Annex 2

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.