

# Procedural Improvements to the Comprehensive Impact Assessment of IMO GHG Reduction Measures

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## Abstract

The International Maritime Organization (IMO) Marine Environmental Protection Committee (MEPC) may adopt actions after completing impact assessments and reviewing results in accordance with the original strategy and impact assessment procedure (MEPC.1/Circ.885). The assessment of the impact of greenhouse gas (GHG) reduction measures is an important step in determining whether to implement GHG regulations. This study identifies and proposes improvements in the impact assessment procedure for future mid- and long-term measures. Improvements for future measures should start with a review of “the procedure for assessing impacts on states of candidate measures” and “the actual process of the comprehensive impact assessment for short-term measures in 2021.” The procedural improvements were largely derived from the order and period of task performance, the clear definition of terms, and the review of task results through lessons learned, analysis, and expert workshops. The impact assessment of future mid- and long-term measures should be procedurally improved to ensure uniformity and consistency, which will provide objective results for Member States and industries to help smooth the adoption of measures.

**Keywords:** *Impact assessment procedure, Mid- and long-term measures, Candidate measures, Lessons learned analysis, Task performance*

## 1. Introduction

As a specialized agency of the United Nations (UN), the International Maritime Organization (IMO) is the global standard-setting authority for the safety, security, and environmental performance of international shipping[1]. Accordingly, its work in the shipping sector is linked to the UN's Sustainable Development Goals (SDGs). One area of the IMO's work is to develop measures to reduce greenhouse gas (GHG) emissions from shipping to minimize the impact on climate change in conjunction with the climate action of the 13 SDGs[2-3]. It has adopted global mandatory technology and operational energy efficiency measures for ships under the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI since 1997[4], and has been working continuously to address the issue of GHG emissions from ships. Since then, it has made efforts to reduce air pollution by adopting global mandatory technology and operational energy efficiency measures for ships in accordance with MARPOL Annex VI[4-5], and in 2018, it adopted the “Initial Strategy” to reduce GHG emissions from international shipping[6].

The Initial Strategy includes candidate measures to be considered in short- (2018 to 2023), mid- (2023 to 2030), and long-term timelines (after 2030)[7]. However, before the adoption of these candidate measures, impacts on states should be assessed and considered. As such, the impact assessment of GHG reduction measures is an important process that determines regulation. Nevertheless, the four-step procedure[8] for impact assessment (initial impact assessment, submission of document with comments, comprehensive response, and comprehensive impact assessment) was not specific, and the definition was unclear. Short-term measures were assessed based on procedures that were somewhat unspecific, and they were not unified from the initial impact assessment results[9]. Ultimately, a comprehensive impact assessment of short-term measures was conducted, unlike the elements included in the procedure, but the results were not perfect[10-14]. Nevertheless, in 2021, the IMO's 76<sup>th</sup> Marine Environmental Protection Committee (MEPC) approved the adoption of the amendments to the MARPOL Annex VI as a short-term measure[15] on the premise that the impact assessment procedure be improved[16] in consideration of the urgency of reducing GHG emissions.

The IMO has prepared a procedure known as impact assessment, to adopt GHG measures. This unprecedented evaluation procedure is also important for the adoption of mid- and long-term measures and the introduction of regulations in the future. Member states should strive to ensure consistency, unity, and concreteness of existing procedures, and

