



Horizon 2020 – “Waterborne” Calls for Proposals 2020

On the following pages, an excerpt is available of the “waterborne” related calls for proposals for 2020 in the related working programmes of Horizon 2020. In total, 67 million will be available in the envelope for 2020, funding around 10 projects



LC-BAT-11-2020: Reducing the cost of large batteries for waterborne transport

Specific Challenge: Large battery packs are increasingly deployed to improve the efficiency and to eliminate emissions from waterborne transport. However waterborne transport batteries can be up to ten times more expensive than an automotive battery of equivalent capacity and their high cost is an important barrier to increasing the deployment of both hybrid and fully battery electric shipping. Unlike for other transport modes, the space, weight and consequently power density of waterborne transport batteries is usually of secondary importance within the systems total life cycle cost. Several factors contribute to the cost difference including production processes, safety certification, fire suppression, lower economies of scale and higher assembly costs. The challenge is to substantially reduce the cost of large waterborne transport battery systems and cells for both marine and inland waterway transport applications.

Scope: Proposals can address either the battery cell or the battery system (racks, battery management system, fault detection and any integrated fire suppression) or both the cell and battery system.

All of the following aspects should be addressed:

- With respect to waterborne transport, research and develop a large battery system and/or specific battery cells that are substantially cheaper on a total cost basis with respect to existing system.
- Work should be applicable to battery systems of at least 1 MWh capacity.
- Prove the technology and manufacturing processes through system trials and testing.
- Address production process efficiency.
- Address the requirements for type approval from relevant authorities including a comprehensive risk based safety assessment.
- Development of a marine battery certification methodology with the objective of: validating and verifying safety (with consideration of air, liquid or passive cooling), including the standardisation of test methods and tools for certification cost reduction.
- Considering of different vessel types, address the integration of battery systems into Energy/Power management system of vessel.
- Undertake a cost benefit analysis to convincingly demonstrate the cost savings in comparison to current state of the art waterborne battery technology.
- Assess end of life and disposal strategies.
- Develop a convincing business case and consider potential financing models.

The Commission considers that proposals requesting a contribution from the EU of between EUR 8 and 12 million would allow the specific challenge to be addressed appropriately.



Expected Impact: The principal impact should be to substantially reduce the lifetime cost of large waterborne battery systems and to enhance the competitiveness of European industry within the waterborne battery market. Cut greenhouse gas emissions from waterborne transport. Increase the European skills base in large battery technology and manufacturing processes. Support European jobs and growth. Increase confidence in waterborne battery technology investment. Speed up the transition of most short range freight and ferry services towards zero emission.

Type of Action: Research and Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

Total budget available: 20.00 mln

Opening call: 03 December 2019, deadline for submission: 21 April 2020



LC-MG-1-13-2020: Decarbonising long distance shipping

Specific Challenge: In 2018 historic targets were agreed within International Maritime Organization (IMO) to cut the total net global GHG emissions from international shipping by at least 50% by 2050, to reduce carbon intensity by at least 40% by 2030 compared to a 2008 benchmark and to completely decarbonise shipping by the end of the century.

Presently shipping accounts for around 2.5% of global GHG emissions and although ships are becoming more efficient, due to increasing global trade this contribution is increasing. These emissions are more than any EU state and if the sector was a country, it would rank as the sixth highest in the world. In 2015, shipping accounted for 13% of overall EU greenhouse gas emissions from the transport sector¹. Overwhelmingly, long distance shipping accounts for the majority of GHG emissions and its decarbonisation is particularly challenging. It is expected that solutions will need to combine a variety of technologies, operational practices, energy sources and efficiency measures. Furthermore, it will be essential to link any measures to robust data and measurements to better quantify their effectiveness and optimisations.

