

Wind Propulsion Strategy Workshop



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Moderator

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Participants

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Wind Propulsion Strategy Workshop

Summary

In June, over 40 key stakeholders came together for a three-hour workshop to identify the strategy priorities for wind propulsion development, focusing on the key barriers that still require work and recommendations for actions to tackle those. The stakeholders represented shipowners, wind propulsion technology providers, finance specialists, class, research and testing institutions and sustainable shipping think tanks. The workshop used the 2016 EU-commissioned [study on the analysis of market potentials and market barriers for wind propulsion technologies for ships](#) as the baseline to assess progress and help to highlight areas for further development. [This report was commissioned by EU DG Clima in 2016 with the results published in late 2016 and made publicly available in Jan 2017 and involved independent assessment headed by CE Delft and involved experts from the Tyndall Centre for Climate Change Research at Manchester University, Fraunhofer ISI, and Chalmers University of Technology.]

The workshop was broken down into three main subgroups, with one focusing on technical issues, one covering business, operations and financial considerations and the final one tackling policy, regulations and other external matters. To be able to get to the heart of the discussions quickly a traffic light system was adopted, and three main sessions covered; the progress made in the past five years, solutions for removing the remaining barriers and finally suggestions for stakeholder's engagement, next steps and the pathway forward.

All participants agreed that significant progress has been made in the field and while the original EU report was limited in scope, selecting only four out of seven wind propulsion technology (WPT) categories to assess along with very limited actual performance data available at the time and a scope only assessing large vessels above 5,000dwt, the progress in installations aligned fairly well with the report. The report authors estimated five installed demonstrators by 2020, with the actual number at the end of that year being two large tankers (VLCC & LR2 Product), one bulker (Ultramax) along with two large ferries and five other vessels of varying sizes in the general cargo and RoRo categories (3,000dwt+) for a total of ten. In addition, there was an additional 'wind-ready' Kamsarmax bulker. The assumed fuel price was \$450/ton for 2020 which was again in the right ballpark and \$550/ton by 2030 which is likely to be conservative, especially with more expensive alternative low carbon fuels entering the market and some form of carbon pricing.

The report headline findings were *"Should some Wind Propulsion Technologies (WPT) reach marketability in 2020, the max. market potential for bulk carriers, tankers and container vessels is estimated to be 3,700-10,700 installed systems until 2030, including both retrofits and installations on newbuilds, depending on the fuel price, speed of the vessels, and discount rate applied. [CO2 savings of 3.5-7.5 Mt CO2 in 2030 + WPT sector: 6,500-8,000 direct & 8,500-10,000 indirect jobs]."*

The report identified a wide range of barriers but emphasised three key ones for the uptake of wind propulsion technologies and these formed the bedrock of much of the discussion in the workshop as elements of all three of these still persist;

1. *(Trusted) information on the performance, operability, safety, durability, and economic implications.*
2. *Access capital for WPT development, especially building/testing of full-scale demonstrators.*
3. *Incentives to improve energy efficiency/reduce CO2 emissions of ships.*

"These key barriers are interrelated, with the most crucial interaction being a chicken-and-egg problem between 1 & 2. In order to breach this, we see the development of a standardized method to assess WPT combined with test cases to develop this assessment method as the most important starting point for overcoming the barriers".

Overall, the three subgroups focused on 12 main challenges (3 x technical, 3 x policy/regulation/external and 6 x business/operations/finance), in the process identifying over 40 solutions to base their recommendations for further action upon.

Technical Issues

The three key areas the group singled out were the need for; further diffusion of engineering and technical knowhow, more in the way of classification WPT guidelines and the need to further boost the R&D pipeline.

Diffusion of Engineering/Design Knowhow [Red changed to Red/Amber]

Regarding the diffusion of engineering and technical knowhow, the discussions centred on the continued need for widely available or accessible and trusted information regarding the operations and benefits of WPT. The participants acknowledged that there has been some movement in this with such projects as the WASP and WiSP projects, there is nonetheless a lot more that needs to be done.

There was a clear call for increased disclosure of results, especially those generated as part of publicly funded projects. There are a number of ongoing projects in this category and efforts should be made to disseminate those third party verified findings as much as possible. As a way to further build that body of data, the technical group also recommended that national and regional governments should step up their efforts in funding research vessels with those disclosure protocols in place as a clear and impactful pathway forward.

