

JOINT MEDIA RELEASE

Singapore, 21 April 2021

International Advisory Panel on Maritime Decarbonisation unveils nine pathways to support decarbonisation in the maritime industry

1. The International Advisory Panel on Maritime Decarbonisation (IAP) formed in July 2020 by the Singapore Maritime Foundation (SMF), with the support of the Maritime and Port Authority of Singapore (MPA), has submitted its recommendations to the Singapore Government. The IAP has identified nine pathways to maritime decarbonisation, including policy options to accelerate the transition and ways in which Maritime Singapore can support the industry's decarbonisation.

2. The IAP is co-chaired by Mr Andreas Sohmen-Pao, Chairman of the Singapore Maritime Foundation, together with Mr Wong Weng Sun, Chairman of the Board and Governing Council of the Singapore Maritime Institute. It comprises 28 other leaders from maritime and related organisations, including shipping associations, shipping companies, port operators, energy companies, engine makers, shipyards, insurance and finance players, as well as academia.

IAP RECOMMENDATIONS

3. The IAP's vision is for Maritime Singapore to support decarbonisation of the industry to meet or exceed the International Maritime Organization's (IMO) goals for 2030 and 2050 by:

- **shaping Greenhouse Gas (GHG) measures** to ensure that actions have a real and lasting positive impact;
- **setting standards** for operational, technical and safety factors;
- **piloting innovations** in the technical, operational and digital sphere;
- **building selective infrastructure** to support these innovations;
- **deploying incentives** at national, regional or global level, combined with private capital initiatives, to implement solutions for vessel efficiency and new fuels; and
- **connecting global stakeholders** to share knowledge and implement actions.

4. To achieve this vision, the IAP has recommended focusing on four strategic objectives: (1) harmonise standards; (2) implement new solutions; (3) finance projects; and (4) collaborate with partners. Supporting these objectives are nine pathways to decarbonisation, as shown in [Table 1](#).

5. Recognising the importance of taking action and collaborating for change, the IAP has further identified joint projects to embark on. These projects include conducting fuel and electrification trials for vessels and setting up a decarbonisation centre in Singapore. *See Annex 1 for the link to the full report, and a summary of the proposed action plans and Annex 2 for joint projects which the IAP has identified.*

Table 1: The IAP recommends four strategic objectives and nine pathways to decarbonisation

HARMONISE Standards	IMPLEMENT New Solutions	FINANCE Projects
1. Shape common metrics for carbon accounting 2. Set standards for new technologies and solutions	3. Pilot trials and deploy solutions 4. Build flexible ship capabilities and relevant infrastructure	5. Develop green financing mechanisms 6. Develop mechanisms that could support carbon pricing 7. Act as custodian for and deploy R&D funds and grants
COLLABORATE with Partners		
8. Multiply local, regional and global collaboration across stakeholders 9. Set up a decarbonisation centre		

6. In his opening address, Mr Sohmen-Pao said that the strategies represent the IAP’s collective vision for how Singapore can contribute to the global effort to reduce GHG emissions from international shipping. He noted that decarbonisation of the industry would require multiple paths of action, and the collective effort of public and private stakeholders.

7. IAP co-chair Mr Wong added that the release of the IAP’s recommendations was a milestone in the journey towards maritime decarbonisation. It would be important to keep up the momentum and bring about concrete action through the joint projects identified in the report. He welcomed additional proposals for collaboration from interested stakeholders.

8. Senior Minister of State for Ministry of Foreign Affairs and Ministry of Transport, Mr Chee Hong Tat said, “We thank the IAP for the significant effort and thought which went into producing the report. We will consider their recommendations when developing the Maritime Singapore Decarbonisation Blueprint 2050. The fight against climate change is a global ambition and a collective responsibility. Singapore is committed to do our part to support the IMO and the international maritime community in climate action.”

Annex 1 – Action and Collaboration Decarbonisation Pathways for the Global Maritime Industry report

Annex 2 – Joint Projects Identified by the IAP

Annex 3 – Members of the International Advisory Panel on Maritime Decarbonisation

<End of release>

About Singapore Maritime Week

The Singapore Maritime Week (SMW) is an annual gathering of the international maritime community to advance key maritime issues and exchange ideas to bring the maritime sector forward. Driven by the Maritime and Port Authority of Singapore, in collaboration with industry stakeholders, research and educational institutions, the SMW brings together key opinion leaders and industry leaders through conferences, dialogues and forums.

