Section 57 of the Competition Act (Cap. 50B)

Grounds of Decision issued by the Competition and Consumer Commission of Singapore in relation to the Proposed Acquisition of Daewoo Shipbuilding & Marine Engineering Co., Ltd by Korea Shipbuilding & Marine Engineering Co., Ltd

Date: 25 August 2020

Case number: 400/140/2019/002

Confidential information in the original version of this Decision has been redacted from the published version on the public register. Redacted confidential information in the text of the published version of the Decision is denoted by [✂]

TABLE OF CONTENTS

I. THE NOTIFICATION AND EXECUTIVE SUMMARY

1. On 12 September 2019, the Competition and Consumer Commission of Singapore ("**CCCS**") received a notification for decision (the "**Application**") from Korea Shipbuilding & Offshore Engineering Co., Ltd. (the "**Applicant**" or "**KSOE**") pursuant to section 57 of the Competition Act (Cap. 50B) (the "**Act**"). The Application requested for a decision by CCCS as to whether the proposed acquisition by KSOE of a majority interest in Daewoo Shipbuilding & Marine Engineering Co., Ltd. ("**DSME**") (the "**Proposed Transaction**") would infringe the prohibition under section 54 of the Act.

2. The Applicant submitted that KSOE and DSME (collectively, the "**Parties**") overlap in the supply of commercial vessels[1].

3. The Phase 1 review of the Proposed Transaction was completed on 29 November 2019. At the end of the Phase 1 review, CCCS was unable to conclude that the Proposed Transaction would not raise competition concerns. On 23 January 2020, upon receipt of a complete Form M2 and other relevant documents from KSOE, CCCS proceeded with a Phase 2 review of the Proposed Transaction.

4. Over the course of the Phase 1 and Phase 2 reviews of the Proposed Transaction, CCCS contacted 36 suppliers of commercial vessels[2], 120 customers (who purchase commercial vessels)[3] and one terminal operator[4] (collectively referred to as "**third parties**"). In addition, CCCS sought information from [✂], as part of its review of the Proposed Transaction. In total, 51 third parties replied[5], of which 28 provided substantive responses[6]. Six (6) of these third parties indicated that they had competition concerns about the Proposed Transaction, of which three (3) are competing suppliers of commercial vessels[7], and three (3) are customers[8]. Of all the market players who responded, 45 indicated that they were neutral or have no competition concerns about the Proposed Transaction.[9]

[1] According to Paragraph 19.2 of the Form M1, commercial vessels generally refer to ships transporting cargo or passengers.
[2] Suppliers: [✂]
[3] Customers: [✂]
[4] [✂]
[5] [✂]
[6] [✂]
[7] [✂]
[8] [✂]
[9] [✂]

5. In assessing the Proposed Transaction, CCCS took into consideration the market feedback and other information and evidence obtained during the Phase 1 and Phase 2 reviews. Based on the information and evidence, CCCS assessed that the Proposed Transaction is unlikely to result in a substantial lessening of competition. In particular, CCCS finds that the Proposed Transaction is unlikely to result in a substantial lessening of competition in the supply of the four relevant vessel classes[10] in Singapore that the Parties mainly overlap in (Ultra Large/Very Large Crude Carriers ("**UL/VLCC**") 200,000+ DWT[11]; Post-Panamax[12] 15,000+ TEU[13], Liquified Petroleum Gas ("**LPG**") carriers 60,000+ cu.m. and Liquified Natural Gas ("**LNG**") carriers 40,000+ cu.m.).

6. While the market share figures indicate that the Parties are two of the main suppliers in two relevant vessel classes (LNG carriers 40,000+ cu.m. and UL/VLCC 200,000+ DWT), and market feedback generally indicates that the Parties are close competitors to each other in all four relevant vessel classes, the market feedback also indicates that there are viable alternative suppliers to the Parties in each of the four relevant vessel classes (notwithstanding that the market share figures suggest that these viable alternative suppliers are currently smaller competitors compared to the Parties). CCCS's quantitative assessment on the closeness of rivalry between shipbuilders supports the market feedback that there are viable alternative suppliers who are close competitors to the Parties in each of the four relevant vessel classes. Further, while the main concern based on market feedback is that the merged entity would raise prices unilaterally, CCCS's analysis of the Parties' historical bidding data does not indicate that the presence of one merger party has a systematic impact on the other's bid prices in a tender/request for quotation, and correspondingly does not support that the Proposed Transaction will result in the merged entity raising prices by removing a close competitor post-merger. This result is in line with the evidence that there are alternative viable suppliers who are close competitors to the Parties, and therefore can impose a competitive constraint on the merged entity following the Proposed Transaction.

7. CCCS therefore finds that the Proposed Transaction, if carried into effect, will not infringe section 54 of the Act.

[10] Vessel classes are sub-classifications of a vessel type based on size of cargo load.
[11] DWT refers to deadweight tonnage.
[12] Post-Panamax is the name given to the largest class of containerships.
[13] TEU refers to twenty-foot equivalent unit and is a standard unit of measurement for the capacity of containerships.

II. THE PARTIES

(a) The Acquirer

KSOE

Description of KSOE's activities worldwide and in Singapore

8. KSOE is a Korean company mainly active in shipbuilding, as well as in supplying industrial products for the electricity and construction sectors and robotic technologies.[14] Prior to 3 June 2019, KSOE was known as Hyundai Heavy Industries Co., Ltd. ("**HHICL**").[15]

9. KSOE, together with its affiliates Hyundai Samho Heavy Industries ("**Samho**") and Hyundai Mipo Dockyard ("**Mipo**"), produces a range of commercial vessels including oil tankers, containerships, LNG[16] carriers and LPG[17] carriers. KSOE (through its Hyundai Heavy Industries Engine & Machinery Division) also produces marine propulsion engines and marine power generation engines, and other vessel parts. Further, KSOE builds offshore facilities that are used to handle oil and gas resources under the sea.[18]

10. In addition, KSOE (through its affiliate Hyundai Electric) manufactures and provides a range of electric and energy solutions for power supply. KSOE (through its affiliate Hyundai Construction Equipment) also produces construction equipment such as excavators and wheel loaders, as well as industrial vehicles such as forklifts.[19]

11. KSOE operates in Singapore as a foreign company registered in Singapore, via an overseas branch office. The Singapore branch of KSOE operates as a sales office.[20]

12. Separately, Hyundai Global Service Singapore Pte. Ltd. operates as a sales office and supplier of technical services and ship parts in Singapore. This is the Singapore entity of Hyundai Global Service, an affiliate of KSOE within the

[14] Paragraph 10.6 of Form M1.
[15] Paragraph 7.1 of Form M1.
[16] "**LNG**" refers to liquefied natural gas.
[17] "**LPG**" refers to liquefied petroleum gas.
[18] Paragraphs 10.6 to 10.7 of Form M1.
[19] Paragraphs 10.7 to 10.8 of Form M1.
[20] Paragraph 10.10 of Form M1.

KSOE Group[21] that operates a ship repair and modification business. Further, Hyundai Oil Singapore Pte. Ltd. operates as the sales and trading office in Singapore of Hyundai Oilbank, an affiliate of KSOE within the KSOE Group that operates an oil and oil-based products sales and trading business.[22]

Description of ownership structure of KSOE

13. The shareholding in KSOE, as of 30 June 2019, is set out in the table below:[23]

<table>
<tr><th colspan="3">Name of Shareholders</th><th rowspan="2">Number of shares owned</th><th rowspan="2">Shareholding ratio</th></tr>
<tr><th colspan="2">Classification</th><th>Name</th></tr>
<tr><td rowspan="5">[✂][24]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td rowspan="3">[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">Total</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td rowspan="5">[✂]</td><td rowspan="2">[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">Total</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="3">Total</td><td>[✂]</td><td>[✂]</td></tr>
</table>

[21] "**KSOE Group**" is defined as "the group of undertakings under the common control with KSOE, and whose ultimate parent company is Hyundai Heavy Industries Holdings Co., Ltd." in definition (y) of the Form M1.
[22] Paragraphs 10.11 to 10.12 of Form M1.
[23] Paragraph 2.1 of KSOE's responses dated 12 September 2019, to Question 2 of CCCS's RFI dated 5 September 2019; Paragraphs 7.1 to 7.2 and 8.2 of Form M1.
[24] Under Korea Fair Trade Law, a "**Business Group**" means a group of corporations whose businesses are in fact controlled by a person or entity ("**Controlling Person**"), and where two or more companies belong to the single business group, each company is an "**Affiliate**" of the others. The term "**Specially-Related Party**" means (i) a person or entity who in fact controls the concerned company or (ii) a Related Party − a company whose operation is in control of the Controlling Person per se (e.g. Affiliates), or a close relative etc. Paragraph 7.1, Footnote 1 of Form M1.

14. As indicated in the table above, [✂] of the shareholding in KSOE is held by parties [✂], as defined under Korea Fair Trade Law. Of this, [✂][25]. KSOE has submitted that [✂] within the meaning of Korean corporate law.[26] The remaining [✂] of the shareholding in KSOE is held by parties [✂].[27]

15. KSOE has submitted that Hyundai Heavy Industries Holdings Co., Ltd. ("**HHIH**") has sole control over KSOE by operation of the Korea Fair Trade Law. As of 30 June 2019, HHIH holds the highest number of shares in KSOE [✂]. According to KSOE, pursuant to the Korea Fair Trade Law, the largest shareholder with 30% ownership or more is deemed to have de facto (management) control over the relevant entities, and such entities are deemed to be affiliates of the largest shareholder.[28]

KSOE's turnover

16. The total (group) worldwide consolidated turnover for the KSOE Group in the financial year ended 31 December 2018 is approximately [✂].[29] KSOE Group's worldwide turnover from the supply of commercial vessels is approximately [✂], which is [✂] of its worldwide consolidated turnover.[30]

17. The total (group) Singapore consolidated turnover for the KSOE Group in the financial year ended 31 December 2018 is approximately [✂].[31] KSOE's Singapore-wide turnover from the supply of commercial vessels is approximately [✂][32], which is [✂] of its Singapore-wide consolidated turnover.[33]

(b) The Target

<u>DSME</u>

Description of DSME's activities worldwide and in Singapore

[25] [✂] Paragraph 7.1 of Form M1.
[26] Paragraph 7.1 of Form M1.
[27] Paragraph 7.1 of Form M1.
[28] Paragraph 7.2 of Form M1.
[29] Paragraph 13.1 of Form M1.
[30] Paragraph 16.1 of Form M1.
[31] Paragraph 3.1 of KSOE's responses dated 12 September 2019, to Question 3(a) of CCCS's RFI dated 5 September 2019.
[32] Paragraph 3.2 of KSOE's responses dated 12 September 2019, to Question 3(b) of CCCS's RFI dated 5 September 2019.
[33] Paragraph 3.3 of KSOE's responses dated 12 September 2019, to Question 3(c) of CCCS's RFI dated 5 September 2019.

18. DSME is a Korean company mainly active in shipbuilding. DSME produces a range of commercial vessels (such as oil tankers, containerships, LNG carriers and LPG carriers), offshore facilities and naval vessels in South Korea.[34] Unlike KSOE, it is not active in the production of marine engines, or any other areas as described above for KSOE.[35]

19. DSME operates in Singapore as a foreign company registered in Singapore, via an overseas branch office.[36] DSME's Singapore office mainly focuses on marketing activities supporting DSME's businesses.[37]

Description of ownership structure of DSME

20. The shareholding in DSME, as of 30 June 2019, is set out in the table below:

<table>
<tr><th colspan="3">Name of Shareholders</th><th rowspan="2">Number of shares owned</th><th rowspan="2">Shareholding ratio</th></tr>
<tr><th colspan="2">Classification</th><th>Name</th></tr>
<tr><td rowspan="3">[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td>[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">Total</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td rowspan="4">[✂]</td><td rowspan="2">[✂]</td><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td>[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">[✂]</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="2">Total</td><td>[✂]</td><td>[✂]</td></tr>
<tr><td colspan="3">Total</td><td>[✂]</td><td>[✂]</td></tr>
</table>

21. As indicated in the table above, Korea Development Bank ("**KDB**") is the ultimate parent company of DSME, with a [✂]. Parties [✂] hold a combined [✂] of the shares in DSME.[38]

[34] Paragraph 10.14 of Form M1.
[35] Paragraph 10.9 of Form M1.
[36] Paragraph 10.13 of Form M1.
[37] Paragraph 10.14 of Form M1.
[38] Paragraph 7.3 of Form M1.

DSME's turnover

22. The total (group) worldwide consolidated turnover for the DSME Group in the financial year ended 31 December 2018 is approximately KRW 9.64 trillion (approximately S$11 billion).[39] DSME Group's worldwide turnover from the supply of commercial vessels is approximately [✂], which is [✂] of its worldwide consolidated turnover.[40]

23. The total (group) Singapore consolidated turnover for the DSME Group in the financial year ended 31 December 2018 is approximately [✂].[41] This turnover comes entirely [✂].[42]

III. THE PROPOSED TRANSACTION

24. The Proposed Transaction consists of the following key steps:[43]

    (a) On 3 June 2019, HHICL's entire market-facing business, (including its shipbuilding, offshore facilities and marine engine businesses), was spun-off from HHICL and newly established as a wholly-owned subsidiary of HHICL.
    (b) As a result of the spin-off, HHICL was converted into an intermediate holding company, KSOE, with control over the current shipbuilding business of HHICL along with its existing affiliates Samho and Mipo.
    (c) KDB will contribute the entirety of its majority ownership [✂] in DSME to KSOE – thereby combining the HHICL business, Samho, Mipo and DSME under the common ownership of KSOE – in return for a minority non-controlling stake in KSOE.
    (d) KSOE will then raise capital from HHIH, other shareholders and the public, and invest in additional shares in DSME by participating as a third party in DSME's private placement, with the purpose of improving DSME's financial structure.

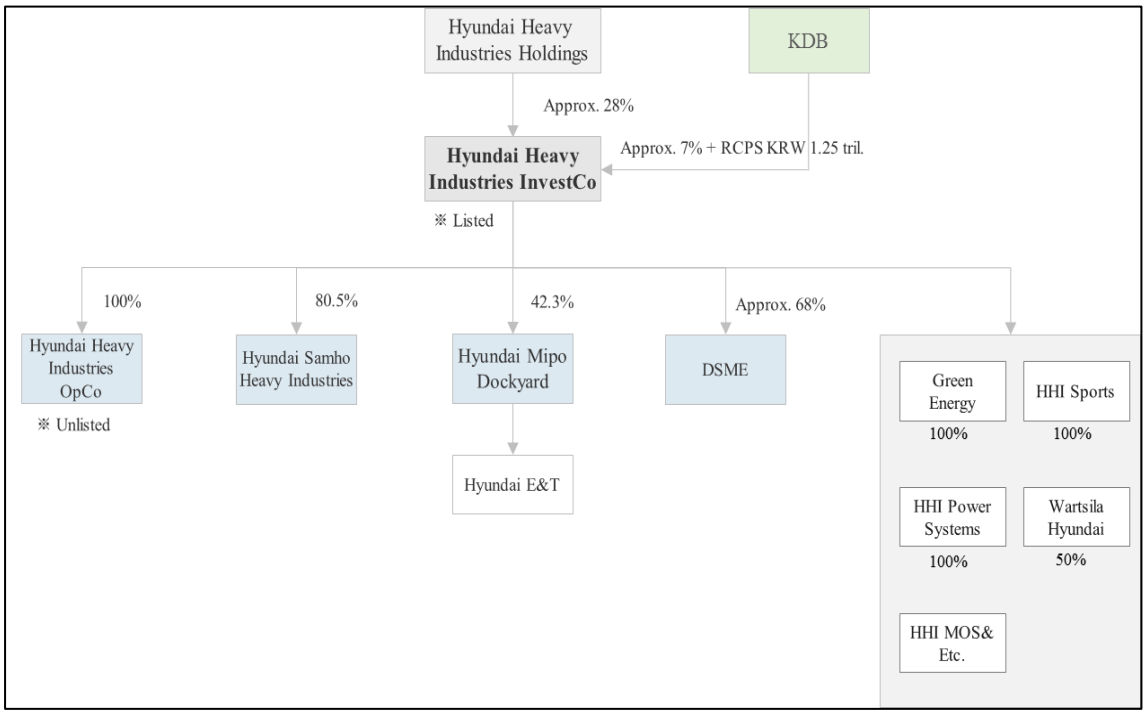
[39] Paragraph 13.2 of Form M1.
[40] Paragraph 16.1 of Form M1.
[41] Paragraph 4.1 of KSOE's responses dated 12 September 2019, to Question 4 of CCCS's RFI dated 5 September 2019.
[42] Paragraph 4.2 of KSOE's responses dated 12 September 2019, to Question 4 of CCCS's RFI dated 5 September 2019.
[43] Paragraphs 8.5.1 to 8.5.4 of Form M1.

25. As a result of the Proposed Transaction, HHIH will own approximately 28.0% of common shares of KSOE, which in turn will become the largest shareholder in DSME with approximately 68.4% of shares. KSOE will solely control DSME.[44]

26. KDB will hold approximately 6.9% of non-controlling common shares and 9.4% of non-voting redeemable convertible preferred shares in KSOE. KDB will hold no shares directly in DSME.[45]

27. The Parties aim to complete the Proposed Transaction by [✂], via the series of steps detailed in paragraphs 24(a) to 24(d).[46] In this regard, HHICL and KDB have concluded an In-Kind Contribution and Investment Agreement, while HHIH and KDB have concluded a Shareholders Agreement on 8 March 2019.[47]

28. The ownership structure of the merged entity following the completion of the Proposed Transaction is set out in the diagram below. KSOE indicated that the entity labelled as "Hyundai Heavy Industries InvestCo" in the diagram below refers to KSOE.[48]



[44] Paragraph 8.6 of Form M1.
[45] Paragraph 8.6 of Form M1.
[46] The long stop date set out in the In-Kind Contribution and Investment Agreement is [✂] (under Article 13(d)), but this date has been extended to [✂].
[47] Paragraph 11.7 of Form M1.
[48] Paragraph 8.7 of Form M1.

29. According to KSOE, the estimated total value of the Proposed Transaction is approximately KRW 2.09 trillion (approximately S$2.39 billion).[49]

30. KSOE submitted that the economic and strategic rationale of the Proposed Transaction is to create a stronger business with a more efficient cost structure that is able to compete effectively in the global shipbuilding market, taking into account the market's long-term recession and overcapacity, aggressive competition from new entrants, and increased production costs due to, among other things, stricter environmental rules and higher minimum wages.[50]

31. KSOE also submitted that the Proposed Transaction aims to address the financial difficulties faced by the Korean shipbuilding industry as a result of the crisis and to [✂], thus re-enforcing effective competition on the global markets.[51]

32. KSOE further submitted that the Proposed Transaction will ensure that the Parties are able to deliver greater benefits to customers in the shape of improved product quality at a lower overall cost, while at the same time returning a publicly owned global shipbuilder to private ownership.[52]

Merger under section 54 of the Act

33. Section 54(2)(b) of the Act states that a merger occurs if one or more persons or undertakings acquire direct or indirect control of the whole or part of one or more undertakings.

34. Following the completion of the Proposed Transaction, CCCS notes that KSOE will own a total of 68.4% of DSME,[53] thereby becoming the majority shareholder of DSME. Furthermore, CCCS notes that KSOE has submitted that the current shipbuilding business of KSOE, Samho, Mipo and DSME will be combined under the common ownership of KSOE.[54] In view of the foregoing, CCCS is of the view that the Proposed Transaction constitutes a merger under section 54(2)(b) of the Act with the acquisition of direct control over DSME by KSOE.

[49] Paragraph 11.6 of Form M1.
[50] Paragraph 12.1 of Form M1.
[51] Paragraph 12.2 of Form M1.
[52] Paragraph 12.3 of Form M1.
[53] Paragraph 8.6 of Form M1.
[54] Paragraph 8.5.3 of Form M1.

IV. COMPETITION ISSUES

35. KSOE submitted that it overlaps with DSME in Singapore for the supply of commercial vessels, specifically the following vessel types:[55]
    (a) Oil Tankers;
    (b) Containerships;
    (c) LNG carriers; and
    (d) LPG carriers.

36. While KSOE and DSME are potential competitors in the supply of offshore facilities and military naval vessels for customers in Singapore, KSOE submitted that there is no actual overlap between the Parties in Singapore.[56] In respect of naval vessels, [✂].[57] Similarly, for offshore facilities, [✂].[58] [✂].[59]

37. While KSOE is active in the supply of inputs for the construction of commercial vessels, CCCS notes that there is no actual overlap between KSOE and DSME in the supply of upstream inputs for commercial vessels, and neither are important suppliers of these inputs. In respect of ship blocks[60], KSOE [✂][61] while DSME only supplies [✂] of its ship blocks to external customers. For all the other major inputs for commercial vessels that KSOE supplies externally, its global market shares for each of these inputs falls below [10-20]% for the period from 2014 to 2018. [✂].[62] CCCS also notes that other shipbuilders have viable alternative suppliers for inputs, including supplying some of these internally.

38. In evaluating the potential impact of the Proposed Transaction, CCCS therefore considered whether the Proposed Transaction will lead to non-coordinated, coordinated and vertical effects that would substantially lessen competition in relation to the *supply of commercial vessels*.

39. In its assessment of the Proposed Transaction during the Phase 2 review, CCCS considered the submissions made by KSOE in response to the competition

[55] Paragraph 15.1 of Form M1; Paragraph 1.1 of KSOE's responses dated 1 October 2019, to Question 1 of CCCS's RFI dated 16 September 2019.
[56] Paragraph 17.2 of Form M1.
[57] Paragraph 17.2 of Form M1.
[58] Paragraph 17.3 of Form M1.
[59] Paragraph 17.3 of Form M1.
[60] KSOE submitted that ship blocks are essentially large blocks manufactured by processing and assembling steel plates for the purpose of assembling a ship.
[61] Paragraph 36.1 of Form M1; Paragraph 36.3.2 of Form M1.
[62] Paragraph 36.6 of Form M1; Paragraphs 10.2.1 to 10.2.3 of KSOE's responses dated 1 October 2019, to Question 10 of CCCS's RFI dated 16 September 2019.

concerns raised at the conclusion of the Phase 1 review. In particular, CCCS focused on KSOE's further submissions made in relation to the issues of whether the Parties' competitors have sufficient capacity to cater to demand for each of the four relevant vessel classes, the closeness of rivalry between KSOE and DSME, and whether the Proposed Transaction will likely lead to unilateral price increases based on the Parties' historical bidding data.

V. COUNTERFACTUAL

40. Paragraph 4.14 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016* states that CCCS will, in assessing mergers and applying the substantial lessening of competition ("**SLC**") test, evaluate the prospects for competition in the future with and without the merger. The competitive situation without the merger is referred to as the "counterfactual". The SLC test will be applied prospectively, that is, future competition will be assessed with and without the merger.

41. In most cases, the best guide to the appropriate counterfactual will be the prevailing conditions of competition, as this may provide a reliable indicator of future competition without the merger. However, CCCS may need to take into account likely and imminent changes in the structure of competition in order to reflect as accurately as possible the nature of rivalry without the merger.[63] For example, where one of the merging parties is genuinely failing, pre-merger conditions of competition might not prevail even if the merger were prohibited as the failing party may exit the market in the event that the merger does not occur. In such cases, the counterfactual might need to be adjusted to reflect the likely failure of the one of the merging parties, and the resulting loss of rivalry.[64] This is generally known as the failing firm defence.

42. To qualify for the failing firm defence, the following conditions must be met:

    (a) The firm must be in such a dire situation that, without the merger, the firm and its asset would exit the market in the near future;
    (b) The firm must be unable to meet its financial obligations in the near future and there must be no serious prospect of re-organising the business; and
    (c) There should be no less anti-competitive alternative to the merger.[65]

[63] Paragraph 4.16 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*
[64] Paragraph 4.16 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[65] Paragraph 4.17 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*

43. The party seeking to rely on the failing firm defence must provide evidence to satisfy CCCS that the conditions have been met.

KSOE's submissions

44. KSOE submitted that the status-quo counterfactual scenario, in which KSOE and DSME both continue operating independently, may not be appropriate, [✂].[66] While KSOE submitted that it is not raising the failing firm defence[67], it submitted that an adjusted counterfactual [✂] may be more appropriate.[68]

45. KSOE's submission is premised upon [✂][69] the possible counterfactual scenarios to the Proposed Transaction. [✂].[70]

46. [✂].[71] [✂]. [✂].[72] [✂].[73] [✂]. [✂].[74] [✂].[75][✂].[76]

47. [✂].[77] [✂].[78] [✂].[79] [✂][80].[81] [✂].[82] [✂].[83]

[66] Paragraph 3 of A&G's letter to CCCS dated 28 February 2020; Paragraph 1.4 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020; Paragraph 3 of KSOE's responses dated 1 April 2020, to Question 1 of CCCS's RFI dated 31 March 2020.
[67] Paragraph 22.1 of KSOE's responses dated 12 March 2020, to Question 22 of CCCS's RFI dated 12 February 2020; Paragraph 1.3 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020; Paragraphs 1 and 2 of KSOE's responses dated 1 April 2020, to Question 1 of CCCS's RFI dated 31 March 2020.
[68] Paragraph 1.4 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020; Paragraph 5 of KSOE's responses dated 1 April 2020, to CCCS's RFI dated 31 March 2020; Paragraphs 2.4 and 3.2 of KDB's responses dated 21 April 2020, to Questions 2 and 3 of CCCS's RFI dated 2 April 2020.
[69] [✂].
[70] [✂]; Paragraph 2.4 KDB's responses dated 21 April 2020, to Question 2 of CCCS's RFI dated 2 April 2020.
[71] [✂]; Paragraph 17.1 of KDB's responses dated 21 April 2020, to Question 17 of CCCS's RFI dated 2 April 2020.
[72] [✂]; Paragraph 17.3 of KDB's responses dated 21 April 2020, to Question 17 of CCCS's RFI dated 2 April 2020.
[73] Paragraph 17.4 of KDB's responses dated 21 April 2020, to Question 17 of CCCS's RFI dated 2 April 2020.
[74] [✂]; Paragraphs 5.2 to 5.3 of KDB's responses dated 21 April 2020, to Question 5 of CCCS's RFI dated 2 April 2020.
[75] Paragraphs 16.1 and 17.4 of KDB's responses dated 21 April 2020, to Questions 16 and 17 of CCCS's RFI dated 2 April 2020.
[76] [✂]; Paragraphs 17.4 to 17.6, 18.1 to 18.3, and 19.1 to 19.5 of KDB's responses dated 21 April 2020, to Questions 17 to 19 of CCCS's RFI dated 2 April 2020.
[77] [✂].
[78] [✂].
[79] [✂].
[80] Paragraph 3.4 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[81] [✂].
[82] Paragraphs 15.7 to 15.11 of KDB's responses dated 21 April 2020, to Question 15 of CCCS's RFI dated 2 April 2020.
[83] [✂]; Paragraphs 4.6, and 15.7 to 15.11 of KDB's responses dated 21 April 2020, to Questions 4 and 15 of CCCS's RFI dated 2 April 2020.

48. KSOE separately submitted that [✂] may be exacerbated by the Covid-19 outbreak, which will likely worsen the current poor performance of the shipbuilding industry participants.[84] KSOE submitted that shipbuilding orders reached extreme low levels in the first quarter of 2020, coinciding with the start of the Covid-19 outbreak.[85] Such adverse events are of particular consequence to industry participants [✂].[86]

49. KSOE also submitted that labour costs in Korea have been steadily increasing. Given the labour-intensive nature of the shipbuilding industry, this would increase the overall shipbuilding cost in Korea, and challenge both the competitiveness of Korean shipbuilders and the profitability of shipbuilding contracts undertaken by Korean shipbuilders.[87] Additionally, steel prices have also been increasing, which would strongly impact overall shipbuilding cost.[88] Whilst these increases in costs are not unique [✂], the impact will be of [✂] consequence [✂].[89]

CCCS's assessment of the appropriate counterfactual

50. CCCS notes that KSOE does not seek to rely on the failing firm defence. In any event, the conditions for the failing firm defence are not met, as no evidence has been provided that DSME and its assets would exit the market in the near future. On the contrary, KDB submitted that even if the Proposed Transaction does not proceed, DSME is not expected to immediately suspend its business or exit the market.[90] [✂].[91] [✂].[92] [✂].[93] [✂].[94] [✂].[95]

51. CCCS notes that instead of a failing firm defence, KSOE has essentially submitted [✂].[96] As set out in paragraph 4.16 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*, CCCS may take into account likely and imminent changes in the structure of competition in order to reflect as accurately as possible

[84] Paragraph 1.8 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020.
[85] Paragraphs 1.9 to 1.10 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020.
[86] Paragraph 1.11 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020.
[87] Paragraphs 1.12 to 1.13 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020.
[88] Paragraph 1.14 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020.
[89] Paragraphs 1.15 to 1.16 of KSOE's responses dated 26 March 2020, to Question 1 of CCCS's RFI dated 16 March 2020.
[90] Paragraph 3.3 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[91] Paragraph 3.3 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[92] Paragraph 3.3 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[93] Paragraph 3.3 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[94] Paragraph 3.3 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[95] Paragraph 3.3 of KDB's responses dated 21 April 2020, to Question 3 of CCCS's RFI dated 2 April 2020.
[96] [✂].

the nature of rivalry without the merger. As part of its assessment, CCCS also considered the decisional practice of the European Commission ("**EC**") in relation to [✂] as submitted by merging parties. In this regard, the EC has, in its merger decisions[97], assessed the likelihood of an alternative counterfactual scenario even where the conditions for the failing firm defence were not met.

52. CCCS is of the view that where a merging party argues that its [✂] should be taken into account in the assessment of a merger, but where these [✂] do not meet the conditions for the failing firm defence, an assessment should be made of whether the [✂] will lead to a deterioration of competition in the relevant market(s) even in the absence of the merger, and whether this deterioration of competition is a likely and imminent change to the relevant market(s). In this regard, evidence must demonstrate such likely and imminent deterioration of competition in the relevant market(s).[98]

53. In [✂][99], the EC found that a merger party's financial situation leaves unaffected its ability to compete effectively. In this case, the EC received a notification of a transaction [✂]. [✂] argued that [✂] its future competitive position should be taken into account in the assessment of the notified transaction, even though these [✂] did not meet the conditions for failing firm defence. The EC noted that even where the criteria for the failing firm defence are not met, the development of competitive conditions could lead to the conclusion that the deterioration of competition in the market is not a consequence of the merger. In such situations, the EC can undertake a general causation test to assess the material cause of the deterioration of the competitive structure following the transaction. The EC will assess how the deterioration of the competition absent the merger would compare to long-term structural effects of the merger on the market. The EC stressed that there is no presumption of a causal link between [✂] and the competitive pressure that it can exert on the market. [✂] will not necessarily call into question the company's ability to compete effectively in the market, particularly where the company has [✂].[100] As per paragraph 9 of the *EC Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings*[101], the EC can take into account future changes to the market that can reasonably be predicted. [✂].

[97] [✂], as elaborated upon further in paragraphs 53 and 54.
[98] [✂]
[99] [✂].
[100] [✂].
[101] OJ C 31, 5.2.2004, p. 5 – 18.

54. Conversely, in [✂][102], the EC received a notification of a transaction [✂]. In this case, the EC considered market feedback, internal documents setting out [✂] strategy, recent trends within [✂] market identifying risks threatening [✂]. Based on these factors, the EC concluded that [✂] cannot be considered an important competitive force in light of (i) its limited market share, (ii) its competitive behaviour and performance, (iii) its [✂] and (iv) the fact that [✂] competitive strength will likely deteriorate even though it will continue operating on the same basis in the absence of the notified transaction. As the notified transaction does not give rise to an impediment of effective competition even if [✂] continues operating on the same basis, the EC did not need to conclude on whether [✂] will actually continue operating. The EC cleared the notified transaction.

55. Applying the above principles, CCCS considered whether there was evidence that [✂], in the absence of the Proposed Transaction. CCCS notes that KDB submitted that [✂].[103] [✂]. These conditions are expected to [✂] due to the market recession caused by the Covid-19 outbreak.[104]

56. However, CCCS notes that there is no definitive plan [✂].[105] Despite requests for supporting evidence (including internal documents) to substantiate the precise manner and timeframe by which [✂], no such supporting documents were identified or provided. CCCS also notes that KSOE has submitted that active shipyards are unlikely to [✂] over time[106], or to [✂] shipyard facilities as these facilities [✂].[107] This casts some doubt over whether [✂].

57. Notwithstanding the lack of evidence to support that [✂], CCCS considered other factors to assess whether it is likely and imminent that [✂] in the absence of the Proposed Transaction. In this regard, CCCS notes that [✂]. [✂].[108] [✂].[109] [✂].[110] [✂], CCCS finds it unlikely that [✂].

[102] [✂].
[103] Paragraph 5.1 of KDB's responses dated 21 April 2020, to Question 5 of CCCS's RFI dated 2 April 2020.
[104] Paragraph 5.2 of KDB's responses dated 21 April 2020, to Question 5 of CCCS's RFI dated 2 April 2020.
[105] Paragraph 5.3 of KDB's responses dated 21 April 2020, to Question 5 of CCCS's RFI dated 2 April 2020; Paragraphs 1.1 and 2.1 of KDB's responses dated 14 May 2020, to Questions 1 and 2 of CCCS's RFI dated 24 April 2020.
[106] Paragraphs 11.1 to 11.5 of KSOE's responses dated 12 March 2020, to Question 11 of CCCS's RFI dated 5 March 2020.
[107] Paragraph 3.7 of KSOE's responses dated 24 April 2020, to Question 3 of CCCS's RFI dated 20 April 2020.
[108] [✂].
[109] [✂]; Paragraph 14.5 of KDB's responses dated 21 April 2020, to Question 14 of CCCS's RFI dated 2 April 2020.
[110] Paragraphs 14.2 to 14.6 of KDB's responses dated 21 April 2020, to Question 14 of CCCS's RFI dated 2 April 2020.

58. In view of the foregoing, CCCS considers it more likely that DSME would continue to bid for future shipbuilding projects across all vessel types and classes, [✂], in the event that the Proposed Transaction does not proceed. Hence, CCCS considers that the status-quo counterfactual scenario is more likely than an alternative counterfactual [✂]. CCCS has therefore proceeded to assess the competitive effect of the Proposed Transaction on the basis of the status-quo counterfactual.

59. However, while CCCS has relied on the status quo counterfactual in the general merger analysis, CCCS has also considered possible imminent changes in market conditions where appropriate. For example, as explained in paragraph 194 below, CCCS considered the forecasted impact of the Covid-19 outbreak on demand for commercial vessels in addition to pre-outbreak demand forecasts in assessing the extent of excess capacities in the industry.

VI. RELEVANT MARKETS

(a) Product Market

KSOE's submissions

60. KSOE submitted that commercial vessels refer to ships transporting cargo or passengers, and they are classified into "vessel types" based on the type of transported item.[111] Within the relevant vessel types, vessels are sub-classified into "vessel classes" based on the size of cargo load. KSOE further submitted that there are good arguments for a single product market for all commercial vessels as supply substitutability between ship types is very high.[112] According to KSOE, if the market were to be further segmented, it should be segmented by vessel type, as both demand-side and supply-side substitutability are high between vessel classes within the same vessel type.[113]

KSOE's submission on segmentation by vessel types

61. KSOE submitted that the Parties overlap in the supply of commercial vessels (such as oil tankers, containerships, LNG carriers and LPG carriers).[114] KSOE submitted

[111] Paragraph 19.2 of Form M1. For example, oil tankers transport liquid cargo such as petroleum, containerships transports containers that contain packed goods or parcels, LNG carriers transport liquefied natural gas, and LPG carriers transport liquefied petroleum gas.
[112] Paragraph 19.2 of Form M1.
[113] Paragraph 19.2 of Form M1.
[114] Paragraphs 15.1 and 19.3 of Form M1.

that while other means of transportation exist, such as air freight, train and trucking, these alternative modes of transportation are differentiated from commercial vessel transportation (in respect of their ability to carry certain types of cargo, etc).[115] Therefore, from a demand-side perspective, there are no close product substitutes to commercial vessels, which are highly specific in terms of use from a customer's point of view, i.e. ships used for transporting cargo or passengers.[116] Between various types of vessels, demand-side substitutability might be limited to specific categories of cargo.[117] KSOE submitted that there is a demand-side distinction for different vessel types based on their intended use, which is a feature of the type of cargo being transported.[118]

62. KSOE submitted that, however, supply-side substitutability between the different vessel types is very high in the commercial vessel market.[119] First, shipbuilders maintain the mixed-model production system and receive orders to build various vessels without distinguishing vessel types and classes.[120] The production facilities and manpower required to build a ship are not exclusive to a certain vessel type.[121] In terms of production facilities, a single shipyard can produce all vessel types as the main body of all vessels (e.g. the hull and general structure of a vessel) is common to all vessels regardless of what type of cargo they are carrying.[122] Further, the major materials and equipment required[123] for a vessel are also common and essential among all vessels regardless of type or size.[124] In terms of manpower, the skills required[125] are commonly used in other manufacturing industries and are applicable and broadly used for the production of all kinds of vessels.[126] Therefore, switching production between vessel types hardly involves additional special labour or facilities.[127]

[115] Paragraph 19.7 of Form M1.
[116] Paragraph 19.7 of Form M1.
[117] Paragraph 19.7 of Form M1.
[118] Paragraph 19.7 of Form M1.
[119] Paragraph 19.11 of Form M1.
[120] Paragraph 19.11.2 of Form M1; Paragraph 5.1 of Form M2.
[121] Paragraph 19.11.1 of Form M1.
[122] Paragraph 19.11.1 of Form M1; Paragraph 5.4 of Form M2.
[123] Examples of major materials and equipment required for a vessel include steel plates, engines, accommodation, etc.
[124] KSOE submitted that even though there may be certain types of vessel which require specific equipment (e.g. LNG carriers require a cargo containment system), from a shipyard production perspective, the shipyard is only responsible for the installation of such equipment (which is procured from suppliers who designed and manufactured the equipment); Paragraph 5.14 of Form M2.
[125] Examples of the required skills are welding, bolting, wiring, painting, etc.
[126] Paragraph 5.13 of Form M2.
[127] Paragraph 5.14 of Form M2.