Scope: All following aspects should be addressed:

- Working together with, for example operators, ship builders, marine equipment manufacturers, fuel and energy suppliers and others research will address the development of technologies combined with operational practices to substantially reduce GHG emissions from long distance shipping in line with the IMO target and without increasing other forms of pollution.
- Excluding fuel development, a wide range of potential solutions can be proposed including the use of wind and solar assistance combined with efficiency improvements and other alternate energies. Solutions can be proposed in combination and should take into account the likely availability of infrastructure (including bunkering) on long distance routes.
- Solutions should also take into account the CO₂ equivalent from any reduction of black carbon emissions.
- Costs, GHG reductions and any other potential waste streams shall be convincingly analysed using real data and testing programmes in addition to theoretical analysis.
- Implications for the provision of new infrastructures shall be quantified and assessed.
- To at least TRL5, technologies, systems and practices shall be tested at full scale on operational shipping. The differences between predicted and measured data should be identified.
- Any reduction in GHG emissions that are founded upon innovative operational practices must be robustly benchmarked against the current state of the art, for example concerning ship routings and speeds through the use of “big” AIS “data” and/or other satellite data.
- A robust communication strategy should be developed and implemented so as to ensure wider public engagement as well as a strong engagement with the global shipping sector and its customers.

¹ <https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-10>.



- Cooperation with IMO and EU activities and fora concerning the decarbonisation of shipping is encouraged. Build upon and cooperate with any related activities and research.

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 10 million would allow the specific challenge to be addressed appropriately.

Expected Impact: Development of innovative solutions to decarbonise shipping that exceed the IMO's 2050 target to decarbonise by 50% and which are applicable to ship types that are the largest emitters of GHGs such as: bulk carriers, tankers, container ships, cruise ships and passenger liners. Establishment of robust benchmarks and methods which will provide wide confidence of the "real world" impacts from any specific GHG reduction measure including potential scalability and any secondary environmental impacts. Improve the competitiveness of European maritime industries and shipping companies within the field of green shipping. Increase the awareness and take up by end users. Provide evidence to policy makers within EU and globally concerning infrastructure requirements necessary to meet the 2050 decarbonisations target.

Type of Action: Research and Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

Total budget available: 20.00 mln

Opening call: 03 September 2019, deadline for submission: 08 September 2020 (second stage)



MG-3-7-2020: Improved Production and Maintenance Processes in Shipyards

Specific Challenge: European Ship building, repair, modification and maintenance has been founded upon a technology based competitive advantage which has enabled it to build, improve and maintain the world's most advanced ships. However, competitors are also becoming more advanced and seeking to enter European high technology markets. Many ship types developed within Europe are now built elsewhere. Also European marine equipment, including environmental technologies are often retrofitted to ships within non-European shipyards. Europe is still a global leader for very high technology ships such as large passenger vessels, but this is a niche and competitors have a strategy to also enter these markets.

The market is particularly challenging for smaller shipyards across Europe who can be agile to develop and maintain niche products or to be integrated within smart supply chains yet do not have significant resources to undertake research and innovation.

Consequently, continuous innovation is needed for the sector to remain competitive and in this respect, lessons and technologies can be drawn for other sectors including automotive, aerospace and IT. For example taking advantage of the latest developments within digital production, advanced robotics and co-bots, machine vision, internet of things, flexible production systems, 3D printing, supply chain integration across multiple sites, skills development and deployment strategies.

Scope: All following aspects should be addressed:

- The development of innovative technologies and systems to enhance the competitiveness of production and maintenance processes within European shipbuilders and ship yards. Where appropriate, technologies transfer from outside of the marine industry shipbuilding, ship maintenance and ship modification sectors, particularly those with potential to reduce CO₂ and/or other polluting emissions.
- Identification of the necessary related skills development needs and strategies to address these in order to maximise the value from innovative production technologies and practices.
- Testing and physical demonstration of the developed technologies to at least TRL 5, including the benchmarking of existing practices, consideration of the environmental impacts and quantification of the additional value from the technology and/or system developed.
- Development of business plans and roll out strategies.
- IPR and or other measures to reduce leakage of the developed innovations outside of Europe.

Whilst not excluding very large shipyards, an emphasis on the competitive needs of smaller and medium size shipyards across Europe would be welcome in cases where the incremental benefits from Research and Innovation maybe higher.

The Commission considers that proposals requesting a contribution from the EU of up to between EUR 4 and 6 million would allow the specific challenge to be addressed appropriately

Expected Impact: With an emphasis on smaller and mediums sized European shipyards and ship builders, to increase competitiveness and growth of the European sector, particularly within international markets. Reinforce and grow European employment and the necessary skills



development for the successful uptake of innovative production processes and technologies. Improve environmental performance of shipyards and ship builders. Support a multiplication effect within Europe beyond the immediate participants. Maximise EU added value by appropriate means of minimising knowledge and technology leakage.