For more information and the full calendar of events, please visit www.smw.sg

About the Maritime and Port Authority of Singapore (MPA)

The Maritime and Port Authority of Singapore (MPA) was established on 2 February 1996, with the mission to develop Singapore as a premier global hub port and international maritime centre (IMC), and to advance and safeguard Singapore's strategic maritime interests. MPA is the driving force behind Singapore's port and maritime development, taking on the roles of Port Authority, Port Regulator, Port Planner, IMC Champion, and National Maritime Representative. MPA partners the industry and other agencies to enhance safety, security and environmental protection in our port waters, facilitate port operations and growth, expand the cluster of maritime ancillary services, and promote maritime R&D and manpower development.

About the Singapore Maritime Foundation

Established in 2004, the Singapore Maritime Foundation (SMF) is a private sector-led organisation that aims to develop and promote Singapore as an International Maritime Centre (IMC), forging partnerships with the public and private sectors. SMF's initiatives aim to strengthen the cluster, attract young talent to the industry, and support work on important issues such as decarbonisation. SMF's Board of Directors comprises prominent leaders in the Singapore maritime community. For details, visit <https://www.smf.com.sg>

For media queries, please contact:

Fouziah Rahim (Ms)

Assistant Director, Content & Marketing Department

Maritime and Port Authority of Singapore

DID: (65) 6375-1852; 9787 6937

Email: Fouziah_RAHIM@mpa.gov.sg

Elizabeth Koh (Ms)

Senior Executive, Corporate Communications & Development Department

Singapore Maritime Foundation

DID: (65) 6235-0228

Email: elizabethkoh@sgmf.com.sg



ACTION AND COLLABORATION – DECARBONISATION PATHWAYS FOR THE GLOBAL MARITIME INDUSTRY

Pathway	Action Plan
1. Shape common metrics for carbon accounting	<ul style="list-style-type: none"> • Map out GHG metrics currently used. • Evaluate lifecycle carbon cost. • Improve monitoring, reporting, verification and transparency through collaborations • Develop IT platforms to measure and benchmark the carbon impact of different operating or navigational parameters. • Build upon the IMO's Data Collection System to create a registry for maritime-related GHG emissions. • Establish a centre to coordinate the harmonisation of carbon footprint measurements.
2. Set standards for new technologies and solutions	<ul style="list-style-type: none"> • Develop a global common standard for improved efficiency through JIT arrivals. • Harmonise data standards to ensure interoperability across port community systems, with a platform for the secure sharing of data. • Develop safety standards for bunkering and regulatory frameworks for the handling of alternative fuels. • Gather and disseminate knowledge on the potential impact of technical and operational solutions on carbon emissions, for instance, through a decarbonisation centre.
3. Pilot trials and deploy solutions	<ul style="list-style-type: none"> • Promote a consortium approach towards the design of pilot projects. • Create a platform for the sharing of findings from pilot projects. • Launch a programme to fund a larger number of feasibility studies and pilot projects.
4. Build flexible ship capabilities and relevant infrastructure	<ul style="list-style-type: none"> • Support projects which allow for future transition to zero-carbon fuels. • Create flexible ship capabilities and port infrastructure which allows multiple fuels to be supplied, and ensure safety standards in the development of such infrastructure. • Track the readiness of fuel solutions for adoption.

Pathway	Action Plan
5. Develop green financing mechanisms	<ul style="list-style-type: none"> • Develop green financing schemes to support investments. • Co-create leasing schemes or financing vehicles to defray upfront cost of new investments. • Explore schemes to close the price gap between existing and new fuels. • Offer incentives to distribute the cost burden among different parties. • Explore schemes to increase carbon footprint disclosure of maritime financial products.
6. Develop mechanisms that could support carbon pricing	<ul style="list-style-type: none"> • Press for carbon cost to be included in the fuel price. • Develop and apply mechanisms for the verification and collection of funds that maximise acceptability and practicality. • Explore offsets or in-setting as a complementary path to carbon reduction.
7. Act as custodian for and deploy research and development funds and grants	<ul style="list-style-type: none"> • Establish a global funding scheme that collects contributions related to bunker consumption (or other suitable metrics), to be deployed for acceleration of maritime decarbonisation.
8. Multiply local, regional and global collaboration across stakeholders	<ul style="list-style-type: none"> • Establish a coalition of ports to develop solutions on a level playing field. • Strengthen communication and information flows among stakeholders in the port ecosystem. • Ensure collaborations include all stakeholder types, and enable interconnection with other like-minded organisations.
9. Set up a decarbonisation centre	<ul style="list-style-type: none"> • Establish a global decarbonisation centre in Singapore that serves as a regional node in a global network of similar centres. • Leverage the centre to coordinate, drive and sustain decarbonisation efforts.