The diffusion of information is not yet at a mature level, and that is in part understandable as early movers among technology providers look to secure market share, however there is much that can be done to both open up the access and standardise the databases and datasets made available. These actions include making provisions to access wind data for routing and assessment of system performance worldwide, the establishment of a global wind protocol and establishing a technology assessment/measurement tool for each WPT. It was also highlighted that it is important that public database information held by the IMO, EU and other institutions is kept updated and a crew training platform could also be established. Of course, all of these measures will be enhanced by OEMs voluntarily sharing their own data once the competitive advantage of that data has receded.

To ensure these measures are implemented then a wide range of stakeholders will need to come together. Research organisations and academia can ensure that the datasets are credible and robust, the International Towing Tank Conference (ITTC) ensuring that standards are upheld. Institutions such as the National Renewable Energy Laboratory (NREL) creating a specific wind data framework and shipyards assessing the optimal types of WPT for specific vessel designations, types and with varied deck space limitations.

Another key aspect the group focused on was the need to take further steps to globalise the dissemination of knowledge, calling on both IWSA and its membership to increase activities outside of Europe and in particular Asia, including outreach to prospective new members from those regions, also with an emphasis on shipyards.

Class Guidelines for WPT [Red/Amber changed to Amber]

Attention then moved to the provision of guidelines for WPT by classification societies. Again, it was noted that there have been positive developments since 2016, with wind-assist guidelines publicly available from five class societies and a growth in expertise in these organisations. However, class is still lagging behind when it comes to emerging new technologies and an increasingly important aspect needs urgent attention and that is the emergence of primary wind vessels and the need for detailed guidelines for those types of ship.

R&D Pipeline of WPT [Holding at Amber]

The research and development pipeline was also singled out as an area requiring additional action in general with the need for the development of testing facilities, match-up services to assist technology developers with engagement with shipowners and the need to leverage public-private partnerships to help lower R&D costs. All of these concerns were mirrored in the business subgroup and while it was accepted that R&D funding has become more available through some public programs, this is not uniform by any means and the bar to entry is often set too high for many small OEMs. Thus, naturally the direct pathway of calling for renewed efforts in delivering public support for R&D activities was a key call from the group, however there was also a call for IWSA to speed up its own efforts to develop the Wind Propulsion Accelerator program. Additional steps can be taken by financial institutions to lower the entry bar for finance along with more manageable interest rates, however OEMs were also encouraged to seek out more collaborative and joint projects that lower investment risk and enhance the expectation of positive results.

Policy, Regulation & External Issues

This was an extensive area to cover during a relatively short workshop, however the group covered a lot of ground and focused on three main barriers where they saw both movement over the last five years and potential to shift further in the short to mid-term. Further work is needed on modifying the existing regulations to reduce Green House Gases (GHGs), strengthening the policy and market incentives to improve energy efficiency and reduce emissions and the systematic inclusion and integration of WPT in regulations, policy & decarbonisation development pathways.

Existing Regulations to Reduce GHG [Holding at Red/Amber]

Back in 2016, there were calls for the EEDI to be tightened and for an EEOI/EEXI to be introduced that could have a positive effect on wind propulsion uptake. The group acknowledged that while there is still substantial work that needs to be done specifically around the treatment of WPT in EEDI, there is ongoing work in this field and as an example there were four submissions in front of MEPC 76 (now postponed until MEPC77 in November). Thus, the existing regulations to reduce GHGs are receiving some attention with the EEXI and CII adoption, but the criteria and provisions concerning WPT in particular should be tightened further. It was recommended that a focus on the CII benefits of WPT would be a good direction to move in.

There is also room to promote WPT as an alternative to or lessen the amount of Engine Power Limitation (EPL). It was also felt that regulations in general should be more specific and clearer around WPT though adding a cautious note that these should not be too complex either. One more provision that should be explored is that the IMO Data Collection System (DCS) and EU Monitoring, Reporting & Verification (MRV) could be improved with a requirement to report alternative technologies in operation. There was also general agreement that any targets adopted should be goal-based measures allowing for flexibility within the adoption of measures and technologies to reach those.

Needless to say, much of this work will fall to the IMO to deliberate and deliver, however the need to provide a coherent framework covering all of these 'wind oriented' initiatives and adjustments will require leadership and a coalition of stakeholders to ensure that these are robust changes. Researchers will need to do further work on the legal and policy requirements for WPT and wind energy in general and IWSA was encouraged to follow through on the plans to establish a permanent multi-stakeholder working group to help facilitate these actions and make recommendations to IMO etc.