Type of Action: Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

Total budget available: 15.00 mln

Opening call: 03 September 2019, deadline for submission: 21 April 2020



MG-4-10-2020: Improving impact and broadening stakeholder engagement in support of transport research and innovation

Specific Challenge: Increasing the impacts and broadening stakeholder engagement in support of transport research is an essential element to underpin the European added value from the Transport challenge of Horizon 2020.

One way to achieve this goal is to organise and participate in events that have major strategic importance.

An excellent example is the Transport Research Arena (TRA) organised in different Member States jointly with the Commission, whilst, amongst others, SMM Hamburg, the world's largest Maritime Technology exhibition represents a valuable opportunity to broaden engagement in European Waterborne research and innovation.

Furthermore, additional targeted coordination and support activities are needed in the Inland Waterways sector and in particular with respect to the further development of the NAIADES actions and the leverage of the outcomes from related projects and to establish a bridge towards future research, innovation and implementation needs within inland waterways in coordination with the wider waterborne and logistics sectors.

Scope: To address this challenge, three sub topics are proposed and proposals should address only one of the following sub-topics:

1) Innovation awards for students and senior researchers in the context of the Transport Research Arena conference - TRA 2022

The action should focus on organising two competitions for transport research and innovation awards to be assigned at the TRA conference in 2022:

- A competition for students and young researchers with the goal of stimulating the interest among young researchers/students in the field of transport.
- A competition for senior researchers in the field of innovative transport concepts based on results from EU-funded projects only.

Both competitions should cover all transport modes and cross-cutting issues (technological, socio-economic and behavioural aspects) in line with the EU policy objectives for smart, green and integrated transport. The organisation of these awards should ensure high-quality competition and very good media coverage before, during and after the TRA conference. The action should give particular attention to gender issues.

The awards shall be widely promoted, including within press articles and via important trade publications. Particularly for the student award, wide pan European participation is expected and should be facilitated through engagement with relevant professional associations, their publications and other related student organisations.



2) Broadening Engagement and increasing impact from Waterborne transport research

The waterborne sector is highly fragmented, with diverse actors and administrative structures, covering ports, maritime and inland shipping. The resulting barriers inhibit innovation and the necessary R&I dialogue to maximise impact. To address this, the following activities should be foreseen:

- Together with Commission services and the broader waterborne sector, identify the information gaps concerning, innovation needs, awareness of outcomes and opportunities for participation and on this basis devise a communication strategy to be implemented over the course of the project.
- Develop KPIs and benchmark these at the outset and use to monitor progress throughout the project.
- Broaden lasting awareness and increase the impact from EU waterborne research through prominent participation within large strategic maritime and inland waterway events such as SMM Hamburg in 2022 and 2024 and for example promote waterborne innovation in overall strategic transport events, stakeholder exercises and the creation of durable engagement with potential public and private users.
- Produce high quality digital and printed dissemination materials concerning the scope and success stories arising from EU waterborne research. This should include a short video presenting the challenges, innovation needs and successes.

3) Towards an implementation of the future inland navigation action programme

The action should focus on consolidating the Inland Waterways Transport (IWT) knowledge network and partnership, which was previously established with the support of FP7. In this respect, it should ensure a solid knowledge basis for the implementation of any future NAIADES programme. The coordination and support action will build on the results of previous work and will reflect the multi-disciplinary requirements and complexity of the subject, coordinating with the wider waterborne, land transport and logistics and land transport communities. The coordination action will be organised around the five NAIADES 2 action areas, but will also take into account the results of the NAIADES 2 progress report (adopted 18.09.2018²) and other related activities. The coordination action will, in close cooperation with the European Commission, set up a roadmap for the implementation of actions not yet started or to be finalised and ensure the support to permanent-type of actions. It will identify the appropriate measures and define the necessary means and tools. In coordination with the Waterborne technology platform, the action will further develop a R&D roadmap by integrating all stakeholders and will also develop the implementation plan. Also in coordination with the Waterborne technology platform, the project will also monitor the inland navigation R&D projects and their impacts from relevant European programmes. The project will also identify barriers for the deployment of research results, market uptake and improvement of framework conditions to increase innovation in inland waterway transport. A particular focus will be to address the need to decarbonise and improve the environmental performance of inland waterway