63. Second, KSOE submitted that even if shipyards are focused on building a certain vessel type, they can switch to building another vessel type easily.[128] While some small shipyards may specialise in building a certain type of vessel, this is likely based on a commercial decision rather than a limitation of their shipyards and they would switch to the production of other vessel types if they were incentivised to do so.[129] Further, once a shipbuilder possesses the technology and necessary know-how to build a specific type of vessel, and provided that there are no physical limitations at its shipyards in relation to the building of vessel of certain sizes, shipbuilders can easily adjust their production to other types of vessels according to market needs.[130] Once they have decided to invest into a new vessel type, there are only minor costs involved in switching production to a vessel type that they have not provided before.[131] These costs are not material enough to constitute a barrier to switching.[132] Any particular difficulties associated with the construction of vessels depend on the vessel type, and are largely due to the characteristics of the transported cargo.[133] Various types of vessels can thus be built at the same time in the same dry dock without significantly affecting one another's productivity.[134] Most shipyards actually build various types of vessels in the same production line.[135] Further evidence of supply-side substitutability between vessel types can be identified by the fact that the same docks can be used to build various vessel types at the same time.[136] Moreover, the evolution of the portfolio of the Parties' shipyards since 2004 shows that the Parties have built a variety of vessel types in the same shipyard, in the same year.[137] In most years, both KSOE and DSME built at least three or more vessel types in the same year.[138] KSOE also submitted that the evidence of entry of existing shipbuilders into markets for new vessel types supports the ease of switching to build another vessel type.[139]

64. With reference to specific vessel types, KSOE submitted that tankers and containerships are one of the simplest kinds of commodity vessels to build, which

[128] Paragraph 19.11.2 of Form M1; Paragraph 5.3 of Form M2.
[129] Paragraph 5.8 of Form M2.
[130] Paragraph 19.11.2 of Form M1; Paragraphs 3.25 and 5.3 of Form M2.
[131] Paragraph 19.11.2 of Form M1; Paragraph 5.3 of Form M2.
[132] Paragraph 19.11.2 of Form M1; Paragraph 5.3 of Form M2.
[133] Paragraph 19.11.2 of Form M1; Paragraph 5.3 of Form M2.
[134] Paragraph 19.11.2 of Form M1; Paragraph 5.3 of Form M2.
[135] Paragraph 19.11.2 of Form M1; Paragraph 5.3 of Form M2.
[136] Paragraph 19.21 of Form M1; Paragraph 5.6 of Form M2.
[137] Paragraph 19.22 of Form M1; Paragraph 5.7 of Form M2.
[138] Paragraph 19.22 of Form M1; Paragraph 5.7 of Form M2.
[139] Paragraph 19.19 of Form M1; Paragraph 5.5 of Form M2.

require no particular know-how or technology to build.[140] Therefore, shipbuilders can easily switch to produce these vessels. KSOE further submitted that while the construction of LNG carriers are relatively more complex in comparison to other vessel types, it does not indicate that there are significant hurdles to switching production from other vessel types to construct LNG carriers.[141] According to KSOE, the know-how required to build LNG carriers is not difficult to acquire; a skilled workforce[142], equipment or facilities implementing membrane tank technology can be easily obtained on the market.[143] Further, experienced welders are also available from other industries (e.g. construction)[144] and experienced workers can also be dispatched from one shipyard to another within shipbuilder groups.[145] In addition, while shipbuilders need to acquire a technological licence for the construction of LNG cargo containment tanks, the licence is not difficult to obtain.[146] Moreover, while there are two different types of LNG cargo containment tanks[147], it is not technically difficult for shipyards to switch construction from Moss-type[148] to membrane-type LNG carriers or vice versa.[149]

65. KSOE also submitted that within the LNG carrier segment, there are also LNG carriers with regasification equipment added.[150] These are known as the floating storage regasification unit ("**FSRUs**") which are typically moored offshore for a

[140] Paragraph 11.6 of Form M2; Paragraphs 2.1.2 and 2.2.2 of KSOE's Supplementary Submissions dated 13 November 2019.
[141] Paragraph 11.9 of Form M2.
[142] While skilled welders are needed but any training of welders takes not more than two to three months (for unskilled welders); Paragraph 11.60 of Form M2.
[143] Paragraph 11.9 of Form M2.
[144] Paragraph 11.61 of Form M2; Welders would only need to follow a work plan or manual of a shipbuilder in order to successfully weld LNG tank pieces or other parts of the LNG carriers.
[145] Paragraph 11.62 of Form M2.
[146] KSOE submitted that this is evident by the fact that some shipyards with GTT licence have little experience in the construction of LNG carriers; Paragraph 5.7 of KSOE's Second Supplementary Submissions dated 2 June 2020; Paragraph 3.45 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[147] For Moss-type technologies, the technology supplier is Moss Maritime Norway; For membrane-type technologies, the technology supplier is GTT; Paragraph 3.45 of KSOE's Second Supplementary Submissions dated 2 June 2020; GTT refers to Gaztransport & Technigaz, retrieved from https://www.gtt.fr on 25 June 2020.
[148] Moss-type LNG carriers refer to LNG carriers that uses a self-supporting cargo tank (compared to a non-self-supporting tank, which is known as a membrane tank). Self-supporting tanks were developed by a Norwegian company called Moss Maritime, and these tanks have their own structure and can carry the weight of the tank's contents alone; Paragraph 8.11 of Form M2.
[149] KSOE submitted that it had only been building Moss-type LNG carriers until it won its first membrane-type LNG carrier order in 2001. In 2013, KSOE obtained orders for Moss-type LNG carriers again, which were constructed successfully given the considerable time that had lapsed after its last Moss-type order. This demonstrates that shipyards are able to switch production from one containment system type to another at any time, as they simply apply the source technology as required by GTT and/or Moss Maritime; Paragraphs 3.45 to 3.46 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[150] Paragraph 15.2 of KSOE's responses dated 12 March 2020, to Question 15 of CCCS's RFI dated 5 March 2020.

certain period of time to store LNG in their cargo tanks.[151] In this regard, KSOE submitted that FSRUs belong to the same product market as other LNG carriers.[152] KSOE submitted that on the demand-side, the customers of FSRUs and LNG carriers are the same.[153] On the supply-side, any shipbuilders that are currently able to build LNG carriers have the necessary technical ability and resources to build FSRUs or convert LNG carriers into FSRUs.[154] Further, KSOE submitted that the shipbuilding industry generally considers FSRUs together with other LNG carriers, as evident by the approach taken by Clarksons Research ("**Clarksons**")[155] where Clarksons reports FSRU-LNG vessel statistics under LNG carriers and acknowledges that FSRUs can be deployed for use as conventional LNG carriers.[156]

66. KSOE submitted that while there are some differences between the construction of different vessel types as noted above, switching between the construction of different ship types is, however, always possible notwithstanding some initial fitting and operational challenges.[157] In particular, classification societies[158] outline the engineering required and also provide guidelines for the construction of the ships.[159] Moreover, shipbuilders can procure all the required materials and equipment externally, and the technology, equipment, know-how and skills are readily available in the market.[160] Furthermore, there are no timing implications for switching, because making any necessary investments and upgrades/changes to equipment required to switch production between vessel types can be done in the engineering time between the signing of the contract and the start of actual production (which is approximately [✂]).[161] The procurement time for the necessary equipment and materials is not significantly different for any of the vessel types.[162] While the construction period for a new vessel type can initially

[151] FSRUs are normally used only temporarily to serve newly established LNG supply routes until a land regasification terminal is constructed; Paragraph 15.2 of KSOE's responses dated 12 March 2020, to Question 15 of CCCS's RFI dated 5 March 2020.
[152] Paragraph 15.1 of KSOE's responses dated 12 March 2020, to Question 15 of CCCS's RFI dated 5 March 2020.
[153] Paragraphs 15.3 and 15.6 of KSOE's responses dated 12 March 2020, to Question 15 of CCCS's RFI dated 5 March 2020.
[154] Paragraph 2.5 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[155] Clarksons Research is a company that provides global shipping intelligence.
[156] Paragraph 15.4 of KSOE's responses dated 12 March 2020, to Question 15 of CCCS's RFI dated 5 March 2020.
[157] Paragraph 19.14 of Form M1; Paragraph 11.5 of Form M2.
[158] Classification societies are non-governmental organisations in the shipping industry that establish and maintain technical standards for construction and operation of marine vessels and offshore structures.
[159] Paragraph 19.14 of Form M1; Paragraph 11.5 of Form M2.
[160] Paragraph 19.14 of Form M1; Paragraph 11.5 of Form M2.
[161] Paragraph 19.15 of Form M1.
[162] Paragraph 19.15 of Form M1.

be longer for certain vessel types due to the learning process involved, this does not matter when there is overcapacity on the market, as the time-efficient construction of vessels can only affect the competitiveness of a shipyard when demand exceeds supply.[163] Although there are some differences in the construction period of each type of vessel, such differences are caused by the nature and complexities of the vessel and not the difficulty in switching production.[164] Shipbuilders do not incur additional costs until they have won an order for a new vessel type for the first time.[165] Those costs are in any event amortised without any material impact on the price of building the vessel.[166]

KSOE's submission on segmentation by vessel classes

67. KSOE submitted that the Parties overlap in the global supply of the following vessel classes[167] for the period 2014 to 2018:

Vessel type	**Vessel class(es)**
Oil tanker	Suezmax 125,000 – 199,999 DWT[168]
	UL/VLCC 200,000+ DWT[169]
Containership	Post-Panamax 15,000+ TEU[170]
LNG carrier	LNG carriers 40,000+ cu.m. [171]
LPG carrier	LPG carriers 60,000+ cu.m. [172]

68. However, KSOE submitted that for vessel classes within the same vessel type, demand-side substitutability is high.[173] According to KSOE, vessel class is a classification of vessel type only based on cargo load.[174] While these vessels may be different in size, they are used for the same purposes due to the same characteristics of the intended cargo.[175] Further, within the same vessel type, there

[163] Paragraph 19.16 of Form M1.
[164] Paragraph 19.16 of Form M1.
[165] Paragraph 19.17 of Form M1.
[166] Paragraph 19.17 of Form M1.
[167] Paragraph 3.6 of KSOE's Supplementary Submissions dated 13 November 2019; Paragraph 4.1 of KSOE's Supplementary Submissions dated 13 November 2019; Paragraph 5.1 of KSOE's Supplementary Submissions dated 13 November 2019; Annex Q2a of KSOE's responses dated 12 February 2020, to Question 2(a) of CCCS's RFI dated 4 February 2020.
[168] "**DWT**" refers to deadweight tonnage.
[169] UL/VLCC 200,000+ DWT refers to oil tankers that are larger than 200,000 DWT.
[170] Post-Panamax 15,000+ TEU refers to containerships that are larger than 15,000 TEU.
[171] LNG carriers 40,000+ cu.m. refers to LNG carriers larger than 40,000m^3.
[172] LPG carriers 60,000+ cu.m. refers to LPG carriers larger than 60,000m^3.
[173] Paragraph 19.8 of Form M1.
[174] Paragraph 19.8.1 of Form M1.
[175] Paragraph 19.8.1 of Form M1.

is a chain of substitution between different vessel classes in terms of cargo load.[176] In particular, the evidence that adjacent classes of the same vessel type were deployed on the same trade routes shows that a chain of substitution exists within adjacent classes of vessels of the same type.[177] While KSOE notes that demand-side substitutability does not exist between a vessel class with the largest cargo load and a vessel class with the smallest cargo load, substitutability can be fully recognised between adjacent vessel classes and would form a chain of substitution.[178] For example, in the case of oil tankers, Suezmax is an oil tanker within the range of 125,000 to 199,999 DWT, and this vessel class is adjacent to a UL/VLCC, which is a tanker that is larger than 200,000 DWT.[179] Due to such chain effect, demand-side substitutability is recognised overall between vessel classes that make up the same type. Further, KSOE submitted that prices of different vessel classes of the same type display similar price fluctuation patterns.[180] This illustrates the close chains of substitution that exists between the vessel classes such that the supply of any vessel class is constrained by the supply of other vessel classes within the same chain.[181] According to KSOE, if the market is to be segmented, it is reasonable to segment it only by way of vessel types and not vessel classes.[182]

69. KSOE further submitted that supply-side substitutability is high between vessel classes within the same vessel type.[183] Within the same vessel type, the characteristics of cargo loaded on a vessel are the same and the only difference is the cargo load.[184] As there is no difference in shipbuilding technology and the regulations of vessel classification that mandate design requirements such as vessel structure and equipment between vessel classes, it is easy for suppliers to build various vessel classes within the same type.[185] Most shipbuilders (including the Parties) can build nearly all vessels classes belonging to a vessel type[186] and have also constructed vessels across a wide range of vessel classes within each vessel type[187]. There is no special expertise or know-how or technology related to particular vessel classes within a type and, accordingly, no particular leaders in

[176] Paragraph 19.8.2 of Form M1.
[177] Paragraph 11.10 of Form M2.
[178] Paragraph 19.8.2 of Form M1.
[179] Paragraph 1.1 of Schedule 1 of KSOE's Supplementary Submissions dated 13 November 2019.
[180] Paragraph 11.11 of Form M2.
[181] Paragraph 11.11 of Form M2.
[182] Paragraph 19.8.2 of Form M1.
[183] Paragraph 19.12 of Form M1.
[184] Paragraph 19.12.1 of Form M1.
[185] Paragraph 19.12.1 of Form M1.
[186] Paragraph 19.12.1 of Form M1.
[187] Paragraphs 3.25 and 11.8 of Form M2.

vessel classes.[188] The core technologies and machinery such as propulsion/generator engines are easily available in the market and can be purchased from engine producers or licensors.[189]

70. KSOE submitted that shipbuilders can supply vessels of any type or class, subject to dock size restrictions.[190] In terms of dock size restrictions, however, KSOE submitted that the cost required to expand existing dock sizes to accommodate the construction of larger vessels is not significant in relation to the overall value of vessels.[191] In fact, for the construction of UL/VLCC 200,000+ DWT and Post-Panamax 15,000+ TEU, there are many shipyards with the requisite dock size for these vessels.[192] Further, shipbuilders have been observed to scale up from building small classes to larger ones.[193] KSOE also submitted that given the overcapacity in the shipbuilding industry, every potential order is important.[194] Therefore, shipbuilders with larger facilities will also compete for the construction of smaller vessels.[195]

KSOE's submission on overall product market segmentation

71. In view of the above, KSOE submitted that the product market is no narrower than the supply of commercial vessels.[196]

CCCS's assessment

Segmentation by vessel types

72. CCCS agrees with KSOE and third parties that, from a demand-side perspective, commercial vessels are distinguished according to the nature of the cargo transported.[197] This in turn determines the specific features of the various vessel types, and therefore, the demand-side substitutability of the various vessel types is likely limited. Specific categories of products require special facilities and a

[188] Paragraph 19.12.1 of Form M1.
[189] Paragraph 19.12.1 of Form M1.
[190] Paragraph 2.2 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[191] Paragraph 2.2.2 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[192] Paragraph 11.6 of Form M2.
[193] For example, DACKS ("**DACKS**" refers to Dalian COSCO KHI Shipbuilding Industry, a second joint venture between COSCO and Kawasaki with the latter holding a 34% stake) had delivered tankers of smaller classes in 2004, and later delivered its first VLCC in 2015; Paragraph 11.8 of Form M2.
[194] Paragraph 11.8 of Form M2.
[195] Paragraph 11.8 of Form M2.
[196] Paragraph 20.1 of Form M1.
[197] [✂]'s responses dated 24 September 2019, to Question 15 of CCCS's RFI dated 17 September 2019; Paragraph 18 of Notes of Call with [✂] dated 20 September 2019.

special design of the vessels, and they cannot be transported other than by dedicated vessels.[198] The construction of these dedicated vessels may also require specialised materials, equipment and labour.[199] For example, LNG fuel is only transported on LNG carriers[200], which require strict safety measures and more sophisticated building criteria.

73. From the supply-side, CCCS notes that shipbuilders generally do build various types of vessels (such as oil tankers, containerships, LPG carriers and LNG carriers) and switching between the production of the different vessel types is possible.[201] Once a shipbuilder possesses the technology and the necessary know-how to build a specific type of vessel, and there are no physical limitation regarding its shipyards for the building of vessels of certain sizes, it is possible for the shipbuilder to adjust its production according to market needs. However, CCCS notes feedback from some shipbuilders that they lack the experience to build LPG carriers and LNG carriers, and it is impossible for a shipbuilder to build all the different vessel types.[202] Further, some shipbuilders highlighted that the construction of LNG carriers require special equipment and special welding techniques.[203] Other shipbuilders highlighted that while their shipyards can physically build different types of commercial vessels, they would be unlikely to do so from a commercial perspective.[204] Shipbuilders would typically either focus on building vessel types with higher value, or specialise in vessel types that they have had experience in building as this would lower their learning costs. This is supported by feedback from [✂], which highlighted that it is uneconomical for shipyards to build all types of vessels and shipbuilders typically have their own specialisations.[205]

74. CCCS also considered the need to segment the LNG carrier product market further into FSRUs vis-à-vis non-FSRUs[206]. In this regard, both FSRUs and non-FSRUs transport LNG fuel[207], and FSRUs have an additional capability to transform the

[198] [✂]'s responses dated 23 September 2019, to Question 9 of CCCS's RFI dated 20 September 2019.
[199] [✂]'s responses dated 24 September 2019, to Question 17 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 February 2020, to Question 9 of CCCS's RFI dated 17 February 2020.
[200] [✂]'s responses dated 23 September 2019, to Question 9 of CCCS's RFI dated 20 September 2019.
[201] [✂]'s responses dated 24 September 2019, to Question 15 of CCCS's RFI dated 17 September 2019.
[202] [✂]'s responses dated 24 September 2019, to Question 15 of CCCS's RFI dated 17 September 2019.
[203] [✂]'s responses dated 24 April 2020, to Question 2(b) of CCCS's RFI dated 17 April 2020.
[204] [✂]'s responses dated 27 September 2019, to Question 15 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 February 2020, to Question 9 of CCCS's RFI dated 17 February 2020.
[205] Paragraph 22 of Notes of Call with [✂] dated 20 September 2019.
[206] Non-FSRUs are conventional LNG carriers without the regasification unit.
[207] [✂]'s responses dated 8 October 2019, to Question 1(b) of CCCS's RFI dated 7 October 2019.

LNG fuel back to the gaseous state.[208] Market feedback on whether FSRUs and non-FSRUs are substitutable for each other appears mixed. On the demand-side, feedback from ship owners suggests that while FSRUs can be deployed as a substitute for non-FSRU LNG carriers, non-FSRU LNG carriers may not be a good substitute to FSRUs due to the absence of the regasification capability.[209] On the supply-side, however, feedback from shipbuilders suggests that the technology to build FSRUs and non-FSRU LNG carriers are similar with the exception of additional modules required to build FSRUs,[210] and therefore, shipyards that build non-FSRU LNG carriers have the technical capability to build FSRUs as well.[211] This is supported by market feedback that FSRUs are largely constructed via conversion projects from non-FSRU LNG carriers rather than new-built projects, and thus the technological requirements to build FSRUs and non-FSRUs are similar.[212] Further, the shipbuilders that supply FSRUs and non-FSRU LNG carriers are almost the same[213], and market shares for the supply of LNG carriers whether including or excluding FSRUs are similar.[214] CCCS is therefore of the view that there is no necessity to segment the LNG carrier product market further into FSRUs and non-FSRUs.[215]

75. Taking into account the above, CCCS is of the view that it is appropriate to segment the product market by vessel types, in particular – oil tankers, containerships, LNG carriers and LPG carriers for the purpose of its assessment.

Segmentation by vessel classes

76. CCCS notes that KSOE has essentially relied on the chains of substitution concept to argue against further segmenting the market by vessel classes.

[208] Sea News (2018). "Know all about FSRU, the Floating storage Regasification Unit". Retrieved from https://seanews.co.uk on 25 June 2020.
[209] [✂]'s responses dated 31 March 2020, to Questions 16 and 17 of CCCS's RFI dated 19 March 2020.
[210] [✂]'s responses dated 23 April 2020, to Question 17 of CCCS's RFI dated 17 April 2020.
[211] [✂]'s responses dated 24 April 2020, to Question 7 of CCCS's RFI dated 17 April 2020; [✂]'s responses dated 24 April 2020, to Questions 10 and 11 of CCCS's RFI dated 17 April 2020.
[212] [✂]'s responses dated 31 March 2020, to Question 17 of CCCS's RFI dated 19 March 2020.
[213] Only 3 shipbuilders with a combined five-year cumulative market share of [0-10]% in the global supply of FSRUs only, do not build non-FSRU LNG carriers.
[214] FSRUs form a very small proportion of sales of LNG carriers. The difference in the combined cumulative five-year market share of the Parties in the global supply of LNG carriers including FSRUs and non-FSRUs, vis-à-vis non-FSRU LNG carriers only, is [0-10]%. The difference in market share for the next largest supplier, Samsung, is [0-10]%.
[215] While there is no necessity for further segmentation, CCCS has considered how the competition assessment would change if FSRUs form a separate product market but found no additional competition concerns.

77. CCCS is of the view that a chain of substitution is a necessary condition for products that do not directly constrain each other, to be part of the same relevant market. However, the existence of a chain of substitution is not a sufficient condition. Simply put, even if buyers view all products adjacent to each other in the chain as substitutes, it does not mean that the whole chain is the relevant market. The important consideration is whether via these chains of substitution, the ability to raise the price of the focal product would be constrained by another product in the chain. This point is explicitly set out in the *CCCS Guidelines on Market Definition*[216], which highlights that the hypothetical monopolist test is the key to determining what range of products in the chain constitutes the relevant product market. This implies that the main consideration is whether a small but significant and non-transitory increase in price ("**SSNIP**") of the focal product would lead to buyers switching to the products along the chain such as to render the increase in price unprofitable for the hypothetical monopolist. Essentially, what drives the SSNIP test is a weighing of the loss of customers to the adjacent product against the additional returns from the customers that remain with the hypothetical monopolist. This means that the longer the chain of products, the more likely the hypothetical monopolist will be able to profit from a SSNIP at some point along the chain, which would accordingly suggest the existence of separate markets, as set out in the *CCCS Guidelines on Market Definition*[217].

78. CCCS notes that the EC, in its past decisional practices[218], took into account market feedback on whether it was economically viable for customers to substitute a larger capacity product with multiple smaller capacity products, *notwithstanding the theoretical possibility of doing so*. Other factors that the EC took into account when determining whether the chain of substitution has been broken includes an assessment of whether there are significant differences in prices between the larger capacity product and the smaller capacity product, as well as whether there are significant differences in the distribution and production of the larger capacity product vis-à-vis the smaller capacity product. Some examples of these differences include the type of customer base, the type of procurement method, the cost and time involved in the development and production of the products. Similarly, CCCS also sought market feedback to assess if there was evidence to support the theoretical chain of substitution argument submitted by KSOE.

[216] Paragraph 3.15 of *CCCS Guidelines on Market Definition.*
[217] Paragraph 3.13 of *CCCS Guidelines on Market Definition.*
[218] Case No. COMP/M.2033, *Metso/Svedaa*, dated 24 January 2001; Case No. COMP/M.1882, *Pirelli/BICC,* dated 19 July 2000; Case. No. COMP/M.1571, *New Holland/Case,* dated 28 October 1999.

79. From a supply-side perspective, while shipbuilders are generally equipped to build commercial vessels of different classes, shipbuilders that typically construct larger vessel classes might not have the incentive to switch to construction of a smaller vessel class. This is supported by market feedback that switching construction from a larger to smaller class reduces efficiency[219] and results in idle capacity in the shipyard[220]. Feedback also suggests that it would diminish profit margins as these shipbuilders will not be able to build smaller classes at a competitive cost.[221]

80. Conversely, shipbuilders that typically construct smaller classes might be constrained in building larger vessel classes due to the size of their building facilities.[222] This is supported by feedback from [✂], which highlighted that while the technology needed to build different vessel classes is similar (for instance, a larger ship would simply require strengthening of the hull), the ability of a shipbuilder to build all vessel classes would depend on the size of the shipyard.[223] Further, even if they are not constrained by the size of their building facilities, some shipbuilders might focus on building only a few vessel classes to optimise their building capacity and efficiency.[224] Shipbuilders may specialise in building a few vessel classes as it might be uneconomical to build all vessel classes.[225] [✂] also highlighted that whether shipbuilders would build all vessel classes depends on their customers' business requirements – if most of their customers only service small island ports, the customers will not purchase large vessels and correspondingly the shipbuilders would not build these large vessels.[226]

81. CCCS also considered whether shipbuilders tend to focus on building specific vessel classes, notwithstanding that shipbuilders could potentially supply all vessel classes. For instance, if there is a clear separation between shipbuilders who supply small vessels and those that supply large vessels, this could support a segmentation of the market based on vessel classes. In this regard, CCCS notes that the evidence is mixed. Of the five shipbuilders that provided feedback, two indicated that they focus their production on building either large vessels or

[219] [✂]'s responses dated 20 February 2020, to Questions 7 and 9 of CCCS's RFI dated 12 February 2020.
[220] [✂]'s responses dated 27 February 2020, to Question 16 of CCCS's RFI dated 12 February 2020.
[221] [✂]'s responses dated 12 March 2020, to Questions 8 and 9 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 28 February 2020, to Questions 6 to 8 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020 to Question 16 of CCCS's RFI dated 12 February 2020.
[222] [✂]'s responses dated 24 September 2019, to Question 23 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 20 February 2020, to Questions 7 and 9 of CCCS's RFI dated 12 February 2020.
[223] Paragraph 22 of Notes of Call with [✂] dated 20 September 2019.
[224] [✂]'s responses dated 27 September 2019, to Question 17 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 24 September 2019, to Question 17 of CCCS's RFI dated 17 September 2019.
[225] [✂]'s responses dated 27 September 2019, to Question 24 of CCCS's RFI dated 17 September 2019.
[226] Paragraph 23 of Notes of Call with [✂] dated 20 September 2019.

smaller ones rather than both[227], while the remaining three shipbuilders indicated that they focus their production on building a mix of both large and small vessels[228]. This observation applies to all vessel types.[229]

82. From a demand-side perspective, ship owners purchase vessel classes that are suitable for their trade requirements and the routes that they operate, as supported by market feedback.[230] Generally, larger vessels are used to transport large volumes of cargo on longer routes, while smaller vessels are used to transport smaller volumes of cargo on shorter routes.[231] For example, feedback suggests that ship owners may use an 18,000 TEU vessel for an Asia-Europe route, but a 3,000 to 4,000 TEU vessel for a shorter South-Asia route.[232] Feedback also supports that it might not be commercially viable for ship owners to switch between all vessel classes for two reasons. First, certain vessel classes might not be able to fit into certain ports along a particular route that they operate on, limiting the substitutability of a large vessel class for that service.[233] Similarly, if a larger vessel can pass through the necessary route, it would be more efficient to use the larger vessel to maximise the amount of goods delivered per trip.[234] This would limit the substitutability of a smaller vessel class for that service. Second, ship owners would have to consider the impact of using certain vessel classes on their ability to offer competitive prices for their shipping services. For instance, it might be uneconomical for ship owners to substitute a small vessel with a large vessel for a particular service, as the capacity of the large vessel might not be maximised if there is insufficient cargo load.[235] Similarly, substituting a large vessel with two small vessels might not be an option as operating costs such as cleaning costs would increase.[236]

[227] [✂]'s responses dated 18 March 2020, to Question 4 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 4 of CCCS's RFI dated 12 February 2020.
[228] [✂]'s responses dated 28 February 2020, to Question 4 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Question 4 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 20 February 2020, to Question 4 of CCCS's RFI dated 12 February 2020.
[229] Paragraph 19.20 of Form M1; Paragraph 20.5 of KSOE's responses dated 1 October 2019, to Question 20(d) of CCCS's RFI dated 16 September 2019, Paragraph 6.1 of KSOE's responses dated 10 October 2019, to Question 6 of CCCS's RFI dated 4 October 2019; [✂]'s responses dated 25 September 2019, to Question 21 of CCCS's RFI dated 17 September 2019.
[230] [✂]'s responses dated 23 September 2019, to Question 11 of CCCS's RFI dated 20 September 2019; [✂]'s responses dated 26 February 2020, to Question 11 of CCCS's RFI dated 17 February 2020.
[231] [✂]'s responses dated 23 September 2019, to Question 4 of CCCS's RFI dated 21 September 2019.
[232] [✂]'s responses dated 23 September 2019, to Question 4 of CCCS's RFI dated 21 September 2019.
[233] Paragraph 7 of Notes of Call with [✂] dated 8 October 2019.
[234] [✂]'s responses dated 5 March 2020, to Question 11 of CCCS's RFI dated 17 February 2020.
[235] Paragraph 7 of Notes of Call with [✂] dated 8 October 2019.
[236] [✂]'s responses dated 26 September 2019, to Question 19 of CCCS's RFI dated 17 September 2019.

83. In addition, CCCS considered whether customers that typically purchase smaller vessels are different from customers who purchase larger vessels, which could support a segmentation of the market based on vessel classes as the impact of the Proposed Transaction on these different customer groups may differ. In this regard, the evidence is again mixed. Of the ten ship owners that provided feedback, one ship owner indicated that they focus their purchase on small vessels[237], five indicated that they focus their purchase on larger vessels[238], and the remaining four indicated that they purchase a mixture of large and small vessels[239]. This observation applies to all vessel types.[240]

84. CCCS is of the view that it is unlikely for all the vessel classes within the same vessel type to constitute a single market, as clearly supported by market feedback on the demand-side and supply-side substitution. However, the market feedback does not clearly indicate how best to divide vessel classes into suitable segments within the same vessel type.

CCCS's conclusion on product market

85. Although the market feedback does not clearly indicate how best to segment all vessel classes within a vessel type, CCCS notes that concerns raised in market feedback are largely focused on the largest vessel class within each of the four relevant vessel types. These are also the vessel classes that the Parties mainly overlap in.[241] CCCS has therefore focused on the largest vessel class within each of the four relevant vessel types for the purpose of its assessment. The four relevant vessel classes (henceforth, any reference to vessel class would be

[237] [✂]'s responses dated 9 March 2020, to Question 1 of CCCS's RFI dated 17 February 2020.
[238] [✂]'s responses dated 24 September 2019, to Question 2 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 February 2020, to Question 1 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 31 March 2020, to Question 1 of CCCS's RFI dated 19 March 2020; [✂]'s responses dated 3 October 2019, to Question 1 of CCCS's RFI dated 1 October 2019; [✂]'s responses dated 21 October 2019, to Question 2 of CCCS's RFI dated 15 October 2019.
[239] [✂]'s responses dated 4 March 2020, to Question 1 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 1 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 5 March 2020, to Question 1 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 8 June 2020, to Question 2 of CCCS's s61A Notice dated 2 June 2020.
[240] Paragraph 20.4 of KSOE's response dated 1 October 2019, to Question 20(c) of CCCS's RFI dated 16 September 2019; Paragraph 5.1 of KSOE's response dated 10 October 2019, to Question 5 of CCCS's RFI dated 4 October 2019; [✂]'s responses dated 24 September 2019, to Question 24 of CCCS's RFI dated 17 September 2019.
[241] Besides the largest vessel class within each of the four vessel types, the Parties overlap thinly in the supply of Suezmax 125,000 – 199,999 DWT, which is the second largest class of oil tankers, for the period of 2014 to 2018. However, the incremental share of DSME's contribution to the 5-year cumulative market shares of the Parties is only [0-10]%, for the period of 2014 to 2018 (against KSOE's market share of [40-50]%). Therefore, the incremental impact from the Proposed Transaction on the supply of Suezmax 125,000 – 199,999 DWT is marginal. For other vessel classes besides the largest vessel class within each of the four vessel types and Suezmax, the incremental 5-year cumulative market shares of the merged entity are [0-10], for the period of 2014 to 2018.

referring to both the vessel type and class together), each of which CCCS assessed as a distinct product market, are as follows:

(i) **UL/VLCC 200,000+ DWT:** Oil tankers that are larger than 200,000 DWT;
(ii) **Post-Panamax 15,000+ TEU:** Containerships that are larger than 15,000 TEU;
(iii) **LNG carriers 40,000+ cu.m.:** LNG carriers that are larger than 40,000 m^3; and
(iv) **LPG carriers 60,000+ cu.m.:** LPG carriers that are larger than 60,000 m^3.

86. While CCCS has focused its competition assessment on these four relevant vessel classes, the potential competitive constraint imposed by other vessel classes are also considered in the competition assessment, where appropriate. For example, in the quantitative analysis performed to assess whether there is adequate capacity in the industry to meet the forecasted demand for (each of) the four relevant classes, CCCS took into consideration that a shipyard's excess capacity for other vessel classes that fall into the same or larger[242] size categories as the specific relevant vessel class, could contribute to meet the forecasted demand for the specific relevant vessel class.

(b) Geographic Market

KSOE's submissions

87. KSOE submitted that customers procure commercial vessels from suppliers on a global basis, while suppliers are typically willing to supply commercial vessels to customers on a global basis.[243] Accordingly, KSOE submitted that the relevant geographic market for the supply of commercial vessels is global.[244]

CCCS's assessment

88. CCCS notes that KSOE and DSME manufacture commercial vessels in shipyards located in Korea, and these are purchased by customers globally, including by customers in Singapore.[245] Customers of the Parties also procure commercial

[242] CCCS's revised RSI analysis models for the rigidities in the use of a shipyard's excess capacity for vessel classes in larger size categories to build the four relevant vessel classes.
[243] Paragraphs 19.24 to 19.25 of Form M1.
[244] Paragraphs 20.2 to 20.3 of Form M1.
[245] Paragraph 18.1 of Form M1.

vessels from other parts of the world.[246] Market feedback also suggests that ship owners would typically procure commercial vessels from suppliers globally.[247]

89. In light of the above, CCCS is of the view that the relevant geographic market is the global supply of commercial vessels to customers worldwide.

(c) CCCS's Conclusion on Relevant Markets

90. As set out in the respective assessments of the relevant product and geographic markets above, CCCS is of the view that the relevant markets for the purpose of assessing the Proposed Transaction are the following:

(i) Global supply of UL/VLCC 200,000+ DWT to customers worldwide ("**global supply of UL/VLCC 200,000+ DWT**");
(ii) Global supply of Post-Panamax 15,000+ TEU to customers worldwide ("**global supply of Post-Panamax 15,000+ TEU**");
(iii) Global supply of LNG carriers 40,000+ cu.m. to customers worldwide ("**global supply of LNG carriers 40,000+ cu.m.**"); and
(iv) Global supply of LPG carriers 60,000+ cu.m. to customers worldwide ("**global supply of LPG carriers 60,000+ cu.m.**").

