

MARINE ENVIRONMENT PROTECTION
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REDUCTION OF GHG EMISSIONS FROM SHIPS

Use of intellectual property generated from IMRB projects

Submitted by ICS

SUMMARY

Executive summary: Commenting on document MEPC 77/7/1 (ICS et al.), ICS provides an illustrative example of how intellectual property issues could be addressed for R&D projects commissioned by the IMRB, as proposed in document MEPC 76/7/7 (Denmark et al.), and how knowledge generated from these projects could be shared for the benefit of all Member States

*Strategic direction,
if applicable:* 3

Output: 3.2

Action to be taken: Paragraph 4

Related documents: MEPC 77/7/1, MEPC 77/7/6; MEPC 76/7/7 and MEPC 76/15

1 This document is submitted in accordance with the document on *Organization and method of work of the MSC and MEPC and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.2) and comments on document MEPC 77/7/1 (ICS et al.).

2 During MEPC 76, the IMRB/IMRF proposal, set out in document MEPC 76/7/7 (Denmark et al.), was deliberated, and a view was expressed that the provisions on intellectual property rights (IPR) did not provide sufficient guarantees to ensure fair access to the results of R&D funded by the IMRB (MEPC 76/15, paragraph 7.71.14).

3 Further to the analysis in document MEPC 77/7/1 of more than 250 projects needed to increase Technology Readiness Levels (TRLs), ICS has commissioned engineering consultants Ricardo to explore how IPR issues might be addressed for the benefit of all Member States. The conclusions of this review, which suggest these issues are surmountable, are set out in the annex to this document.

Action requested of the Committee

4 The Committee is invited to consider the information contained in this document and its annex and take action as appropriate.

ANNEX

USE OF INTELLECTUAL PROPERTY GENERATED FROM IMRB PROJECTS

After the proposed IMRB approval at MEPC 77, it will be possible to make adjustments to the regulatory package set out in document MEPC 76/7/7 (Denmark et al.) prior to adoption at a future session. The following suggestions from the engineering consultants Ricardo are not presented as firm proposals but ideas that can be developed when the proposed Charter for the Establishment and Governance of the International Maritime Research and Development Board is finalized.*

Intellectual Property (IP) policies of a number of grant programmes, operated by a variety of regional and international organizations, have been reviewed by Ricardo. These show that the issues that would need to be addressed by the IMRB, when commissioning R&D programmes funded by the IMRF, are neither unique nor insurmountable if there is sufficient political will.

Ricardo provides an example of a potential R&D project to be commissioned by the IMRB, to demonstrate how IP issues might be addressed whilst allowing all Member States and other relevant stakeholders to benefit from the sharing of information and knowledge generated by this and the other 250 plus potential projects identified in document MEPC 77/7/1 (ICS et al.).

As defined by UN World Intellectual Property Organization, WIPO, IP refers to "creations of the mind – everything from works of inventions, computer programmes to trademarks and other commercial signs". Intellectual Property Rights (IPR) are the legal rights given to people over the creation of the mind for a certain period of time. Based on the objectives of the IMRB and best practice for such programmes, the following IPR approaches could be considered:

The IMRB could be granted authorization to make IPR decisions in execution of projects to help ensure rapid project commissioning. This would enable the IMRB to meet its objective, inter alia, to rapidly accelerate R&D of zero-carbon technologies so as to increase TRLs.

The IMRB could create a "model grant agreement" document that offers a framework for the project partners (grantees) in the management of IPR. This document could include:

- .1 policy recommendations for project partners on identification, exploitation, protection and dissemination of IP;
- .2 a "Code of Practice" that contains guidance on implementation; and
- .3 a detailed annex on example cases, specific rules, consequences of non-compliance, etc.

The IMRB could allocate a professional officer responsible for supporting project partners in establishing agreements on IP rights and monitoring the implementations of the recommendations.

The IMRB could set up a database for IP, including patents and licence status, from both IMRB projects and prior technologies related to potential IMRB projects. IP within the database could be included regardless of whether patents have or will be applied for.

* For the Ricardo report including a list of programmes examined, references and a legal disclaimer, see <https://rsc.ricardo.com/insights/research-development-requirements-for-zero-carbon-shipping-en>.

The IMRB could develop a policy to promote easy dissemination of the results, such as publication of findings in open access databases. For example, IMRB could generate a repository accessible to all Member States and other relevant stakeholders. The repository could contain both existing public domain information and IMRB funded project reports.

To support knowledge sharing among all Member States, the IMRB could look favourably on grant applications that include collaboration with organizations from multiple Member States, including those located in different regions and in both developed and developing countries.

Example of IPR application through a potential R&D project commissioned by IMRB

The following is based on an example of a potential R&D project that might be commissioned by the IMRB which elaborates on potential project partners and project management, as well as agreements and benefits to the project partners and other stakeholders in terms of IPR.