Policy/Market Incentives to Improve Energy Efficiency/Reduce GHG [Holding at Red]

On the external side, five years ago there were calls for the accelerated uptake of Market-Based-Measures (MBM), however the industry is only now returning to this rather contested, if not controversial subject. There is a clear agreement that any MBM will have some positive effects on WPT uptake and if funds are returned to the industry in way of subsidies to adopt decarbonisation technologies, then that will enhance the impact. WPT's are a key bridge between fossil fuels and sustainable alternatives and is compatible with all options, therefore although WPTs are propulsive systems, emphasising the energy efficiency aspect is also key to uptake.

While the group agreed that IMO is the critical body for industry wide action, the participants also recognised that the EU is a front runner in pushing for change in the policy field and thus suggested an increased focus on the EU to help facilitate change in this area. There also needs to be more concerted activity in the gathering and disseminating of WPT data whether that be the calculation of EEXI/fuel savings, real case studies comparing year-by-year Annual Efficiency Ratio (AER) etc., overall, there is the need for concrete numbers. On these matters, IWSA should lead the charge, using the 'Decade of Wind Propulsion' campaign to showcase these in a pre-competitive manner. This will also assist IWSA in identifying investable pathways that are predictable, stable and consistent. In line with these recommendations, IWSA is already preparing a series of industry surveys to gauge current market developments and planning the release of a market report later in the year.

Inclusion of WPT in Regulations, Policy & Development Pathways [Red changed to Red/Amber]

The final area that was covered by the group was the need for inclusion of WPT in regulations, policy & development pathways across the board. To assist with integrating WPT at the heart of these, it would be appropriate to call for the reporting of WPT to be mandatory in both the MRV & DCS and such measures should be considered as one of the low-hanging-fruit when the aforementioned working group is established.

Business, Operations & Finance Issues

This larger subgroup broke into two teams and was able to cover a wide spread of other barriers from availability and access to capital for R&D, pilots & installations, the diffusion of demonstrators and WPT knowledge and the need for trusted third party performance information that echo some of the concerns of the technical group. The need to update commercial agreements and revisit legal aspects that can restrict the full potential of WPT deployment, through to fuel prices, returns on investment and perception issues that still persist in some quarters. The two team's conclusions aligned quite closely on most of the key points raised.

Availability/Access to Capital for R&D, Pilots & Installations [Red/Amber changed to Amber]

Both groups immediately honed-in on this bottom-line issue. Again, it was agreed that there had been movement in the past five years with the adoption of the Poseidon Principles and some increased public innovation support, however there is also a great deal of room for improvement. The original EU report identified; the need for additional public funding, for the European Investment Bank to intensify support and for long-term agreements to be struck with shippers and these are areas that still need substantial improvement.

An increasing number of stakeholders are acknowledging that WPT are one of the few solutions already available to improve EEXI and CII, however the finance sector needs more in the way of demonstrating that WPT are credible and they are solutions that they can bring to their customers. Demonstrating the value of energy 'reduction' versus investing in clean fuel development and infrastructure is an important activity going forward and there should also be analysis done on how bankable OEMs are for Merger and Acquisition(M&A) and Venture Capital (VC) portfolios. IWSA is encouraged to work more on getting banks and other funders onboard and the wind propulsion working group could be a key portal to tackle the issues of financial barriers, making financial risk assessments for WPT and working with partners on other due diligence issues.

Even though barriers have been coming down and funds are more accessible, those barriers are still high for new entrants and new technology developments, especially when the bar is set high for applications for public R&D funding. This is seen as a key barrier that the development of the Wind Propulsion Accelerator will help to address and the deployment of this facility should be done as soon as possible.

Diffusion of Demonstrators & Knowledge of WPT [Red changed to Amber]

While there has also been progress here in the number of demonstrator vessels, this level needs to be raised to the point where there are a selection of vessels with WPT installed in each vessel segment, and the current lack of demonstrators in the container market was noted as significant. It comes down to IWSA and all stakeholders involved in the sector to assist with the diffusion of information regarding these demonstrators more widely. It was also highlighted that the industry doesn't differentiate WPT from standard technology when it comes to investment decisions and thus requires exactly the same third party validated data to make investment decisions, thus echoing the technical group's call for wider access to performance data and for OEMs to share these datasets wherever possible.