VII. MARKET STRUCTURE

(a) Market Shares

KSOE's submissions on the measurement of market shares

91. KSOE submitted that measurements of market shares for the supply of commercial vessels can be estimated based on value of orders, DWT[248], Gross Tonnage ("**GT**")[249], Compensated Gross Tonnage ("**CGT**")[250], or number of

[246] Paragraphs 38.1.1, 38.1.2 and Annex Q38 of KSOE's responses dated 1 October 2019, to Question 38 of CCCS's RFI dated 16 September 2019; Paragraph 1 of Notes of Call with [✂] dated 20 September 2019.
[247] [✂]'s responses dated 24 September 2019, to Question 27 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 September 2019, to Questions 26 and 27 of CCCS's RFI dated 17 September 2019.
[248] DWT is a measure of the weight a vessel can carry.
[249] GT is a measure of the vessel total cargo carrying capacity.
[250] CGT is calculated by multiplying the ship type factor ("A") by GT modified by a coefficient ("B"), which depends on the vessel type or class (i.e. $CGT = A * GT^B$). "A" and "B" values are determined in advance by the OECD's CGT system based on sampling of shipyard outputs.

orders.[251] However, KSOE submitted that it has no readily available information on the total market size by value.[252]

92. KSOE submitted that CGT is the most appropriate measure of market shares to accurately measure the activity of shipyards as it takes into account the complexity of the building process for a particular type of ship.[253] This offers a better reflection of the value of a vessel and therefore the revenue that the shipbuilder receives.[254]

93. Further, KSOE submitted that DWT and GT are alternative measures to estimate market shares for the supply of commercial vessels.[255] KSOE also submitted that GT is used to calculate harbour dues and canal transit dues for commercial vessels or certain statutory requirements and is also a good indication for ship owners of how much trade revenue the vessel is capable of generating.[256]

94. In comparing the use of DWT and GT to CGT as measures of market share, KSOE submitted that the use of DWT and GT can underestimate or overestimate the real value of a vessel.[257] DWT and GT does not take into account the complexity of the shipbuilding process or the know-how required, which affects the production costs of a vessel and therefore the price of a vessel. As such, KSOE submitted that CGT is a more accurate and reliable estimation of the value of a vessel.[258]

95. In relation to the time period to assess market shares, KSOE submitted that the shipbuilding industry is characterised by large infrequent orders such that relying on market shares in a single year is unlikely to offer a meaningful reflection of competitors' respective market power as market shares fluctuate considerably from year to year.[259] Therefore, it is more appropriate to consider the market shares over a five-year period.[260]

<u>CCCS's assessment on the measurement of market shares</u>

[251] Paragraph 21.3 of Form M1.
[252] Paragraph 21.3 of Form M1.
[253] Paragraph 21.7 of Form M1.
[254] Paragraphs 21.8 and 21.9 of Form M1.
[255] Paragraph 21.3 of Form M1.
[256] Paragraph 21.5 of Form M1.
[257] Paragraphs 21.8 and 21.9 of Form M1.
[258] Paragraph 21.9 of Form M1.
[259] Paragraph 21.10 of Form M1.
[260] Paragraph 21.10 of Form M1.

96. As set out in the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*, competition concerns are unlikely to arise in a merger situation unless the merged entity will have a market share of 40% or more, or the merged entity will have a market share of between 20% to 40% and the post-merger CR3[261] is 70% or more.[262]

97. In relation to the appropriate measure of market shares for the supply of commercial vessels, CCCS notes that the OECD has adopted and promulgated the use of CGT as a consistent unit of measurement for new building production by shipyards.[263] Further, feedback from shipbuilders and ship owners suggests that CGT is an appropriate and reasonable measure of a shipyard's capacity.[264] In this regard, CCCS is of the view that assessing the market shares of orders received by shipbuilders based on CGT, as proposed by the Parties (for all vessel types and classes), is reasonable.[265]

98. As orders for commercial vessels are lumpy and vary significantly year-to-year, cumulative market shares and the consistency of market shares over a longer period may be a better indicator of market power than just annual market shares in the most recent few years. In this regard, CCCS is of the view that the five-year period from 2014 to 2018[266] proposed by the Parties (for all vessel types and classes) is reasonable as a starting point to observe competitive dynamics, given that it takes about 1.5 to 3 years from negotiating the contract to delivery of the vessel and customers procure vessels every one to two years.[267] Where appropriate, CCCS also considered the annual market shares in each year over the same five-year period.

99. The following section sets out the market shares for the global supply of each of the relevant vessel classes (i.e. UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU, LNG carriers 40,000+ cu.m. and LPG carriers 60,000+ cu.m.).

---

[261] CR3 refers to the combined market share of the three largest firms.
[262] Paragraph 5.15 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[263] OECD (2007). Paragraph 6, OECD's Council Working Party on Shipbuilding 'Compensated Gross Ton (CGT) System". Retrieved from: https://www.oced.org/industry/ind/37655301.pdf
[264] [✂]'s responses dated 4 March 2020 to Question 35 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 20 February 2020 to Question 10 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 10 of CCCS's RFI dated 12 February 2020.
[265] In the Phase 1 merger review, CCCS received feedback from a shipbuilder that both GT and CGT are appropriate measures of market shares. In the Phase 2 merger review, CCCS received further feedback from both shipbuilders and ship owners that CGT is the appropriate measure. Therefore, the feedback is consistent that CGT is an appropriate measure of market shares in the shipbuilding industry.
[266] This refers to the duration from 1 January 2014 to 31 December 2018.
[267] CCCS also checked the market shares over a 10-year period (i.e. 2009 to 2018) for the global supply of the four relevant classes. In doing so, CCCS notes that the conclusions on whether the Parties' combined market share for the supply of each relevant class indicate competition concerns remain consistent.

Market for the global supply of UL/VLCC 200,000+ DWT

100. **Table 1** sets out the five-year cumulative market shares for the global supply of UL/VLCC 200,000+ DWT, for the period 2014 to 2018 based on the CGT of orders received by shipbuilders.

Table 1: Five-year cumulative market shares for the global supply of UL/VLCC 200,000+ DWT, for the period 2014 to 2018

Shipbuilder Group	**Total CGT**	**Share in CGT**
KSOE	[✂]	[30-40]%
DSME	[✂]	[20-30]%
CSIC	[✂]	[10-20]%
Japan Marine United Corporation	[✂]	[10-20]%
COSCO Shipping Heavy Industry Co Ltd	[✂]	[0-10]%
Samsung Heavy Industries	[✂]	[0-10]%
CSSC	[✂]	[0-10]%
Mitsui Engineering & Shipbuilding Co. Ltd.	[✂]	[0-10]%
Hanjin Heavy Industries & Construction Co. Ltd.	[✂]	[0-10]%
Namura Shipbuilding Co. Ltd.	[✂]	[0-10]%
Imabari Shipbuilding Co. Ltd.	[✂]	[0-10]%
HNA Group	[✂]	[0-10]%
Total	[✂]	**100.0%**
KSOE + DSME	**[✂]**	**[50-60]%**
Post-merger CR3	**[✂]**	**[70-80]%**

101. The Parties' five-year cumulative market shares for the global supply of UL/VLCC 200,000+ DWT, for the period 2014 to 2018, is [50-60]%. The post-merger CR3 is [70-80]%. These figures exceed the indicative threshold set out in the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.[268] Further, CCCS notes that the Parties' annual shares for the global supply of UL/VLCC 200,000+ DWT for the period 2014 to 2018 has been consistently above [50-60]% except for 2015 (refer to **Annex A1** for the annual market share figures).[269]

[268] Paragraph 5.15 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*
[269] The Parties' combined annual market share in 2015 is [40-50]%; Paragraph 1.10 of Schedule 1 of KSOE's Supplementary Submissions dated 13 November 2019.

102. Hence, the Parties' combined market share for the global supply of UL/VLCC 200,000+ DWT may indicate competition concerns for this vessel class.

Market for the global supply of Post-Panamax 15,000+ TEU

103. **Table 2** sets out the five-year cumulative market shares for the global supply of Post-Panamax 15,000+ TEU, for the period 2014 to 2018 based on CGT of orders received by shipbuilders.

Table 2: Five-year cumulative market shares for the global supply of Post-Panamax 15,000+ TEU, for the period 2014 to 2018

Shipbuilder Group	Total CGT	Share in CGT
KSOE	[✂]	[10-20]%
DSME	[✂]	[20-30]%
Samsung Heavy Industries	[✂]	[20-30]%
Imabari Shipbuilding Co Ltd	[✂]	[10-20]%
CSSC	[✂]	[10-20]%
COSCO Shipping Heavy Industry Co Ltd	[✂]	[0-10]%
Hanjin Heavy Industries & Construction Co Ltd	[✂]	[0-10]%
CSIC	[✂]	[0-10]%
Total	**[✂]**	**100.00%**
KSOE + DSME	**[✂]**	**[40-50]%**
Post-merger CR3	**[✂]**	**[70-80]%**

104. CCCS notes that the Parties' five-year cumulative shares for the global supply of Post-Panamax 15,000+ TEU, for the period 2014 to 2018, is [40-50]%. The post-merger CR3 is [70-80]%. These figures exceed the indicative threshold set out in the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.[270]

105. However, CCCS notes that Samsung Heavy Industries ("**Samsung**") remains a significant competitor to the Parties with a share of [20-30]%. Further, CCCS notes from the Parties' annual market shares over the period 2014 to 2018, that neither of the Parties has consistently been the largest player, nor have they been consistently the two largest players (refer to **Annex A2** for the annual market share figures).[271]

[270] Paragraph 5.15 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*
[271] Paragraph 2.5 of Schedule 1 of KSOE's Supplementary Submissions dated 13 November 2019.

106. Hence, while the Parties' combined market share for the global supply of Post-Panamax 15,000+ TEU marginally exceeds CCCS's indicative thresholds, this may not be indicative of competition concerns for this vessel class.

Market for the global supply of LNG carriers 40,000+ cu.m.

107. **Table 3** sets out the five-year cumulative market shares for the global supply of LNG carriers 40,000+ cu.m., for the period 2014 to 2018 based on CGT of orders received by shipbuilders.

Table 3: Five-year cumulative market shares for the global supply of LNG carriers 40,000+ cu.m., for the period 2014 to 2018

Shipbuilder Group	Total CGT	Share in CGT
KSOE	[✂]	[20-30]%
DSME	[✂]	[30-40]%
Samsung Heavy Industries	[✂]	[10-20]%
CSSC	[✂]	[0-10]%
Mitsubishi Heavy Industries Co Ltd	[✂]	[0-10]%
Kawasaki Heavy Industries Corp	[✂]	[0-10]%
Imabari Shipbuilding Co Ltd	[✂]	[0-10]%
Japan Marine United Corporation	[✂]	[0-10]%
China Merchants Group	[✂]	[0-10]%
Total	**[✂]**	**100.0%**
KSOE + DSME	**[✂]**	**[60-70]%**
Post-merger CR3	**[✂]**	**[80-90]%**

108. CCCS notes that the Parties' five-year cumulative market shares for the global supply of LNG carriers 40,000+ cu.m., for the period 2014 to 2018, is [60-70]%, which is above the indicative threshold as set out in the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.[272] CCCS also notes that the market for the global supply of LNG carriers 40,000+ cu.m. is concentrated. Specifically, the post-merger CR3 is [80-90]%, with only one competitor to the Parties remaining that has a significant market share (Samsung). Samsung, however, had a relatively much smaller market share of [10-20]% compared to the Parties' combined market share.

[272] Paragraph 5.15 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*

109. CCCS also notes that the Parties' annual market shares for the global supply of LNG carriers 40,000+ cu.m. for the period 2014 to 2018, have been consistently above [50-60]% except for 2015 (refer to **Annex A3** for the annual market share figures).[273]

110. Hence, the CCCS is of the view that the Parties' combined market share for the global supply of LNG carriers 40,000+ cu.m. may indicate competition concerns for this vessel class.

Market for the global supply of LPG carriers 60,000+ cu.m.

111. **Table 4** sets out the five-year cumulative market shares for the global supply of LPG carriers 60,000+ cu.m., for the period 2014 to 2018 based on CGT of orders received by shipbuilders.

Table 4: Five-year cumulative market shares for the global supply of LPG carriers 60,000+ cu.m., for the period 2014 to 2018

Builder Group	**Total CGT**	**Share in CGT**
KSOE	[✂]	[40-50]%
DSME	[✂]	[10-20]%
CSSC	[✂]	[10-20]%
Mitsubishi Heavy Industries Co Ltd	[✂]	[0-10]%
Kawasaki Heavy Industries Corp	[✂]	[0-10]%
Samsung Heavy Industries	[✂]	[0-10]%
Japan Marine United Corporation	[✂]	[0-10]%
Hanjin Heavy Industries & Construction Co Ltd	[✂]	[0-10]%
CSIC	[✂]	[0-10]%
Total	**[✂]**	**100.0%**
KSOE + DSME	**[✂]**	**[50-60]%**
Post-merger CR3	**[✂]**	**[80-90]%**

112. CCCS notes that the Parties' five-year cumulative market shares for the global supply of LPG carriers 60,000+ cu.m., for the period 2014 to 2018, is [50-60]%. This figure exceeds the indicative threshold as set out in the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.[274]

[273] In 2015, the Parties' combined global market shares is [40-50]%.
[274] Paragraph 5.15 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*

113. However, CCCS notes that prior to the Proposed Transaction, KSOE's annual market share already exceeded 40% and the incremental market share that KSOE will gain from DSME is only [10-20]% (refer to **Annex A4** for the annual market share figures). Further, DSME's annual market share has been decreasing[275] and its market shares were [0-10]% in 2016, 2017 and 2018.

114. Hence, CCCS is of the view that the Parties' combined market share for the global supply of LPG carriers 60,000+ cu.m. may not be indicative of competition concerns for this vessel class.

Other mergers and joint ventures in the shipbuilding industry

115. CCCS is cognisant that there are other mergers and joint ventures taking place in the shipbuilding industry, in addition to the Proposed Transaction. CCCS has computed the market shares of these transactions to assess whether they may result in a merged entity that poses significant competitive constraint to the KSOE/DSME merged entity.[276] These transactions include the merger between CSSC and China Shipbuilding Industry Corp ("**CSIC**"), which obtained regulatory approval in China in end-2019[277], and a joint venture ("**JV**") formed between Japan Marine United Corp. ("**JMU**") and Imabari, which is targeted to begin operations in October 2020[278].

Merger between CSSC and CSIC

116. CCCS notes that the CSSC/CSIC merged entity will have business activities in the construction of military ships (for example, warships) and commercial ships (including containerships, oil tankers, and gas carriers).

117. Within the four relevant vessel classes, CSSC and CSIC overlap in the global supply of UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU and LPG carriers 60,000+ cu.m. **Table 5** sets out the five-year cumulative combined market

[275] DSME's annual market shares decreased from [10-20]% in 2014 to [0-10]% to 2015.
[276] CCCS has performed its main assessment based on the position that the shipbuilders involved in these other mergers and joint ventures are independent, as it has not been confirmed whether these transactions have been completed. However, CCCS has also carried out an additional assessment in this section to determine whether these transactions will result in a significant competitor to the KSOE/DSME merged entity. As explained in this paragraph, these transactions do not result in a significant competitor to the KSOE/DSME merged entity and therefore the conclusions made in the section on market shares remain consistent.
[277] China's State-owned Assets Supervision and Administration Commission approved the merger between CSSC and CSIC in end-2019.
[278] It was announced in March 2020 that JMU and Imabari has formed a joint venture company, Nihon Shipyard Co; The JV will begin its operations effective on 1 October 2020 (targeted); JMUC (2020). Announcement of the conclusion of Agreement regarding Capital and Business Alliance and Establishment of Joint Venture Company. Retrieved from https://jmuc.co.jp on 1 July 2020.

shares of the CSSC/CSIC merged entity for the global supply of these respective vessel classes for the period 2014 to 2018, based on CGT of orders received by shipbuilders.

Table 5: Five-year cumulative combined market shares of CSSC and CSIC for the global supply of UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU and LPG carriers 60,000+ cu.m., for the period 2014 to 2018

	Total CGT	**Share in CGT**
UL/VLCC 200,000+ DWT		
CSSC	[✂]	[0-10]%
CSIC	[✂]	[10-20]%
CSSC + CSIC	**[✂]**	**[10-20]%**
Post-Panamax 15,000+ TEU		
CSSC	[✂]	[10-20]%
CSIC	[✂]	[0-10]%
CSSC + CSIC	**[✂]**	**[10-20]%**
LPG carriers 60,000+ cu.m.		
CSSC	[✂]	[10-20]%
CSIC	[✂]	[0-10]%
CSSC + CSIC	**[✂]**	**[10-20]%**

118. CCCS notes that the combined market shares of the CSSC/CSIC merged entity in the global supply of UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU and LPG carriers 60,000+ cu.m., for the period of 2014 to 2018, do not exceed 20% in all cases, and in any event, the incremental shares arising from the merger are small. In contrast, the Parties' combined market shares range from [40-50]% to [50-60]% in all cases. Therefore, the market share figures do not suggest that the merger between CSSC and CSIC will result in a significantly stronger competitor to the Parties in the global supply of the respective vessel classes.[279]

Joint venture between JMU and Imabari

[279] While CCCS notes the feedback of some shipbuilders that the CSSC/CSIC merged entity could pose a competitive constraint on the Parties, especially in the supply of oil tankers and containerships, the feedback was not substantiated with supporting reasons. [✂]'s responses dated 20 February 2020, to Question 24 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Question 24 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 34 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 34 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 4 March 2020, to Question 34 of CCCS's RFI dated 17 February 2020.

119. CCCS notes that the JV formed between JMU and Imabari will be involved in the construction of commercial vessels, excluding LNG carriers.[280]

120. Within the four relevant vessel classes, JMU and Imabari overlap in the global supply of UL/VLCC 200,000+ DWT. **Table 6** sets out the five-year cumulative combined market shares of JMU and Imabari for the global supply of UL/VLCC 200,000+ DWT for the period 2014 to 2018, based on CGT of orders received by shipbuilders.

Table 6: Five-year cumulative combined market shares of JMU and Imabari for the global supply of UL/VLCC 200,000+ DWT, for the period 2014 to 2018

	Total CGT	**Share in CGT**
UL/VLCC 200,000+ DWT		
JMU	[✂]	[10-20]%
Imabari	[✂]	[0-10]%
JMU + Imabari	**[✂]**	**[10-20]%**

121. CCCS notes that the combined market shares of JMU and Imabari in the global supply of the UL/VLCC 200,000+ DWT, for the period of 2014 to 2018, is only [10-20]%, and in any event, the incremental share arising from the merger is small. In contrast, the Parties' combined market shares in the global supply of UL/VLCC 200,000+ DWT is [50-60]%. Therefore, the market share figures do not suggest that the JV formed between JMU and Imabari will result in a significantly stronger competitor to the Parties in the global supply of UL/VLCC 200,000+ DWT.

(b) Barriers to Entry and Expansion

KSOE's submissions

122. KSOE submitted that for existing shipbuilders, there are very low or no barriers to entry for any vessel type or vessel class as shipbuilders do not need particular skills or equipment for building different vessel types.[281] The type of skill or know-how needed to build any vessel type is not difficult to acquire even when building more complex vessels, including LNG carriers.[282] For containerships and oil tankers, KSOE submitted that there are virtually no barriers to entry

[280] The JV will be effective as of 1 October 2020 (targeted); JMUC (2020). Announcement of the conclusion of Agreement regarding Capital and Business Alliance and Establishment of Joint Venture Company. Retrieved from https://jmuc.co.jp on 1 July 2020.
[281] Paragraph 11.57 of Form M2.
[282] Paragraph 11.59 of Form M2.

considering that these vessel types are one of the simplest kinds of vessels, so the threat of new entry/expansion will continue to constrain the Parties post-Proposed Transaction.[283]

123. KSOE further submitted that a lack of track record does not present an insurmountable barrier to entry or expansion for shipbuilders with respect to more sophisticated vessels such as LNG carriers.[284] According to KSOE, the empirical evidence demonstrates that competitors have secured orders without previously constructing any LNG carriers. Given the limited scope of the market and its relative immaturity, KSOE submitted that a shipbuilder's track record in relation to LNG carriers can increase significantly in a short period of time. KSOE also submitted that the low barriers of entry and expansion for existing shipbuilders into the LNG carrier segment can be demonstrated by the fact that at least 40 shipyards globally have a track record in constructing LNG carriers.[285]

124. KSOE submitted that barriers to entry for entirely new entities (i.e. no previous experience in shipbuilding) are high due to the requirement to construct or obtain a shipyard. However, given that the shipbuilding industry is a labour intensive industry that is regarded as a key industry in many countries, it is possible to build commercial vessels within a short period of time if there is promotion and support at a national level.[286] KSOE submitted that it is increasingly facing competition from new market entrants from other countries and regions such as Russia, Saudi Arabia and Southeast Asia, and these new entrants are generally well placed to grow their presence through aggressive investment (with governmental assistance) and a low cost base.[287]

Technology and knowledge barriers

125. KSOE submitted that all source technologies, regardless of vessel type, are outsourced and can be easily procured by any shipbuilder through licensing arrangements. This includes the necessary technology needed to build the vessels that KSOE and DSME build. In particular, there is no source technology or patent

[283] Paragraphs 2.1.2 and 2.2.2 of KSOE's Supplementary Submissions dated 13 November 2019.
[284] Paragraph 11.66 of Form M2; Paragraphs 5.2 and 5.3 of KSOE's Third Supplementary Submissions dated 3 August 2020; Indeed, KSOE provided examples of shipbuilders that pose significant credible threat of entry in the market in the near future, even though these shipbuilders do not currently have track record for large LNG carriers. However, as elaborated upon in paragraph 152 below, the lack of a track record and experience may pose a significant entry/expansion barrier for shipbuilders in respect of large LNG carriers.
[285] Paragraph 5.11 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[286] Paragraph 11.53 of Form M2.
[287] Paragraph 26.1 of Form M1; Paragraph 11.53 of Form M2.

that would prevent competitors from entering the market.[288] As such, shipyards can generally easily acquire any specialised knowledge required to build different types of commercial vessels.[289] In relation to LNG carriers, KSOE submitted that the key technology specifically required for the construction of an LNG carrier with the membrane type cargo hold, which was developed by Gaztransport & Technigaz ("**GTT**"), is readily available in the market against a payment of royalty fees to GTT.[290] KSOE submitted that GTT has granted licenses to 26 shipyards to enable them to produce membrane LNG carriers, and the fact that some of these shipyards have little experience in construction of vessels shows obtaining a GTT license is not difficult, and therefore does not represent a significant barrier to entry.[291] KSOE further submitted that the rest of the technologies used in the construction of hulls of ships have long been established and standardised across the shipbuilding industry, and classification societies apply the same inspection standards across vessel types in both the design and production of hulls.[292]

126. KSOE submitted that entry can be achieved or facilitated through cooperation agreements and know-how transfer between shipyards.[293] Know-how transfers can take place either from one shipbuilder to another, or from one shipyard to another in the same shipbuilding group.[294] In this regard, KSOE cited examples of cooperation between the Chinese and Japanese shipyards, and Koreans with other foreign yards, which demonstrate that market entry can be achieved through such know-how transfer.[295] KSOE submitted that it has also entered into cooperation agreements with different shipbuilding groups (including [✂]).[296] KSOE also submitted that within the same shipbuilding group, there are no internal or external barriers restricting know-how transfer through the transfer of employees between shipyards.[297] KSOE cited HHI Ulsan, as an example of the KSOE shipyard that was the first to build commercial vessels including large containerships, oil tankers, LPG carriers and LNG carriers, and from which the capability and know-how was shared with other yards (including Hyundai Samho Heavy Industries,

[288] Paragraph 26.2 of Form M1.
[289] Paragraph 14.1 of KSOE's responses dated 1 October 2019, to Question 14 of CCCS's RFI dated 16 September 2019.
[290] Paragraph 5.18 of KSOE's Supplementary Submissions dated 13 November 2019.
[291] Paragraphs 5.6 and 5.7 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[292] Paragraph 5.8 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[293] Paragraph 11.74 of Form M2.
[294] Paragraph 11.76 of Form M2. Paragraph 1.6 of KSOE's responses dated 8 May 2020, to Question 1 of CCCS's RFI dated 27 April 2020.
[295] Paragraph 11.82 of Form M2.
[296] Paragraph 1.5 of KSOE's responses dated 8 May 2020, to Question 1 of CCCS's RFI dated 27 April 2020.
[297] Paragraph 11.87 of Form M2, Paragraph 1.4 of KSOE's responses dated 8 May 2020, to Question 1 of CCCS's RFI dated 27 April 2020.

KSOE Gunsan, Hyundai Mipo Dockyard and Hyundai Vinashin Shipyards) within KSOE Group.[298]

127. KSOE submitted that a shipyard would retain its capability to build vessels of a certain vessel type or class even if the shipyard has not constructed such vessels for a long and extended period of time.[299] KSOE submitted examples of observed breaks in between the production of certain types for shipyards, and stated that such production break for shipbuilders in respect of any given vessel type is common, and may last for several years.[300]

Regulatory barriers

128. KSOE submitted that there are various international environmental regulations governing the shipbuilding industry.[301] KSOE also submitted that in recent years, international organisations have rolled out strict environmental standards that shipbuilders have to comply with, which has increased production costs for new vessels.[302]

Role of classification societies

129. KSOE submitted that classification societies play a large role in standardising the quality and other attributes of the ships across various shipyards.[303] KSOE also submitted that classification societies' approval are in and of themselves evidence of high quality consistent with industry standard, as the scope of review by classification societies is so significant. The classification societies' approvals require not only that a vessel built by the shipyard has a certain minimum quality, but also that it conforms to recognised industry quality standards, international conventions, the classification society's rules and the customers' own preferences outlined in the customer' technical specifications.[304] Consequently, KSOE submitted that for LNG carriers in particular, all shipbuilders have a similar offering and there is generally no real differentiation between LNG carriers based on quality.[305]

Entry in the last 5 years

[298] Paragraph 1.3 of KSOE's responses dated 8 May 2020, to Question 1 of CCCS's RFI dated 27 April 2020.
[299] Paragraph 1.11 of KSOE's responses dated 8 May 2020, to Question 1 of CCCS's RFI dated 27 April 2020.
[300] Paragraph 2.1 of KSOE's responses dated 28 May 2020, to Question 1 of CCCS's RFI dated 22 May 2020.
[301] Paragraph 18.6 of Form M1.
[302] Paragraph 12.5 of Form M1.
[303] Paragraph 6.27 of Form M2.
[304] Paragraphs 11.32 and 11.33 of Form M2.
[305] Paragraph 11.34 of Form M2.

130. KSOE submitted that there is one new shipyard that International Maritime Industry Company ("**IMI**") is currently constructing in Saudi Arabia, and is expected to begin its operations in 2022. KSOE submitted that IMI can build up to 18 commercial vessels, and it is expected to have the capability to build the largest vessel classes within all vessel type categories (including VLCCs and Post-Panamax).[306] KSOE submitted that Russia's Zvezda began operations related to commercial shipbuilding in 2015, and has recently entered the market for LNG carriers by taking an order for one 173,000 m^3 LNG carrier. KSOE also submitted that Zvezda is contemplating an aggressive capacity expansion plan, and will become a strong competitor in the market for large LNG carriers, and a potential competitor in the market for larger oil tankers (including UL/VLCC 200,000+ DWT).[307]

131. For LPG carriers, KSOE submitted that there have been instances of market entry in the global supply of LPG carriers since 2013, leading to intensifying competition.[308] The list of market entrants includes Hanjin Heavy Industries and Construction, Samsung and JMU.[309]

132. For LNG carriers, KSOE submitted that the fact that entry is easy is demonstrated by the fact that there have been 18 new entrants into the LNG carrier segment since 2011.[310] This includes Qidong Fengshun Shipbuilding Heavy Industries, Jiangsu Hantong HI, China Merchants, Yangzijiang Holdings and CSIC.[311] KSOE also submitted that joint ventures have been formed that specialise in the production of LNG carriers.[312] KSOE submitted that a joint venture company, Yangzi Mitsui, has been established by the Japanese shipbuilder Mitsui and China's largest private shipbuilder group Yangzijiang, and the joint venture company has announced that it intends to focus on the construction of large LNG carriers.[313]

Residual supply index analysis

[306] Paragraph 3.3 of KSOE's responses dated 24 April 2020, to Question 3 of CCCS's RFI dated 20 April 2020.
[307] Paragraphs 3.4 and 3.5 of KSOE's responses dated 24 April 2020, to Question 3 of CCCS's RFI dated 20 April 2020.
[308] Paragraph 29.1 of Form M1.
[309] Paragraph 29.2 of Form M2.
[310] Paragraph 5.20 of KSOE's Supplementary Submissions dated 13 November 2019.
[311] Paragraph 29.1 of Form M1.
[312] Paragraph 29.2 of Form M1.
[313] Paragraph 3.5 of KSOE's responses dated 24 April 2020, to Question 3 of CCCS's RFI dated 20 April 2020.

133. KSOE submitted that market outcomes in the shipbuilding industry are closely related to the level of capacity utilisation, as capacity is a main driver of competition in the industry.[314] According to KSOE, anti-competitive effects are generally unlikely if existing shipbuilders have enough capacity to quickly expand production to satisfy all demand (i.e., barriers to expansion are low)[315], since in that case the merged entity would not be pivotal and would have no ability to raise prices unilaterally by withdrawing output. KSOE submitted that therefore, a competitive assessment of the Proposed Transaction should focus on a formal screen for pivotality: the residual supply index ("**RSI**").[316]

134. KSOE submitted that the RSI of supplier *i* (RSI^i) is defined as: $RSI^i = \frac{C^T - C^i}{D^T}$ where C^T stands for the industry's total capacity, C^i represents the capacity of supplier *i* (the supplier the RSI is calculated for) and D^T denotes the total demand.[317]

135. KSOE further submitted that the RSI^i shows the fraction of total demand (D^T) that the joint capacity of supplier *i*'s competitors ($C^T - C^i$) – i.e. the residual capacity excluding supplier *i*'s capacity – could satisfy.[318] In other words, it indicates whether supplier *i* is pivotal to satisfying total demand (pivotal in the sense that total demand cannot be met if supplier *i* is not supplying).[319] KSOE submitted that to assess post-merger pivotality, the RSI for the merged entity following the Proposed Transaction (by adding up the Parties' respective capacities) is interpreted as follows:[320]

    (a) For RSI values of 1 or above, the residual capacity is at least as large as total demand. In that case, the supplier in question is not pivotal and unlikely to possess market power. Post-merger RSIs of 1 or above are therefore unlikely to lead to anti-competitive effects: the merged firm is not pivotal and has no ability to increase price; and

    (b) For RSI values below 1, the supplier in question is pivotal for the portion of demand the residual capacity cannot satisfy. It is still unclear in this case,

[314] Paragraph 1.3, Annex 5 of Form M2.
[315] Some of the expansion could also be considered "entry" into the market for the supply of a specific relevant vessel class, as the capacity used for expansion may also be used for other vessel classes.
[316] KSOE submitted that the RSI is an approach that is well grounded in economics, and has been used by competition authorities to analyse competitive effects of a merger. The European Commission, for example, has applied this approach in previous merger cases and one example is Case M.7504 – Cemex/Holcim Assets. Paragraph 1.2 of KSOE's responses dated 12 March 2020, to Question 1 of CCCS's RFI dated 5 March 2020.
[317] Paragraph 1.6, Annex 5 of Form M2.
[318] Paragraph 1.7, Annex 5 of Form M2.
[319] Paragraph 1.7, Annex 5 of Form M2.
[320] Paragraph 1.7, Annex 5 of Form M2.

however, if the supplier would have an incentive to exercise market power. Post-merger RSIs below 1 therefore indicate that further analysis is required to rule out anti-competitive effects.

KSOE's RSI methodology

136. KSOE submitted its methodology as follows. The first step consists of identifying which shipyards should be considered as capable shipyards for the purpose of the RSI analysis. The second step consists of considering which part of the capable shipyards' capacity should be allocated to the specific relevant vessel classes. The third step estimates the demand for the specific relevant vessel classes, and computing the RSI values for the specific relevant vessel classes.

(a) First step – identifying capable shipyards

137. KSOE submitted that shipyards capable of building each specific relevant vessel class are assumed to be:

(a) Shipyards which have built or received orders for the specific vessel type in the period of 2004-2019 (and therefore have the *technological capability* to build such vessels) and have the *physical capability* to build the specific vessel class[321]; or

(b) Shipyards which have not themselves built or received orders for a specific vessel type in the period of 2004-2019 but belong to a shipbuilding group within which another shipyard has built or received orders for a specific vessel type, and have the physical capability to build the specific vessel class.

138. KSOE further submitted that its RSI analysis only considers shipyards that are active, and the capacity of all inactive shipyards (shipyards that have received no orders, or if it has not delivered any vessels from 2016-2018) is set to zero.

(b) Second step – allocating capacities to vessel classes

139. KSOE submitted that it has examined two categories of capacity to measure and allocate capacity, namely the "base" capacity and "balanced" capacity.

[321] KSOE submitted that a shipyard's dimensions – in particular its dock size limits the maximum vessel size that the shipyard can produce. A shipyard is considered physically capable of building a specific vessel class if either:

(a) The shipyard has large enough docks (in terms of breadth and length) to build the specific vessel class; or
(b) The shipyard has produced a vessel of the specific vessel class.

Base capacity

140. According to KSOE, the base capacity of a shipyard should not only be assessed at the level of a specific relevant vessel class, but should be broader and include capacity that was used to produce other vessel classes of a similar size or larger size (given that this capacity could have been used to produce the specific relevant vessel class).[322] KSOE submitted that a shipyard's base capacity for a specific relevant vessel class is thus computed as the maximum of the shipyard's annual historical output (in CGT) for all vessel classes that are in the same or larger size categories[323] as the specific vessel class, over the period from 2004 to 2018. The size categories defined by KSOE, and the mapping of vessel classes to the defined size categories, are set out in **Annex B**.

Balanced capacity

141. KSOE further submitted that it may not be realistic to assume that all of a shipyard's base capacity can be diverted to the relevant vessel class in question, as the shipyard may also use the base capacity to build other vessel classes that belong to the same or larger physical size categories. KSOE submitted that it accounted for this by assuming that only the shipyard's average levels of spare capacity (i.e. capacity that is not typically used to produce vessels), can be readily allocated to expand production of the relevant vessel class in question. KSOE submitted that the shipyard's balanced capacity for the relevant vessel class in question would therefore consist of the sum of (i) the shipyard's average level of production (from 2004 to 2018) for the relevant vessel class in question and (ii) the shipyard's average level of spare capacity (from 2004 to 2018) for the vessel class in question.

(c) Third step – estimating demand for vessel classes and computing RSI values

142. KSOE submitted that it has computed both historical (2018) RSI values and forward-looking RSI values (from 2020-2029) for each of the four relevant vessel classes.

Historical (2018) RSI values

[322] Capacities for vessels that are smaller than a specific relevant vessel class, however, are not considered to be suitable for reallocating to building the specific vessel class. This is to be conservative in estimating what portion of capacity in a shipyard is available to be allocated to the specific relevant class.
[323] Size categories are defined by the physical size of vessels, rather than by CGT.

143. In computing the historical (2018) RSI values, KSOE estimated shipyards' balanced capacities for 2018[324] and relied on historical demand (actual output) in 2018.

Forward-looking RSI values

144. In computing forward-looking RSI values (from 2020 to 2029), KSOE estimated shipyards' *expected* balanced capacities. Expected balanced capacities are computed by subtracting from each shipyard's base capacity (the same base capacity as described above is used) the average level of production in that shipyard of the other vessel classes (excluding the relevant vessel class in question) in the same and larger size categories *multiplied by a market factor*[325]. Further, KSOE relied on demand forecasts published in 2019 for the four relevant vessel classes from three major shipbuilding market intelligence providers, namely Clarksons, [✂] and Maritime Strategies International ("**MSI**").

KSOE's RSI results

145. KSOE submitted that its RSI results show that, under all plausible combinations of assumptions, its competitors would have sufficient capacity to satisfy all expected demand for each of the four vessel classes considered, i.e. the Parties would not become pivotal as a result of the Proposed Transaction as the RSI values are above one.[326] The historical (2018) and forward-looking RSI results submitted by KSOE are set out in **Tables 7** to **10** below.[327]

Table 7: Historical (2018) and forward-looking RSI results for UL/VLCC 200,000+ DWT (in million CGT)[328]

[324] Balanced capacity for 2018 is derived by the taking the maximum historical annual output in the past 15 years (up till 2018) of all vessel classes in the same and larger size categories, net of the average level of production in the past 15 years (up till 2018) of all vessel classes in the same and larger size categories other than the relevant vessel class for which the RSI is computed.
[325] The market factor is equal to the ratio of the average demand forecast to average historical demand for that vessel class.
[326] Paragraphs 3.3 and 3.8 of Form M2; Paragraph 1.1 of KSOE's responses dated 21 January 2020, to CCCS's Letter dated 17 January 2020.
[327] CCCS has presented all of KSOE's RSI results by vessel classes, and not vessel types, given that it has defined the relevant market by the relevant vessel classes. This applies to the rest of the tables presented in this section.
[328] Paragraph 3.59 of Form M2.

Demand source	Balanced capacity	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[✂]	[2.0-3.0]
[✂]	[✂]	[✂]	[✂]	[2.0-3.0]
MSI	[✂]	[✂]	[✂]	[2.0-3.0]
Clarksons	[✂]	[✂]	[✂]	[2.0-3.0]

Table 8: Historical (2018) and forward-looking RSI results for Post-Panamax 15,000+ TEU (in million CGT)[329]

Demand source	Balanced capacity	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[✂]	[1.0-2.0]
[✂]	[✂]	[✂]	[✂]	[2.0-3.0]
MSI	[✂]	[✂]	[✂]	[1.0-2.0]
Clarksons	[✂]	[✂]	[✂]	[1.0-2.0]

Table 9: Historical (2018) and forward-looking RSI results for LNG carriers 40,000+ cu.m. (in million CGT)[330]

Demand source	Balanced capacity	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[✂]	[1.0-2.0]
[✂]	[✂]	[✂]	[✂]	[5.0-6.0]
MSI	[✂]	[✂]	[✂]	[4.0-5.0]

[329] Paragraph 3.67 of Form M2.
[330] Paragraph 3.75 of Form M2.