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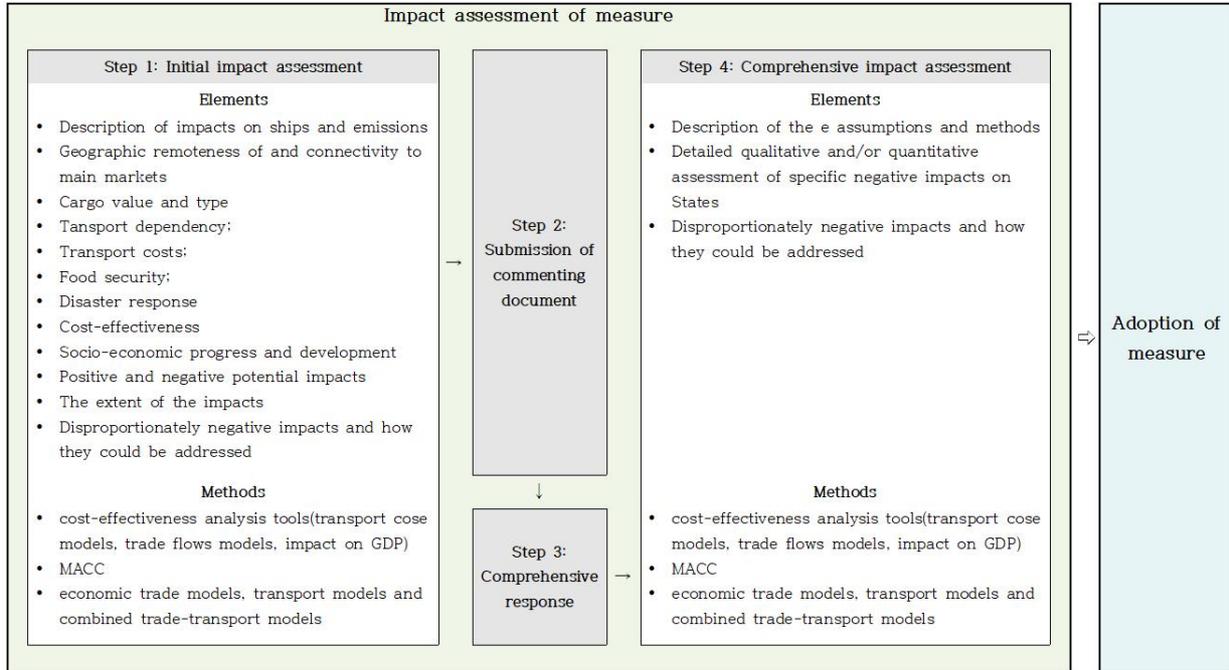


Figure 1. Impact assessment procedure (MEPC.1/Circ.885).

the Republic of Korea is also responsible for making efforts as a member of the Steering Committee (SC) for the comprehensive impact assessment. Therefore, this study proposes procedural improvements to the impact assessment of GHG reduction measures to conduct consistent assessments for mid- and long-term measures in the future.

## 2. Materials and methods

### 2.1. Impact assessment of measures

#### 2.1.1. Procedure for assessing the impacts of candidate measures on states

In May 2019, MEPC 74 adopted the impact assessment procedure (MEPC.1/Circ.885), including a three-page annex. The procedure briefly describes the four steps of impact assessment, and the elements to be considered for each step are illustrated in Figure 1.

Step 1 is to propose a measure to submit the initial impact assessment results by the 13-week submission deadline, but detailed impact assessment results can also be submitted by considering the comprehensive impact assessment elements of Step 4. However, there are practical difficulties with considering the elements of Step 4 in the initial impact assessment as the elements to be considered in the initial impact assessment, such as impacts of measure on ships, emissions, geographic remoteness of and connectivity to main markets, cargo value and type, transport dependency, transport costs, food security, disaster response, cost-effectiveness, socio-economic progress, and development, the positive and negative potential impacts and how they could be addressed, are never small. Furthermore, the Committee should focus on developing countries, particularly the Small Island Developing States (SIDS) and Least Developed Countries (LDCs), in Step 4 of the comprehensive impact assessment. It should also recom-

mend ways to address disproportionately negative impacts. Given the absence of a clear definition for each term, MEPC.1/Circ.885 has limitations as a simplified procedure.