JOINT PROJECTS IDENTIFIED BY THE IAP

ESTABLISH A DECARBONISATION CENTRE

MPA will set up a maritime decarbonisation centre, with joint contribution from the industry. BW Group, Eastern Pacific Shipping (EPS), Ocean Network Express (ONE), Sembcorp Marine, The Foundation Det Norske Veritas and BHP have committed towards funding for the establishment of the centre.

COLLABORATE WITH GLOBAL DECARBONISATION CENTRES

The decarbonisation centre and the Maritime Energy and Sustainable Development (MESD) Centre of Excellence in Singapore will collaborate with global centres such as the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping.

EXPLORE FUTURE FUEL TRIALS FOR REGIONAL CONTAINER FEEDER VESSELS

MPA and ONE are exploring a coalition with other liner companies and feeder operators to advance decarbonisation solutions for regional container services. Stakeholders, such as classification societies, fuel suppliers and cargo interests, will be involved too.

EXPLORE BIOFUEL TRIAL FOR TRAMP SERVICES

MPA and Eastern Pacific Shipping are considering trialling biofuel bunkering at the Port of Singapore in collaboration with relevant partners such as a biofuel supplier.

ELECTRIFICATION OF PULAU BUKOM FERRIES

Shell Eastern Trading is exploring the electrification of its ferries calling at Pulau Bukom, which is used to ferry workers between Pulau Bukom and the main island of Singapore.

RETROFIT AND CONSTRUCT NEWBUILD VESSELS TO USE METHANOL AND AMMONIA AS MARINE FUEL

EPS, OCI N.V. (OCI) and MAN Energy Solutions (MAN) have signed a MoU to develop methanol and ammonia as marine fuels. Conventional vessels from EPS's existing fleet that uses MAN engines will be retrofitted to run on methanol and ammonia supplied by OCI. EPS will also construct newbuild methanol and ammonia-powered vessels using MAN engines.

EXPLORE GREEN AMMONIA BUNKERING IN SINGAPORE

A.P. Møller-Mærsk A/S, Fleet Management Limited, Keppel Offshore & Marine, Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, Sumitomo Corporation and Yara International have signed a MoU to conduct a feasibility study. This aims to establish an end-to-end supply chain to provide green ammonia ship-to-ship bunkering at the Port of Singapore.

CONDUCT JOINT WORKSHOPS ON AMMONIA AS A MARINE FUEL

DNV and MPA are looking to engage selected shipowners interested in exploring the use of ammonia as zero-emission fuel. This could be through workshops to address the production and utilisation of ammonia, its availability and future pricing.

STUDY SUBSEA STORAGE OF GREEN AMMONIA

ABS will partner NOV on “Subsea Ammonia Energy Storage System” to address existing challenges with green ammonia as a route towards the hydrogen economy. The research project will study a novel method of storing, recovering and transporting green ammonia in the most optimal way. The end goal is to increase the ease and safety of storing green ammonia and the efficient fuelling of shipping vessels.

EXPLORE CROSS INDUSTRY COLLABORATION FOR HYDROGEN AND SOLID OXIDE FUEL CELL TRIAL

MPA is looking at collaborating with interested parties such as Shell Eastern Trading and Corvus Energy to test hydrogen and solid oxide fuel cells in Singapore. Shipyards such as Sembcorp Marine and hydrogen frontrunners such as CMB could be involved.

EXPLORE CARBON CAPTURE TECHNOLOGY ONBOARD VESSELS

MPA is looking at working with parties such as Pacific Carriers Limited and Sembcorp Marine to investigate the technical and economic feasibility of installing carbon capture technology on board vessels.