Demand source	Balanced capacity	Residual capacity [A]	Demand [B]	RSI [A/B]
Clarksons	[✂]	[✂]	[✂]	[1.0-2.0]

Table 10: Historical (2018) and forward-looking RSI results for LPG carriers 60,000+ cu.m. (in million CGT)[331]

Demand source	Balanced capacity	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[✂]	[24.0-25.0]
[✂]	[✂]	[✂]	[✂]	[18.0-19.0]
MSI	[✂]	[✂]	[✂]	[32.0-33.0]
Clarksons	[✂]	[✂]	[✂]	[10.0-11.0]

146. KSOE further submitted the results of an RSI analysis that applied a more stringent definition of capability, in which only shipyards that has a proven track record, or belonging to a shipbuilder group with a proven track record, of producing the specific relevant vessel *class* (and not just the specific vessel type) are considered capable.[332] KSOE submitted that the RSI results (as seen in **Tables 11** to **14** below) indicate that even when a more stringent definition of capability is applied, the merged entity would not be pivotal as a result of the Proposed Transaction as the RSI value for each of the four relevant vessel classes is above one.

Table 11: Historical (2018) and forward-looking RSI results for UL/VLCC 200,000+ DWT (in million CGT) – proven track record at vessel class level[333]

Demand source	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[2.0-3.0]

[331] Paragraph 1.9 of KSOE's responses dated 21 January 2020, to CCCS's Letter dated 17 January 2020.
[332] Paragraph 6.2 of KSOE's response dated 12 March 2020, to Question 6 of CCCS's RFI dated 4 February 2020.
[333] Table 3 of KSOE's response dated 12 March 2020, to Question 6 of CCCS's RFI dated 4 February 2020.

Demand source	Residual capacity [A]	Demand [B]	RSI [A/B]
MSI	[✂]	[✂]	[2.0-3.0]
Clarksons	[✂]	[✂]	[2.0-3.0]

Table 12: Historical (2018) and forward-looking RSI results for Post-Panamax 15,000+ TEU (in million CGT) – proven track record at vessel class level[334]

Demand source	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]]	[✂]	[1.0-2.0]
MSI	[✂]	[✂]	[1.0-2.0]
Clarksons	[✂]	[✂]	[1.0-2.0]

Table 13: Historical (2018) and forward-looking RSI results for LNG carriers 40,000+ cu.m. (in million CGT) – proven track record at vessel class level[335]

Demand source	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[1.0-2.0]
MSI	[✂]	[✂]	[2.0-3.0]
Clarksons	[✂]	[✂]	[1.0-2.0]

Table 14: Historical (2018) and forward-looking RSI results for LPG carriers 60,000+ cu.m. (in million CGT) – proven track record at vessel class level[336]

Demand source	Residual capacity [A]	Demand [B]	RSI [A/B]
Historical (2018)	[✂]	[✂]	[19.0-20.0]
MSI	[✂]	[✂]	[24.0-25.0]

[334] Table 3 of KSOE's response dated 12 March 2020, to Question 6 of CCCS's RFI dated 4 February 2020.
[335] Table 3 of KSOE's responses dated 12 March 2020, to Question 6 of CCCS's RFI dated 4 February 2020.
[336] Table 3 of KSOE's responses dated 12 March 2020, to Question 6 of CCCS's RFI dated 4 February 2020.

Demand source	Residual capacity [A]	Demand [B]	RSI [A/B]
Clarksons	[✂]	[✂]	[7.0-8.0]

147. KSOE submitted that both sets of its RSI results (as seen in **Tables 7** to **14**) underestimate the true level of overcapacity in the shipbuilding industry as the demand forecasts published in 2019 do not accurately reflect the negative impact of the Covid-19 outbreak on the shipbuilding industry.[337] KSOE submitted that Clarksons' forecasted demand published in March 2020 showed a decrease by up to [✂] between 2020 and 2024 compared to the forecast in September 2019.[338] To compensate for this, KSOE carried out the RSI analysis using Clarksons' latest demand forecast published in March 2020. Additionally, KSOE updated its RSI analysis by incorporating 2019 figures.

148. KSOE submitted that the RSI results, shown in **Tables 15** to **16** below, better reflect the prevailing conditions in the commercial shipbuilding industry as it is based on the most recent data on actual vessel output (in 2019) and the demand forecasts that reflect to some extent, the negative impact of the Covid-19 outbreak.[339] KSOE submitted that using the most recent data on demand forecasts and production performance the RSI values are above 1 in all cases.[340]

Table 15: Historical (2019) and forward-looking RSI results for UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU, LNG carriers 40,000+ cu.m. and LPG carriers 60,000+ cu.m. (in million CGT)[341]

Vessel class	Balanced capacity		Residual capacity [A]		Demand [B]		RSI [A/B]	
	Historical (2019)	Clarksons	Historical (2019)	Clarksons	Historical (2019)	Clarksons	Historical (2019)	Clarksons
UL/VLCC 200,000+ DWT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	**[1.0-2.0]**	**[2.0-3.0]**
Post-Panamax 15,000+ TEU	[✂]	[✂]	[✂]	[✂	[✂]	[✂]	**[1.0-2.0]**	**[1.0-2.0]**

[337] Paragraph 3.3.3 of KSOE's responses dated 8 May 2020, to Question 3 of CCCS's RFI dated 27 April 2020.
[338] Footnote 5 of paragraph 4.2 of KSOE's responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 20 April 2020.
[339] Paragraph 3.4 of KSOE's responses dated 8 May 2020, to Question 3 of CCCS's RFI dated 27 April 2020.
[340] Paragraph 3.5 of KSOE's responses dated 8 May 2020, to Question 3 of CCCS's RFI dated 27 April 2020.
[341] Tables 2 to 5 of KSOE's responses dated 18 May 2020, to Question 1 of CCCS's RFI dated 14 May 2020.

Vessel class	Balanced capacity		Residual capacity [A]		Demand [B]		RSI [A/B]	
	Historical (2019)	Clarksons	Historical (2019)	Clarksons	Historical (2019)	Clarksons	Historical (2019)	Clarksons
LNG carriers 40,000+ cu.m.	[✂]	[✂]	[✂]	[✂]	[✂]	[✂	**[2.0-3.0]**	**[2.0-3.0]**
LPG carriers 60,000+ cu.m.	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	**[13.0-14.0]**	**[13.0-14.0]**

Table 16: Historical (2019) and forward-looking RSI results for UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU, LNG carriers 40,000+ cu.m. and LPG carriers 60,000+ cu.m. (in million CGT) – proven track record at vessel class level[342]

Vessel class	Residual capacity [A]		Demand [B]		RSI [A/B]	
	Historical (2019)	Clarksons	Historical (2019)	Clarksons	Historical (2019)	Clarksons
UL/VLCC 200,000+ DWT	[✂]	[✂]	[✂]	[✂]	**[1.0-2.0]**	**[2.0-3.0]**
Post-Panamax 15,000+ TEU	[✂]	[✂]	[✂]	[✂]	**[1.0-2.0]**	**[1.0-2.0]**
LNG carriers 40,000+ cu.m.	[✂]	[✂]	[✂]	[✂]	**[1.0-2.0]**	**[1.0-2.0]**
LPG carriers 60,000+ cu.m.	[✂]	[✂]	[✂]	[✂]	**[9.0-10.0]**	**[8.0-9.0]**

CCCS's assessment

Regulatory barriers

149. CCCS understands from [✂] that there are no regulations governing the purchase of commercial vessels from shipyards that are located overseas.[343] However, vessels operating to and from Singapore must meet the mandatory requirements of safety and pollution regulations and Singapore is a signatory to international regulations that govern the shipping industry.

Role of classification societies

[342] Table 8 of KSOE's responses dated 18 May 2020, to Question 1 of CCCS's RFI dated 14 May 2020.
[343] Paragraph 2 of Notes of Call with [✂] dated 20 September 2019.

150. In relation to the role of classification societies, market feedback suggests that these classification societies only ensure that a commercial vessel built by the shipyard has a certain minimum quality that meets the regulatory standard required,[344] by standardising the technical requirement and quality of commercial vessels across all shipbuilders.[345] CCCS notes however that customers can still perceive differences in the quality of commercial vessels that are built by each shipbuilder as shipbuilders may vary in their techniques and skills (e.g. design and engineering), production capability of workers, standards and quality management etc.[346]

Barriers to entry and expansion

151. Market feedback suggests that barriers to entry in the supply of commercial vessels for new shipbuilders are generally high, as the building of commercial vessels requires substantial resources and investments into capital, land, labour, technology and knowledge.[347] Further, CCCS understands that it would take time for shipbuilders to gain experience and reputation in order to attract customers.[348] CCCS also notes from market feedback that, besides prices, the quality of the shipbuilders' commercial vessels, technical capabilities and reputation are key factors that customers consider when choosing a supplier.[349] Therefore, even after initial entry, the survival of new shipbuilders hinges on their ability to develop adequate technical expertise to meet the requirements of customers.

152. Market feedback suggest that barriers to entry and expansion are higher for the supply of more sophisticated vessel types such as LNG carriers and LPG carriers,[350] due to the higher level of technical expertise and financial investment into the facilities required.[351] The market feedback therefore suggests that the lack

[344] [✂]'s responses dated 18 March 2020, to Question 21 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 9 March 2020, to Question 30 of CCCS's RFI dated 17 February 2020.
[345] [✂]'s responses dated 26 February 2020, to Question 30 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 30 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 31 March 2020, to Question 22 of CCCS's RFI dated 19 March 2020; [✂]'s responses dated 17 April 2020, to Question 22 of CCCS's RFI dated 19 March 2020.
[346] [✂]'s responses dated 9 March 2020, to Question 30 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 5 March 2020, to Question 30 of CCCS's RFI dated 17 February 2020.
[347] [✂]'s responses dated 24 September 2019, to Question 37 of CCCS's RFI dated 17 September 2019.
[348] [✂]'s responses dated 26 September 2019, to Question 42 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 27 September 2019, to Question 30 of CCCS's RFI dated 17 September 2019.
[349] [✂]'s responses dated 24 September 2019, to Question 4 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 September 2019, to Question 4 of CCCS's RFI dated 17 September 2019; Paragraph 16 of [✂]'s responses dated 24 September 2019, to CCCS's RFI dated 17 September 2019.
[350] [✂]'s responses dated 27 September 2019, to Question 37 of CCCS's RFI dated 17 September 2019.
[351] [✂]'s responses dated 27 September 2019, to Questions 37 and 40 of CCCS's RFI dated 17 September 2019.

of a track record and experience may also pose a significant entry/expansion barrier for shipbuilders with respect to such vessel types.[352]

153. In relation to the difficulties that shipbuilders may face in expanding their production mix to build smaller vessel classes, market feedback suggests that shipbuilders which specialise in larger vessel classes may not switch to constructing smaller vessel classes due to the cost inefficiencies that they may incur.[353] In relation to the challenges that shipbuilders may face in expanding their production mix to build larger vessel classes, market feedback suggests that shipbuilders may be physically constrained by the dock size and equipment required to build larger vessel classes[354], and substantial investment is required on the part of the shipbuilders to upgrade their facilities and equipment to build larger vessel classes.[355] CCCS also understands from the market feedback that the construction of larger vessel classes may require additional manpower, skills and experience and it is not so easy to construct a larger vessel class within a short period of time.[356]

154. For LNG carriers in particular, market feedback suggests that it is very capital intensive to build large LNG carriers, and customers tend to require assurance that the shipbuilders have the experience to build such large LNG carriers before committing to the purchase.[357] Larger and smaller classes of LNG carriers may also require different types of cargo tank systems.[358] Market feedback also suggests that it is not as easy to switch construction between different vessel sizes of Moss-type LNG carriers.[359]

---

[352] [✂]'s responses dated 12 February 2020, to Question 36 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 20 February 2020, to Question 36 of CCCS's RFI dated 12 February 2020, [✂]'s responses dated 18 March 2020, to Question 36 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 36 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 5 March 2020 to Question 36 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 4 March 2020, to Question 46 of CCCS's RFI dated 17 February 2020.

[353] [✂]'s responses dated 28 February 2020, to Questions 6 and 8 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 18 March 2020, to Question 7 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 16 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 4 March 2020, to Questions 11 and 13 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 5 March 2020 to Question 14 of CCCS's RFI dated 17 February 2020.

[354] [✂]'s responses dated 20 February 2020, to Questions 7 and 9 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 5 March 2020 to Question 13 of CCCS's RFI dated 17 February 2020.

[355] [✂]'s responses dated 24 February 2020, to Question 13 of CCCS's RFI dated 17 February 2020.

[356] [✂]'s responses dated 5 March 2020, to Question 13 of CCCS's RFI dated 17 February 2020.

[357] [✂]'s responses dated 31 March 2020, to Question 11 of CCCS's RFI dated 19 March 2020.

[358] [✂]'s responses dated 31 March 2020, to Question 12 of CCCS's RFI dated 19 March 2020.

[359] [✂]'s responses dated 28 February 2020, to Question 9 of CCCS's RFI dated 12 February 2020.

155. For containerships, market feedback suggests that larger containerships require thicker steel plates that need a special welding certification.[360] For LNG carriers and LPG carriers, market feedback suggests that special facilities for cutting, bending and welding as well as high skilled workers are required as LPG carriers and LPG carriers require a special type of steel or aluminium that is tolerable to low temperature as the temperature of the cargo for LNG carriers and LPG carriers have to be kept low.[361]

Instances of market entry

156. In terms of actual market entry, CCCS notes that KSOE has provided instances of new entry in the building of each of the four relevant vessel classes from 2009 to 2019. For Post-Panamax 15,000+ TEU, KSOE submitted eight (8) instances of shipbuilders starting to build Post-Panamax 15,000+ TEU from 2011 to 2015.[362] Based on the five-year cumulative market shares for global supply of Post-Panamax 15,000+ TEU for 2014 to 2018, CCCS notes that these entrants make up most of the suppliers, besides the Parties, with a sizeable combined cumulative market share of [50-60]%. For UL/VLCC 200,000+ DWT, KSOE submitted three (3) instances of shipbuilders starting to build UL/VLCC 200,000+ DWT from 2010 to 2014. However, only one (1) of them (HHIC) had a market share of [0-10]% for the period from 2014 to 2018. The other two (2) new entrants (China Huarong Energy Company Limited and New Century Shipbuilding Group) [✂] between 2014 and 2018. For LNG carriers 40,000+ cu.m., KSOE submitted two (2) instances of shipbuilders starting to build LNG carriers 40,000+ cu.m. since 2015 to 2019. However, only one (1) of them (China Merchants Group) had a market share of [0-10]% for the period from 2014 to 2018, and the other new entrant (Zvezda) [✂] between 2014 to 2018. For LPG carriers 60,000+ cu.m., KSOE submitted three (3) instances of shipbuilders starting to build LPG carriers 60,000+ cu.m. from 2012 to 2015. Their combined cumulative market shares between 2014 to 2018 was not high, at [10-20]%. Considering the market share growth of entrants for the four relevant vessel classes, CCCS notes that the barriers to new entry and expansion in a particular vessel class are likely higher for LNG carriers 40,000+ cu.m., UL/VLCC 200,000+ DWT and LPG carriers 60,000+ cu.m., as compared to Post-Panamax 15,000+ TEU. Furthermore, the market share growth suggests that it would take a number of years for entrants to expand sales.

Instances of production/delivery gaps

[360] [✂]'s responses dated 4 March 2020, to Question 13 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 April 2020, to Question 2(b) of CCCS's RFI dated 17 April 2020.
[361] [✂]'s responses dated 10 October 2019, to Question 8 of CCCS's RFI dated 7 October 2019.
[362] Annex 1 of KSOE's responses dated 28 May 2020, to Question 1 of CCCS's RFI dated 22 May 2020.

157. In terms of shipbuilders restarting production of a particular vessel class after a break in production, CCCS notes that KSOE has also provided instances of production/delivery gaps by shipbuilders for each of the four relevant vessel classes for the time period 2009 to 2019.[363] In relation to LNG carriers 40,000+ cu.m., KSOE listed two (2) shipbuilders that had a production gap of between 7 to 9 years, but only one (1) of them (Imabari) has [✂] from 2014 to 2018 (with a low market share of [0-10]%). In relation to UL/VLCC 200,000+ DWT, KSOE submitted a list of seven (7) shipbuilders that had a delivery gap of between 6 to 9 years but the combined market shares of three (3) of them from 2014 to 2018 was low at [0-10]%. The other four (4) shipbuilders had [✂] during this period. In relation to LPG carriers 60,000+ cu.m., KSOE submitted only one (1) shipbuilder (DSME) that had a production gap of 5 years, and the market shares of DSME was [10-20]% from 2014 to 2018.[364] In relation to Post-Panamax 15,000+ TEU, KSOE did not provide any instance of shipbuilders having a production gap. Considering the above, CCCS notes that while it is possible for shipbuilders to retain the capability to produce vessels despite a long production gap, the market shares of the shipbuilders tend to remain low, which suggests that such shipbuilders are unlikely to be able to quickly expand sales and production.

Residual supply index analysis

(a) <u>Assumptions required for the RSI analysis to be valid</u>

158. CCCS notes at the outset that multiple assumptions are needed for the RSI analysis to be valid for the purpose of using it as a screen for the ability of an entity to exercise market power, and the evidence does not suggest that these assumptions hold in the market for the supply of commercial vessels. Correspondingly, the RSI analysis may not provide a reliable indication of the ability of the merger parties to raise prices unilaterally following the Proposed Transaction.

159. The following paragraphs set out the assumptions that are needed for the RSI analysis to be valid, and the CCCS's assessment on why they do not hold.

<u>Homogenous products</u>

[363] Annex 2 of KSOE's responses dated 28 May 2020, to Question 2 of CCCS's RFI dated 22 May 2020.
[364] Additionally, CCCS has received feedback specifically for LPG carriers suggesting that shipbuilders will lose the welding technology for low temperature steel plates if they stop constructing LPG carriers for several years as such technology cannot be mechanised or automated. [✂]'s responses dated 24 April 2020, to Question 2(a) of CCCS's RFI dated 17 April 2020.

160. The RSI analysis relies on the assumption that commercial vessels are homogenous products, and customers are indifferent and face no friction in switching from one shipbuilder to another. However, CCCS notes from market feedback that commercial vessels are perceived by ship owners as differentiated products and ship owners do encounter some costs in switching from one shipbuilder to another.

161. Third party feedback suggests that ship owners are not indifferent between the Korean, Chinese and Japanese shipbuilders in terms of the technological capability, quality of vessels built, flexibility to meet customers' requests and delivery schedule.

(a) **Chinese shipbuilders.** CCCS notes from market feedback that compared to Korean shipbuilders, the Chinese shipbuilders have less experience and their vessels may be of a lower quality, which translate to a longer delivery time due to the multiple attempts required to meet the expected quality.[365] Nonetheless, feedback from shipowners suggests that the Chinese shipbuilders are more price competitive, and are able to provide better payment terms and financing conditions.[366] Overall, the feedback suggests that therefore, customers consider that there are differences between Chinese shipbuilders and Korean shipbuilders.[367,368]

(b) **Japanese shipbuilders.** With respect to Japanese shipbuilders, feedback suggests that they have the expertise and have a similar level of technology compared to the Korean shipbuilders.[369] However, feedback suggests that

[365] [✂]'s responses dated 8 October 2019, to Question 11 of CCCS's RFI dated 7 October 2019; [✂]'s responses dated 4 March 2020, Question 31 of CCCS's RFI dated 17 February 2020.
[366] [✂]'s responses dated 26 February 2020, to Question 31 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 4 March 2020, to Question 31 of CCCS's RFI dated 17 February 2020.
[367] [✂]'s responses dated 4 March 2020, to Question 31 of CCCS's RFI dated 17 February 2020.
[368] Specifically on the supply of LNG carriers, CCCS notes KSOE's submission at paragraphs 4.16 to 4.37 of KSOE's Third Supplementary Submissions dated 3 August 2020 about the apparent improvements of CSSC's quality to price ratio and that CSSC has made efforts to improve its design and technological capabilities for LNG carriers. Therefore, the competitive constraint posed by CSSC is likely to increase in the short term. In this regard, CCCS notes the mixed feedback from customers that while Chinese shipbuilders are catching up to the Korean shipbuilders in the supply of LNG carriers, there are currently still some perceived differences in terms of vessel quality and technological capability; [✂]'s responses dated 8 October 2019, to Questions 1(e) and 11 of CCCS's RFI dated 7 October 2019; [✂]'s responses dated 31 March 2020, to Question 23 of CCCS's RFI dated 19 March 2020.
[369] [✂]'s responses dated 9 March 2020, to Question 32 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 5 March 2020, to Question 32 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 32 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 31 March 2020, to Questions 24 and 32 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 17 April 2020, to Question 24 of CCCS's RFI dated 19 March 2020.

the vessels built by Japanese shipbuilders are more expensive and also require a longer delivery time.[370] Further, Japanese shipbuilders are perceived as inflexible in their customer relations as they do not always accommodate customised requests.[371] Feedback suggests that therefore, customers consider that there are differences between the Japanese and Korean shipbuilders despite the similarity in technological expertise.[372]

(c) **Korean shipbuilders.** Even within Korean shipbuilders, CCCS notes from market feedback that ship owners are not indifferent between the individual shipbuilders. Feedback suggests that there are differences between the product offerings by the individual shipbuilders in terms of vessel design, specifications and prices.[373]

162. In addition, CCCS notes that the differences in capability between the Korean shipbuilders vis-à-vis the Japanese and Chinese shipbuilders are especially apparent in the supply of LNG carriers, which requires more sophisticated technology and know-how compared to the oil tankers, containerships and LPG carriers.[374,375]

163. In view of the above, CCCS is of the view that ship owners do not view commercial vessels as homogenous products. They are not indifferent and do face some friction in switching from one shipbuilder to another. Therefore, the assumption that commercial vessels are homogeneous products is not valid.

Cost efficiencies

164. Another assumption of the RSI analysis is that all capacity in the market can be utilised with equal cost efficiency, as otherwise other shipbuilders would not be able to absorb demand at the same cost as the merging parties. However, CCCS notes that this holds true only if all competitors are similar to the merging parties

[370] [✂]'s responses dated 24 September 2019, to Question 3 of CCCS's RFI dated 17 September 2019.
[371] [✂]'s responses dated 24 September 2019, to Question 3 of CCCS's RFI dated 17 September 2019; Paragraph 7 of [✂]'s responses dated 24 September 2019 to CCCS's RFI dated 17 September 2019.
[372] Paragraph 7 of [✂]'s responses dated 24 September 2019, to CCCS's RFI dated 17 September 2019.
[373] [✂]'s responses dated 8 October 2019, to Question 1(e) of CCCS's RFI dated 7 October 2019; [✂]'s responses dated 26 June 2020, to Question 2 of CCCS's RFI dated 22 June 2020.
[374] [✂]'s responses dated 24 February 2020, to Question 31 of CCCS's RFI dated 17 February 2020.
[375] On this point, CCCS notes KSOE's submission at paragraph 3.1 of KSOE's Third Supplementary Submissions dated 3 August 2020 that there is a low degree of differentiation between large LNG carriers supplied by different shipbuilders. As explained in paragraphs 161 and 227 to 229, CCCS notes that this submission is not fully supported by market feedback from ship owners as the feedback is mixed about the extent of differentiation between different shipbuilders.

in terms of cost efficiency, and if their marginal costs are not increasing with greater utilisation or adjustments in production mix.

165. CCCS is of the view that this assumption is unlikely to hold for two reasons:

(a) First, CCCS notes from market feedback that shipbuilders may tend to specialise in a certain production mix comprising only a few vessel types and classes, and such specialisation can bring about greater cost efficiency for the shipbuilders.[376] While shipyards can physically build different types of commercial vessels, they would unlikely do so from a commercial perspective.[377] Instead, shipbuilders would typically either focus on building vessel types with higher value, or specialise in vessel types that they have had experience in building as this would lower their learning costs.[378] This would optimise a shipyard's building capacity and efficiency. Therefore, shipbuilders would achieve greater cost efficiencies through their specialisation in building only a few vessel types and classes.

(b) Second, CCCS notes from market feedback that the construction of different vessel types requires different expertise, technology and skills. In particular, the construction of LNG carriers would require more sophisticated technology and skills. As a result, construction of more sophisticated vessels would require specific investments in the equipment needed to build these vessels, as well as training in the specific welding techniques.[379] Therefore, CCCS is of the view that the cost structure for building more sophisticated vessels such as LNG carriers are likely to have a different cost structure from those of shipbuilders which do not build these sophisticated vessels.

166. CCCS is therefore of the view that shipbuilders are unlikely to have similar cost efficiencies and the assumption of similar cost efficiencies between shipbuilders is also unlikely to hold.

Mode of competition

The RSI analysis is designed to assess whether the Parties have the ability to raise prices unilaterally through a decision to withhold output (i.e., capacity) for

[376] [✂]'s responses dated 27 September 2019, to Question 17 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 24 September 2019, to Question 17 of CCCS's RFI dated 17 September 2019.
[377] [✂]'s responses dated 27 September 2019, to Question 15 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 February 2020, to Question 9 of CCCS's RFI dated 17 February 2020.
[378] [✂]'s responses dated 24 September 2019, to Question 17 of CCCS's RFI dated 17 September 2019.
[379] [✂]'s responses dated 24 April 2020, to Question 2(b) of CCCS's RFI dated 17 April 2020.

homogenous products. However, CCCS notes that that there are perceived differences by customers of the commercial vessels supplied by different shipbuilders, and shipbuilders compete by setting prices for their differentiated products (instead of setting output/capacity for homogeneous products) in the industry. This is supported by market feedback that ship owners consider price as one of the key factors in selecting the shipbuilder to contract with.[380]

167. CCCS is therefore of the view that it may be inappropriate to rely on the RSI analysis, which assumes that shipbuilders compete by setting capacity for their homogeneous commercial vessels.

RSI threshold

168. CCCS notes from existing literature that the application of the RSI analysis in the supply of commercial vessels would require the identification of a reliable and appropriate value for the RSI threshold as a screen test for market power, which might not necessarily be equivalent to one.[381]

169. In theory, an RSI equal to one corresponds to the lower bound of excess capacity (relative to demand) in the market ensuring a zero cost mark-up.[382] However, there are different measures of costs, and an over- or underestimation of the costs may in turn have consequences on the estimated relationship with the RSI. Hence, literature suggests that the lower bound can be greater than one, and the threshold could differ across markets depending on the prevailing state of competition in those markets. In fact, existing studies on wholesale electricity markets have assessed quite different values for the relevant RSI threshold, ranging from 1.2 to 1.9.[383]

170. Therefore, the literature on the RSI analysis shows that an RSI value above one[384] may be needed for some markets to ensure that Parties are unable to increase prices unilaterally through withholding their capacity. Consequently, CCCS notes that

[380] [✂]'s responses dated 26 September 2019, to Question 4 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 June 2020, to Question 1 of CCCS's RFI dated 22 June 2020.
[381] Sheffrin, Anjali. 2002. 'Predicting Market Power Using the Residual Supply Index'; Tsangaris, Panagiotis. 2017. Capacity Withdrawals in the Electricity Wholesale Market: Between Competition Law and Regulation. Munich Studies on Innovation and Competition; London Economics (2007). Structure and Performance of Six European Wholesale Electricity Markets in 2003, 2004, 2005; Bataille *et al.* (2014). Screening Instruments for Monitoring Market Power in Wholesale Electricity Market – Lessons from Applications in Germany.
[382] Tsangaris (2017).
[383] Sheffrin (2002); London Economics (2007); Bataille *et al.* (2014).
[384] RSI value above one would indicate that the residual industry capacity must more than offset the market demand.

this implies that an RSI value of one may not be the appropriate figure for the RSI threshold in screening for the ability to exert market power in the supply of commercial vessels.

(b) Revised RSI analysis

171. Notwithstanding the above, CCCS has proceeded to carry out a revised RSI analysis *which addresses the weakest features in KSOE's RSI methodology*, while maintaining the reasonable features.[385] The following paragraphs set out the features of KSOE's RSI methodology that CCCS has maintained, and the features that CCCS has adjusted.

Physical capability and technological capability

172. CCCS agrees with KSOE's submission that a shipyard's capability to build a certain vessel is based on two requirements: physical capability and technological capability. Both physical capability and technological capability have to be satisfied (it is not sufficient to satisfy only one of the two). CCCS has maintained the way that physical capability is assessed by the Parties – based on market feedback[386], it seems reasonable that: (i) if a shipyard has a direct track record of building vessels in a given vessel class or in a larger class of the same vessel type or, alternatively, (ii) it has delivered or contracted vessels with both length and breadth larger than the average length and breadth of the vessels in a given class, a shipyard can be assumed to be physically capable of building that vessel class.

173. For technological capability, CCCS notes that in KSOE's first RSI analysis, shipyards are assumed to have the technological capability for a given vessel class if they have built vessels of any class of the same *vessel type* during the past 15 years (direct track record), or if any other shipyard in the same shipbuilder group satisfies the requirement (indirect track record). CCCS notes that while KSOE subsequently submitted the RSI results using a more conservative definition of technological capability based on *vessel class*, this stricter definition of technological capability may not be necessary. While there is some market feedback that building larger vessels may require some additional experience/skills, the initial definition of technological capability based on vessel type appears to be reasonable as the vessel type is likely to capture the salient features of a vessel technology. Further, two additional constraints provided for in

[385] CCCS engaged an external economic consultant to assist with its revised RSI analysis.
[386] [✂]'s responses dated 27 February 2020, to Questions 3 and 7 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 28 February 2020, to Question 3 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Questions 8 and 9 of CCCS's RFI dated 12 February 2020.

CCCS's revised RSI analysis (and also in KSOE's first RSI analysis) mitigate concerns that additional know-how may be required to build larger vessels:

(a) The first constraint is that the shipyard also has to be physically capable for the relevant vessel class and this always implies a direct track record of vessels that are at least on average as large as the average-sized relevant vessel class (although the track record might be for other vessel types);

(b) The second constraint is on the supply substitutability of capacity: even for a shipyard that is physically and technologically capable in one of the four relevant vessel classes, the amount of capacity that can be used to actually meet demand in these classes is restricted based on the size of vessels actually delivered in the past by the shipyard; specifically, this capacity equals at most the maximum capacity observed in each shipyard's own track record for a set of vessel classes that are in the same or in larger size categories as the relevant vessel classes, i.e. capacity that was never used to build vessel classes of the same or larger size categories as the relevant vessel classes is excluded.

174. However, CCCS has revised KSOE's assumption of frictionless transfer of technological know-how across shipyards within the same shipbuilding group. The market feedback suggests that it would take time to transfer capabilities across shipyards as different shipyards may have different ways of business, working practices and supply chains especially in terms of outsourcing of suppliers. Transfer of capabilities may also be limited by the availability of workforce and differences in the specifications of each shipyard. Therefore, in contrast to KSOE's argument that technological capability can be instantaneously transferred across shipyards within the same shipbuilding group, the evidence suggests that there could be difficulties in the transferability of technological capabilities across shipyards. However, the evidence does not allow CCCS to provide a reliable estimate of the probability with which such a transfer of the technology would occur for each of the four relevant vessel classes, apart from LNG carriers. Based on the average number of years required for a new shipyard to contract its first LNG carrier,[387] CCCS has applied a 20% discount factor[388] to a shipyard's

[387] Paragraph 1.3.1 of KSOE's responses dated 8 May 2020, to Question 1 of CCCS's RFI dated 27 April 2020.
[388] The probability has been assessed as the average likelihood, in a 10-year time horizon, that the shipyard is able to supply its first LNG carrier. [✂].
In practice the probability is proxied as follows. During the first 5-years period there is a transition of the shipyard from a zero probability of contracting for LNG types, to a state where this probability equals one in the fifth year (and stays at one thereafter). In this transition, the probability additively increases every year by a factor of 1/5

capacity that is used to build LNG carriers 40,000+ cu.m. when the shipyard has no direct track record in building LNG carriers 40,000+ cu.m., but another shipyard in the same shipbuilding group has a direct track record in building LNG carriers 40,000+ cu.m.[389]

Multiple counting of a shipyard's estimated base capacity and spare capacity for the relevant vessel classes

175. CCCS notes that in KSOE's RSI methodology, a shipyard's estimated base capacity and spare capacity may be accounted for multiple times. In doing so, KSOE's assumption is that the same spare capacity (derived from the base capacity) can be simultaneously allocated to each of the four relevant vessel classes. Such an assumption may be reasonable only in the instance that the merged entity would withhold capacity in only one of the four relevant vessel classes at each point in time to raise prices, which may not necessarily be the case since the merged entity could potentially have the incentive to withhold capacity in all four or some of the relevant vessel classes simultaneously. The following hypothetical example illustrates how a shipyard's base capacity may be accounted for multiple times.

Example of duplication of estimated base capacity

Consider the estimation of a shipyard's base capacity for LNG carriers 40,000+ cu.m. This will be estimated as the shipyard's maximum historical annual output, taking into account **large vessels** and **very large vessels,** over the period 2004-2018 (since LNG carriers 40,000+ cu.m. are mapped to the large size category by KSOE). Assume this is 250,000 CGT.

Now consider the estimation of the same shipyard's base capacity for LPG carriers 60,000+ cu.m. This will be estimated as the shipyard's maximum historical annual output, taking into account **medium vessels**, **large vessels** and **very large vessels,** over the period 2004-2018 (since LPG carriers 60,000+ cu.m. are mapped to the medium size category by KSOE). This may also be 250,000 CGT, if the shipyard's maximum historical annual output was not for medium vessels.

(probability in year 1 = 0.2; probability in year 2 = 0.4 and so on). Therefore, over a 10-year period, the average probability of the shipyard to contract LNG carriers is 0.8.

[389] There is a probability lower than one that, on average, over the 10-year time horizon considered in the forward-looking RSI (2020-2029) such a shipyard with no direct track record can use its capacity to build LNG carriers.

As a consequence, there is a duplication or overlap in the estimation of the shipyard's base capacity for LNG carriers 40,000+ cu.m. and the same shipyard's base capacity for LPG carriers 60,000+ cu.m.

Since spare capacity (and balanced capacity) are derived from base capacity, this means there may also be duplication or overlaps in the estimation of a shipyard's balanced capacity for LNG carriers 40,000+ cu.m. and the shipyard's balanced capacity for LPG carriers 60,000+ cu.m.

176. In order to avoid the duplication in the estimation of a shipyard's base capacity for each of the four relevant vessel classes, CCCS estimated a shipyard's base capacity for a specific vessel class as the maximum of the shipyard's annual historical output (in CGT) for all vessel classes that are only in the same size categories as the specific vessel class, over the period from 2004 to 2015.[390] CCCS has defined this as the shipyard's incremental base capacity for the specific vessel class.

177. This means that in the above example, the shipyard's incremental base capacity for LNG carriers 40,000+ cu.m. will be estimated as its maximum historical annual output of large vessels alone. The same shipyard's incremental base capacity for LPG carriers 60,000+ cu.m. will be estimated as its maximum historical annual output of medium vessels alone. Therefore, there are no overlaps in the estimation of the shipyard's base capacity for LNG carriers 40,000+ cu.m and the shipyard's base capacity for LPG carriers 60,000+ cu.m (and correspondingly no overlaps in the estimation of spare capacities and balanced capacities).

178. As it is not realistic to assume that all of the base capacity will be used to build the specific relevant vessel class exclusively, CCCS computed the shipyard's balanced capacity for the specific relevant vessel class by subtracting the average levels of production of all the other vessel classes in the same size category only

[390] This does not mean that the shipyard's capacity for vessel classes in larger size categories will not be taken into account in the estimation of the shipyard's capacity for the relevant vessel class – it will eventually be taken into account at a later stage of the methodology. However, a shipyard's capacity for vessel classes in larger size categories will only be used to satisfy demand for the relevant vessel class after the capacity has been used to satisfy demand for the vessel classes in those larger size categories. This is to model for the higher preference (due to efficiency) that a shipyard would have for using capacity for larger vessels to build those larger vessels rather than smaller vessels. This is detailed below in the hierarchical allocation of capacities in CCCS's revised RSI analysis.

from the incremental base capacity.[391] CCCS has defined this as the shipyard's incremental balanced capacity for that specific vessel class.

Allocation of a shipyard's entire spare capacity to the relevant vessel class

179. CCCS notes that in KSOE's RSI methodology, it is assumed that a shipyard's spare capacity would be allocated entirely to the relevant vessel classes, even though the shipyard's spare capacity could also be allocated to the other non-relevant vessel classes in the same or larger size categories that also contribute to the estimation of the shipyard's base capacity (and spare capacity). For example, in estimating a shipyard's base capacity for LNG carriers 40,000+ cu.m, the shipyard's capacity for seven (7) other vessel classes (in the large and very large-sized categories) is also included. This means that the shipyard's spare capacity may actually be used to build these other seven (7) vessel classes instead of being dedicated to build LNG carriers 40,000+ cu.m alone.

180. CCCS is of the view that this assumption can be maintained, as the four relevant vessel classes are the vessel classes where the Parties may have the incentive to withhold capacity following the Proposed Transaction and therefore are also the vessel classes where competitors may need to use their spare capacities to supply unmet demand. Therefore, it is reasonable to assume that a shipyard's estimated spare capacity would be allocated only to the four relevant vessel classes (but there would be no overlap in allocation between the four relevant vessel classes as explained above).