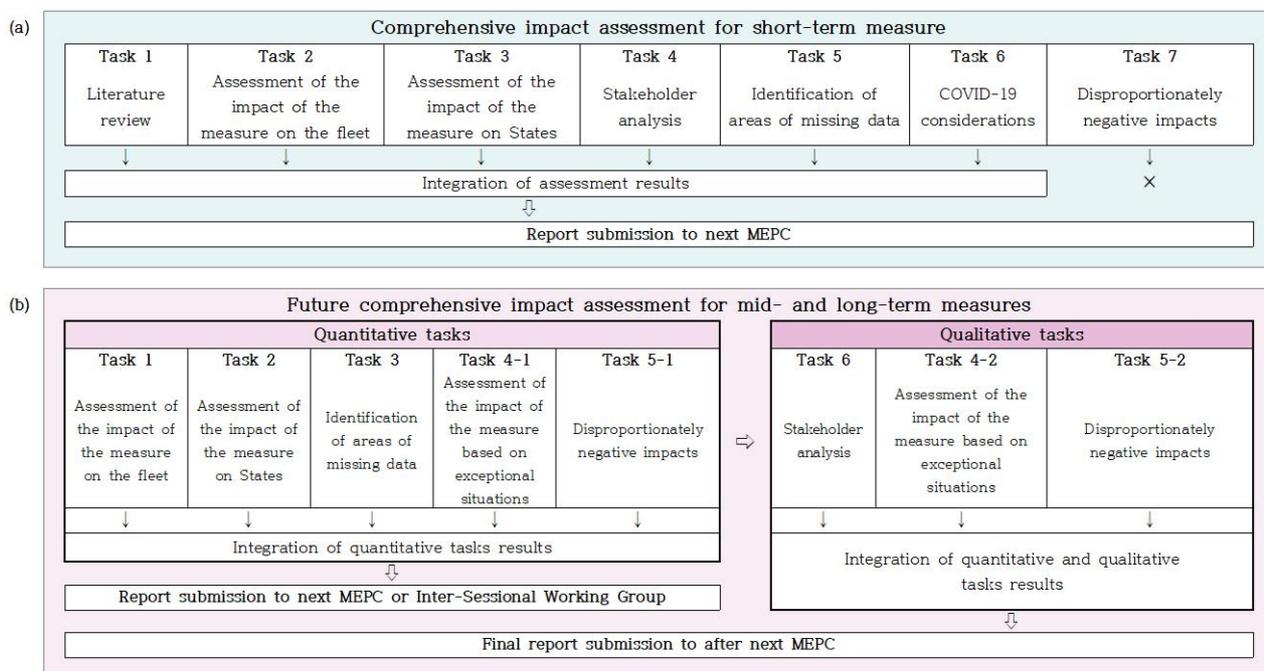
#### 2.1.2. Comprehensive impact assessment of the short-term measure

MEPC 75 gave instructions to initiate the comprehensive impact assessment and to establish a SC for the short-term measure[17]. The SC conducted seven distinct and interrelated tasks, such as a literature review, assessment of the impact of the measure on the fleet, assessment of the impact of the measure on the states, stakeholder analysis, identification of areas of missing data, COVID-19 considerations, and disproportionately negative impacts[18]. These tasks are constructed differently from the contents of the existing impact assessment procedure. In addition, each task was commissioned by specialized institutions in various parts of the world according to a tight schedule.

### 2.2. Collection of lessons learned

The collection of lessons learned from previous projects plays an important role in management[19]. Moreover, since the IMO rarely conducted impact assessment prior to the introduction of regulations, lessons learned for continuous improvement of impact assessment procedures are important. The collection of such lessons is a tool used in various fields such as medicine, engineering, environment, energy, agriculture, and management.

The basic process for lessons learned is to define the project, collect data, verify the applicability, and store and distribute for revision of the process[20]. This study conducted a review of the IMO documentation and an expert workshop for the collection of lessons learned. The IMO MEPC documents contain comprehensive and historical information on GHG reduction measures, making it easier to com-



**Figure 2.** Procedure of comprehensive impact assessment for short-term measure (a) and suggestion about future procedure for mid- and long-term measures (b).

pare and analyze the lessons learned, and the expert workshop provides an opportunity to share views on these by field.

### 3. Results and discussion

#### 3.1. Effective sequence of tasks

In the comprehensive impact assessment of the short-term measure, both quantitative and qualitative tasks are carried out simultaneously. The effectiveness of qualitative tasks is relatively low because, the parallel progress of tasks is derived mainly from the former results, and those of each task cannot be reflected inter-connect. For example, stakeholder analysis is effective in disclosing the results of quantitative tasks to stakeholders and identifying the qualitative impact through brainstorming.

To compensate for this, a two-step procedure may be applied, in which a quantitative task is performed first followed by a qualitative task (see Figure 2).

The purpose of quantitative tasks, which is the first step, is conducting an impact assessment on fleet and states and identify missing data and the quantifiable portion of the impact of the measure in exceptional situations such as COVID-19 (Task 4-1) and disproportionately negative impacts (Task 5-1). The purpose of the qualitative tasks, the second step, is to conduct stakeholder analysis and identify qualitative impacts in exceptional situations (Task 4-2), and to identify any disproportionately negative qualitative impacts (Task 5-2). Finally, the Committee can decide whether to adopt measures based on the final report that reflects both quantitative and qualitative findings. In addition, since the literature review should basically be conducted in the initial impact assessment, excluding it from the comprehensive impact

assessment procedure in the future is effective.