The groups called on IWSA to increase its outreach activities with shipowners and charterers in particular and to ensure that charterers are included as stakeholders in the wind propulsion working group.

Trusted Third Party Performance Information [Holding at Red]

The group did acknowledge that this barrier will see some significant movement over the coming year with the public release of performance data from the EU WASP project. There is also quite a lot of commercially sensitive information growing that is not yet publicly available, however that is already feeding into prediction models that will be more available to industry in the near future. This data is also difficult to standardise across routes, technologies and vessel types. As it stands today, there is limited trusted information in the marketplace, and this has a knock-on effect in investment decision making.

To tackle this the teams agreed with the technical group that it will require multiple stakeholders to get more involved, however they specifically focused on solutions that could include a rating system with parameters for each technology type, route profiles and to incentivise early adopters to share performance data. They also called on certifiers to define standard metrics that are understandable for customers and for registries to adopt rankings based on the inclusion of technology or data disclosure as an incentive to encourage data acquisition.

Two IWSA activities were again identified as crucial in boosting this. Firstly, the deployment as soon as possible of the Wind Propulsion Accelerator program will have significant capacity to collect and analyse data from

across a wide range of technologies though it's test fleet monitoring. The proposed working group was also again flagged as an ideal platform to push for a standardised and clear, simplified way of presenting all results. To these ends, the group called on all stakeholders to increase their support and funding for both.

Fuel Prices & ROI [Red changed to Red/Amber]

The original report called for policy level action on MBMs, including carbon levies and little has changed on the ground yet, though debate on the issue has increased significantly along with recent EU moves to incorporate shipping into the ETS scheme. While a carbon levy would have upward pressure on fuel prices and thus make all alternative fuels and propulsion technologies more competitive, there was scepticism that a tax alone would have significant benefit, though a hypothecated (or ring-fenced) tax making funding available for R&D and installations would be beneficial and recommended IWSA support such moves, but also help more to identify additional finance opportunities.

There was also an acknowledgement that shipping isn't as attractive for investment as many other sectors, therefore supporting the development of alternative financial and business models is also a key area that could unlock a lot of potential, such as transferring heavy CAPEX expenditure to an OPEX model (through pay-as-you-save or leasing approaches) The accelerator program was also deemed to be a vehicle for lowering the R&D burden and support early market adoption with a mix of public-private funding for early installations.

The group also called on researchers to assist with an assessment of likely fuels that will come online and be scaled over the coming 5-20 years with the view to possibly creating technology bundling (wind + fuel) ROI assessments. The need for further research on the appetite for consumers to pay higher costs for low emissions wind propulsion vessels and other potential market drivers was also highlighted.

Commercial Agreements & Legal [Red changed to Amber]

Wind propulsion installations can fall foul of the split incentive in shipping, where the shipowner must make the capital investment in low carbon/fuel saving systems, but the charterer reaps the benefit from lower fuel bills, however this situation is evolving with increased pressure for companies to make 'green' investments through the Poseidon Principles but also in general from companies pushing their ESG agendas. To encourage that beneficial cycle, IWSA is encouraged to reach out more to cargo owners and to promote the triple bottom line benefits of WPT more. The group also tackled the issues that arise around charter parties that stipulate expedited speed/routes and the new wind propulsion working group should set in motion a comprehensive review of current agreements and advise on the criteria necessary for WPT consideration in the drawing up of future ones. The need to identify any and all insurance liability issues surrounding the deployment of these new technologies is also an important area that needs to be assessed carefully.

Scepticism/Perception Issues [Holding at Red/Amber]

This is a particularly difficult area to challenge as it is multi-faceted and entrenched, however it is deemed to be a high priority issue. Although progress has been made, especially with first movers, there is still a lot of work to be done here. The 2016 report identified that there was a challenging mix of; lack of experience with WPT, the perception that installing WPT was a regressive step using 'old' technology and that there were concerns (often unjustified) around safety issues. Inroads have been made in all of these areas, however most diffusion of WPT information has been limited to Europe and while there has been a growth in the number of demonstrator vessels, the use of wind is considered as less significant than the development of alternative, low carbon and zero-emissions fuels, even though many of those are decades away from deployment at scale. Each of these areas of concern is naturally reduced as more demonstrator installations enter the market and more data becomes available, however there is need to widen the message/audience, including cargo owners and consumers.