Substitution between vessel classes in different size categories

181. CCCS notes that KSOE's RSI analysis implies substitutability from larger to smaller classes, but not the reverse. Shipyards can move available capacity within a size category and from larger to smaller size categories: i.e. output in track records for larger vessels can be used to build smaller vessels; on the contrary, output in track records for smaller vessels cannot be used to build larger vessels. Whilst CCCS agrees with this approach, it is of the view that there may be some rigidities in switching a shipyard's capacity from building larger vessels to building smaller vessel classes, as the market feedback suggests that shipbuilders may lose some efficiency when capacity for building larger vessels is used to meet demand for smaller vessels. Shipbuilders are therefore likely to prefer to first use

[391] KSOE computed a shipyard's balanced capacity by subtracting the average levels or production of all the other vessel classes in the same or larger size categories as KSOE's base capacity included output of vessel classes in the same or larger size categories.

such capacity to build the larger vessels. These rigidities have been modelled for in CCCS's revised RSI analysis, through a *hierarchical capacity allocation*: capacity in shipyards is first allocated to vessel classes in the same size category from which it is derived, and used for vessel classes in smaller size categories only after there is no excess demand left at that level.

182. When the allocation of demand is completed, capacity that was transferred from larger to smaller vessel classes but was not used to satisfy demand for the smaller vessel classes is transferred back to the vessel class of origin, so that the RSI values properly reflect the residual capacity attributable to the vessel class of origin. This adjustment is necessary to avoid all the residual capacity ending up in the smaller vessel classes and resulting in an overestimated RSI value for smaller vessel classes and underestimated RSI values for larger vessel classes. CCCS has defined the capacity that takes into account this reallocation, as the shipyard's available balanced capacity.

Fractions of capacity at the shipyard level

183. CCCS notes that KSOE's RSI analysis aggregates shipyards' capacities into an overall industry capacity in CGTs in a given relevant vessel class. When measured in CGT, fractions of capacity that, on their own at the shipyard level, would be insufficient to build an entire average capacity vessel (in CGT) of the relevant class can arise. However, KSOE's methodology would pool such fractional capacities across all shipyards together, and the aggregated capacity would then contribute to meeting demand in the RSI analysis. CCCS however notes that what matters is how many full vessels each shipyard can supply based on its own capacity. While KSOE has argued that the building of a commercial vessel typically takes a few years and shipbuilders can build various parts of vessels at different points in time, CCCS notes that in the RSI analysis, industry demand is estimated through the average annual demand forecast for deliveries and matched with an average capacity to deliver. The analysis therefore assesses whether, in a given year, each capable shipyard can contribute to satisfying such demand, expressed in terms of full vessels. Fractional capacity can instead only contribute vessels that would be delivered in years to come. Therefore, given that the overall approach does not take into account vessels' construction times, fractions of capacity at the shipyard level should not be considered.

184. CCCS has revised the methodology by converting capacity at the shipyard level to number of units of an average capacity vessel (in CGT) in the relevant vessel

classes, in order to discard fractions of capacity. Only whole number units of average capacity vessels are used in computing the RSI.

Definition of size categories

185. CCCS also adjusted the size categories and correspondingly adjusted the mapping of vessel classes to size categories. In particular, the size categories are defined by considering the historical variation in size observed for the four relevant vessel classes between 1999 to 2018.[392] The size categories defined by CCCS, and the mapping of vessel classes to the defined size categories, are set out in **Annex C**.

186. Separately, **Annex D** sets out the full details and steps of the CCCS's revised RSI methodology.

Demand forecasts used in forward-looking RSI analysis

187. CCCS has focused on a forward-looking RSI analysis rather than a historical RSI analysis, given that a merger assessment is forward looking. KSOE submitted that while it carried out its forward-looking RSI analysis using demand forecasts from three service providers (Clarksons, [✂], and MSI), it is of the view that Clarksons' demand forecasts tend to be unrealistically optimistic compared to other forecasts such as [✂] and MSI.[393] However, CCCS notes that this is not supported by market feedback. Third parties highlighted that Clarksons' demand forecasts are accurate.[394] In fact, CCCS notes from feedback that the Clarksons' database is regarded as one of the most comprehensive in relation to shipbuilding activities as it has a wide information network.[395] Clarksons' demand forecasts also tend to be closer to historical outputs. Therefore, CCCS is of the view that there is no compelling reason to disregard Clarksons' demand forecasts. Additionally, where Clarksons' demand forecasts are more optimistic, using them for the RSI analysis would be a more conservative approach. If the Parties'

[392] The number of size categories to be formed is set to four as this is the minimum number of categories that makes the allocation into size categories of the four relevant vessel classes unconstrained by the number of size categories (e.g. with three size categories, one would be imposing to the data that at least two of the relevant vessel classes should end up in the same category).
[393] Paragraph 3.49 of Form M2; Paragraph 4.2 of KSOE's responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 20 April 2020; Paragraph 3.3.3 of KSOE's responses dated 8 May 2020, to Question 3 of CCCS's RFI dated 27 April 2020.
[394] [✂]'s responses dated 4 March 2020, to Question 7 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 7 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 20 February 2020, to Question 31 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 28 February 2020, to Question 31 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Question 31 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 31 of CCCS's RFI dated 12 February 2020.
[395] [✂]'s responses dated 12 March 2020, to Question 31 of CCCS's RFI dated 12 February 2020.

competitors have sufficient excess capacities to satisfy an optimistic forecasted demand, using less optimistic demand forecasts will similarly reveal sufficient excess capacities. Furthermore, Clarksons has a more recent update of its demand forecasts published in March 2020 that allowed for an analysis of the potential impact of the Covid-19 outbreak. Therefore, CCCS has relied upon the demand forecasts published by Clarksons in the revised RSI analysis.

188. **Table 17** sets out the results of CCCS's revised forward-looking RSI analysis.

Table 17: Forward-looking revised RSI results for vessel units. Technological capability rule: shareable within shipbuilder group and within vessel type[396]

Vessel class **(1)**	**Size category (CCCS)** **(2)**	**Demand (units)** **(3)**	**Residual incremental balanced capacity (units)** **(4)**	**Residual available balanced capacity (units)** **(5)**	**Excess demand (Excess available capacity) (units)** **(6) = (3) - (5)**	**Residual excess capacity (units)** **(7)**	**RSI** **(8)**
Post-Panamax 15,000+ TEU	1	[✂]	[✂]	[✂]	[✂]	[✂]	[0-1.0]
UL/VLCC 200,000+ DWT	2	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
LNG carriers 40,000+ cu.m.	3	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
LPG carriers 60,000+ cu.m.	4	[✂]	[✂]	[✂]	[✂]	[✂]	[4.0-5.0]

189. CCCS notes that the results indicate that demand for Post-Panamax 15,000+ TEU is not met in terms of units of vessels, as the available balanced capacity of the competitors of the merging parties is not sufficient to meet all demand. Market demand would require [✂] vessels than competitors would be able to supply. In the other three relevant vessel classes, the overall number of vessels that the competitors of the merging parties would be available to supply is always larger than the number of vessels that the market demand implies. However, for LNG carriers 40,000+ cu.m., the RSI value is larger than one only marginally.

[396] It is important to note that the average capacity in CGTs of vessels in the different vessel classes are quite different; therefore, units at one level cannot be directly compared with units at another level (large LNG carriers are the largest in terms of CGTs closely followed by Post-Panamax 15,000+ TEU, UL/VLCCs 200,000+ DWT are about one half the CGT of a large LNG, while large LPG carriers are about one third the CGT of a large LNG carrier).

190. CCCS also notes that residual incremental balanced capacity for LNG carriers 40,000+ cu.m, that is, the capacity that is entirely attributable to its vessel size category, would have not been sufficient to satisfy industry demand. Demand for LNG carriers 40,000+ cu.m is only met (RSI value larger than one) because shipyards have a large amount of spare capacity that originates in the second size category, which is left after satisfying demand in that size category. Therefore, the RSI results depends on the methodology, and in particular, on how the size categories are defined.

191. This is further demonstrated by replication of the revised RSI analysis but using the size categories defined by KSOE. The size categories mapped by KSOE generates different combinations of vessel classes within size categories. In addition, the Post-Panamax 15,000+ TEU and UL/VLCC 200,000+ DWT are mapped to the same size category (very large sized category). The results are presented in **Table 18**.

Table 18: Forward-looking revised RSI results when using the size categories set by KSOE. Technological capability rule: shareable within shipbuilder group and within vessel type

Vessel class **(1)**	**Size category (KSOE)** **(2)**	**Demand (units)** **(3)**	**Residual incremental balanced capacity (units)** **(4)**	**Residual available balanced capacity (units)** **(5)**	**Excess demand (Excess available capacity) (units)** **(6) = (3) - (5)**	**Residual excess capacity (units)** **(7)**	**RSI** **(8)**
Post-Panamax 15,000+ TEU	1	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
UL/VLCC 200,000+ DWT	1	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
LNG carriers 40,000+ cu.m.	2	[✂]	[✂]	[✂]	[✂]	[✂]	[0-1.0]
LPG carriers 60,000+ cu.m.	3	[✂]	[✂]	[✂]	[✂]	[✂]	[6.0-7.0]

192. CCCS notes that the results now indicate that the RSI value for Post-Panamax 15,000+ TEU is [1.0-2.0], while the RSI value for LNG carriers 40,000+ cu.m. is [0-1.0]. CCCS notes that this is because with Post-Panamax 15,000+ TEU and UL/VLCC 200,000+ DWT now belonging to the same size category, there may be more excess capacity to meet the industry demand for Post-Panamax 15,000+

TEU, but this leaves less excess capacity available to satisfy the demand for LNG carriers 40,000+ cu.m..

193. The above illustrates that there is at least one relevant vessel class in which competitors may not have sufficient capacity to meet all demand. However, the identification of the vessel class in which this occurs depends on the size categories that are defined. Based on CCCS's size categories, concerns may arise in the class of large containerships Post-Panamax 15,000+ TEU (where the RSI is [0-1.0]). Using KSOE's size categories, concerns may arise in the class of LNG carriers 40,000+ cu.m. (where the RSI is [0-1.0]). The discrepancy also highlights that it is difficult to rely on the RSI analysis to assess the competitive constraints on the merged entity – a change in an assumption/parameter used results in a significant change in outcome.

194. CCCS further notes that the current Covid-19 outbreak may lead to a reduction in expected demand, as KSOE has argued. However, supply may also respond to the crisis with a reduction in industry capacity. The likelihood of an effect on supply due to the current Covid-19 outbreak will depend on whether it is perceived to be a temporary shock or a persistent one. If the present Covid-19 outbreak persists, then a reduction in sector capacity may follow the reduction in demand. There are significant uncertainties on whether the crisis would persist, and there is therefore no evidence available to formulate an expectation about the impact of the crisis on supply. There is, however, some estimate of the impact on demand. The Clarksons' updated demand forecast in March 2020 suggests that demand would be adversely affected in the medium term (5 years). However, demand is expected to revert back to its growth path, as well as to get to the previously expected levels or above thereafter.

195. CCCS has therefore also performed the revised RSI analysis using Clarksons' forecasted demand published in March 2020, to simulate the scenario that the current Covid-19 outbreak is limited to the medium run and the supply capacity remains unchanged. In using Clarksons' forecasted demand published in March 2020, the RSI figures are expected to increase given the reduction in demand and expected output. **Table 19** shows the results of the revised RSI analysis based on Clarksons' forecasts published in March 2020.

Table 19: Forward-looking revised RSI results when using Clarksons forecast published in March 2020. Technological capability rule: shareable within shipbuilder group and within vessel type

Vessel class **(1)**	**Size category (CCCS)** **(2)**	**Demand (units)** **(3)**	**Residual incremental balanced capacity (units)** **(4)**	**Residual available balanced capacity (units)** **(5)**	**Excess demand (Excess available capacity) (units)** **(6) = (3) - (5)**	**Residual excess capacity (units)** **(7)**	**RSI** **(8)**
Post-Panamax 15,000 + TEU	1	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
UL/VLCC 200,000 + DWT	2	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
LNG carriers 40,000 + cu.m.	3	[✂]	[✂]	[✂]	[✂]	[✂]	[1.0-2.0]
LPG carriers 60,000 + cu.m	4	[✂]	[✂]	[✂]	[✂]	[✂]	[4.0-5.0]

196. CCCS notes that the RSI values for all four relevant classes, including Post-Panamax 15,000+ TEU, are now [1.0-2.0]. However, CCCS notes that these results need to be taken with caution since they do not take into account any effects of the crisis on supply, and furthermore, there is a high level of uncertainty in relation to the duration of the crisis. The additional excess capacity arising from the crisis may dissipate in the medium term as demand reverts to its original growth path.

Overall assessment of barriers to entry and expansion

197. In light of the above, CCCS is of the view that the barriers to entry and expansion for the supply of the relevant vessel classes are generally high, particularly for new suppliers of a particular relevant vessel class, given the significant capital outlay and resources required. There is also evidence that the building of more sophisticated vessel types such as LNG carriers and LPG carriers requires higher

technical expertise, and a lack of track record and experience may pose as a significant barrier to the supply of such vessel types. Further, the evidence also suggests that shipbuilders may be constrained by their dock size and technical expertise to build larger vessel classes within each vessel type. While it appears to be easier for shipbuilders building larger vessel classes to switch to building smaller vessel classes, the inefficiencies of doing so may reduce their incentive to do so. Further, CCCS's revised RSI analysis shows that there may be at least one relevant vessel class where the Parties' competitors are unable to serve the industry's forecasted demand, and as such they would be unable to readily expand production for that relevant vessel class.

(c) Countervailing Buyer Power

KSOE's submission

198. KSOE submitted that the shipbuilding industry is characterised by the presence of strong buyers with considerable purchasing power. The main customers of shipbuilders are large and sophisticated shipping companies with substantial countervailing buyer power, irrespective of the vessel type.[397] For oil tankers and containerships, KSOE submitted that these customers enjoy significant countervailing buyer power, considering their strength in terms of the value of orders, the absence of barriers to switching suppliers, and their high level of technical and commercial knowledge and sophistication.[398] For LNG carriers, KSOE submitted that there are strong and sophisticated customers who have access to key information about vessel prices and technical features, and are able to enhance their negotiating position by leveraging the fact that there are alternative suppliers in the market that they can easily switch to, to keep prices low.[399]

199. KSOE submitted that shipbuilders will have to maintain a customer relationship when negotiating and fulfilling individual orders in order to secure future orders across all vessel types.[400] KSOE submitted that many of the customers operate various vessel types at the same time, and are able to leverage on their purchase in one vessel type to prevent the shipbuilders from exploiting any potential power in another vessel type.[401] KSOE also submitted that large shipping companies do

[397] Paragraph 32.3 of Form M1.
[398] Paragraphs 3.32 and 4.25 of KSOE's Supplementary Submissions dated 13 November 2019.
[399] Paragraphs 5.25 and 5.32 of KSOE's Supplementary Submissions dated 13 November 2019; Paragraph 11.94 of Form M2; Paragraph 6.1 of KSOE's Third Supplementary Submissions dated 3 August 2020.
[400] Paragraph 3.36 of KSOE's Supplementary Submissions dated 13 November 2019.
[401] Paragraphs 3.35, 4.27 and 5.28, of KSOE's Supplementary Submissions dated 13 November 2019.

not rely solely on one shipyard for the construction of their vessels, but place orders with multiple shipbuilding companies.[402]

200. KSOE submitted that the use of discounts and options offered by shipbuilders in contractual negotiations further entrenches the countervailing buyer power available to customers, and would continue to constrain the merged entity's position post-Proposed Transaction.[403] KSOE also submitted that the sponsored entry of new competitors into the market is additional evidence of customers' strong buyer power.[404]

CCCS's assessment

201. Market feedback in general[405] indicates that customers do purchase commercial vessels from multiple suppliers, and this applies to all four vessel types i.e. oil tankers[406], containerships[407], LPG carriers[408] and LNG carriers[409]. However, CCCS notes that the fact that customers multi-source, in and of itself, is not an indication of buyer power.

202. CCCS has also considered the size of the Parties' five largest customers for each of the four relevant vessel classes which is shown in **Table 20** below.

Table 20: Top five customers of KSOE and DSME for each of the four relevant vessel classes, based on contract value (EURm) for 2018

KSOE's top customers	Share of total contract value	DSME's top customers	Share of total contract value
UL/VLCC 200,000+ DWT			
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
Post-Panamax 15,000+ TEU			

[402] Paragraph 32.3 of Form M1.
[403] Paragraph 11.105 of Form M2.
[404] Paragraph 11.119 of Form M2.
[405] Only [✂]and [✂] stated that they do not procure commercial vessels from multiple suppliers. [✂]'s responses dated 4 March 2020, to Question 51 of CCCS's RFI dated 17 February 2020; Paragraph 8 of Notes of Call with [✂] dated 27 February 2020.
[406] [✂]'s responses dated 28 February 2020, to Question 30 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020 to Question 51 of CCCS's RFI dated 17 February 2020.
[407] [✂]'s responses dated 9 March 2020, to Question 50 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 50 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 5 March 2020, to Question 50 of CCCS's RFI dated 17 February 2020.
[408] [✂]'s responses dated 24 February 2020 to Question 51 of CCCS's RFI dated 17 February 2020.
[409] [✂]'s responses dated 24 February 2020 to Question 51 of CCCS's RFI dated 17 February 2020.

KSOE's top customers	Share of total contract value	DSME's top customers	Share of total contract value
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]		
LNG carriers 40,000+ cu.m.			
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]
LPG carriers 60,000+ cu.m.			
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]		
[✂]	[✂]		
[✂]	[✂]		
[✂]	[✂]		

203. Based on **Table 20** above, CCCS notes that each of the Parties' customers are large shipping companies that accounts for a significant portion of its sales in 2018. CCCS notes that the observation that the Parties' customers are large shipping companies accounting for a significant proportion of the Parties' sales, is consistent in each year from 2014 to 2018.[410]

204. However, the fact that a customer accounts for a large proportion of the Parties' sale, is not in and of itself, sufficient to conclude that buyer power is strong. Even if these large customers have some buyer power, it may not be sufficient to prevent an SLC in the market if only these large customers are shielded from potential unilateral effects.

205. Market feedback does not corroborate KSOE's submissions that the use of discounts and options offered by shipbuilders are common in contractual negotiations. In relation to the use of discounts, while market feedback suggests that customers would typically engage in price negotiations with the shipbuilders, none of the feedback suggests that shipbuilders offered discounts from the

[410] For UL/VLCC 200,000+ DWT, the largest customer in each year from 2014 to 2018 accounts for between [✂]% of KSOE's sales and between [✂]% of DSME's sales. For Post-Panamax 15,000+ TEU, the largest customer in each year from 2014 to 2018 accounts for between [✂]% of KSOE's sales and between [✂]% of DSME's sales. For LNG carriers 40,000+ cu.m., the largest customer in each year from 2014 to 2018 accounts for between [✂]% of KSOE's sales and between [✂]% of DSME's sales. For LPG carriers 60,000+ cu.m., the largest customer in each year from 2014 to 2018 accounts for between [✂]% of KSOE's sales and between [✂]% of DSME's sales.

outset.[411] In relation to the use of options, market feedback generally does not corroborate KSOE's submission that options are common in contractual negotiations, and in any event, would not necessarily indicate that a customer was exercising buyer power.[412]

206. In relation to self-supply, market feedback indicates that customers would not be willing or able to self-supply, and customers also appear to be unlikely to sponsor new entrants that do not have prior track record for specialised commercial vessels. Market feedback also indicates that customers do not have the plan to sponsor the entry or expansion of shipbuilders, and they have also not done so.[413]

207. In light of the above, CCCS is of the view that there is insufficient evidence of adequate countervailing buyer power to constrain the Parties following the Proposed Transaction.

VIII. COMPETITION ASSESSMENT

(a) Non-Coordinated Effects

208. Non-coordinated effects may arise where, as a result of the Transaction, the merged entity finds it profitable to raise prices (or reduce output or quality) because of the loss of competition between the merged entities.[414]

KSOE's submissions

209. KSOE submitted that non-coordinated effects will not arise from the Proposed Transaction, given the prevailing state of competition in the shipbuilding industry[415]:

[411] [✂]'s responses dated 4 March 2020, to Question 54 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 54 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 54 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 24 February 2020, to Question 54 of CCCS's RFI dated 17 February 2020.
[412] [✂]'s responses dated 28 February 2020, to Question 27 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 18 March 2020, to Question 27 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 4 March 2020, to Question 53 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 53 of CCCS's RFI dated 17 February 2020, [✂]'s responses dated 26 February 2020, to Question 53 of CCCS's RFI dated 17 February 2020.
[413] [✂]'s responses dated 26 February 2020, to Question 51 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 51 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 4 March 2020, to Question 51 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 51 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 5 March 2020, to Question 51 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 18 March 2020, to Question 25 of CCCS's RFI dated 12 February 2020.
[414] Paragraph 5.21 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[415] Paragraphs 34.2 to 34.14 of Form M1.

(a) The nature of the shipbuilding industry fosters a competitive environment, given that many competitors have to compete for a small number of contracts each year. As there is no clear indication of when the next order will come to the market, the significance of each and every order to shipbuilders is increased. Competition is therefore fierce for each and every contract across all commercial vessels.

(b) The excess supply in the supply of commercial vessels that has persisted since 2008 is projected to continue, with demand expected to remain depressed. Shipbuilders therefore have and will continue to have significant excess capacity, which they have the ability and incentive to use for each and every order that comes to the market. [416] This excess capacity will therefore continue to constrain the Parties following the Proposed Transaction.

(c) The shipbuilding industry is also characterised by the presence of strong players on a global basis. The Parties need to compete against a number of strong Chinese, Japanese and Korean competitors. [417] Since most of these leading competitors are capable of building nearly all commercial vessel types, they also compete fiercely in the market for all commercial vessels and will continue to do so in the future.

(d) Chinese shipbuilders are becoming increasingly strong competitors due to their competitiveness in price based on low labour cost and government support.[418] In the commercial vessel sector for instance, the share attributable to Chinese shipbuilders has increased steadily over the past years and now exceeds the share attributable to Korean shipbuilders.[419] Chinese shipbuilders are also rapidly expanding to new markets, including the construction of high value vessels, and have already won contracts for highly technical next-generation LNG carriers, a segment in which until now only Japanese and Korean shipyards had a market presence. Korean shipbuilders are increasingly losing market shares in traditional strongholds, such as large LNG, LPG tankers and larger containerships, with key customers switching to Chinese shipbuilders, as the technological gap between Korean and Chinese shipbuilders is shrinking.

[416] Paragraphs 4.3 and 4.6 to 4.9 of KSOE's Third Supplementary Submissions dated 3 August 2020.
[417] Paragraph 4.2 of KSOE's Third Supplementary Submissions dated 3 August 2020.
[418] Paragraphs 4.13 to 4.15 of KSOE's Third Supplementary Submissions dated 3 August 2020.
[419] On average over the past five years, China's shipbuilders accounted for [30-40] per cent. of commercial vessel orders (in CGT), while Korean and Japanese shipbuilders accounted for [20-30] per cent. and [20-30] per cent. respectively.

(e) The state of competition for the supply of commercial vessels is only likely to intensify. In China, two state-owned shipbuilders, CSSC and CSIC are currently in the process of merging their activities, thereby creating a very large shipbuilder with future annual sales largely exceeding those of its competitors.[420] Furthermore, in addition to cooperation between domestic shipyards, cross-border cooperation to enhance competitiveness is increasing.

210. KSOE further submitted that switching costs are very low in the shipbuilding industry and there are hardly any additional costs for customers who decide to place orders with a different shipbuilder. KSOE submitted that it is common for customers to switch between shipbuilders and order vessels from various or different shipbuilders.[421] KSOE further submitted that the ability of customers to switch or to credibly threaten to switch is evidenced by the high-level of switching and/or multi-sourcing by customers.[422] KSOE submitted that the retention rates show that many of the Parties' customers ordered from competing builders for the same vessel types and classes, and that DSME's customers are rarely exclusive to that builder.[423] The retention rates by the four relevant vessel types, as well as the retention rates for the four relevant vessel classes are shown in **Tables 21** and **22** respectively.[424]

[420] At the time that KSOE's submission was made, the merger between CSSC and CSIC had not yet obtained regulatory approval. In end 2019, China's State-owned Assets Supervision and Administration Commission approved the merger; Paragraph 4.38 of KSOE's Third Supplementary Submissions dated 3 August 2020.
[421] Paragraph 32.4 of Form M1.
[422] Paragraph 6.9 of KSOE's Third Supplementary Submissions dated 3 August 2020.
[423] Paragraph 11.102 of Form M2.
[424] KSOE had provided the retention rates by all vessel types and classes. CCCS has only presented the retention rates for the four relevant vessel classes (i.e. UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU, LNG carrier 40,000+ cu.m, and LPG carrier 60,000+ cu.m.) which we have focused the assessment on.

Table 21: Retention rates by four relevant vessel types, 2009 – 2019[425]

Party	Vessel type	Number of multi-contracts customers [A][426]	Number of exclusive customers [B][427]	Number of non-exclusive customers [C][428]	Retention rate [B/A]	Multi-sourcing rate [C/A]
KSOE	Oil tankers	[✂]	[✂]	[✂]	**[20-30]%**	**[70-80]%**
	Containerships	[✂]	[✂]	[✂]	**[10-20]%**	**[80-90]%**
	LNG carriers	[✂]	[✂]	[✂]	**[10-20]%**	**[80-90]%**
	LPG carriers	[✂]	[✂]	[✂]	**[50-60]%**	**[40-50]%**
DSME	Oil tankers	[✂]	[✂]	[✂]	**[20-30]%**	**[70-80]%**
	Containerships	[✂]	[✂]	[✂]	**[0-10]%**	**[90-100]%**
	LNG carriers	[✂]	[✂]	[✂]	**[0-10]%**	**[90-100]%**
	LPG carriers	[✂]	[✂]	[✂]	**[50-60]%**	**[50-60]%**

Table 22: Retention rates by four relevant vessel classes, 2009 – 2019[429]

Party	Vessel class	Number of multi-contracts customers [A]	Number of exclusive customers [B]	Number of non-exclusive customers [C]	Retention rate [B/A]	Multi-sourcing rate [C/A]
KSOE	UL/VLCC 200,000+ DWT	[✂]	[✂]	[✂]	**[50-60]%**	**[40-50]%**
	Post-Panamax 15,000+ TEU	[✂]	[✂]	[✂]	**[30-40]%**	**[60-70]%**
	LNG carriers 40,000+ cu.m.	[✂]	[✂]	[✂]	**[20-30]%**	**[70-80]%**

[425] Table at Paragraph 4.1 of KSOE's responses dated 21 January 2020, to CCCS's Letter dated 17 January 2020.
[426] KSOE defined multi-contract customers as customers who had at least two contractual relationships in a given segment over the period.
[427] KSOE defined exclusive customers as customers with multiple purchases in a vessel type or class, and all were ordered from a single party.
[428] KSOE defined non-exclusive customers as multi-contract customers who purchase vessels of a given type or class from other builders apart from the specified party.
[429] Annex 42 of KSOE's responses dated 12 February 2020, to Question 42 of CCCS's RFI dated 17 January 2020.

Party	Vessel class	Number of multi-contracts customers [A]	Number of exclusive customers [B]	Number of non-exclusive customers [C]	Retention rate [B/A]	Multi-sourcing rate [C/A]
	LPG carriers 60,000+ cu.m.	[✂]	[✂]	[✂]	**[70-80]%**	**[30-40]%**
DSME	UL/VLCC 200,000+ DWT	[✂]	[✂]	[✂]	**[30-40]%**	**[60-70]%**
	Post-Panamax 15,000+ TEU	[✂]	[✂]	[✂]	**[20-30]%**	**[80-90]%**
	LNG carriers 40,000+ cu.m.	[✂]	[✂]	[✂]	**[10-20]%**	**[90-100]%**
	LPG carriers 60,000+ cu.m.	[✂]	[✂]	[✂]	**[0-10]%**	**[90-100]%**

211. Other than the presence of strong competition in the market, KSOE also submitted that there are other factors that restrict the merged entity's ability and incentive to raise prices, reduce service quality or otherwise act anti-competitively following the Proposed Transaction:

(a) In addition to the traditional competitors, the Parties are increasingly facing competition from new market entrants from other countries and regions such as Russia, Saudi Arabia and South East Asia, who are well placed to grow their presence in the market significantly through aggressive investment and/or low labour costs. Due to its labour-intensive nature, the shipbuilding industry is regarded as a key industry in many countries and therefore, it is possible to enter the market within a short period of time, if there is promotion and support at a national level.

(b) The main customers of shipbuilders are large and sophisticated shipping companies with substantial countervailing buyer power, irrespective of the vessel type, as noted above.

(c) The Parties are not each other's closest competitor in the supply of commercial vessels as a whole. With regard to the global shares for the supply of commercial vessels as a whole, the aggregation in shares is not significant (approximately [0-10]%), and the impact of the Proposed

Transaction on competition for the supply of commercial vessels is low and marginal at best.

CCCS's assessment

212. CCCS notes that the Proposed Transaction involves the merger of the top two shipbuilders for the supply of LNG carriers 40,000+ cu.m. and UL/VLCC 200,000+ DWT, and feedback indicates that they are close, if not the closest, competitors to each other. Additionally, market feedback suggests that the Parties may be close competitors in the supply of Post-Panamax 15,000+ TEU, and LPG carriers 60,000+ cu.m.

Market Shares

213. **LNG carriers 40,000+ cu.m.** As noted in paragraph 108 above, the Proposed Transaction creates a merged entity with a substantial combined cumulative market share of [60-70]% in the global supply of LNG carriers 40,000+ cu.m. for the period from 2014 to 2018. Samsung, the next largest competitor, only has a market share of [10-20]% for the same period. Further, the Parties' annual market shares in the same period have been consistently high.

214. **UL/VLCC 200,000+ DWT.** As noted in paragraph 102 above, the combined cumulative market share of the Parties in the global supply of UL/VLCC 200,000+ DWT for the period 2014 to 2018 crossed CCCS's indicative thresholds. Further, the Parties' annual market shares in the same period have been consistently high. In comparison, the identity of the shipbuilder that holds the next largest market shares, after the Parties' combined market shares, is inconsistent across the years.[430]

215. **Post-Panamax 15,000+ TEU.** As noted in paragraph 106 above, the combined cumulative market share of the Parties in the global supply of Post-Panamax 15,000+ TEU for the period 2014 to 2018 marginally crossed CCCS's indicative thresholds. However, there are other significant competitors such as Samsung. Further, based on the Parties' annual market shares, neither of the Parties has consistently been the largest player, nor have they been consistently the two largest players.

[430] The next largest supplier after the Parties are: Hanjin Heavy Industries & Construction Co Ltd. (in 2014); CSIC (in 2015); JMU (in 2016); CSIC (in 2017); Samsung (in 2018).

216. **LPG carriers 60,000+ cu.m.** As noted in paragraph 112 above, the combined cumulative market share of the Parties in the global supply of LPG carriers 60,000+ cu.m. for the period 2014 to 2018 crossed CCCS's indicative thresholds. However, the incremental market share arising from the Proposed Transaction is not large, and DSME [✂] LPG carriers 60,000+ cu.m. from 2016 to 2018.

217. In any event, CCCS notes that market shares may not be a good indicator of market power in the shipbuilding industry. The shipbuilding market is heavily reliant on tenders (including requests for quotations) and is essentially a bidding market. In bidding markets, having high market share may not confer market power as market share can be easily lost in the next bidding round. Instead, in bidding markets, the existence of at least one credible alternative to the Parties may be enough to constrain their ability to exert market power following the Proposed Transaction. An analysis on the closeness of rivalry between the shipbuilders is therefore important to determine whether the Proposed Transaction increases the ability and incentive of the merged entity to raise its prices unilaterally by removing the closest and most credible alternative.

Countervailing buyer power

218. As highlighted above, CCCS notes that each of the Parties' customers accounted for a significant proportion of its sales in 2018. However, this is insufficient to conclude that buyer power is strong. Further, even if these large customers have some buyer power, it may not be sufficient to prevent an SLC in the market if only these large customers are shielded from potential unilateral effects.

219. Overall, there is insufficient evidence of adequate countervailing buyer power to constrain the Parties following the Proposed Transaction.

Barriers to entry and expansion

220. As highlighted above, barriers to entry and expansion for the supply of the relevant vessel classes may be high, and there may be challenges for existing shipbuilders to expand their production range to include vessel types or vessel classes that they currently do not produce.[431] Across vessel types, barriers to entry and expansion are higher for sophisticated vessel types (such as LNG carriers and LPG carriers) than conventional vessel types (such as oil tankers and containerships).[432] Within

[431] [✂]'s responses dated 27 September 2019, to Question 40 of CCCS's RFI dated 17 September 2019.
[432] [✂]'s responses dated 12 March 2020, to Question 36 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 36 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 26 February 2020, to Question 46 of CCCS's RFI dated 17 February 2020.

each vessel type, the barriers to entry and expansion are higher for the construction of larger vessel classes (and the relevant vessel classes are the largest classes within their respective types) due to physical constraints and equipment required.[433] Further, the cost inefficiencies faced by shipbuilders in switching from building larger vessel classes to building smaller vessel classes, may limit expansion into the smaller classes among the relevant vessel classes.

221. Additionally, as set out in paragraphs 159 to 170, while CCCS is of the view that the RSI analysis is not an appropriate screen for the ability to exert market power in the shipbuilding industry, CCCS's revised RSI analysis (to address the inherent problems in the RSI methodology submitted by KSOE) shows that there is at least one vessel class (either LNG carriers 40,000+ cu.m. or Post-Panamax 15,000+ TEU, depending on the size categories defined) where the Parties' competitors may not have adequate excess capacities to absorb all demand in these markets.

Competitive constraint from second-hand commercial vessels

222. Besides new vessels, CCCS also considered whether the supply of second-hand commercial vessels may pose a competitive constraint to the Parties in the supply of brand new commercial vessels. The life span of a commercial vessel is typically about 20 to 30 years[434]. However, CCCS notes from the feedback that the extent to which this could be so is likely to be limited.[435] Feedback suggests that ship owners generally do not consider second-hand vessels to be good substitutes for new-built vessels.[436] While the feedback applies generally to all vessel types and classes, one ship owner noted that this is especially so for LNG carriers due to the long-term nature of the chartering contract for LNG carriers.[437] Further, CCCS notes that the percentage of second-hand LNG carriers compared to new LNG carriers is small.[438]

[433] [✂]'s responses dated 4 March 2020, to Question 46 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 46 of CCCS's RFI dated 17 February 2020.
[434] [✂]'s responses dated 24 September 2019, to Question 22 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 24 September 2019, to Questions 22 and 24 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 27 September 2019, to Question 28 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 24 September 2019, to Question 28 of CCCS's RFI dated 17 September 2019.
[435] [✂]'s responses dated 18 March 2020, to Question 17 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 17 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 4 March 2020, to Question 22 of CCCS's RFI dated 17 February 2020.
[436] [✂]'s responses dated 4 March 2020, to Question 22 of CCCS's RFI dated 17 February 2020.
[437] [✂]'s responses dated 24 February 2020, to Question 22 of CCCS's RFI dated 17 February 2020.
[438] Paragraphs 23.7 to 23.8 of KSOE's response dated 1 October 2019, to Questions 23(d) and 23(e) of CCCS's RFI dated 16 September 2019.

223. In addition, feedback suggests that vessels would also need to be replaced when they no longer comply with the revised environmental or safety standards set by the International Maritime Organisation.[439] In this regard, a recent revision was the implementation of the IMO 2020 Global Sulphur Limit ("**New Sulphur Limit**"), which has been in force since 1 January 2020,[440] with the effect of tightening environmental regulations[441]. While retrofitting of vessels with current technology could be an option, it could be expensive and the cost savings compared to buying a new vessel would be marginal.[442] Feedback also suggests that it would not be commercially efficient to modify existing second-hand vessels to comply with the New Sulphur Limit.[443]

224. Therefore, this suggests that second-hand commercial vessels would likely only pose a limited competitive constraint for the supply of new-built commercial vessels, and especially so for LNG carriers 40,000+ cu.m.

Closeness of rivalry between the Parties and alternative suppliers

Market feedback

(a) LNG carriers 40,000+ cu.m.

