offered products / services, change of the manufacturing process, changes in the supply chain - in response to the climate crisis and related threats. Polish boatyards are engaged in research and development projects related to ecology and lower emissions. For example, the Nothman shipyard has signed a cooperation agreement with the Polish Academy of Sciences in the field of a new type of battery. In addition, they are conducting a project in the field of integration of zero-emission propulsion systems into motor yachts (powered by methanol). Several Polish boatyards are also introducing hybrid solutions as well as solar and electric propulsion. Moreover, the boatyards are implementing a policy of reusing production waste in production processes.

In **Slovenia** the Greenline hybrid and electric range and brand was introduced at the end of 2008, with the help of VW group automotive maker. Since then, a full range of models from 33 to 68 feet was developed and more than 1000 hybrid or full-electric yachts were delivered worldwide. Today this company is the most important representative of responsible boating in the world showcasing that boating can reduce its emissions without giving away any comfort or convenience of this recreational activity. Designers and engineers from Ljubljana, were responsible for the development of the hybrid and full-electric concept of responsible boating. The hull hydrodynamics, the lithium battery storage, the photovoltaic elements were joined and harmonized with diesel-electric or full-electric propulsion. Special effort was needed to adapt the diesel engines clutching them to an electric motor/generator and redesigning the electrical system to perform properly in zero-emission mode while preserving a good range and speed performance. The design office used this type of green boating awareness for many other builders worldwide with hybrid- or full-electric solutions. The designer is considered the world leader in design of boats which use the environmentally advanced technologies and features.

In **UK** 'the Green Blue' is a successful initiative which focuses on practical steps boaters should take to minimise their impact on the environment including climate change, for example sustainable anchoring techniques, biofouling management and promotion of carbon negative boating. <https://thegreenblue.org.uk> In addition, the Royal Yachting Association (RYA) have issued a Vision for a Zero Carbon Recreational Boating Sector by 2050 and a sustainability strategy for the sector [Environment & Sustainability | RYA](#)

Climate change Initiatives (3)	In Israel, one partner has focussed on reducing spare waste in manufacturing - Massivit is a pioneer of large format 3D printing solutions for the Engineering and other sectors, including the boating industry. Through promotion of 3D printing of boat parts, spare waste generated by traditional manufacturing is avoided and carbon footprint reduced. In Norway there are several notable initiatives which address climate change: Electric Propulsion - there are several businesses working on developing electrical propulsion in recreational boats. Some examples are: I. HYDROLIFT has released an electrical version of their 22-footer; the E-22: https://www.batmagasinet.no/delingsokonomi-elbat-evoy/hydrolift-satser-elektrisk-med-evoy-pa-hekken/712931 II. EVOY has released both a high torque inboard engine, and during METSTRADE 2021, launched their first high torque outboard (150-180HP). Their inboard engine holds what is believed to be an unofficial world highspeed record with their boat Evoy 1 reaching an average speed of 54 knots. This boat is not a leisure boat yet, as it is not CE compliant. https://evoy.no III. SEADRIVE has released several electrical pods for leisure boats and with great success both regarding durability and power. https://seadrive.no GREENWAVES produces two different models of electric boats, but they rely on existing components and don't produce their own solutions. They also electrify existing boats. https://greenwaves.no IV. IBIZA: is developing an all-electric boat, the Ibiza 600 EL https://www.ibizaboats.no/elektrisk/ Common for all these boats and solutions are prices that far mismatch their fossil alternatives, and issues related to speed and range. It is, however, only the beginning of the electrification of leisure boats. VI. Batteries: There is a giant start-up of a new battery factory in the south of Norway https://www.morrowbatteries.com/ In USA, NMMA highlights activities in its membership which are reducing emissions and the carbon footprint of the recreational boating industry through implementation of more sustainable manufacturing processes. For example, several manufacturers have changed their energy mix and are switching to renewable sources. Work also continues to expand the availability and use of biofuels in marine engines. There is also significant activity to improve management of biofouling on immersed areas of boats which optimises hull performance and emissions of GHG and other pollutants. See NMMA-Conservation-Environment-White-Paper-Jan-2021.pdf
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Climate change Initiatives (4)	NMMA is also monitoring the 30 by 30 movement — an initiative aimed at combating climate change by conserving 30 percent of our oceans and lands by 2030. The Wilderness Society 30X30 Movement. NMMA is engaged in the reauthorization of the Water Resources Development Act (WRDA), major water infrastructure legislation that sets policy and funding for the U.S. Army Corps of Engineers – a leading provider of public recreation access and environmental sustainability and resiliency public works. In addition to key priorities that would improve recreation access on Corps-managed lakes and reservoirs, NMMA is working to include language in WRDA22 that would require the Corps to evaluate the potential of natural distributed storage approaches to reduce natural hazard risk to western water supplies, and make permanent the authority of the Corps to evaluate and approve water supply conservation measures at water resources development projects in States that have experienced repeated droughts. Also specifies that the Corps may evaluate a water supply conservation measure utilising a natural feature or nature-based feature to reduce drought risk. There are also initiatives in Norway from paint companies to keep hulls clean more effectively which reduces greenhouse gas emissions from boating through more effective antifouling paints and proactive hull cleaning. For example, https://www.jotun.com/no-no/decorative/yachting/products In Hong Kong, the Boating Association continues to promote its 'Low Impact Boating Initiative (LIBI)' which addresses areas in which the world wide leisure marine industry can work together to reduce the carbon footprint and overall environmental impact of the marine leisure industry. Hong Kong Boating Industry Association 香港遊艇業總會 - HKBIA Online Series: Low Impact Boating Initiative (LIBI) by Simon Boyde (hongkongbia.com)
Education (1)	In Poland, the MIA Polboat is presenting a special program during this year's edition of the Polboat Yachting Festival, the largest floating show in Poland. It is an initiative that increases competence in addressing climate change among people sitting on supervisory and management bodies of companies. In Slovenia the international Internautica event (the largest boat show in Slovenia) organized a separate segment of the show dedicated to green energy use and improving environmental aspects of recreational boating. Since 2009 this segment of the show has become richer and more importantly impacts the awareness of the general boating public and especially recreational boat owners about the importance of paying special attention to this area. Slovenia as a green country is fully devoted to protection of environment and its boating industry is an important part of these efforts.