Project summary

One potential R&D project proposed is "*Ammonia cracking to hydrogen for reducing onboard energy storage requirement*" with an estimated project cost of \$20 million over two to three years (as set out in case study 7 in document MEPC 77/7/1). The project aims to design and develop an ammonia reformer system, which will investigate cracking of H₂ from NH₃ to be used in combustion systems. If demonstration of a working prototype of the technology is successful, the technology will enable NH₃ as the primary energy carrier instead of H₂, which will significantly reduce the infrastructure investment needed for large H₂ tank storage systems. The reformer system is anticipated to be comprised of catalyst, heat exchanger and H₂ purification/separation systems. The basic working principle of the technology is as follows: Ammonia is heated in a heat exchanger and then decomposed into nitrogen and hydrogen over a catalyst in a "NH₃ membrane cracker" unit. Hydrogen is then recovered through a separation system to be fed into a hydrogen internal combustion engine.

IPR scenario

The project is assumed to be a multi-partnered project that involves four stakeholders from four different IMO Member States. In this example, the potential project partners could be a Reformer Company (A) from Asia, a Research Institute (B) from South America, a Simulation Software Company (C) from Europe, and a Shipping Company (D) from a SIDS.

Of the overall project cost of \$20 million, \$15 million might be provided by the IMRB; the additional \$5 million is match funded, in this example, by the Reformer Company (A).

Reformer Company (A) would be the project leader and responsible for the development and deployment of the prototype of the technology. Research Institute (B) might support design and development of the catalyst and separation systems. Simulation Software Company (C) might be responsible for simulations on fuel reformer modelling chemical reaction, heat transfer, flow field structure and material transfer within the reformer system. Shipping Company (D) might advise on efficient integration of the system into ships.

Potential IPR settlements and benefits to all stakeholders

The project partners could be expected to set up a contractual agreement on IPR following the guidelines for a "model grant agreement" that would be prepared by the IMRB. The agreement would be established before the start of the project.

The project partners would designate a contact point responsible for IPR management who would liaise with an IMRB IP officer throughout the project to ensure that the IP is appropriately disseminated.

The contractual agreement could clarify and identify IP related topics such as:

- .1 identification of IP owned beforehand (Background IP);
- .2 ownership of results (Foreground IP) and its protection; and
- .3 access rights and licence fee to Foreground and Background IP.

Stakeholders involved in the project could be required to consider signing a non-disclosure agreement (NDA) that might cover a period of time after completion of the project to protect any existing IP or any IP generated prior to decisions on IP dissemination or patent filing.

Background IP would be retained by the owner who created or developed it before the date of the agreement. Background IP owned by Reformer Company (A) would be made accessible to the project partners, to be considered as part of the match funding.

Foreground IP would belong to the project partners who generate it. In this example, potential Foreground IP that could be generated during the execution of the project includes:

- .1 materials processing method developed for the membrane system;
- .2 software programme developed for modelling the overall NH₃ cracking process; and
- .3 development of the prototype reformer.

The project partners would share any licencing fees dependent on the patents, or shares of patents owned which are generated from the project. Reformer Company (A), as the sole match funder, would benefit from preferential access to the Foreground IP generated by the other project partners which will potentially enable acceleration of manufacturing the ultimate product. The project partners could also benefit from licencing royalties due to further applications of the technology by other companies.

The IMRB model grant agreement should ensure that the licence fee of the IP of this project is suitably priced to enable rapid global manufacture and therefore uptake of the technology. However, the licence fee must be fair to ensure there is sufficient benefit to match funder Reformer Company (A) to recoup its project investment with an appropriate margin, and for the other project partners to justify their involvement in the project.

IMRB would facilitate dissemination of the knowledge and information to Member States which can have fee-free access to the repository during and after the execution of the project, which could also help advance the availability of the technology to the market. The repository could include:

- .1 IP related documents; internal policies and agreements;
- .2 quarterly reports outlining success and failures;
- .3 project deliverables such as experimental data, model simulations; and
- .4 reports and presentations, discussed during progress meetings.

Conclusions

Evaluation of other large collaborative programmes shows that addressing IPR issues is not insurmountable given the importance of what is at stake. The IMRB can readily ensure that project partners would be able to exploit the benefits of the intellectual property achieved by their individual contribution to the project by means of ownership and licences. But the IMRB could also ensure equitable and fair access to intellectual property generated through the R&D projects, to the mutual benefit of all project partners and stakeholders, including Member States, the shipping industry and other stakeholders. With political will, the IMRB Charter can establish an open and equitable approach to dissemination and exploitation of project results which will greatly ease the knowledge transfer and accelerate the development and deployment of zero-carbon technologies and fuels worldwide, contributing significantly towards achieving the full decarbonization of international shipping within the timelines agreed in the Initial IMO Strategy.