225. Various shipbuilders and Singapore-based customers[444] provided feedback that KSOE and DSME are close competitors in the global supply of LNG carriers 40,000+ cu.m., with the Parties and Samsung being the three main suppliers of LNG carriers 40,000+ cu.m. globally.[445]

226. A Singapore-based customer ([✂]) suggested that although it found Samsung to be less competitive than DSME in terms of vessel design and prices for LNG

[439] Paragraph 24 of Notes of Call with [✂] dated 20 September 2019.
[440] [✂]'s responses dated 24 September 2019, to Question 48 of CCCS's RFI dated 17 September 2019.
[441] MPA (2019), MPA Publishes Second Edition of Guides on IMO 2020.
[442] Paragraph 25 of Notes of Call with [✂] dated 20 September 2019.
[443] [✂]'s responses dated 4 March 2020, to Question 23 of CCCS's RFI dated 17 February 2020. However, feedback received from a shipbuilder suggests that larger classes of vessels could bear the additional environmental costs, compared to smaller classes; [✂]'s responses dated 12 March 2020, to Question 17 of CCCS's RFI dated 12 February 2020.
[444] Singapore-based customers refer to ship owners that have a registered office located in Singapore.
[445] [✂]'s responses dated 24 September 2019, to Question 14 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 24 September 2019, to Question 14 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 20 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 17 April 2020; [✂]'s responses dated 24 September 2019, to Questions 3 and 14 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

carriers 40,000+ cu.m, it is of the view that KSOE, DSME and Samsung are close competitors to one another as they have similar track records, experience, quality and capabilities.[446] In this regard, CCCS notes that [✂] has ordered [✂] LNG carriers 40,000+ cu.m. from KSOE, [✂] LNG carriers 40,000+ cu.m. from DSME and [✂] LNG carriers 40,000+ cu.m. from Samsung, in the past nine years from 2011 to 2019.[447]

227. Further, while [✂] perceives Chinese shipbuilders to have less experience and to produce vessels of lower quality (which translate to a longer delivery time due to the multiple attempts required to meet the expected quality for the construction of LNG carriers)[448], [✂] still views Hudong-Zhonghua Shipbuilding[449] (a Chinese shipbuilder) as a viable supplier of LNG carriers.[450]

228. Singapore-based customers of LNG carriers 40,000+ cu.m. also bought LNG carriers *from other shipbuilders* besides the Parties. A Singapore-based customer ([✂]) indicated that it purchased LNG carriers 40,000+ cu.m. from Keppel Nantong, located in China.[451] [✂] is of the view that Chinese shipbuilders have caught up with Korean shipbuilders and has therefore purchased LNG carriers 40,000+ cu.m. from China.[452] Further, Qatar Petroleum has reserved LNG carrier construction capacity with Hudong-Zhonghua Shipbuilding in addition to all the Korean shipbuilders.[453] Therefore, it appears that certain Chinese shipbuilders (e.g. Keppel Nantong and Hudong-Zhonghua Shipbuilding) are viable suppliers of LNG carriers 40,000+cu.m., including from the perspective of Singapore-based customers.

---

[446] [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 8 October 2019, to Question 1(e) of CCCS's RFI dated 7 October 2019; [✂]'s responses dated 5 November 2019, to Questions 2 and 3 of CCCS's email dated 4 November 2019; [✂]'s responses dated 15 November 2019, to Question 3 of CCCS's email dated 14 November 2019.
[447] [✂]'s responses dated 5 November 2019, to Question 1 of CCCS's email dated 4 November 2019; [✂]'s responses dated 8 October 2019, to Question 1(e) of CCCS's RFI dated 7 October 2019.
[448] [✂]'s responses dated 8 October 2019, to Question 11 of CCCS's RFI dated 7 October 2019.
[449] Hudong-Zhonghua Shipbuilding is a wholly owned subsidiary of CSSC.
[450] [✂]'s responses dated 8 October 2019, to Question 1(e) of CCCS's RFI dated 7 October 2019.
[451] [✂]'s responses dated 31 March 2020, to Question 2 of CCCS's RFI dated 19 March 2020.
[452] [✂]'s responses dated 31 March 2020, to Question 23 of CCCS's RFI dated 19 March 2020.
[453] Qatar Petroleum (2020). Qatar Petroleum enters agreement that could reach QR 11 billion to reserve LNG shipyard capacity in China. Retrieved from https://qp.com.qa/en/MediaCentre/Pages/ViewNews.aspx?NType=News on 15 July 2020; Qatar Petroleum (2020). Qatar Petroleum signs the largest LNG shipbuilding agreements in history to secure more than 100 ships valued in excess of QR 70 billion to cater for its LNG growth plans. Retrieved from https://qp.com.qa/en/MediaCentre/Pages/ViewNews.aspx?NType=News on 15 July 2020.

229. Singapore-based customers indicated that the Japanese shipbuilders have equivalent technical expertise as the Parties.[454] One of the customers however indicated that the Japanese shipbuilders require a longer delivery time and are seen as inflexible in their customer relations.[455]

(b) UL/VLCC 200,000+ DWT

230. The feedback from various shipbuilders and Singapore-based customers suggests that KSOE and DSME are close competitors as they are equivalent in terms of capability, experience and track record in the global supply of UL/VLCC 200,000+ DWT.[456]

231. Feedback from these customers also suggested that Samsung is the next best alternative to the Parties as they are equivalent in capability and have a similar track record and experiences.[457]

232. Various shipbuilders and Singapore-based customers indicated that the Chinese shipbuilders are other viable competitors to the Parties.[458] These viable Chinese shipbuilders include COSCO, Dalian Shipbuilding Ind. Co., Ltd. and Bohai Shipyard.[459] A customer indicated that the Chinese shipbuilders are not too far behind in terms of technological capability in the production of UL/VLCC 200,000+ DWT, compared to the Parties, although the Parties offer better vessel quality and design.[460] In addition, the market feedback also suggests that the merger between CSSC and CSIC could pose a competitive constraint on the Parties in the global supply of UL/VLCC 200,000+ DWT.[461] Further, various

[454] [✂]'s responses dated 31 March 2020, to Question 24 of CCCS's RFI dated 19 March 2020; [✂]'s responses dated 24 February 2020, to Question 32 of CCCS's RFI dated 17 February 2020;

[455] [✂]'s responses dated 24 September 2019, to Question 3 of CCCS's RFI dated 17 September 2019.

[456] [✂]'s responses dated 5 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 20 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 17 April 2020; [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020.

[457] [✂]'s responses dated 5 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[458] [✂]'s responses dated 27 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 51 of CCCS's RFI dated 17 February 2020.

[459] [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 51 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 27 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020

[460] [✂]'s responses dated 24 February 2020, to Question 33 of CCCS's RFI dated 17 February 2020.

[461] However, the feedback was not supported with reasons on why the CSSC/CSIC merged entity would impose a competitive constraint on the Parties; [✂]'s responses dated 20 February 2020, to Question 24 of CCCS's RFI

shipbuilders and Singapore-based customers also indicated that the Japanese shipbuilders, such as JMU, Namura Shipbuilding Co Ltd (**"Namura"**) and Mitsui Engineering & Shipbuilding Co Ltd (**"Mitsui"**), are viable competitors to the Parties.[462]

(c) Post-Panamax 15,000+ TEU

233. Various shipbuilders and customers provided feedback that KSOE and DSME are likely to be close competitors as they are equivalent in terms of capability, quality and track record in the global supply of Post-Panamax 15,000+ TEU.[463] A customer suggested that Samsung is also similar to the Parties in terms of quality, price and delivery terms.[464]

234. Some customers indicated that the Chinese shipbuilders are viable alternatives to the Parties, in the global supply Post-Panamax 15,000+ TEU.[465] In particular, the viable alternatives amongst the Chinese shipbuilders are CSSC, CSIC and COSCO.[466] One of the customers suggested that these Chinese shipbuilders are comparable to the Parties and Samsung in terms of price and reliability.[467] Further, the market feedback also suggests that the merger between CSSC and CSIC could pose a competitive constraint on the Parties in the global supply of Post-Panamax 15,000+ TEU.[468]

---

dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Question 24 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 34 of CCCS's RFI dated 17 February 2020.

[462] However, no third parties provided reasons to support their views; [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 8 October 2019, to Question 5(a) of CCCS's RFI dated 7 October 2019.

[463] [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 20 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020, [✂]'s responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 17 April 2020; [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 4 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 5 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[464] Paragraph 22 of [✂]'s responses dated 24 September 2019, to CCCS's RFI dated 17 September 2019.

[465] [✂]'s responses dated 4 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[466] [✂]'s responses dated 4 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 9 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[467] [✂]'s responses dated 26 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020

[468] However, the feedback was not supported with reasons on why the CSSC/CSIC merged entity would impose a competitive constraint on the Parties; [✂]'s responses dated 20 February 2020, to Question 24 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 12 March 2020, to Question 24 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 34 of CCCS's RFI dated 17 February 2020; [✂]'s

235. In addition, a customer that procures containerships on a global basis highlighted that it switched its purchase of Post-Panamax 15,000+ TEU from Korean shipyards to Chinese shipyards when the price gap increased from [✂], suggesting that a small price increase would lead to switching to alternative suppliers for Post-Panamax 15,000+ TEU.[469]

236. Some customers also indicated that the Japanese shipbuilders, in particular Imabari, MHI and JMU, are viable competitors to the Parties in the global supply of Post-Panamax 15,000+ TEU, in terms of price and reliability.[470]

(d) <u>LPG carriers 60,000+ cu.m</u>

237. There is mixed feedback from various competitors and Singapore-based customers on whether the Parties are close competitors in the global supply of LPG carriers 60,000+ cu.m.[471] While some competitors indicated that the Parties are not close competitors to each other, there is customer feedback indicating that the Parties, together with Samsung, are close competitors to one another.[472]

238. In terms of viable alternative suppliers, a Singapore-based customer that does not purchase LPG carriers 60,000+ cu.m. from the Parties indicated that the Chinese shipbuilders are catching up with the Koreans shipbuilders, in terms of level of technology for LPG carriers 60,000+ cu.m.[473] Further, the customer highlighted that the Chinese shipbuilders have been able to secure contracts for LPG carriers 60,000+ cu.m. at low contract prices.[474]

---

responses dated 9 March 2020, to Question 34 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 4 March 2020, to Question 34 of CCCS's RFI dated 17 February 2020.

[469] Paragraph 9 of [✂]'s responses dated 24 September 2019, to CCCS's RFI dated 17 September 2019.

[470] [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 9 March 2020, to Question 28 of CCCS's RFI dated 17 February 2020; [✂]'s responses dated 26 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[471] [✂]'s responses dated 20 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 17 April 2020; [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[472] [✂]'s responses dated 20 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 April 2020, to Question 4 of CCCS's RFI dated 17 April 2020; [✂]'s responses dated 12 March 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 27 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 24 February 2020, to Question 28 of CCCS's RFI dated 17 February 2020.

[473] [✂]'s responses dated 26 February 2020, to Question 31 of CCCS's RFI dated 17 February 2020.

[474] [✂]'s responses dated 26 February 2020, to Question 31 of CCCS's RFI dated 17 February 2020.

239. A shipbuilder and a Singapore-based customer that does not purchase LPG carriers 60,000+ cu.m. from the Parties suggested that other viable shipbuilders in the supply of LPG carriers 60,000+ cu.m. include MHI, JMU and Kawasaki Heavy Industries ("**Kawasaki**").[475] The customer indicated that Japanese shipbuilders are viable alternatives as they are similar in terms of prices.[476]

240. To assess the closeness of rivalry between shipbuilders in greater depth, CCCS has considered additional quantitative analyses, which are elaborated on below.

Quantitative Analyses

241. The following sections set out CCCS's review of the bidding analysis carried out by KSOE as well as CCCS's alternative analyses[477] to make a comprehensive assessment of whether the Proposed Transaction would increase both the ability and incentive[478] of the merged entity to raise prices.[479]

KSOE's submission

Participation ratio and win-loss ratio

242. KSOE submitted the participation rates and the winning rates of all the shipbuilders that participated in tenders together with (at least one of) the Parties, for the supply of commercial vessels from 2009 – 2019 (refer to **Annex E**).[480] Based on the participation ratios and win-loss ratios, KSOE highlighted that there

[475] [✂]'s responses dated 27 February 2020, to Question 20 of CCCS's RFI dated 12 February 2020; [✂]'s responses dated 21 October 2019, to Question 3 of CCCS's RFI dated 15 October 2019.
[476] [✂]'s responses dated 21 October 2019, to Question 3 of CCCS's RFI dated 15 October 2019.
[477] CCCS engaged an external economic consultant to assist with its alternative analyses.
[478] The various closeness of rivalry analyses study whether the Proposed Transaction would likely increase the Parties' *ability and incentive* to raise prices. If the Parties are close competitors to each other (with no other close competitors), the Proposed Transaction is likely to increase the merged entity's *ability* to raise prices. The closer the rivalry between the Parties, the more the Proposed Transaction would allow KSOE to internalise the effect of losing customers to DSME if KSOE were to raise prices unilaterally, and the more the Proposed Transaction would increase the merged entity's *incentive* to raise prices unilaterally.
[479] The econometric models test for whether there is evidence in the past that the following factors create positive returns:
(a) an increase in market concentration;
(b) an increase in the (expected) number of participants in the tenders that the Parties participated in; and
(c) DSME's absence from the tenders that KSOE participated in (and vice versa)

This evidence (if any) would support the hypothesis that the Proposed Transaction would give the merged entity *both the ability and incentive* to raise prices unilaterally.
[480] These are tenders called for the four relevant vessel classes, as well as for Suezmax 125-199,999 DWT and Neo-Panamax 12-14,999 TEU. DSME competed against KSOE for the supply of Suezmax 125-199,999 DWT and Neo-Panamax 12-14,999 TEU for the period from 2009-2019, but [✂] for the supply of these two vessel types and classes from 2015-2019.

are multiple competitors that have participated in and won tenders in each of the vessel types and classes. According to KSOE, the shipbuilders that compete with the Parties in each of the vessel types and classes are set out as follows:

S/N	Vessel type and class	Competitors
1.	Post-Panamax 15,000+ TEU[481]	Samsung, CSSC, STX, Hanjin, Sekwang, CSIC, Imabari and JMU
2.	UL/VLCC 200,000+ DWT[482]	Samsung, CSSC, STX, CSIC, IHI, Mitsubishi, Universal, JMU and New Century
3.	LNG carriers 40,000+ cu.m.[483]	Samsung, CSSC, STX, Hanjin, JMU, Kawasaki, Imabari and Mitsubishi
4.	LPG carriers 60,000+ cu.m.[484]	Samsung, CSSC, STX, Sanko, Kawasaki, Hanjin and Mitsubishi
5.	Suezmax 125-199,999 DWT[485]	Samsung, CSSC, STX, Sundong, Daehan, Hanjin, JMU, Yanzijiang and New Century
6.	Neo-Panamax 12-14,999 TEU[486]	Samsung, CSSC, STX, CSBC, CSIC, Hanjin, Imabari, JMU, Mitsubishi, COSCO and Yangzijiang

CCCS's assessment

243. The participation ratio and win-loss ratio analyses submitted by KSOE only identify the shipbuilders that have competed with the Parties in past tenders and won some of these tenders, without providing a measure of the closeness of rivalry between (each of the Parties) and its competitors. CCCS is of the view that an assessment of the closeness of rivalry is important in two aspects. First, it is important to assess the closeness of rivalry between the Parties. The closer the rivalry between the Parties, the more the Proposed Transaction would allow KSOE to internalise the effect of losing customers to DSME if KSOE were to raise prices unilaterally, and the more the Proposed Transaction would increase the merged entity's incentive to raise prices unilaterally. Similarly, the closer the rivalry between the Parties, the larger the extent of competitive constraint that would be removed by the Proposed Transaction, increasing the merged entity's ability to raise prices. Second, it is also important to assess the closeness of rivalry between (each of) the Parties and other shipbuilders. This is because the presence of other

[481] Paragraph 3.5(d), Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[482] Paragraph 3.5(f), Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[483] Paragraphs 40.2 and 40.3 of KSOE's responses dated 12 February 2020, to Question 40(b) of CCCS's RFI dated 4 February 2020.
[484] Paragraph 3.5(b), Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[485] Paragraph 3.5(e), Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[486] Paragraph 3.5(c), Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

close competitors to (each of) the Parties can constrain the merged entity's ability to raise prices.

244. CCCS has performed three (3) quantitative exercises to assess the closeness of rivalry between shipbuilders. First, CCCS has conducted a propensity score matching analysis to identify the shipbuilders likely to be close competitors to (each of) the Parties in each of the four relevant vessel classes based on the matching of observable characteristics in the shipbuilders' contracts. Second, CCCS has conducted a switching analysis to identify the shipbuilders likely to be close competitors to (each of) the Parties in each of the four relevant vessel classes based on the percentages of customers who switched from (each of) the Parties to other shipbuilders. Further, CCCS has carried out a winner-runner up analysis to corroborate the findings of the propensity score matching analysis, based on the actual ranking of shipbuilders in the tenders that the Parties participated in. The winner-runner up analysis goes above and beyond the participation ratios and win-loss ratios for tenders which the Parties participated in, as it allows for the assessment of the frequency with which one of the Parties was the winner, and the other was the runner-up in the tenders which both Parties participated in. This assesses the closeness of rivalry between the Parties, and not simply only whether one of the Parties won a tender that the other participated in. The winner-runner up analysis is extended to the other close competitors identified through the propensity score matching, to assess the frequency with which these competitors are the runner-up in the tenders won by one of the Parties.

Propensity score matching

245. The propensity score matching analysis performed by CCCS assesses the probability that contracts signed by KSOE or DSME would have been concluded by each of its rivals. The intuition behind the analysis is that close competitors contend for the same demand, and shipbuilders that have signed contracts similar to those signed by KSOE (or DSME) would be able to compete for the same demand served by KSOE (or DSME). A crucial step is therefore matching the contracts signed by KSOE (or DSME) with those signed by any other shipbuilders, and the propensity score is estimated based on observable characteristics including vessel characteristics[487] and characteristics of the customer that placed the order[488]. The propensity score matching is implemented separately for each of the

[487] Vessel characteristics such as CGT.
[488] Customer characteristics such as the number of vessels in its fleet, the average time it waits to get the vessel delivered after the order is placed, and the time passed by the first time it made a vessel order.

four relevant vessel classes, to take into account that contracts are likely to be heterogeneous across vessel classes.

246. KSOE's (or DSME's) closest competitors are then identified based on the frequency with which contracts signed by a given shipbuilder are matched to those signed by KSOE (or DSME). The closest competitors are the shipbuilders that achieve the highest share of matches, i.e. the shipbuilders whose contracts appear more frequently as the most similar contracts to those signed by KSOE (or DSME).[489] For different shipbuilders that achieve an identical share of matches to KSOE (or DSME), the average difference in the propensity score of KSOE's (or DSME's) contracts and the shipbuilder's contracts would identify the closer competitor to KSOE (or DSME).[490]

247. **Table 23** presents the matching results obtained for KSOE's contracts. For each of the four relevant vessel classes, the table presents the shipbuilders whose contracts have been matched, in descending order based on the share of their contracts that have been matched with KSOE (or DSME).

[489] For shipbuilders with contracts that are individually matched multiple times to KSOE's (or DSME's) contracts, the closeness of rivalry is assessed based on the total number of matches achieved, instead of the number of contracts matched.

[490] The lower the average difference in the propensity score, the higher the similarity between KSOE's (or DSME's) contracts and its matched competitor, and the higher the probability that the contracts signed by KSOE (or DSME) could have been concluded by that competitor.

The share of matches is the main criteria that is used to select the closest competitors. Each KSOE's (DSME's) contract is matched with a rival's contract that registers the most similar score among all the rivals' contracts. In other words, matched contracts are those whose difference in score is the minimum. Shipbuilders with the higher share of matches are those whose contracts have been more often the most similar to KSOE's (DSME's) contracts.

However, when the share of matches is identical among shipbuilders, the average difference in score for each shipbuilder used to assess who is the merger party's closest competitor.

Table 23: Matching results for KSOE's contracts[491]

Shipbuilder	Number of matches	Number of shipbuilder's contracts from 2005 - 2019	Average difference in score	Last observed market share (%)[492]	Number of KSOE's contracts matched
UL/VLCC 200,000+ DWT					
CSIC	[30%]	[✂]	0.00131	[0-10]	[✂]
DSME	[25%]	[✂]	0.00176	[60-70]	
Japan Marine United Corporation	[20%]	[✂]	0.00122	[0-10]	
CSSC	[8%]	[✂]	0.00186	[20-30]	
Imabari Shipbuilding Co Ltd	[6%]	[✂]	0.00221	[0-10]	
New Century Shipbuilding Group	[5%]	[✂]	0.00113	[0-10]	
Samsung Heavy Industries	[3%]	[✂]	0.00006	[0-10]	
COSCO Shipping Heavy Industry Co Ltd	[2%]	[✂]	0.00146	[0-10]	
Hanjin Heavy Industries & Construction Co Ltd	[1%]	[✂]	0.00362	[10-20]	
HNA Group	[1%]	[✂]	0.00171	[10-20]	
LNG carriers 40,000+ cu.m.					
DSME	[37%]	[✂]	0.00150	[20-30]	[✂]
Samsung Heavy Industries	[34%]	[✂]	0.00200	[50-60]	
Kawasaki Heavy Industries Corp	[20%]	[✂]	0.00107	[0-10]	
CSSC	[2%]	[✂]	0.00003	[10-20]	
Hanjin Heavy Industries & Construction Co Ltd	[2%]	[✂]	0.00112	[0-10]	
Mitsubishi Heavy Industries Co Ltd	[2%]	[✂]	0.00239	[30-40]	
Imabari Shipbuilding Co Ltd	[2%]	[✂]	0.00086	[10-20]	
STX Offshore & Shipbuilding Co Ltd	[1%]	[✂]	0.00387	[0-10]	

[491] The propensity score matching analysis is based on all the contracts signed by KSOE in the period 2005-2019, based on Clarksons' vessel data.

[492] Since some of the shipbuilders have no contracts signed in 2019 for some vessel classes, the table reports the last observed market share which refers to the shipbuilder's share in the last single year that it had received an order. However, most of them refer to the years 2015 - 2018. [✂].

Shipbuilder	Number of matches	Number of shipbuilder's contracts from 2005 - 2019	Average difference in score	Last observed market share (%)[492]	Number of KSOE's contracts matched
Post-Panamax 15,000+ TEU					
Samsung Heavy Industries	[43%]	[✂]	0.15000	[20-30]	[✂]
DSME	[38%]	[✂]	0.06600	[30-40]	
CSSC	[19%]	[✂]	0.01800	[30-40]	
LPG carriers 60,000+ cu.m.					
Mitsubishi Heavy Industries Co Ltd	[54%]	[✂]	0.00685	[10-20]	[✂]
Kawasaki Heavy Industries Corp	[30%]	[✂]	0.00976	[10-20]	
DSME	[9%]	[✂]	0.00475	[0-10]	
Japan Marine United Corporation	[4%]	[✂]	0.00708	[40-50]	
CSSC	[3%]	[✂]	0.00012	[30-40]	

248. For UL/VLCC 200,000+ DWT, CSIC, DSME and JMU are the competitors whose contracts have been more often matched to the contracts signed by KSOE: 30% of the KSOE's matched contracts have been matched to CSIC, 25% of the KSOE's matched contracts have been matched to DSME, and 20% to JMU. The results suggest that CSIC is the competitor who has achieved the higher share of matches, and hence it is KSOE's closest competitor in the global supply of UL/VLCC 200,000+ DWT.[493]

249. For LNG carriers 40,000+ cu.m., DSME and Samsung are the competitors whose contracts have been more often matched to the contracts signed by KSOE: 37% of KSOE's matched contracts are matched to DSME's contracts, and 34% are matched to Samsung's contracts. The results suggest that DSME is the competitor who has achieved the higher share of matches. This is supported by the average difference in the propensity score which shows that on average, DSME's matched contracts are closer to KSOE's contracts than Samsung's.[494]

250. For Post-Panamax 15,000+ TEU, Samsung appears to be the closest competitor to KSOE, as 43% of KSOE's contracts were matched to Samsung's contracts. However, DSME is also a very close competitor to KSOE, as 38% of KSOE's contracts were matched to DSME's contracts. Further, the average difference in

[493] Although JMU's matched contracts are, on average, more similar to KSOE's contracts than CSIC's contracts, the number of times in which JMU's contracts have been similar to KSOE's contracts is lower than CSIC.
[494] The average difference in score is equal to 0.0015 for DSME, and 0.002 for Samsung.

the propensity score shows that on average, DSME's matched contracts are closer to KSOE's contracts than Samsung's.[495]

251. For LPG carriers 60,000+ cu.m., MHI appears to be the closest competitor to KSOE, as more than half of KSOE's contracts were matched to MHI's contracts.

252. **Table 24** presents the matching results obtained for DSME's contracts.

[495] The average difference in score is equal to 0.15 for Samsung, and 0.066 for DSME.

Table 24: Matching results for DSME's contracts[496]

Shipbuilder	Number of matches	Number of shipbuilder's contracts from 2005 - 2019	Average differences in score	Last observed market share (%)[497]	Number of DSME's contracts matched
UL/VLCC 200,000+ DWT					
KSOE	[26%]	[✂]	0.00175	[20-30]	[✂]
Japan Marine United Corporation	[21%]	[✂]	0.00232	[0-10]	
CSIC	[19%]	[✂]	0.00154	[0-10]	
CSSC	[19%]	[✂]	0.00100	[20-30]	
Mitsui Engineering & Shipbuilding Co Ltd	[5%]	[✂]	0.00727	[0-10]	
Kawasaki Heavy Industries Corp	[5%]	[✂]	0.00767	[0-10]	
Mitsubishi Heavy Industries Co Ltd	[5%]	[✂]	0.00055	[0-10]	
Imabari Shipbuilding Co Ltd	[3%]	[✂]	0.00491	[0-10]	
Samsung Heavy Industries	[1%]	[✂]	0.00172	[0-10]	
LNG carriers 40,000+ cu.m.					
KSOE	[54%]	[✂]	0.00108	[40-50]	[✂]
Samsung Heavy Industries	[27%]	[✂]	0.00154	[50-60]	
Kawasaki Heavy Industries Corp	[8%]	[✂]	0.00352	[0-10]	
CSSC	[6%]	[✂]	0.00335	[10-20]	
Mitsubishi Heavy Industries Co Ltd	[3%]	[✂]	0.00016	[30-40]	
Imabari Shipbuilding Co Ltd	[1%]	[✂]	0.00104	[10-20]	
STX Offshore & Shipbuilding Co Ltd	[1%]	[✂]	0.00000	[0-10]	
Post-Panamax 15,000+ TEU					
Samsung Heavy Industries	[63%]	[✂]	0.00383	[20-30]	[✂]
KSOE	[37%]	[✂]	0.00717	[30-40]	
LPG carriers 60,000+ cu.m.					
Mitsubishi Heavy Industries Co Ltd	[46%]	[✂]	0.00783	[10-20]	[✂]
KSOE	[42%]	[✂]	0.00100	[50-60]	
Samsung Heavy Industries	[13%]	[✂]	0.00166	[30-40]	

[496] The propensity score matching analysis is based on all the contracts signed by DSME in the period 2005-2019, based on Clarksons' vessel data.

[497] Since some of the shipbuilders have no contracts signed in 2019 for some vessel classes, the table reports the last observed market share. However, most of them refer to the years 2015 - 2018. [✂].

253. For UL/VLCC 200,000+ DWT, KSOE and JMU are the competitors whose contracts have been more often matched to the contracts signed by DSME: 26% of the DSME's matched contracts have been matched to KSOE, and 20% to JMU. Further, the average difference in the propensity score shows that on average, KSOE's matched contracts are closer to DSME's contracts than JMU's.[498] The results therefore suggest that KSOE is the competitor with the higher probability of competing for DSME's demand in UL/VLCC 200,000+ DWT.

254. For LNG carriers 40,000+ cu.m., KSOE appears to be the closest competitor to DSME, as more than half of DSME's contracts were matched to KSOE's contracts.

255. For Post-Panamax 15,000+ TEU, Samsung appears to be the closest competitor to DSME, as more than half of DSME's contracts were matched to Samsung's contracts.

256. For LPG carriers 60,000+ cu.m., MHI appears to be the closest competitor to DSME, as 46% of DSME's contracts were matched to MHI's contracts. However, KSOE is also a very close competitor to DSME, as 42% of DSME's contracts were matched to KSOE's contracts. Further, the average difference in the propensity score shows that on average, KSOE's contracts are matched closer to DSME's contracts that MHI's.[499]

257. **Table 25** recaps the results obtained. The results of the propensity score matching exercise shows that the Parties constrain each other and Samsung is also a close competitor to each of the Parties for LNG carriers 40,000+ cu.m. KSOE also appears to be DSME's closest competitor in UL/VLCC 200,000+ DWT. While the Parties are not each other's closest competitor in LPG carriers 60,000+ cu.m and Post-Panamax 15,000+ TEU, DSME still competes closely with KSOE in these two relevant vessel classes. Overall, the matching results therefore suggest that the Parties have a large number of contracts that are matched to each other, achieving in general the first or second highest number of matches.[500] Further, the competitive constraint that Samsung exerts on the Parties in LNG carriers 40,000+ cu.m. and Post-Panamax 15,000+ TEU, and the competitive constraint that MHI exerts on the Parties in LPG carriers 60,000+ cu.m., are comparable to the competitive constraint that the Parties exert on each other.

[498] The average difference in score is equal to 0.00175 for KSOE, and 0.00232 for JMU.
[499] The average difference in score is equal to 0.00783 for MHI, and 0.001 for KSOE.
[500] Except for the matching of KSOE's contracts for LPG carriers 60,000+ cu.m., where DSME achieved the third highest number of matches.

Table 25: Parties' closest competitors

	DSME's closest competitor	KSOE's closest competitor
UL/VLCC 200,000+ DWT	**KSOE**	CSIC
LPG carriers 60,000+ cu.m.	MHI	MHI
Post Panamax 15,000+ TEU	Samsung	Samsung
LNG carriers 40,000+ cu.m.	**KSOE**	**DSME**

Switching analysis

258. As highlighted above, KSOE submitted that the Parties' low customer retention rates and high multi-sourcing rates suggest that their customers can switch or credibly threaten to switch if the merged entity were to raise prices unilaterally following the Proposed Transaction. CCCS notes that DSME does indeed have low retention rates (and high multi-sourcing rates) for all four relevant vessel classes. However, KSOE has relatively high retention rates and low multi-sourcing rates for UL/VLCC 200,000+ DWT and LPG carriers 60,000+ cu.m. In any event, CCCS is of the view that the mere notion of customer switching does not indicate that the Parties are constrained competitively, since KSOE's analysis does not study the proportion of customers who *switched from one merger party to the other*. For example, even if KSOE (or DSME) has low customer retention rates and high multi-sourcing rates, it could be the case that many of KSOE's (or DSME's) customers actually switched to DSME (or KSOE). If this were the case, then the Proposed Transaction would remove the best alternative for customers and the merged entity may still be able to raise prices unilaterally.

259. CCCS has adapted the concept to instead assess the proportion of customers that one merger party has lost to the other, in order to further assess the closeness of rivalry between the Parties. Similar to the propensity score matching analysis, the switching analysis assesses the closeness of rivalry between (each of) the Parties and other shipbuilders unlike KSOE's participation ratio and win-loss ratio analysis which simply identifies shipbuilders who have competed with and won some of the past tenders against the Parties. However, unlike the propensity score matching analysis which matches shipbuilders based on similar observable characteristics in their contracts, the switching analysis assesses the degree in closeness of rivalry based on the proportion of customers *who actually switched* from (each of) the Parties to other shipbuilders in each of the four relevant vessel classes.

260. **Tables 26** and **27** present the results obtained for KSOE and DSME respectively, based on the Parties' tender data from 2009-2019.

Table 26: KSOE's switching customers

Vessel class	Non-exclusive customers	DSME share	Samsung share	KAWASAKI share	MHI share	CSSC share	CSIC share	JMU share	STX share	OTHER share
Post-Panamax 15,000+ TEU	[✂]	[70-80] %	[20-30] %	[0-10]%	[0-10]%	[20-30] %	[0-10]%	[0-10]%	[0-10] %	[0-10]%
LNG Carriers 40,000+ cu.m.	[✂]	[40-50] %	[60-70] %	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10] %	[0-10]%
LPG Carriers 60,000+ cu.m.	[✂]	[20-30] %	[20-30] %	[20-30]%	[20-30] %	[20-30] %	[0-10]%	[0-10]%	[0-10] %	[0-10]%
UL/VLCC 200,000+ DWT	[✂]	[50-60] %	[0-10]%	[0-10]%	[0-10]%	[10-20] %	[10-20] %	[10-20] %	[0-10] %	[20-30] %

Table 27: DSME's switching customers

Vessel class	Non-exclusive customers	Total contracts of customers	KSOE share	Samsung share	KAWASAKI share	MHI share	CSSC share	CSIC share	JMU share	STX share	OTHER share
Post-Panamax 15,000+ TEU	[✂]	[✂]	[70-80]%	[50-60]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
LNG Carriers 40,000+ cu.m.	[✂]	[✂]	[60-70]%	[30-40]%	[10-20]%	[10-20]%	[10-20]%	[0-10]%	[10-20]%	[20-30]%	[0-10]%
LPG Carriers 60,000+ cu.m.	[✂]	[✂]	[90-100]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
UL/VLCC 200,000+ DWT	[✂]	[✂]	[50-60]%	[20-30]%	[0-10]%	[0-10]%	[10-20]%	[10-20]%	[0-10]%	[0-10]%	[0-10]%

261. At the onset, CCCS notes that the period of the dataset used for the switching analysis differs from the period of the dataset used for the propensity score match

exercise.[501] Therefore, some differences may emerge in the assessment of shipbuilders' closeness of rivalry. Nonetheless, similar conclusions can still be drawn.

262. KSOE's results showed that DSME captured most of KSOE's switching customers in the UL/VLCC 200,000+ DWT class and Post-Panamax 15,000+ TEU class.[502] In the LNG carriers 40,000+ cu.m. class, Samsung captured most of KSOE's switching customers and DSME has the second highest share.[503] In the LPG carriers 60,000+ cu.m. class, the shares are equally distributed between DSME, Samsung, MHI, Kawasaki and CSSC.[504] DSME's results showed that on average, KSOE captured most of DSME's switching customers in all the four relevant vessel classes/types.[505]

263. Therefore, overall, the results of the switching analysis are generally aligned with that of the propensity score matching analysis. Each of the Parties captured a large share of customers that switched from the other merger party, achieving in general the largest or second largest share of switching customers.

Win-loss ratio analysis

264. CCCS considers that the frequency with which, prior to the Proposed Transaction, one of the Parties had been the runner-up when the other submitted the winning bid would provide some signal on the extent of the competitive constraint that the Parties exerted on each other prior to the Proposed Transaction. Specifically, the higher the frequency with which, prior to the Proposed Transaction, DSME (KSOE) had been the runner-up in the tenders that KSOE (DSME) eventually won, the higher the probability that the Proposed Transaction would remove KSOE's closest competitor and increase its ability and incentive to raise prices.

---

[501] The propensity score matching analysis relies on Clarksons' vessel data from 2005 to 2019. The switching analysis relies on the Parties' tender data from 2009 to 2019. [✂].

[502] In the propensity score matching analysis, CSIC was the closest competitor (and DSME the second closest) to KSOE in UL/VLCC 200,000+ DWT. Samsung was the closest competitor (and DSME the second closest) to KSOE in Post-Panamax 15,000+ TEU.

[503] In the propensity score matching analysis, DSME was the closest competitor (and Samsung the second closest) to KSOE in LNG carriers 40,000+ cu.m.

[504] In the propensity score matching analysis, MHI was the closest competitor (followed by Kawasaki and DSME) to KSOE in LPG carriers 60,000+ cu.m.

[505] In the propensity score matching analysis, KSOE was the closest competitor (and JMU the second closest) to DSME in UL/VLCC 200,000+ DWT. KSOE was also the closest competitor (and Samsung the second closes) to DSME in LNG carriers 40,000+ cu.m.

In the propensity score matching analysis, KSOE was the closest competitor (followed by JMU) to DSME in UL/VLCC 200,000+ DWT. Samsung was the closest competitor (followed by KSOE) to DSME in Post Panamax 15,000+ TEU.

265. Based on a sample size of 11 multilateral tenders where the contract was eventually awarded by the customer[506] to one of the Parties from 2005 to 2019, CCCS has carried out a win-loss ratio analysis. **Table 28** presents the results of the win-loss ratio analysis.

Table 28: Win-loss analysis

Customer	Contract year	Vessel class	Ranked 1st	Ranked 2nd	Ranked 3rd	Total number of participants	Winning bids	Ranking criteria [507]
[✂]	[✂]	UL/VLCC	DSME	KSOE	Samsung	[✂]	[✂]	pdrots
[✂]	[✂]	Post-Panamax	DSME	Samsung[508]	KSOE	[✂]	[✂]	pdrots
[✂]	[✂]	Post-Panamax	KSOE	Samsung	DSME	[✂]	[✂]	pdrots
[✂]	[✂]	UL/VLCC	KSOE	Samsung	CSIC	[✂][509]	[✂]	pdrots
[✂]	[✂]	LNG	DSME	Samsung	KSOE	[✂]	[✂]	pdrots-hsse
[✂]	[✂]	LNG	DSME	Samsung		[✂]	[✂]	
[✂]	[✂]	LNG	KSOE	DSME/ Samsung[510]		[✂]	[✂]	p
[✂]	[✂]	LNG	KSOE	Samsung		[✂]	[✂]	pts
[✂]	[✂]	LNG	DSME	KSOE/ Samsung	NA	[✂]	[✂]	p
[✂]	[✂]	LNG	DSME	Samsung	NA	[✂]	[✂]	p
[✂]	[✂]	LNG	DSME	Samsung	NA	[✂]	[✂]	p

266. In seven (7) out of 11 tenders, both parties participated; in three (3) tenders, one of the parties ranked second and the other won. Samsung is the most recurrent rival: it is the runner up in ten out of eleven tenders, and together with DSME, has signed a contract with [✂] for Post-Panamax 15,000+ TEU vessels.