Education (2)	In Hong Kong the MIA is engaging with local maritime schools and training centres to build a stronger maritime education network. Schools include: - Hong Kong Sea School - Hong Kong Sea Cadets - Maritime Services Training Institute The goal is to start disseminating our reports and findings, and to raise environmental awareness on issues such as climate change via this network with the aim to educate the future generation. At a global level Blue Flag have launched a GAIA 20:30 Biodiversity Campaign, running from March – August 2022. They are working with 5 other programs (Green Key, Eco-Schools, Learning about Forests, and Young Reporters for the Environment) on activities such as biodiversity courses and webinars. https://www.blueflag.global/campaign-blog-1/2021/11/3/gaia-2030-biodiversity-campaign
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Appendix 1: General sustainability activities reported from MIAs

In **South Africa**: Kinetic Catamarans:

One of their employees, Xoliswa Nethe, started a recycling business in their factory. All cleaners have instructions to sort metal cans, plastics and paper/cardboard separately. Xoliswa then organizes this and delivers it with the Kinetic truck to the recycling plant in Knysna. This is a small initiative but it has had a definite impact on waste generation and disposal.

Also in South Africa, the MIA supports the Suzuki Clean Ocean Project, which includes Clean Up campaigns and the Micro-plastics filter. They have a clean ocean policy in which they offer discounts on the purchase of Suzuki outboards to companies that do ocean conservation.

In **Israel**, the MIA keeps promoting optimisation and standardisation of the recreational boating sector as a way to advance the industry to the newest technologies, and reduce its ecological footprint, both inside Israel and around the world. The path to it is through data collection infrastructures in the industry that will open the door for multiple environmentally friendly solutions and for circular economy models. This is a continuous activity for us that will be carried on in the coming years.

The MIA in **New Zealand** has been proactive and successful in changing people's habits in relation to 'plastic' pollution. It is a coastal environment where the waterways are clean and fish are plentiful. No licence is required to drive a boat nor catch saltwater fish and boating is the number one recreational activity. People generally respect the environment and keep NZ pure, and the tourism slogan is actually Pure NZ! Government does a lot of talking about actions related climate change and has stopped new mines and oil/ gas field openings.

In **Brazil** ACOBAR member BR Marinas has embarked on a desalinisation project aiming to provide drinkable water to the entire local nautical centre. (see pg42 of Marina World for more information) <https://www.marinaworld.co.uk/latest.php>

In **USA** the report "The Recreational Boating Industries Commitment to Protecting our Environment" includes actions taken, in addition to climate change, to make environmental improvements and recommends actions for policymakers [NMMA-Conservation-Environment-White-Paper-Jan-2021.pdf](#)

In **UK**, the MIA is involved in the Wild Oyster project which seeks to restore the seas to health through the restoration of wild oysters.

In **Australia**, the Boating Industry Association Ltd and Marina Industries Association have introduced a pledge to eliminate single-use plastics.

Appendix 2: ICOMIA Declaration on Climate Change

ICOMIA recognises the risks and challenges of Climate Change and will actively pursue a sustainable future for the marine industries by supporting its members in addressing this challenge.

ICOMIA acknowledges that the climate is changing and the evidence is unequivocal. Climate Change and the associated irreversible changes to weather patterns represent a threat to marine businesses, aquatic lifestyle and activities, safety and infrastructure. This threat extends to local, national and global economies. The threat cannot be ignored and a positive, proactive response can respond to the threat and reduce the risks, and bring social, economic and environmental benefits.

ICOMIA commits to taking pragmatic action in response to the threats posed by Climate Change.

ICOMIA will encourage its members to:

- develop strategies to decarbonise the recreational boating sector
- educate the industry to the importance of the ocean in terms of weather changes, biodiversity and sustainability.
- apply evidence to inform and support Climate Change action
- strengthen operational resilience by developing risk assessments and contingency plans (e.g., marinas, training)
- collaborate with energy and water suppliers, transport providers and others involved in the supply chain to understand interdependencies and reduce exposure to associated risks
- consider a range of Climate Change scenarios when developing adaptation strategies and include an appropriate combination of structural, operational and institutional measures
- focus on flexible and adaptive infrastructure, systems and operations to allow for future modification and to avoid 'locking in' to solutions that prove inappropriate as conditions change

ICOMIA will continue to support marine industry associations across recreational vessels and marinas by facilitating knowledge sharing to help them manage the Climate Change challenge locally through effective risk management.

ICOMIA will contribute to the global discussion to ensure that marine industries' interests are properly acknowledged, and to disseminate key messages to its members and the wider marine industries community where appropriate.

ICOMIA and its members will join forces with other marine industries stakeholders to meet these challenges, explore opportunities and contribute to a responsible, informed and sustainable way forward.