IWSA and member companies were clearly identified as the most important change agents in this regard and the group called for members to engage in collective marketing activities whenever possible and they should share market developments more. To sharpen the wind propulsion message and improve the marketing in general IWSA needs to improve market analysis and reporting and widen its outreach activities, but also should consider improving its branding and employ a specialist communications company. Taking that to another level, IWSA should also consider bringing a large change management company onboard to improve strategy etc.

Concluding Comments

While there has been significant progress over the five years since the report was published and market developments align more or less with the projections for 2020, there is still substantial work to be done and raising expectations and the growing number of entrants into the sector feed into that narrative.

The calls for action align quite closely with a number of projects and initiatives already under development notably the Wind Propulsion Accelerator program and the International Multi-Stakeholder Wind Propulsion Working group and these current activities and proposed programs and projects are listed below.

Both the WiSP JIP and EU WASP projects currently underway along with revised submissions to MEPC77 will all make significant impacts over the next 12 months. However, the findings from this important workshop are a call to action, and as part of the 'Decade of Wind Propulsion', www.decadeofwindpropulsion.org, the need to deliver on solution for these continued barriers is critical, on a national, regional and international level.

We would like to thank all participants and these finding will directly feed into the working group to be established in the coming months but has already impacted on the direction of IWSA activities and will continue to help mould the association strategy going forward.

Wind Propulsion Working Group: This multi-stakeholder working group will be established in Q4, 2021 to evaluate and quantify wind propulsion's potential contribution to decarbonise the global fleet. It will work on all aspects of wind propulsion uptake and highlight required changes to the regulatory, policy, market, and technical spheres and promote the potential from a hybrid approach to decarbonization with wind propulsion fully integrated together with operational and vessel optimisation measures along with eco-fuels.

Wind Propulsion Accelerator Program: This large-scale accelerator/incubator program is under development that supports WPT R&D and early market entry by means of design, engineering and business development support, incorporating a test fleet with various ship sizes/types along with an early installation funding facility.

Open Letter: Over 90 maritime corporations, shipowners, designers and technology providers all involved with WPT released this open letter calling for all maritime industry decision-makers and shipping community to fully assess and utilise all available power solutions that deliver the necessary deep, swift cuts in carbon emissions over the next decade commensurate with responding to the climate emergency. To that end, readily available and proven WPT solutions must be integrated into all decarbonisation deliberations, which is currently not the case. [Chinese](#) // [Dutch](#) // [English](#) // [French](#) // [German](#) // [Italian](#) // [Japanese](#) // [Korean](#) // [Spanish](#)

Wind Assist Ship Propulsion (WASP) Project: Three-year project launched in Oct 2019 and part funded by the Interreg North Sea Europe programme, part of the European Regional Development Fund (ERDF). The project brings together universities, WPT providers and five ship owners to research, trial and validate the operational performance of a selection of WPT solutions. [Website](#)

WiSP Project: This Joint Industry Project (JIP) (launched July 2019) led by ABS and MARIN has the objective to overcome barriers to the uptake of WPT, specifically to improve methods for transparent performance prediction, use these improved methods to provide ship owners/operators with fast low-cost predictions for their fleet and to review the regulatory perspective including status of rules and regulations, identify gaps and make recommendations, and provide examples on establishing compliance. Phase II starts in Q3 2021 [Website](#)

MEPC 76 & EEDI Submissions: (postponed to MEPC77): Proposed EEDI modifications for WPT:

Comoros and RINA ([MEPC 76/7/31](#) & [MEPC Inf.30](#)) Prediction and verification of CO2 emission savings with WPT (derived from WiSP JIP + IWSA input)

China/Germany/Japan ([MEPC 76/6/2](#)) Draft amendments to MEPC.1Circ.815 for verification of WPT

Finland/Germany ([MEPC 76/6/6](#)) Additional draft amendments to MEPC.1Circ.815

Comoros and RINA ([MEPC76/6/10](#)) - Comments on documents MEPC 76/6/2 and MEPC 76/6/6

France ([MEPC76/6/8](#)) - Draft amendments to MEPC.1/Circ.815 additional to the amendments proposed by MEPC 76/6/2, concerning the calculation of the wind propulsion system force matrix and the extension of the scope of that circular to the EEXI.