267. While the data is too limited to draw robust conclusions, the relevance of Samsung as a competitive constraint on the Parties is consistent with the findings from the propensity score matching analysis and the switching analysis, at least for UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU and LNG carriers 40,000+ cu.m..

[506] Five customers in total. Four ([✂], [✂], [✂], and [✂]) are Singapore-based customers. [✂] does not have a Singapore-registered office.
[507] These criteria were provided by the customer as the selection criteria at the point of awarding the tender to the shipbuilder. In the ranking criteria "p" stands for price, "d" for delivery schedule; "r" for reference, "o" for orderbook, "ts" for technical specification, "hsse" for health, safety, security and environment performance.
[508] [✂].
[509] [✂].
[510] In the two tenders for LNG vessels issued by [✂] in 2005 and 2015, only the information on the final winner was available. The ranking of the other competitors that submitted offers was unavailable.

Other quantitative analyses on the likely effect of the Proposed Transaction

Relationship between KSOE's margins and industry concentration

KSOE's submission

268. KSOE submitted that it has evaluated the extent to which margins are driven by concentration and the intensity of competition between the Parties. According to KSOE, if concentration is a key driver of prices, higher margins should be observed in all vessel types and classes, and relatively higher margins in the segments in which the Parties hold higher market shares and face fewer competitors.

269. KSOE submitted that based on the distribution of its expected gross margins per vessel across all vessel types for the projects that KSOE won in the period 2009-2019, most of KSOE's expected gross margins are in the [✂] range, with very few instances of its expected gross margins above [✂] (refer to **Annex F1**). KSOE also highlighted that even though the LNG segment is more concentrated, the LNG segment has the [✂]. KSOE further submitted that based on the distribution of its expected profit margins per vessel across all vessel types, its expected net margin is [✂] except for chemical tankers and LPG, which shows that its expected gross margins [✂] (refer to **Annex F1**).

270. KSOE submitted that based on the distribution of its expected gross margins per vessel across all vessel classes for the projects that KSOE won in the period 2009-2019, its margins per vessel [✂] (refer to **Annex F1**). KSOE further submitted that based on the distribution of its expected profit margins per vessel across all vessel classes, its expected profit margin is negative for most projects and most vessel classes (refer to **Annex F1**).

271. Next, KSOE submitted that based on the evolution of its expected gross margins per vessel across the four relevant vessel types (i.e. oil tankers, containerships, LNG carriers and LPG carriers) in the 2009-2019 period, the expected gross margin of the median project won by KSOE is consistently below [✂] (refer to **Annex F2**). KSOE further submitted that based on the evolution of its expected profit margins per vessel across the four relevant vessel types, the expected profit margin is typically [✂]. KSOE also submitted that the same observations emerge based on the evolution of its expected gross margins and expected profit margins across the four relevant vessel classes (i.e. UL/VLCC 200,000 DWT, Post-

Panamax 15,000+ TEU, LNG carriers 40,000+ cu.m. and LPG carriers 60,000+ cu.m. (refer to **Annex F2**).

272. KSOE submitted that in view of the above, the observations are not consistent with the view that concentration is a key driver of prices as its expected gross margins are [✂] and its expected profit margins are often [✂] across all segments.

273. KSOE also submitted that there is a [✂] and KSOE's bid prices in the four relevant vessel types, as well as in the four relevant vessel classes for the period from 2009-2019 (refer to **Annex F3**).[511] According to KSOE, prices that are highly reflective of the underlying variable costs of production are consistent with intense competition, and are aligned with the Parties' claim that the industry is currently characterised by high levels of spare capacity and intense competition.

CCCS's assessment

274. An analysis between market concentration and prices/margins aims at testing whether competitors do in fact constrain the Parties by determining the effect on Parties' prices/margins when the number of competitors changes (i.e. when market concentration changes).[512] However, in a bidding market, the existence of at least one credible alternative to the merging parties may be enough to constrain their ability to exert market power after the merger. Therefore, a general analysis on the relationship between market concentration and prices may not be particularly informative.

275. Further, the analysis carried out by KSOE does not account for other possible determinants of margins besides the vessel type and class. If there are other determinants of margins such as customer characteristics that are not accounted for, then KSOE's conclusion that industry concentration does not drive prices, would be fundamentally flawed.

276. In addition, the analysis carried out by KSOE is based on the margins of KSOE alone. Given that the pricing decisions of both KSOE and DSME are relevant, CCCS has instead pooled the data of both KSOE and DSME to determine whether the Proposed Transaction may affect the ability of the Parties to increase prices or profits by increasing the market concentration. In order to control for other factors (besides market concentration) that could affect margins, CCCS has performed

[511] According to KSOE, the coefficient of correlation is [✂] or above for all vessel types, and above [✂] for all vessel classes except for UL/VLCC 200,000+ DWT where the coefficient is [✂].
[512] By assessing market concentration at vessel class level, this analysis also discards the assumption of the RSI analysis that competitors can easily switch from a vessel class to another.

the following regression analysis. The intuition of the analysis is that if competitors are able to constrain the Parties' prices or profits, an increase in market concentration should relax the constraint on the Parties allowing them to increase their prices or profits.[513]

277. The relationship between market concentration and the Parties' performance is estimated through the following econometric model:

$$y_{ijt} = \alpha + \beta_1 HHI_{ct} + \beta_2 X_{ijt} + \beta_3 \gamma_i + \beta_4 \delta_c + \beta_5 \theta_j + \beta_6 \mu_t + \varepsilon_{ijt}$$

where:

- y_{ijt} is the price the Parties charged or the gross margins they expected to gain for the vessels they supplied. Gross margins are computed as the ratio of the difference between the Parties' price and their expected variable costs, over the Parties' prices.[514] Price and expected gross margins are measured at tender level, i.e. for each tender won by each merging party i, with any customer j, at any time t. The analysis is based on the vessels supplied by the Parties over the period 2009-2019;
- HHI_{ct} is the Herfindahl-Hirschman Index[515], computed on the basis of the capacity of all the shipbuilders operating in the market for the global supply of commercial vessels.[516] The shipbuilders' capacity is computed every year, on a rolling basis, as the maximum output sold in the last three years. [517] The HHI is computed at vessel class level (c), for each of the four relevant classes[518], and for each year;
- X_{ijt} are control variables at tender level, to control for the type of tender (multilateral or bilateral), for the participation of the other merging party, for the number of vessels ordered through the tender;
- γ_i are fixed effects at merging party level, that capture the time invariant difference between the price charged by KSOE and the price charged by DSME;

[513] Therefore, one should observe a positive relationship between the Parties' expected prices or margins and market concentration.
[514] Variables costs are as measured by the Parties, no changes have been implemented.
[515] This is defined as the sum of the squares of the market shares of the firms within the market, and ranges from 0 to 10.000.
[516] By computing the HHI based on the output sold by each shipbuilder each year (rather than its capacity), the HHI showed high variability. However, such variability is likely to be associated to some shipbuilders having short production break rather than to a proper change in the market structure. Given that vessels' orders are not frequent, and that the production of a vessel may take up to three years, short production break may be quite common in the industry.
[517] The output is based on both the orders and the fleet. The time frame used to estimate capacity, i.e. three years, is based on the average construction time for vessels (as estimated through the average difference between the order date and the delivery date included in the Clarksons' vessel data). While producing new vessels, shipbuilders may not take orders for additional vessels.
[518] This is based on Clarksons' vessel data.

- δ_c are fixed effects at vessel class level, that capture the time invariant price differences across the four relevant classes[519];
- θ_j are fixed effects at customer nationality level, that capture the time invariant price differences among customers belonging to different regions;
- μ_t are fixed effects at year level, that capture the average price differences across years.

278. **Table 29** presents the results obtained. Results reveal that a change in market concentration, proxied by a change in the HHI, does not significantly affect the Parties' prices (Model (1)) and the Parties' expected gross margins (Model (2)).[520] Therefore, the analysis seems to support that market concentration does not drive prices, and the increase in market concentration that would be triggered by the Proposed Transaction would not affect the Parties' ability to increase their prices or profit.[521]

Table 29: Market structure and performance analysis

Dependent variables:	**(1)**	**(2)**
	Final bid (log)	**Expected gross margin %**
HHI	[✂]	[✂]
	(0.001)	(0.000)
LNG carriers 40,000+ cu.m.	0.833***	0.055
	(0.123)	(0.043)
Post-Panamax 15,000+ TEU	0.481***	0.005
	(0.102)	(0.036)
UL/VLCC 200,000+ DWT	0.111*	0.008
	(0.059)	(0.020)
Control variables/Fixed effect	YES	YES
Constant	3.139***	1.030***
	(1.120)	(0.392)
Observations	[✂]	[✂]
R-squared	0.949	0.477

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

279. However, CCCS notes that the relevance of the results obtained may be limited by the mode of competition prevailing in the market for the global supply of commercial vessels, which is characterised by tenders (formal and informal) and

[519] The base class is assigned to LPG carriers 60,000+ cu.m., so that the fixed effects measure the average price difference between each of the remaining classes and the base class (e.g. the difference between the price of the UL/VLCC 200,000+ DWT and the price of the LPG carriers 60,000+ cu.m.).
[520] The coefficient of the variable HHI is very small, and not statistically different than zero.
[521] The results remain consistent when CCCS accounted for non-linear effects of the independent variable "HHI" on the dependent variable "bid prices/margins", in two different ways by using HHI thresholds instead of a continuous variable for HHI, and adding a quadratic term of the HHI variable.

is essentially a bidding market.[522] Generally, in bidding markets, having high market share may not confer market power because market share can easily be lost in the next bidding round. This implies that market shares are volatile, where each bidding round can drastically impact the share of each shipbuilder and change the overall market structure. This makes it difficult to find a significant and systematic relationship between the degree of concentration in the market and the prices or profits of the Parties.

Relationship between KSOE's bid prices and the number of participants in the tender

KSOE's submissions

280. KSOE submitted that it had also examined whether KSOE's expected gross margins are associated with the number of participants in the tenders that KSOE participated in from 2009-2019. Based on KSOE's averaged expected gross margins, distinguishing between: (a) lost and won tenders; and (b) multilateral tenders, bilateral negotiations and projects in which the mode of competition is unknown, KSOE highlighted that expected gross margins do not systematically decrease as the number of competitors increases (refer to **Annex G1**). To account for differences in margins across vessel types and classes, KSOE performed the same analysis separately for each of the four relevant vessel types and each of the four relevant vessel classes. KSOE highlighted that the results suggest there is no vessel type or class in which its expected gross margins systematically decrease as the number of competitors increases (refer to **Annex G1**).

281. To account for other possible determinants of margins besides vessel types and classes, KSOE submitted that it went further to test the robustness of its conclusions by means of a regression analysis. According to KSOE, the regression analysis determines whether the lack of association between KSOE's bid prices/margins[523] and the number of competitors remains after accounting for the characteristics and circumstances of the tenders. KSOE submitted the results of its regression analyses[524], which supports its conclusion that there is no systematic

[522] Customers may not always conduct a formal tender. Instead, they may informally request for quotations from various shipbuilders. There would also be some purchases where the customer has already decided the shipbuilder upfront and would simply negotiate exclusively with that shipbuilder.

[523] The analysis was performed using KSOE's price, expected gross margins, and expected profit margins separately as the dependent variable.

[524] KSOE conducted the analysis for different samples of projects:

(a) All vessel types where the Parties mainly overlap in (i.e. oil tankers, containerships, LNG carriers and LPG carriers).

relation between KSOE's expected price or margins and the number of competitors, even after accounting for differences across projects in tender characteristics and demand/cost conditions[525] (refer to **Annex G2**). According to KSOE, this suggests that the Proposed Transaction is unlikely to cause unilateral price increases, by reducing the expected number of participants in the multilateral tenders that KSOE participates.

282. While KSOE noted from the regression analysis that margins and prices are [✂] in multilateral tenders than in bilateral negotiations for LNG projects (which could raise the concern that for the multilateral tenders which only KSOE and DSME participate, these tenders would become bilateral negotiations following the Proposed Transaction and lead to an increase in prices for LNG carriers sourced through these tenders), KSOE submitted that it is unlikely that the tenders where the Parties are the only bidders would become bilateral negotiations following the Proposed Transaction. KSOE submitted that this is because customers would be expected to maintain the procurement method of their choice (i.e. multilateral tenders) for the same projects in which multilateral souring was deemed to be superior than direct bilateral negotiations prior to the Proposed Transaction. Further, according to KSOE, there are alternative credible suppliers besides the merged entity that customers can turn to for LNG carriers, so customers would still be able to source multilaterally following the Proposed Transaction.

CCCS's assessment

283. Given the mode of competition in the market for the supply of commercial vessels is heavily based on tenders (both formal and informal), CCCS notes that an analysis at the tender level would better reflect the competition dynamics compared to a general analysis on the relationship between the Parties' prices/margins and market concentration. CCCS notes that the Proposed Transaction could lead to a participation effect at the tender level – by reducing the number of competitors in the market, the Proposed Transaction *may* reduce the (expected) number of participants in a tender. The participation effect can take place in two ways: (1) the shipbuilder behaviour changes as competition is expected to become less vigorous in the tender; (2) the customer has a smaller pool of shipbuilders to choose from and so tends to do worse on average. This in turn implies that the Proposed Transaction, by reducing the number of expected

(b) All vessel types where the Parties mainly overlap in, excluding LNG carriers.
(c) Only LNG carriers.

[525] These include the expected variable costs of the project, whether KSOE won the tender or not, and whether the customer is the top 5 customers for the vessel class and the orderbook. KSOE's model also includes fixed effects such as the customer location and the vessel class.

number of participants in a tender, may increase KSOE's ability and incentive to increase prices unilaterally.

284. The theory on the participation effect would suggest that prices should be lower when customers source multilaterally compared to bilateral negotiations. However, CCCS notes that on the contrary, the Parties' prices are [✂]% higher (but their expected gross margins are [✂]% lower) in multilateral tenders on average.

285. Results remain robust even when CCCS controlled for observable tender characteristics with an econometric model, to isolate the effects of multilateral tenders on the Parties' prices/margins from all tender or customer characteristics that may affect the Parties' price/margins. Compared to the regression analysis carried out by KSOE, which is based only on KSOE's margins, CCCS has again pooled the data of both KSOE and DSME given that the bidding behaviour of both Parties are relevant since the analysis is intended to determine the closeness of rivalry between the Parties. Further, while the regression analysis performed by KSOE is based on the four relevant vessel types, CCCS's analysis is based on the four relevant vessel *classes*.

286. The econometric model is set out as follows:

$$y_{ijt} = \alpha + \beta_1 Multi_{ijt} + \beta_2 X_{ijt} + \beta_3 \gamma_i + \beta_4 \delta_c + \beta_5 \theta_j + \beta_6 \mu_t + \varepsilon_{ijt}$$

where:

- y_{ijt} is the bid the Parties proposed or the gross margins they expected to gain (regardless of whether they won the tender or not). Price and expected gross margins are measured at tender level, i.e. for each tender each merging party i participated in, with any customer j, at any time t. The analysis is based on the tenders the Parties participated in over the period 2009-2019;
- $Multi_{ijt}$ is a binary variable that takes value one if the tender the party i participated in, with the customer j, at time t, is multilateral, zero otherwise;
- X_{ijt} are control variables at tender level, to take into account (i) whether the party won the tender, (ii) the vessel's compensated gross tonnage (iii) the number of vessels included in the tender;
- γ_i are fixed effects at merging party level, that capture the time invariant difference between the price charged by KSOE and the price charged by DSME;

- δ_c are fixed effects at vessel class level, that capture the time invariant price differences across the four relevant classes[526]
- θ_j are fixed effects at customer nationality level, that capture the time invariant price differences among customers belonging to different regions;
- μ_t are fixed effects at year level, that capture the average price differences across years.

287. **Table 30** shows the results obtained. The coefficient of the variable *Multilateral* measures the impact of multilateral negotiations on the Parties' bid or margins. While the Parties' prices are higher in multilateral tenders compared to bilateral tenders (Model (1)), the Parties' gross margins are lower in multilateral tenders (Model (2)). The results on prices and margins therefore seem to indicate that customers generally rely on multilateral tenders for more expensive and sophisticated vessels: the Parties' prices are higher, but profits are lower thereby indicating that costs are higher. The data also seems to suggest that customers retendering for vessels of the same class rely, on average, on the same type of procurement method over time (e.g. customers calling a bilateral negotiation instead of a tender for their first contract, will always rely on bilateral negotiations for the subsequent contracts in that class).[527]

Table 30: Multilateral tenders and bilateral negotiations

Dependent variables:	**(1)**	**(2)**
	Log Final Bid	**Expected gross margin %**
LNG carriers 40,000+ cu.m.	0.853***	-0.041***
	(0.055)	(0.012)
Post-Panamax 15,000+ TEU	0.549***	-0.050***
	(0.062)	(0.013)
UL/VLCC 200,000+ DWT	0.149***	-0.032***
	(0.043)	(0.009)
Mp participated - Yes	-0.039	0.011
	(0.045)	(0.010)
Mp participated - Unknown	-0.150***	0.013
	(0.052)	(0.011)

[526] The base class is assigned to LPG carriers 60,000+ cu.m. so that the fixed effects measure the average price difference between each of the remaining classes and the base class (e.g. the difference between the price of the UL/VLCC 200,000+ DWT and the price of the LPG carriers 60,000+ cu.m.).

[527] Based on the Parties' tender data, it has been assessed whether customers tend to switch to different tenders' types over time, when calling tenders for vessels of the same class. Results shows that [✂] KSOE's customers that have called a bilateral tender for their first contract in the period 2009-2019, keep calling that type of tender over time. Only [✂] of KSOE's customers that have called a multilateral tender for their first contract in the period 2009-2019, switch to a bilateral tender over time. [✂] of DSME's customers that have called a bilateral tender for their first contract in the period 2009-2019, keep calling that type of tender over time. [✂] of DSME's customers that have called a multilateral tender for their first contract in the period 2009-2019, switch to a bilateral tender over time. Unfortunately, tender data are available only starting from 2009: some customers may have made their first contract before 2009.

Dependent variables:	(1)	(2)
	Log Final Bid	Expected gross margin %
Multilateral	[✂]**	[✂]**
	(0.056)	(0.012)
Control variables/Fixed effects	YES	YES
Constant	5.074***	0.283***
	(0.477)	(0.101)
Observations	[✂]	[✂]
R-squared	0.809	0.293

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

288. Given that many of the observations in the Parties' tender data have incomplete information on participation, CCCS has also relied on exogenous shocks including new entries and mergers at vessel class level, to proxy for a change in the number of participants in the tender for that vessel class. More specifically, a new entry in a vessel class is expected to increase the number of participants in the tenders for the vessels of that class; and a merger between two shipbuilders that were both active in a given vessel class is expected to decrease the number of participants in the tenders for vessels of that class.

289. The effects of the new entries and of the mergers on Parties' prices and profits is identified through an econometric model.[528] **Table 31** shows the results obtained.[529] The reduction in the number of tenders' participants triggered by the merger does not significantly affect the Parties' prices (Model (1)) and the Parties' expected gross margins (Model (2)). The increase in the number of tenders' participants triggered by the new entry negatively affects the Parties' prices, but the estimated coefficients are not statistically different than zero (Model (3)). When looking at the effect on the Parties' expected gross margins, results are counterintuitive[530]: the entry of a new player, and the subsequent expected

[528] The analysis on the effects of entry relies on the following equation:

$$y_{ijt} = \alpha + \beta_1 entry_{ct-1} + \beta_2 X_{ijt} + \beta_3 \gamma_i + \beta_4 \delta_c + \beta_5 \theta_j + \beta_6 \mu_t$$

$entry_{ct-1}$ is a variable that counts the number of entries in the vessel class c and at time t-1.

The analysis relies on the effects of the mergers relies on the following equation:

$$y_{ijt} = \alpha + \beta_1 merger_{ct-1} + \beta_2 X_{ijt} + \beta_3 \gamma_i + \beta_4 \delta_c + \beta_5 \theta_j + \beta_6 \mu_t$$

$merger_{ct-1}$ is a variable that counts the number of mergers between firms both active in the vessel class c and at time t-1.

[529] For each year, the variable *merger* measures the number of mergers occurred the previous year and in each vessel class. The variable only counts the merger involving firms that were both operating in the same vessel class (among the four relevant classes). For each year, the variable *entry* measures the number of new entries occurred in the previous year and in each vessel class. The effect of mergers and new entries on the number of participants is assumed to take place within one-year period: for instance, once entered the market, the new player may need time to be known by customers and participate in the tender they call.

[530] A possible limitation of both the entry and the merger analysis is that new entries and mergers are endogenous: when prices or profits are high, new players enter the market; while when profits or price are low, firms tend to consolidate. However, taking the lag of new entry and merger should help to solve the endogeneity issue.

increase in the number of participants, positively and significantly affect the gross margins the Parties expected to gain (Model (4)).[531]

Table 31: Participation effects

Dependent variables:	(1) Final bid (log)	(2) Expected gross margin %	(3) Final bid (log)	(4) Expected gross margin %
Nr of mergers t-1	[✂]	[✂]		
	(0.042)	(0.008)		
Nr of entry t-1			[✂]	[✂]**
			(0.039)	(0.007)
LNG Carriers 40,000+ cu.m.	0.821***	-0.051***	0.857***	-0.058***
	(0.066)	(0.013)	(0.068)	(0.012)
Post-Panamax 15,000+ TEU	0.529***	-0.053***	0.581***	-0.055***
	(0.075)	(0.014)	(0.076)	(0.013)
UL/VLCC 200,000+ DWT	0.183***	-0.045***	0.139**	-0.042***
	(0.068)	(0.013)	(0.055)	(0.010)
Control variables/Fixed effect	YES	YES	YES	YES
Constant	4.882***	0.193*	5.189***	0.085
	(0.537)	(0.104)	(0.540)	(0.093)
Observations	[✂]	[✂]	[✂]	[✂]
R-squared	0.770	0.297	0.786	0.299

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

290. Therefore, the results do not support the hypothesis that for the multilateral tenders which KSOE and DSME participate, the Proposed Transaction would increase the merged entity's ability to raise prices unilaterally by reducing the expected number of participants in a multilateral tender.[532]

Effect of DSME's presence on KSOE's margins

KSOE's submissions

291. KSOE submitted that it had also examined whether KSOE's expected gross margins are associated with DSME's participation. According to KSOE, if DSME's competitive constraint is meaningful from KSOE's perspective, KSOE's

[531] The variability of entry and merger at class level is not sufficiently high to investigate the heterogenous effect on Parties' prices and profits at vessel class level.

[532] Including the special case of multilateral tenders which only KSOE and DSME participate, which would become bilateral following the Proposed Transaction.

However, the model does not study whether the shipbuilders that entered or merged are major competitors to the Parties that may have an impact on the Parties' bid prices/margins.

expected margins should be lower when they both compete for a project vis-à-vis when they do not.

292. Based on KSOE's average expected gross margins in multilateral tenders from 2009-2019 for the four relevant vessel types, distinguishing between: (a) lost and won tenders; and (b) between projects in which DSME participated, projects in which DSME did not participate, and projects in which DSME's participation is not confirmed, no obvious pattern could be observed in relation to the impact of DSME's participation on KSOE's expected gross margins (refer to **Annex H1**). To account for differences in margins across vessel types and classes, KSOE performed the same analysis separately for each of the four relevant vessel types and each of the four relevant vessel classes. KSOE highlighted that the results suggest that there is no evidence that KSOE's expected gross margins are systematically lower when it competes against DSME compared to when it does not (refer to **Annex H1**).

293. To account for other possible determinants of margins besides vessel types and classes, KSOE submitted that it went further to test the robustness of its conclusions by means of a regression analysis. According to KSOE, the regression analysis determines whether the lack of association between KSOE's bid prices/margins[533] and DSME's presence remains after accounting for the characteristics and circumstances of the tenders. KSOE submitted the results of its regression analyses[534], which supports its conclusion that there is no systematic relation between KSOE's expected price or margins and DSME's presence[535], even after accounting for differences across projects in tender characteristics and demand/cost conditions[536] (refer to **Annex H2**). According to KSOE, this suggests that there is no systematic relation between DSME's presence and KSOE's expected bid prices/margins.

[533] The analysis was performed using KSOE's price, expected gross margins, and expected profit margins separately as the dependent variable.

[534] KSOE conducted the analysis for different samples of projects:

(a) All vessel types where the Parties mainly overlap in (i.e. oil tankers, containerships, LNG carriers and LPG carriers).

(b) All vessel types where the Parties mainly overlap in, excluding LNG carriers.

(c) Only LNG carriers.

[535] KSOE submitted that one complication for the analysis is that DSME's participation is not confirmed in some tenders. For this reason, KSOE considered two scenarios (one which assumes that DSME only participated in tenders where its presence has been confirmed by KSOE, another which includes a variable in the model specification that identifies cases where DSME's participation is not confirmed). KSOE submitted that the conclusions are similar for both scenarios.

[536] These include the expected variable costs of the project, whether KSOE won the tender or not, and whether the customer is the top 5 customers for the vessel class and the orderbook. KSOE's model also includes fixed effects such as the customer location and the vessel class.

CCCS's assessment

294. CCCS considers that if DSME (or KSOE) constrains the ability and incentive of the KSOE (or DSME) to increase prices, KSOE's (or DSME's) bid is expected to be lower in those tenders in which both Parties participated. In this case, the Proposed Transaction may increase the ability and incentive of the merged entity to raise prices by removing the competitive constraint exerted by the other merger party.

295. CCCS has performed its own regression analysis to study the impact of one merger party's participation in a tender on the bid proposed by the other merger party. As before, while the regression analysis carried out by KSOE is based on KSOE's margins alone, CCCS considers that the bidding behaviour of both KSOE and DSME are relevant given that the analysis is intended to determine the closeness of rivalry between the Parties. CCCS has therefore pooled the data of both KSOE and DSME. Further, while the regression analysis performed by KSOE is based on the four relevant vessel types, CCCS's analysis is based on the four relevant vessel classes. Additionally, CCCS has analysed the effect on bid prices rather than margins, as bid prices reflect how the presence of one merger party affects the bidding behaviour of the other merger party.

296. The econometric model is set out as follows:

$$y_{ijt} = \alpha + \beta_1 \, MP\ participation_{jt} + \beta_2 \, X_{ijt} + \beta_3 \, \gamma_i + \beta_4 \, \delta_c + \beta_5 \, \theta_j + \beta_6 \, \mu_t + \varepsilon_{ijt}$$

where:

- y_{ijt} is the bid proposed by each merging party i in every tender they participated in (even tenders the Parties have not won), that is for any tender called by any customer j at any time t. The analysis is based on the tenders the Parties participated in over the period 2009-2019[537];
- $MP\ participation$ is a binary variable, that takes value one if the other party participated in the tender, and value zero if the other party was not present;

[537] This is based on the data submitted by the Parties, and it is limited to the tenders' for which the information on whether the other party participated is different than "unconfirmed" (this amounts to [✂] observations over [✂]). However, the values of the control variables are not available for all the tenders, and this brings down the number of observations to [✂].
By excluding the instances in which the participation of the other merging party is unconfirmed, CCCS relied on [✂] observations. Although the tenders in which both participated are the majority ([✂]), there is still enough sample variation to properly identify the effect of the other party participation with the standard rule of significance.

- X_{ijt} are control variables at tender level, to take into account (i) the number of competitors in the tender, (ii) whether the party won the tender, (iii) the vessel's compensated gross tonnage (iv) the number of vessels ordered through the tender;
- γ_i are fixed effect at party level, to control for time-invariant differences between the bid proposed by KSOE and the bid proposed by DSME;
- δ_c are fixed effects at vessel class level, that capture the time invariant price differences across the four relevant classes;[538]
- θ_j are fixed effects at customer nationality level, that capture the time invariant price differences among customers belonging to different regions;
- μ_t are fixed effects at year level, that capture the average price differences across years.

297. The coefficient of the variable *MP participation* estimates the impact of the participation of one party on the bidding behavior of the other, holding constant all the other factors that may also affect the bid proposed.[539]

298. The tenders in which both Parties participate appear to be characterized by [✂][540], compared to the tenders in which only one of the Parties participated (refer to **Figure 1** below).[541] These differences in variable costs across tenders, other than the participation of one merger party, may also affect the other merger party's bid prices. Correspondingly, this implies that if the differences in variable costs across

[538] The base class is assigned to LPG carriers 60,000+ cu.m., so that the fixed effects measure the average price difference between each of the remaining classes and the base class (e.g. the difference between the price of the UL/VLCC 200,000+ DWT and the price of the LPG carriers 60,000+ cu.m.).

[539] The definition of the variable *MP participation* is based on the Parties' beliefs. This analysis relies on the assumption that the Parties form prior expectations on the identity of tenders' participants, and that these expectations are rational. Thus, competitors' actual participation coincides with the rational expectations on their participation.

[540] Variable costs include material costs, transportation and electricity costs, as well as labour costs (related to contract and subcontractor employees, but not permanent employees).

[541] The difference in the expected variable costs across the tenders in which both parties participate and those in which only one party participates can be explained by different reasons:

(a) the tenders both parties participate in are related to more sophisticated vessels. This is also consistent with the evidence showing that multilateral tenders are characterized by higher prices but lower profits compared to bilateral tenders;
(b) when competing with its rivals, the Parties can leverage on other dimensions of competition, different than prices, which may affect their variable costs.

The evidence collected from the sample of customers selected for the win/loss analysis[541] shows that the criteria the customers use to select a shipbuilder include:

(a) the price;
(b) the delivery schedule, i.e. the time needed by the shipbuilder to deliver the vessel;
(c) the orderbook of the shipbuilder, i.e. the degree of saturation of the shipbuilding capacity;
(d) the reference of the shipbuilder, i.e. the level of experience and the relationship history between the customer and the shipbuilder; and
(e) the ability of the shipbuilder to provide the technical specifications required by the customer.

tenders are not controlled for, the impact of one merger party's participation on the other's bid price will *not* be properly identified.[542]

Figure 1: Variable costs across tenders

[✂]

299. **Table 32** shows the results obtained for the models that attempt to control for the difference in variable costs across tenders, in two different ways.[543] Model (1) disentangles the effects of one party's participation on the other party's bidding behavior from any other potential effect on the other party's variable costs, by only controlling for customers' propensity for delivery schedules shorter or longer than average[544].[545] The coefficient of the variable *MP participation* in Model (1) captures whether the Parties change their bidding behavior when the other party is participating in the tender, holding constant the customers' propensity for the delivery schedule.[546] The effect is not statistically significant. Model (2) controls for the overall difference in variable costs across tenders, instead of focusing on a single cost item.[547] The effect is again not statistically significant.[548]

[542] For example, it may be the case that DSME does pose a significant competitive constraint to KSOE, and KSOE's bid prices is significantly lower when it competes with DSME in tenders. However, the presence of DSME may also increase KSOE's variable costs at the same time (e.g. because if the customer gives weight to short delivery schedules, KSOE may try to win the tender against DSME by offering a shorter delivery schedule and has to hire more workers as a result), and KSOE raises its prices to mitigate the higher costs. These two effects confound each other, and the impact of DSME's participation on KSOE's bid prices may not be properly identified as such.

[543] The models control for the variable costs by including them among the control variables of the regression, rather than estimating the impact of participation on the Parties' gross margins. This allows us to explicitly take into account the effect of variable costs on prices. Further, the analysis aims at understanding the impact of one party's participation on the other party's bidding behaviour, which is correctly measured by the bid proposed by the Parties for each tender, and not by their expected gross margins.

[544] This will depend on the customers' preferences which is clearly not observable but can be proxied by the long-run systematic differences in delivery schedules across customers, unconditional on the supplier identity.

[545] The variable *Wait time above mean* is a binary variable that takes value one when the customers has requested, on average, a delivery schedule stricter than the average delivery time in the class.[545] The coefficient of this variable is positive, thereby indicating that, holding all the other factors constant, the Parties charge higher prices for customers requesting stricter delivery schedule. This supports the notion that the positive impact of one merger party's participation on the other's bid prices (through increasing the latter's variable costs) is likely to lead to confounding effects from the negative impact of one merger party's participation on the other's bid prices (through increasing the latter's competitive constraint).

[546] Since the customer's propensity for delivery schedule is constant across tenders in which only one merger party participates in and those tenders in which both merger parties participate in, (each of) the Parties should respond to the competitive pressure posed by the other by reducing its price.

[547] Since variable costs largely explain the time invariant differences in prices across classes, Model (2) does not include the fixed effects at class level. The coefficient of the variable costs is positive and strongly significant: holding constant all the other factors, the Parties charge higher prices for tenders whose expected variable costs are higher.

[548] CCCS also used another econometric specification to test whether the effects of one merger party's participation on the other is *heterogeneous at vessel class level*. This was carried out by including interaction

Table 32: Parties' bidding behaviour

	(1)	(2)
Dependent variables:	**Log Final Bid**	**Log Final Bid**
MP participation	[✂]	[✂]
	(0.034)	(0.015)
LNG Carriers 40,000+ cu.m.	0.903***	
	(0.064)	
Post-Panamax 15,000+ TEU	0.578***	
	(0.061)	
UL/VLCC 200,000+ DWT	0.132***	
	(0.037)	
Two participants	-0.019	-0.011
	(0.025)	(0.010)
Tender type – Multilateral	0.117***	-0.027
	(0.044)	(0.019)
Wait time above mean	0.044*	
	(0.024)	
Variable cost (log)		0.936***
		(0.015)
KSOE	-0.070***	-0.009
	(0.025)	(0.010)
CGT (log)	-0.001	0.018
	(0.052)	(0.012)
Nr of vessel in tender (log)	-0.011	-0.006
	(0.016)	(0.006)
Win	0.061**	-0.014
	(0.026)	(0.010)
Constant	4.635***	0.235**
	(0.558)	(0.115)
Observations	[✂]	[✂]
R-squared	0.914	0.984
Mp part. - Unconfirmed excluded	Yes	Yes
Year FE	Yes	Yes
Customer Macro Area	Yes	Yes

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

300. CCCS notes that the results suggest that, holding constant all the other tender's characteristics, the bids that the Parties propose for the tenders in which both participate are *not different* from the bids proposed for the tenders in which one of

terms between the binary variable. *participation*, and a variable indicating to which of the four relevant vessel classes the vessel tendered belongs (e.g. *LNG*MP participation*).

The participation of the other merger party still negatively affects the price charged by the other merger party in Model (1), but the results are only statistically significant for LNG carriers 40,000+ cu.m.. However, the results are not robust. When controlling for the overall differences in variable costs across tenders in Model (2), the effect on the Parties' bidding behavior for tenders in LNG carriers 40,000+ cu.m. is no longer significant.

the two is not competing. This may indicate that there exist some other competitors that also constrain the Parties' bid prices, and that the presence of the other party does not trigger a further competitive reaction. In this regard, CCCS notes from the propensity score matching analysis that Samsung is identified to be a close competitor to each of the Parties for LNG carriers 40,000+ cu.m. Further, the competitive constraint that Samsung exerts on the Parties in LNG carriers 40,000+ cu.m. and Post-Panamax 15,000+ TEU, and the competitive constraint that MHI exerts on the Parties in LPG carriers 60,000+ cu.m., are comparable to the competitive constraint that the Parties exert on each other. This implies that overall, while the Parties are close competitors to each other, they do not seem to exert a strong constraint on each other's bid prices as there are also other close competitors in each of the four relevant vessel classes.[549]

301. As an additional check, CCCS considered whether the close competitors to the Parties have sufficient spare capacities to serve a significant portion of the diverted demand from the merged entity in the event that it unilaterally raises prices. **Table 33** sets out the *spare balanced capacities* and *spare base capacities* estimated for the close competitors to the Parties, in each of the four relevant vessel classes. The spare balanced capacities show that the Parties' close competitors would have sufficient excess capacities to satisfy *part of the* diverted demand for three relevant vessel classes and *all of the* diverted demand for LPG carriers 60,000+ cu.m., if the close competitors use only their typical spare capacity for the specific relevant vessel class.[550] The spare base capacities show that the Parties' close competitors would have sufficient excess capacities to absorb *all of the* diverted demand from the merged entity in three relevant vessel classes, and most of the diverted demand from the merged entity ([✂]%) in LNG carriers 40,000+ cu.m.[551], if these close competitors are willing to use their spare capacity typically used to build other vessel classes in the same size category to build the specific relevant vessel class. The credible threat that these close competitors are able to do so if necessary, is

[549] CCCS notes that the reliability of the regression analysis relies on its ability to properly control for all the differences across tenders, other than the Parties' participation. CCCS's models controlled for the vessels' characteristics, the customers' preferences, the number of participants to the tenders, and the Parties' expected variable costs. The latter are strongly significant, and their inclusion changes the results obtained. For example, CCCS has also tried other model specifications. by repeating Model (1) and Model (2) *without controlling for the differences in costs across tenders*, in particular by excluding the variable *Wait time above mean*. The exclusion of the proxy variable for costs (*Wait time above mean)* highlights a negative and significant effect of the *Mp participation* variable. However, introducing interaction terms between *Mp participation* and vessel class dummies, the coefficient loses significance, in all classes, except for the LNG class.