#### 3.2. Sufficient period to conduct impact assessment

The SC for comprehensive impact assessment of short-term measures should have submitted the report to MEPC 76. However, the deadline for submitting the documents was less than three months after the first meeting was held for SC. Since the MEPC is held approximately every six months, even if the first meeting of the SC is held immediately after the previous MEPC meeting, the total assessment period cannot be six months considering the selection of task leaders and deadline for document submission. After the end of MEPC 75, it took three weeks to nominate member states for the SC[21-22], and there was a month's delay before the first meeting following the announcement of the SC presented in Table 1.

Therefore, the SC must secure at least six months of pure work time for the comprehensive impact assessment, including about three months each for quantitative and qualitative tasks. Furthermore, considering the time required for the establishment of the SC, selection of a task leader, and report to the working group/the committee, the final report may be submitted to the next session or one after that.

#### 3.3. Clear definition of terms

Initial Strategy and MEPC.1/Circ.885 use undefined terms such as "main markets," "transport dependency," "food security," "disaster response," and "disproportionately negative impacts." Since there is no clear definition of each term, each one must be evaluated subjectively. Specifically, the initial impact assessment should identify the impact of short-term measures on geographic remoteness of and connectivity to main markets, but it is not clear where the major markets for each car-

**Table 1. Timeline for Comprehensive Impact Assessment of IMO**

Title	Date	Note
MEPC 75	From 16 to 20 November 2020	
Invitation to nominate for SC	26 November 2020 (Deadline: 15 December 2020)	- Approximately 3 weeks
Establishment the SC	16 December 2020	
First meeting of the SC	18 January 2021	- Approximately 1 month - To approve a draft work plan and require a collaborative effort from all stakeholders
Second meeting of the SC	25 February 2021	- Consideration of tasks update
Third meeting of the SC	18 March 2021	- Consideration of tasks update
Fourth meeting of the SC	1 April 2021	- Consideration of tasks update
Fifth meeting of the SC	12 April 2021	- Conclusion on the tasks
Submission of the report	14 April 2021 (Deadline: 7 April 2021)	- Approximately 3 months - The report of comprehensive impact assessment should be submitted by 9-week deadline
MEPC 76	From 10 to 17 June 2020	

go are. Additionally, it is difficult to determine what factors to consider or calculate in relation to transport dependency. Rather, “geographic remoteness and connectivity to major markets” can be regarded as quantitative parameters. Above all, as one of the main purposes of impact assessment is to understand the impact on developing countries, the most important term is “disproportionately negative impact(s).” Unfortunately, the comprehensive impact assessment of short-term measures could not identify this due to the lack of definition and time constraints. Therefore, clarification of definition is an indispensable part of improvement in the impact assessment process of GHG measures. Moreover, impact criteria should be considered with quantitative parameters available.

#### 3.4. Adding a review process for the task results

A comprehensive impact assessment of short-term measures was conducted by organizing various tasks, but the task results were not unified. Specifically, the literature review of Task 1 confirmed that ship speed reduction reduced transportation costs and emissions, but the impact assessment on the fleet of Task 2 and the stakeholder analysis of Task 4 concluded that the short-term measure could increase transportation costs and overall emissions[10,23]. Even though the task results were concluded differently, the SC and task leaders could not explain the reason for the difference. The impact assessment should identify the point from which these differences arise, and what kind of impact they will have on the assessment of the impacts on states. This problem is the reason improvements such as 3.1 to 3.3 are necessary. The impact assessment procedure for future mid- and long-term measures requires a separate group to review the results to supplement this situation. The group may consist of experts from member states or of experts outside of the IMO and should review the logical errors and inconsistencies that the SC and task leaders have not yet identified and submit a final report after complementing the task results. However, all contents of the supplementary process must be submitted in writing, with evidence left behind.

## 4. Conclusion

In its strengthening of the regulations to protect the marine environment, the IMO is attempting to comprehensively consider the impact on the environment, ships, and countries in its GHG regulations. The impact assessment of GHG reduction measures is part of such efforts and has significance in determining whether to introduce regulations. Nevertheless, the short-term measure impact assessment procedure has some deficiencies due to exceptional situations such as COVID-19 and lack of experience. This study compared and analyzed the circular (MEPC.1/Circ.885) for the impact assessment procedure and the actual process for short-term measures. Future impact assessments for the adoption of mid- and long-term measures, from 2023, should complement the procedures in terms of sequence, time, definition for task performance, and review of results. In this way, the IMO will be able to conduct more uniform and efficient impact assessments, and member countries and industries should accept the objective results and introduce smooth regulations.

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