DEVELOP JUST-IN-TIME OPERATIONS

MPA has embarked on digitalPORT@SG™ which will facilitate just-in-time operations at the Port of Singapore, and will collaborate with stakeholders to harmonise efforts through its digitalOCEANS™ initiative. The Singapore Shipping Association has been working with MPA on this front, and liner companies such as Pacific International Lines may participate through sharing of data.

PUBLISH CARBON FOOTPRINT FOR COMMONLY-PLIED MARITIME TRADE ROUTES

The Baltic Exchange could explore publishing carbon footprint measurements tagged to the Baltic routes. This could be in consultation with academic experts at University College London and existing efforts such as the Sea Cargo Charter. MPA could support this by soliciting industry feedback on the computation methodology and trial numbers.

EXAMINE POSSIBILITY OF DEVELOPING VOLUNTARY TRADING OF MARITIME OFFSETS

The Baltic Exchange and the Singapore Exchange are exploring the trading of maritime offset credits to create a voluntary carbon market. In its concept development phase, MPA could facilitate industry consultation for feedback on the idea and sizing of demand.

MEMBERS OF THE INTERNATIONAL ADVISORY PANEL ON MARITIME DECARBONISATION

- | | | |
|-----|--|---|
| 1. | Mr Andreas Sohlen-Pao
(Co-Chair, IAP) | Chairman, Singapore Maritime Foundation; Chairman, BW Group |
| 2. | Mr Wong Weng Sun
(Co-Chair, IAP) | Chairman of the Board & Governing Council, Singapore Maritime Institute; President & Chief Executive Officer, Sembcorp Marine |
| 3. | Dr Gu Hai | Vice President, American Bureau of Shipping |
| 4. | Mr Mark Jackson | Chief Executive Officer, Baltic Exchange |
| 5. | Mr Alexander Saverys | Chief Executive Officer, CMB |
| 6. | Mr Jan Dieleman | President, Cargill Ocean Transportation |
| 7. | Mr Geir Bjørkeli | Chief Executive Officer, Corvus Energy |
| 8. | Mr Zhu Jian Dong | Chairman & President, COSCO Shipping (South East Asia) Pte Ltd |
| 9. | Dr Pierre C Sames | Group Research and Development Director, DNV |
| 10. | Mr Odin Kwon | Chief Technology Officer, Daewoo Shipbuilding & Marine Engineering, Co. Ltd (DSME) |
| 11. | Mr Cyril Ducau | Chief Executive Officer, Eastern Pacific Shipping (EPS) |
| 12. | Ms Caroline Yang | Chief Executive, Hong Lam Marine; President, Singapore Shipping Association |
| 13. | Mr Esben Poulsson | Chairman, International Chamber of Shipping; Executive Chairman, Enesel Pte Ltd |
| 14. | Mr Nick Shaw | Chief Executive Officer (CEO), International Group Of P&I Clubs |

15. Mr Aziz Merchant Executive Director, Keppel Marine & Deepwater Technology Pte Ltd
16. Mr Yee Yang Chien President and Group CEO, MISC Berhad
17. Mr Palle Brødsgaard Laursen Chief Technical Officer, Senior Vice President of Maersk
18. Ms Quah Ley Hoon Chief Executive, Maritime And Port Authority of Singapore
19. Professor Lam Khin Yong Senior Vice President (Research), Nanyang Technological University (NTU)
20. Mr Jeremy Nixon Chief Executive Officer, Ocean Network Express
21. Mr Tan Chong Meng Group Chief Executive Officer, PSA International
22. Mr Hor Weng Yew Chief Executive Officer, Pacific Carriers Limited
23. Mr Teo Choo Wee Executive Director, Pacific International Lines (Private) Limited
24. Prof Lynn Loo Director, Andlinger Centre for Energy and the Environment, Princeton University
25. Mr Nick Potter General Manager, Shipping & Maritime, APME Region, Shell Eastern Trading Pte Ltd
26. Ms Tan Beng Tee Senior Advisor, Maritime And Port Authority of Singapore; Executive Director, Singapore Maritime Foundation
27. Mr Rasmus Bach Nielsen Global Head of Fuel Decarbonisation, Trafigura
28. Dr Tristan Smith Reader in Energy And Shipping, University College London, Energy Institute
29. Mr Andrea Morgante Vice-President Strategy, Wärtsilä Marine Power
30. Dr German Weisser Senior Advisor Research & Development, Winterthur Gas & Diesel Ltd