² Commission SWD(2018) 428 final: "Mid-term progress report on the implementation of the NAIADES II action programme for the promotion of inland waterway transport (covering the period 2014-2017)" – <https://ec.europa.eu/transport/sites/transport/files/legislation/swd20180428-naiades2.pdf>



transport, particularly when operating close to urban areas, as well as on future-proof infrastructure, compatible with digital and automation developments under a changing climate.

This coordination and support action will ensure an active participation of key industrial stakeholders, the Waterborne Technology Platform, Member States administrations, industry associations and river commissions.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 0.7 million for sub-topic 1); of up to EUR 1.3 million for sub topic 2) and of up to EUR 2 million for sub topic 3) would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Contribute to a wide dissemination of the results of European transport research, broaden stakeholder engagement and raise the visibility and weight of the EU policy in the field.
- Increase the attractiveness of transport related studies and reinforce the pursuit of excellence and impact in European transport research and innovation, by giving recognition and visibility to the best achievements.
- Creating links and exchanges between research and innovation stakeholders and policy makers, thus improving the development and deployment of innovative solutions for transport in Europe.
- Increase the impacts and take up of the outcomes from EU research and innovation and broaden engagement beyond those already familiar with EU research programmes.
- Promotion and development of the inland waterway sector: increasing awareness so as to increase usage of Inland waterway transport. Identify best practices and increase their take up and faster modernisation of the inland fleet. Provide a knowledge exchange, discussion and promotion platform; strengthen the coordination between national, EU and industrial research across waterborne transport and the wider logistics chain. Working together with the waterborne platform, assist in assessing current/future EU R&I programmes, implementation actions, technology assessments, forecasts and transfer of R&I solutions. Improve the environmental performance of inland waterways and contribute to future-proof infrastructure, compatible with digital and automation developments under a changing climate.

Type of Action: Coordination and support action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

Total budget available: 4 mln

Opening call: 03 September 2019, deadline for submission: 21 April 2020



MG-BG-03-2020: Under water noise mitigation and environmental impact

Specific Challenge: Underwater noise from shipping and boats impacts upon the behaviour and health of water organisms in rivers and at sea, including marine mammals. However, despite previous research, the environmental impacts from effects and the propagation of underwater noise at different amplitudes and frequencies remain poorly understood and largely unquantified. Furthermore, there has been comparatively few studies to better understand the potential noise reduction measures that could be applied to both existing and future vessels.

Scope: All following aspects should be addressed:

- Develop standardised methods to measure and assess the impacts from underwater noise generated by shipping and boats. Consideration should be given to the acute and cumulative effects on different water species in rivers and at sea including marine mammals.
- Establish a stakeholder group of researchers within the domain of underwater noise assessment and mitigation together with other relevant actors including for example NGO's, marine and waterway authorities, industry, ship owners, naval industry etc. Use this group to support methodology and standards development as well as its wide spread take up.
- Identify, quantify and validate any negative impacts from different types and amplitudes of underwater noise from shipping and boats.
- Propose the most effective feasible solutions to mitigate the effects of underwater noise and to establish appropriate limits.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 8 million would allow the specific challenge to be addressed appropriately.

Expected Impact: To enable appropriate mitigation measures, increase understanding of the short and long term environmental impacts of underwater noise from shipping and boats. Identification of the most harmful underwater noise characteristics and the acute and longer term impacts on different organisms including marine mammals. Establishment of standards which can be widely adopted for underwater noise measurement to increase the comparability of data between research programs. Develop cost effective solutions to measure underwater radiated noise from shipping. Identification and assessment of solutions to reduce harm from underwater noise. Develop innovative solutions to reduce the most harmful radiated shipping noise. Provide a foundation for policy. Support implementation of the marine strategy framework directive.

Type of Action: Research and Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

Total budget available: 8.00 mln

Opening call: 03 September 2019, deadline for submission: 21 April 2020