[550] The spare balanced capacities of the Parties' close competitors are sufficient to satisfy part of the diverted demand from the merged entity i.e. [✂]% for UL/VLCC 200,000+ DWT, [✂]% for Post-Panamax 15,000+ TEU, and [✂]% for LNG carriers 40,000+ cu.m.

[551] The spare base capacities of the Parties' close competitors are sufficient to absorb *all* the diverted demand from the merged entity for UL/VLCC 200,000+ DWT, Post-Panamax 15,000+ TEU and LPG carriers 60,000+ cu.m., and [✂]% of the diverted demand from the merged entity for LNG carriers 40,000+ cu.m.

likely sufficient to pose a significant competitive constraint on the merged entity. While the close competitors do not have sufficient base capacities to absorb all of the merged entity's diverted demand for LNG carriers 40,000+ cu.m., CCCS notes that the close competitors do not need to be able to absorb all of the merged entity's diverted demand, in order to impose a significant competitive constraint on the merged entity, as the potential loss of just a sizeable portion of its demand to close competitors can prevent the merged entity from profitably sustaining a price increase. Further, not all of the merged entity's customers may switch to other shipbuilders in the event of an unilateral price increase. In this regard, the competitive constraint imposed by the close competitors on the merged entity for LNG carriers 40,000+ cu.m. is likely to be significant as the close competitors have sufficient base capacities to absorb a large proportion of the merged entity's diverted demand.

Table 33: Spare balanced capacities and spare base capacities of Parties' close competitors

Vessel class	Parties' diverted demand (in units of vessels)	Close competitor	Close competitors' spare balanced capacities (in units of vessels)[552]	Close competitors' spare base capacities (in units of vessels)[553]
UL/VLCC 200,000+ DWT	[✂]	Samsung	[✂]	[✂]
		CSSC + CSIC	[✂]	[✂]
		JMU	[✂]	[✂]
		Total of close competitors	[✂]	[✂]
Post-Panamax 15,000+ TEU	[✂]	Samsung	[✂]	[✂]
		CSSC + CSIC	[✂]	[✂]
		Total of close competitors	[✂]	[✂]

[552] Negative spare balanced capacities arise when the forecasted demand for the shipbuilder exceeds the shipbuilder's balanced capacity for the relevant vessel class.

When a close competitor has negative balanced capacity i.e. it does not have sufficient balanced capacity to satisfy its own demand, CCCS has conservatively assumed that the Parties' other close competitors will cater to this excess demand i.e. reducing the close competitors' total spare balanced capacities to absorb the diverted demand from the merged entity.

[553] Negative spare base capacities arise when the forecasted demand for the shipbuilder exceeds the shipbuilder's base capacity for the relevant vessel class.

When a close competitor has negative base capacity i.e. it does not have sufficient base capacity to satisfy its own demand, CCCS has conservatively assumed that the Parties' other close competitors will cater to this excess demand i.e. reducing the close competitors' total spare base capacities to absorb the diverted demand from the merged entity.

Vessel class	Parties' diverted demand (in units of vessels)	Close competitor	Close competitors' spare balanced capacities (in units of vessels)[552]	Close competitors' spare base capacities (in units of vessels)[553]
LNG carriers 40,000+ cu.m.	[✂]	Samsung	[✂]	[✂]
		Kawasaki	[✂]	[✂]
		MHI	[✂]	[✂]
		CSSC + CSIC	[✂]	[✂]
		JMU	[✂]	[✂]
		STX	[✂]	[✂]
		Total of close competitors	[✂]	[✂]
LPG carriers 60,000+ cu.m.	[✂]	Samsung	[✂]	[✂]
		Kawasaki	[✂]	[✂]
		MHI	[✂]	[✂]
		CSSC + CSIC	[✂]	[✂]
		Total of close competitors	[✂]	[✂]

302. The analysis studies whether the competitive constraint that the Parties exert on each other is such that the Parties charge lower prices in the tenders in which both participate, and does not address whether the Parties compete closely in aspects other than prices that also affect their probability of winning the tender.[554] In this regard, CCCS notes from the customers' ranking criteria, that price is typically the most important consideration (followed by delivery times) in their selection of shipbuilders. Importantly, while the market feedback has been focused on the concern of higher prices following the Proposed Transaction, no concerns have been raised in relation to other aspects such as longer delivery times.[555]

CCCS' conclusion on non-coordinated effects

303. Overall, CCCS is of the view that the Proposed Transaction is unlikely to give rise to non-coordinated effects. In particular, based on market feedback, there are viable alternative suppliers in which customers are willing and able to switch to,

[554] The available data does not indicate the delivery schedule the Parties proposed for each tender. The Parties' expected variable costs, which may be affected by the delivery schedule proposed, include many different items and does not allow us to properly identify the effects of the Parties' participation on the delivery time.

[555] While the market feedback suggests that the Korean shipbuilders are more flexible in customised delivery times compared to Japanese shipbuilders (with both on par in terms of quality), no concerns have been raised regarding longer delivery times after the Proposed Transaction takes place. CCCS notes that this may be because a major Korean shipbuilder (Samsung) still remains after the Proposed Transaction, which will put pressure on the merged entity to offer competitive delivery times. Further, the market feedback is inconclusive in relation to whether the Proposed Transaction will result in lower quality of commercial vessels. In this regard, CCCS notes that this could be because the merged entity would still have to compete with Samsung and the Japanese shipbuilders, which are deemed to be on par in terms of vessel quality with the Parties.

for each of the four relevant vessel classes. In addition, based on the quantitative analyses (i.e. Propensity Score Matching Analysis and Switching Analysis), there are close competitors that can impose a competitive constraint on the merged entity following the Proposed Transaction. **Table 34** below provides the identities of these suppliers.

Table 34: Summary of viable alternative suppliers and close competitors to the Parties

Viable alternative suppliers based on market feedback		
UL/VLCC 200,000+ DWT	Samsung, CSSC, CSIC, COSCO, JMU, Mitsui, Namura, Dalian Shipbuilding, Bohai shipyard	
Post Panamax 15,000+ TEU	Samsung, CSSC, CSIC, COSCO, JMU, Imabari, MHI	
LNG carriers 40,000+ cu.m.	Samsung, Hudong-Zhonghua, Keppel Nantong, Japanese shipbuilders	
LPG carriers 60,000+ cu.m.	Samsung, MHI, JMU, Kawasaki, Chinese shipbuilders	
Propensity score matching analysis		
	Close competitors to KSOE	**Close competitors to DSME**
UL/VLCC 200,000+ DWT	CSIC, DSME, JMU	KSOE, JMU
Post Panamax 15,000+ TEU	Samsung, DSME	Samsung, KSOE
LNG carriers 40,000+ cu.m.	DSME, Samsung	KSOE, Samsung
LPG carriers 60,000+ cu.m.	MHI, Kawasaki, DSME	MHI, KSOE
Switching analysis		
	Close competitors to KSOE	**Close competitors to DSME**
UL/VLCC 200,000+ DWT	DSME, CSSC, CSIC, JMU	KSOE, Samsung, CSSC, CSIC
Post Panamax 15,000+ TEU	DSME, Samsung, CSSC	KSOE, Samsung
LNG carriers 40,000+ cu.m.	Samsung, DSME, Kawasaki, MHI, CSSC, JMU, STX	KSOE, Samsung, Kawasaki, MHI, CSSC, JMU, STX
LPG carriers 60,000+ cu.m.	DSME, Samsung, MHI, Kawasaki, CSSC**	KSOE

** (Shipbuilder's name) in underline refers to the closest competitor*
*** The analysis indicates these are equally close competitors*

(b) Coordinated Effects

304. A merger may also lessen competition substantially by increasing the possibility that, post-merger, firms in the same market may coordinate their behaviour to raise prices, or reduce quality or output.[556] Given certain market conditions, and without any express agreement, tacit collusion may arise merely from an understanding that it will be in the firms' mutual interests to coordinate their decisions.[557]

[556] Paragraph 5.33 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[557] Paragraph 5.34 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.

305. Coordinated effects may arise where a merger reduces competitive constraints from actual or potential competition in a market, thus increasing the probability that competitors will collude or strengthening a tendency to do so.[558] Coordinated effects can arise as a result of a merger, even if not all competitors in a given market are involved.[559]

KSOE's submission

306. KSOE submitted that the Proposed Transaction will not give rise to any coordinated effects in the supply of commercial vessels, on the basis of the following[560]:

(a) The shipbuilding industry includes a large number of competitors. Based on the characteristics of the supply of commercial vessels where there is fierce competition for a small number of contracts, it is extremely difficult for shipbuilders to agree tacitly with other competitors in the market on specific transaction terms such as price.

(b) Markets where competition is driven by the extent of capacity available in the market are not conducive to coordination because it is difficult to monitor future capacity levels and utilisation, and even more difficult for competitors to punish any deviation from an attempt to coordinate. For example, even if shipbuilders are able to reach terms of coordination on the basis of capacity, any deviation from a coordinating shipbuilder by increasing its capacity cannot be 'punished' by the other coordinating shipbuilders, because the capacity will already have been increased and cannot be undone. In addition, any attempt to 'punish' the deviation would require the other coordinating shipbuilders to increase their own capacity which would be contrary to their intentions when agreeing to coordinate in the first place. Further, competitors have every incentive to maximise utilisation of their capacity, giving any one firm strong incentives to undercut any attempt at coordination.

(c) The possibility of market entry by a new shipbuilder, and many of these shipbuilders are state sponsored, giving them goals other than profit maximisation. As the shipbuilding industry is a key national industry, countries such as Russia and Saudi Arabia are establishing large-scale

[558] Paragraph 5.35 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[559] Paragraph 5.37 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[560] Paragraphs 35.1.1 to 35.1.3 of Form M1.

production lines and accelerating their entry into the market in full swing, despite the recent severe recession in the industry. Even in the market for each vessel type, it is always possible for shipbuilders to shift their production to other vessel types, due to the combined production system of shipbuilders explained above. In addition, more and more Chinese companies are participating in the market for LNG carriers. Competition in this market has been intensifying due to the continuous inflow of new market entrants (e.g., joint ventures specialising in the production of LNG carriers). It is difficult for competitors to collude to increase price in a market where new entrants are actively entering the market.

CCCS's assessment

307. CCCS notes that the Proposed Transaction results in a high market concentration for the global supply of each of the four relevant vessel classes, with the CR3 ranging from [70-80]% to [80-90]% following the Proposed Transaction.

308. However, based on market feedback, prices of commercial vessels tend not to be transparent due to the possibility of private negotiations between shipbuilders and their customers.[561] Such procurement processes are generally applicable across all vessel types.[562] Customers typically do not share with shipbuilders information on the identity or prices of their competitors.[563] The frequency at which private negotiations between shipbuilders and their customers are used to negotiate prices serve to limit the extent of price transparency available to coordinate in the relevant market. In addition, the differentiation in the quality and experience of shipbuilders located in different countries, as perceived by customers[564], could make it difficult for these shipbuilders to coordinate on prices. Further, no third parties have raised the concern that the Proposed Transaction could lead to coordinated effects in the supply of the four relevant vessel classes.

309. Whilst KSOE's RSI analysis shows that there is excess capacity in the supply of each of the four relevant vessel classes (which could suggest difficulties in coordination among shipbuilders), CCCS notes that the analysis is not robust to model changes. When CCCS revised certain aspects of KSOE's RSI analysis, there was insufficient excess capacity to cater to forecasted demand for at least one vessel class (either Post-Panamax 15,000+ TEU or LNG carriers 40,000+

[561] Paragraphs 2.5 to 2.15 of Form M2; [✂]'s responses dated 24 September 2019, to Question 31 of CCCS's RFI dated 17 September 2019.
[562] Paragraph 31.1 of KSOE's Response dated 12 Feb 2020, to Question 31 of CCCS's RFI dated 4 February 2020.
[563] Paragraph 2.5 of Form M2; Paragraph 25.2 of Form M1.
[564] [✂]'s responses dated 24 September 2019, to Question 3 of CCCS's RFI dated 17 September 2019.

cu.m.). However, CCCS notes that the effect of excess capacity on coordinated effects is not always straightforward. While excess capacity might make coordination difficult if some shipbuilders have a strong incentive to utilise their excess capacity, the threat of loss from excess capacity may incentivise suppliers to coordinate behaviour to raise profits if other conditions are conducive for coordination. Excess capacity could also be a credible threat to deter fellow collusive shipbuilders thinking of deviating from the coordinated behaviour.

310. Overall, CCCS is of the view that there is no credible evidence to suggest that the Proposed Transaction will result in coordinated effects.

(C) VERTICAL EFFECTS

311. Vertical effects may arise from a merger involving firms at different levels of the supply chain, for example a merger between an upstream supplier and a downstream customer. The vertically-integrated firm may be able to foreclose rivals from either an upstream market for selling inputs or a downstream market for distribution or sales.[565] CCCS will be concerned in situations where competitors lack a reasonable alternative to the vertically integrated firm, as they may either be deprived of access to inputs or customers altogether or might be allowed to obtain the product or the facility only at unfavourable prices, thereby lessening rivalry in the market.[566] CCCS will also consider whether the merged entity would have the ability and incentive to foreclose its competitors and the likely effect of that foreclosure on competition.[567]

KSOE's submissions

312. KSOE submitted that whilst the Proposed Transaction gives rise to a vertical integration with the Parties' combined operations for the building of commercial vessels, the Proposed Transaction will not result in input foreclosure for the Parties' competitors in the upstream markets relevant to the supply of commercial vessels.

313. KSOE submitted that while it is active in the supply of products that are inputs for the construction of commercial vessels, the only upstream component for commercial vessels supplied by DSME externally is ship blocks.[568] However,

[565] Paragraph 6.11 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*
[566] Paragraph 6.12 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*
[567] Paragraph 6.13 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016.*
[568] Paragraph 36.1 of Form M1.

DSME only supplies [✂] of the ship blocks it manufactures to external customers. KSOE also manufactures ship blocks, [✂].

314. In relation to the supply of inputs used in the construction of commercial vessels (excluding ship blocks), KSOE submitted that its market share in the upstream markets does not give it sufficient market power to have the ability to foreclose access by its competitors to inputs of any type. KSOE highlighted that its market share for the supply of any inputs for the construction of commercial vessels does not exceed [10-20]% for any given input.[569]

315. Further, KSOE submitted that there are numerous alternative viable sources of supply, aside from KSOE, for shipbuilders. Competing shipbuilders have the ability to switch to alternative suppliers for these inputs, as switching will not incur additional time costs or monetary costs. There are also limited quality differences between the inputs supplied by KSOE and that supplied by alternative suppliers.[570]

316. Even if KSOE decided to stop supplying inputs to competing shipbuilders post-completion of the Proposed Transaction, KSOE submitted that the impact would be very limited as competitors purchase very small volumes from KSOE.[571] Further, KSOE submitted that the inputs that it supplies do not amount to particularly important products for the construction of commercial vessels. Each of the inputs do not represent a significant cost factor relative to the price of the commercial vessel, and are not critical key components for competing shipbuilders that cannot be sourced from other component suppliers at similar prices.[572] Furthermore, KSOE submitted that it does not supply externally any inputs that are specific to the construction of LNG and LPG carriers.[573] The remaining inputs that KSOE does manufacture and supply externally are used in commercial vessels generally, including tankers, LNG carriers, LPG carriers and containerships.[574]

[569] Paragraph 10.2.1 of KSOE's responses dated 1 October 2019, to Question 10 of CCCS's RFI dated 16 September 2019; Paragraph 36.3.1 of Form M1.
[570] Paragraph 36.3.3 of Form M1.
[571] Paragraph 10.2.1 of KSOE's responses dated 1 October 2019, to Question 10 of CCCS's RFI dated 16 September 2019; Paragraph 36.3.4 of Form M1.
[572] Paragraph 10.2.2 of KSOE's responses dated 1 October 2019, to Question 10 of CCCS's RFI dated 16 September 2019 Paragraph 36.3.5 of Form M1.
[573] Paragraphs 9.1 to 9.2 of KSOE's responses dated 1 October 2019, to Question 9 of CCCS's RFI dated 16 September 2019; Paragraph 11.1 of KSOE's responses dated 1 October 2019, to Question 9 of CCCS's RFI dated 16 September 2019.
[574] Paragraph 9.2 of KSOE's responses dated 1 October 2019, to Question 9 of CCCS's RFI dated 16 September 2019.

317. KSOE submitted that, in view of the above, even if the merged entity were to cease supply of the inputs to competing shipbuilders, the disruption caused by switching suppliers, and the costs associated with doing so, would be so minimal that the merged entity would not be able to sustainably foreclose access to input products.[575] In any event, KSOE does not intend to cease supplying inputs to competing shipbuilders post-completion of the Proposed Transaction.[576]

318. KSOE also highlighted that a number of competing shipyards are themselves vertically integrated. COSCO Group has established a joint venture with KHI on technological cooperation. CSSC and CSIC both procure main propulsion engines through their own subsidiary companies. CSSC has also acquired WinGD[577], which is a specialist technologies licensor for main engines. MHI also has source technologies for main propulsion engines, and manufactures main engines in-house.[578]

319. Similarly, in relation to the supply of ship blocks, KSOE submitted that DSME has a limited presence in the supply of ship blocks[579] and that there are numerous alternative suppliers of ship blocks globally[580]. KSOE further submitted that ship blocks are typically manufactured internally for in-house use by shipbuilders, and most shipbuilders are able to manufacture and supply ship blocks. Additionally, ship blocks are not considered by shipbuilders as essential components that must be sourced externally. Any attempt by DSME to foreclose its competitors from ship blocks will have minimal effect as its customers will either manufacture the ship blocks required internally, or look to alternative sources.[581]

320. Finally, KSOE submitted that the Proposed Transaction will not result in customer foreclosure in the upstream markets for the supply of inputs for commercial vessels, as there are numerous alternative customers available to input manufacturers. It is submitted that there will remain in the market a significant number of shipbuilders to whom competing input manufacturers can turn for demand. This will be even more so if and when the market starts to revive and

[575] Paragraph 10.2.3 of KSOE's responses dated 1 October 2019, to Question 10 of CCCS's RFI dated 16 September 2019; Paragraph 36.3.5 of Form M1.
[576] Paragraph 36.3.4 of Form M1.
[577] WinGD refers to Winterthur Gas & Diesel Ltd.
[578] Paragraphs 37.1 to 37.2 of Form M1.
[579] Paragraph 10.2.1 of KSOE's responses dated 1 October 2019, to Question 10 of CCCS's RFI dated 16 September 2019; Paragraph 36.3.2 of Form M1.
[580] Paragraph 6.4 of KSOE's responses dated 12 September, to Question 6 of CCCS's RFI dated 5 September 2019.
[581] Paragraph 36.3.6 of Form M1.

demand increases. Accordingly, the Proposed Transaction will not result in a significant reduction of choice of customers for other input manufacturers.[582]

CCCS's assessment

321. CCCS notes that the merged entity is unlikely to have the ***ability*** to foreclose its competitors by restricting access to inputs for commercial vessels. KSOE's market share for the supply of any inputs for commercial vessels does not exceed [10-20]% for any given input. CCCS also notes that DSME has a limited presence in the supply of ship blocks. Further, feedback from third parties supports KSOE's submission that there are a number of alternative suppliers of inputs, including ship blocks.[583] None of the competitors that responded to CCCS's enquiries indicated that they procure inputs from the Parties for commercial vessels.[584] Additionally, market feedback supports KSOE's submission that a number of competing shipyards are vertically integrated[585], with three competing shipyards indicating that they manufacture ship blocks for internal use.[586]

322. There is no actual overlap between the parties in the supply of inputs. In relation to the inputs externally supplied by KSOE, CCCS notes that DSME [✂]. Further, in relation to the ship blocks externally supplied by DSME, KSOE [✂]. The Parties therefore do not gain market power in the supply of inputs arising from the Proposed Transaction that could increase their ability to foreclose downstream competition.

323. Since KSOE and DSME procure some of their inputs from external sources, another potential concern is that the merged entity could become a dominant customer of inputs such that they can foreclose other suppliers of inputs or have the market power to restrict the supply of inputs from input manufacturers to their competing shipbuilders. CCCS notes that such potential concerns would more likely arise for LNG carriers 40,000+ cu.m. as it appears unlikely that dominance

[582] Paragraph 36.4 of Form M1.
[583] [✂]'s responses dated 24 September 2019, to Questions 35 and 36 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 27 September 2019, to Questions 35 and 36 of CCCS's RFI dated 17 September 2019.
[584] [✂]'s response dated 24 September 2019, to Question 34 of CCCS's RFI dated 17 September 2019; [✂]'s response dated 25 September 2019, to Question 34 of CCCS's RFI dated 17 September 2019; [✂]'s response dated 24 September 2019, to Question 34 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 27 September 2019, to Questions 35 and 36 of CCCS's RFI dated 17 September 2019.
[585] [✂]'s responses dated 24 September 2019, to Question 30 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 26 September 2019, to Question 30 of CCCS's RFI dated 17 September 2019; Paragraph 10 of Notes of Call with [✂] dated 8 October 2019.
[586] [✂]'s responses dated 24 September 2019, to Questions 36 of CCCS's RFI dated 17 September 2019; [✂]'s response dated 24 September 2019, to Question 36 of CCCS's RFI dated 17 September 2019; [✂]'s responses dated 27 September 2019, to Questions 35 and 36 of CCCS's RFI dated 17 September 2019.

would arise from the Proposed Transaction in relation to the other relevant vessel classes or for commercial vessels overall. However, there is no indication that there are inputs that are specific to LNG carriers 40,000+ cu.m.

324. The impact of the Proposed Transaction on the procurement of inputs also appears minimal, given that KSOE supplies most of the major inputs internally and only procures a small proportion of these major inputs from external sources. **Table 34** below sets out five major inputs[587] used commonly across all commercial vessels, and the percentages of these inputs that KSOE manufactures internally. Furthermore, there has been no concerns raised about foreclosure of input suppliers or that the merged entity will be able to restrict the supply of inputs from input manufacturers to competing shipbuilders.

Table 34: Five major inputs used commonly across all commercial vessels and percentage sourced internally by KSOE

Input Name	Percentage Sourced Internally by KSOE
Marine Propulsion Engine	[✂]
Marine Generator Engine	[✂]
Switchboards	[✂]
Marine rotating machine	[✂]
Ballast Water Treatment System[588]	[✂]

325. Given the above, CCCS is of the view that it is unlikely the Proposed Transaction would give rise to vertical effects.

IX. EFFICIENCIES

KSOE's submissions

326. KSOE submitted that following the Proposed Transaction, the merged entity has the potential to realise cost synergies to compete effectively in the global shipbuilding market. This is against the backdrop of the market's long-term recession and overcapacity, aggressive competition from new entrants, and

[587] A "**major input**" refers to an item that typically exceeds approximately KRW 100million per vessel.
[588] The Ballast Water Treatment System is not an input that is specific to the construction of LNG and LPG carriers. Instead, it is used in commercial vessels generally (including tankers, LNG carriers, LPG carriers and containerships). Paragraphs 9.1 to 9.2 of KSOE's responses dated 1 October 2019, to Question 9 of CCCS's RFI dated 16 September 2019; Paragraph 11.1 of KSOE's responses dated 1 October 2019, to Question 9 of CCCS's RFI dated 16 September 2019.

increased production costs due to, among other things, stricter environmental rules and higher minimum wages.[589]

327. Further, KSOE submitted that following the Proposed Transaction, the Parties are able to deliver greater benefits to customers in terms of improved product quality at a lower overall cost, while at the same time returning a publicly owned global shipbuilder to private ownership.[590]

328. KSOE also submitted that the Proposed Transaction addresses the financial difficulties faced by the Korean shipbuilding industry as a result of the crisis and [✂], thus re-enforcing effective competition on the global markets.[591]

CCCS's assessment

329. CCCS notes that in the assessment of net economic efficiencies, merger parties are required to show that these efficiencies will be sufficient to outweigh the adverse effects resulting from SLC caused by the merger.[592]

330. In order to be taken into account by CCCS, merger parties must demonstrate that the efficiencies are:[593]
    (a) Demonstrable;
    (b) Merger specific, that is, they are likely to arise from the merger;
    (c) Timely, in that the benefits will materialise within a reasonable period of time; and
    (d) Sufficient in extent.

331. However, CCCS notes that the efficiencies claimed by KSOE are neither sufficiently quantified nor substantiated with concrete evidence, and KSOE has not provided detailed and verifiable evidence about the claimed efficiencies at this stage.

332. In any event, given that CCCS has not found an SLC, it is not necessary to make an assessment on the claimed efficiencies by KSOE.

[589] Paragraph 42.1 of Form M1.
[590] Paragraph 42.3 of Form M1.
[591] Paragraph 42.2 of Form M1.
[592] Paragraphs 7.3 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.
[593] Paragraph 7.9 of the C*CCS Guidelines on the Substantive Assessment of Mergers 2016*.

X. CONCLUSION

333. For the reasons above and based on available information, CCCS has assessed that the Proposed Transaction, if carried into effect, will not infringe the section 54 of the Act.

334. In accordance with section 57(7) of the Act, this decision shall be valid for a period of one year from the date of this decision.

Sia Aik Kor
Chief Executive
Competition and Consumer Commission of Singapore

ANNEXES A1 TO A4: ANNUAL MARKET SHARES FOR THE WORLWIDE SUPPLY OF COMMERCIAL VESSELS, SEGMENTED BY VESSEL TYPES AND CLASSES

Annex A1

Table A1: Annual market shares for the global supply of UL/VLCCs 200,000+ DWT based on CGT of orders received, for the period 2014 to 2018

	2014		2015		2016		2017		2018	
Builder Group	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**
KSOE	[✂]	[30-40]%	[✂]	[20-30]%	[✂]	[10-20]%	[✂]	[40-50]%	[✂]	[20-30]%
DSME	[✂]	[20-30]%	[✂]	[10-20]%	[✂]	[30-40]%	[✂]	[20-30]%	[✂]	[30-40]%
CSIC	[✂]	[10-20]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%
CSSC	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Japan Marine United Corporation	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[30-40]%	[✂]	[0-10]%	[✂]	[0-10]%
COSCO Shipping Heavy Industry Co Ltd (CHI)	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Samsung Heavy Industries	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[[0-10]%

Mitsui Engineering & Shipbuilding Co Ltd (MES)	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Hanjin Heavy Industries & Construction Co Ltd (HHIC)	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Namura Shipbuilding Co Ltd	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]]	[0-10]%	[✂]	[0-10]%
Imabari Shipbuilding Co Ltd	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
HNA Group	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%
Total	[✂]	**100.0%**	[✂]	**100.0%**	[✂]	**100.0%**	[✂]	**100.0%**	[✂]	**100.0%**
KSOE + DSME	**[✂]**	**[50-60]%**	**[✂]**	**[40-50]%**	**[✂]**	**[50-60]%**	**[✂]**	**[60-70]%**	**[✂]**	**[60-70]%**
Post-merger CR3	**[✂]**	**[80-90]%**	**[✂]**	**[70-80]%**	**[✂]**	**[90-100]%**	**[✂]**	**[80-90]%**	**[✂]**	**[[80-90]%**

Annex A2

Table A2: Annual market shares for the global supply of Post-Panamax 15,000+ TEU based on CGT of orders received, for the period 2014 to 2018

	2014		2015		2016		2017		2018	
Builder Group	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**
KSOE	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[30-40]%
DSME	[✂]	[40-50]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[30-40]%
Samsung Heavy Industries	[✂]	[40-50]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[20-30]%	[✂]	[20-30]%
CSSC	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[[0-10]%	[✂]	[30-40]%	[✂]	[0-10]%
Imabari Shipbuilding Co Ltd	[✂]	[0-10]%	[✂]	[20-30]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
COSCO Shipping Heavy Industry Co Ltd (CHI)	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Hanjin Heavy Industries & Construction Co Ltd (HHIC)	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
CSIC	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[[✂]	[0-10]%	[✂]	[0-10]%

Total	[✂]	**100.0%**	[✂]	**100.0%**	**[✂]**	**100.0%**	[✂]	**100.0%**	[✂]	**100.0%**
KSOE + DSME	**[✂]**	**[50-60]%**	**[✂]**	**[20-30]%**	**[✂]**	**[0-10]%**	**[✂]**	**[30-40]%**	**[✂]**	**[70-80]%**
Post-merger CR3	**[✂]**	**[90-100]%**	**[✂]**	**[70-80]%**	**[✂]**	**[0-10]%**	**[✂]**	**[90-100]%**	**[✂]**	**[90-100]%**

Annex A3

Table A3: Annual market shares for the global supply of LNG carriers 40,000+ cu.m. based on CGT of orders received, for the period 2014 to 2018

	2014		2015		2016		2017		2018	
Builder Group	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**
KSOE	[✂]	[10-20]%	[✂]	[10-20]%	[✂]	[20-30]%	[✂]	[30-40]%	[✂]	[40-50]%
DSME	[✂]	[50-60]%	[✂]	[20-30]%	[✂]	[30-40]%	[✂]	[20-30]%	[✂]	[20-30]%
Samsung Heavy Industries	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[10-20]%	[✂]	[10-20]%	[✂]	[20-30]%
CSSC	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[20-30]%	[✂]	[20-30]%	[✂]	[0-10]%
Mitsubishi Heavy Industries Co Ltd (MHI)	[✂]]	[[0-10]%	[✂]	[30-40]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Kawasaki Heavy Industries Corp	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Imabari Shipbuilding Co Ltd	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
STX Offshore & Shipbuilding Co Ltd	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%

Japan Marine United Corporation	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
China Merchants Group	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Total	**[✂]**	**100.0%**	**[✂]**	**100.0%**	**[✂]**	**100.0%**	**[✂]**	**100.0%**	**[✂]**	**100.0%**
KSOE + DSME	**[✂]**	**[70-80]%**	**[✂]**	**[40-50]%**	**[✂]**	**[60-70]%**	**[✂]**	**[50-60]%**	**[✂]**	**[60-70]%**
Post-merger CR3	**[✂]**	**[80-90]%**	**[✂]**	**[80-90]%**	**[✂]**	**[90-100]%**	**[✂]**	**[90-100]%**	**[✂]**	**[90-100]%**

Annex A4

Table A4: Annual market shares for the global supply of LPG carriers 60,000+ cu.m. based on CGT of orders received, for the period 2014 to 2018

	2014		2015		2016		2017		2018	
Builder Group	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**	**Total CGT**	**Shares in CGT**
KSOE	[✂]	[50-60]%	[✂]	[50-60]%	[✂]	[20-30]%	[✂]	[40-50]%	[✂]	[50-60]%
DSME	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
CSSC	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[20-30]%	[✂]	[30-40]%
Mitsubishi Heavy Industries Co Ltd (MHI)	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[30-40]%	[✂]	[0-10]%	[✂]	[10-20]%
Kawasaki Heavy Industries Corp	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%
Samsung Heavy Industries	[✂]	[10-20]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Japan Marine United Corporation	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[40-50]%	[✂]	[0-10]%	[✂]	[0-10]%
Hanjin Heavy Industries & Constructio	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[10-20]%	[✂]	[0-10]%

n Co Ltd (HHIC)										
CSIC	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%	[✂]	[0-10]%
Total	**[✂]**	**100.0%**	**[✂]**	**100.0%**	**[✂]**	**100.0%**	**[✂]**	**100.0%**	**[✂]**	**100.0%**
KSOE + DSME	**[✂]**	**[60-70]%**	**[✂]**	**[50-60]%**	**[✂]**	**[20-30]%**	**[✂]**	**[40-50]%**	**[✂]**	**[50-60]%**
Post-merger CR3	**[✂]**	**[90-100]%**	**[✂]**	**[80-90]%**	**[✂]**	**[90-100]%**	**[✂]**	**[80-90]%**	**[✂]**	**[90-100]%**

ANNEX B: SIZE CATEGORIES DEFINED BY KSOE

1. KSOE segmented all commercial vessels into five equally large size categories. To determine which vessel class falls into each size category, KSOE performed the following steps:

   (a) First, KSOE computed the average length (breadth) of the vessels contained in each of the different vessel classes in the sample (1999-2018).

   (b) Second, KSOE combined the averages for the different vessel classes.

   (c) Third, KSOE divided the average vessel length (breadth) of the classes into five equally large size categories of approximately 80 (13.6) metres each. This results the following rounded thresholds for length [80, 160, 240, 320] and breadth [14, 27, 41, 54]. KSOE refers to the five size categories (in ascending order) as "very small", "small", "medium", "large" and "very large".

   (d) Fourth, KSOE assigned each vessel class to a size category by comparing the vessel class's length and breadth, with the thresholds, separately. The size category for the vessel class as a whole is then the lower of the size categories for length and breadth.

2. The result of the classification is a mapping of vessel classes to size categories as follows:

Vessel Type	Vessel Class	Size category
Containerships	Post-Panamax 15,000+ TEU	Very large
Oil Tankers	UL/VLCC 200,000+ DWT	Very large
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
LNG	LNG Carriers 40,000+ cu.m.	Large
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
LPG	LPG Carriers 60,000+ cu.m.	Medium

Vessel Type	Vessel Class	Size category
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]
[✂]	[✂]	[✂]

ANNEX C: CCCS'S DEFINITION OF SIZE CATEGORIES, AND THE MAPPING OF VESSEL CLASSES TO THE DEFINED SIZE CATEGORIES

1. CCCS notes that there exists a common ranking of vessel classes based on size *within* each vessel type. However, it is not straightforward to rank classes based on size *across* vessel types. Consequently, there can be different ways to identify the size categories and the mapping of the vessel classes to these categories.

2. CCCS carried out two amendments to the mapping of vessel classes to size categories:

   (a) CCCS has considered that the historical variation in size should be observed for the *four relevant vessel classes* between 1999 to 2018. CCCS is of the view that this would be more in line with market feedback, compared to KSOE's methodology where the historical variation in size is observed for *all* the commercial vessel classes, since feedback suggests that shipbuilders tend to specialise its production mix to reap efficiency gains.

   (b) In addition, CCCS has set the number of size categories to *four*, instead of five as defined by KSOE. CCCS is of the view that this is the minimum number of categories that makes the allocation into size categories of the four relevant vessel classes unconstrained by the number of size categories.[594]

3. The mapping of vessel classes into the four size categories is performed in two steps:

   (a) First, CCCS divides the historical range of length of the relevant vessel classes into four equally spaced intervals (given by the difference between the historical maximum length and the historical minimum length observed for any vessel in the four relevant vessel classes between 1999 and 2018).

   (b) Second, CCCS compares the average length of vessels in each class with the lower bound length of each of the four intervals identified. In particular, the vessel class is assigned to the smallest size group for which its average vessel

[594] For example, if there are 3 size categories, this would force at least two of the relevant vessel classes into the same size category. Accordingly, if there are 5 size categories, this would force one size category to be absent of a relevant vessel class.

length is equal to or greater than the left boundary of the length interval that characterises that group.[595]

4. Table C shows the mapping of vessel classes to the defined size categories, as determined by CCCS.

Table C: Size categories defined by CCCS

Vessel class				Size category		
Type	**Class name**	**Length (average)**	**Breadth (average)**	**Cat.#**	**Length (lower cutoff)**	**Breadth (lower cutoff)**
Containerships	**Post-Panamax 15,000+ TEU**	**393.7**	**57.7**	**1**	**348.4**	**57.6**
Containerships	Neo-Panamax 12-14,999 TEU	365.4	49.7	1	348.4	57.6
Oil Tankers	**UL/VLCC 200,000+ DWT**	**333.1**	**59.8**	**2**	**296.7**	**47.1**
Containerships	Neo-Panamax 8-11,999 TEU	327.7	45.7	2	296.7	47.1
LNG	**LNG Carriers 40,000+ cu.m.**	**292.5**	**46.1**	**3**	**245.1**	**36.7**
Bulk Carrier	Capesize Bulkers 100,000+ DWT	296.5	47.9	3	245.1	36.7
Oil Tankers	Suezmax 125-199,999 DWT	274.7	48.2	3	245.1	36.7
Containerships	Intermediate 3-7,999 TEU	269.7	35.5	3	245.1	36.7
Oil Tankers	Aframax 85-124,999 DWT	246.1	43.1	3	245.1	36.7
Combined Carriers	Misc Types 10,000+ GT	245.6	39.5	3	245.1	36.7
LPG	**LPG Carriers 60,000+ cu.m.**	**226.3**	**36.2**	**4**	**193.4**	**26.3**
Bulk Carrier	Panamax Bulkers 65-99,999 DWT	228.1	33.5	4	193.4	26.3
Oil Tankers	Panamax Tankers 55-84,999 DWT	226.5	33.4	4	193.4	26.3
RO-RO	Ro-Ro 10,000+ DWT	209.5	29.5	4	193.4	26.3
Containerships	Feeder 2-2,999 TEU	205.3	30.8	4	193.4	26.3

[595] There is no constraint onto which size group each of the four relevant vessel classes should be placed in; this is in fact determined by the average length of vessels in each class, when compared with the left boundary of the length interval that characterises the group.
A fifth group is clearly automatically formed by all vessel classes that do not reach the minimum length observed between 1999 and 2018 for vessels in the four relevant vessel classes (i.e. those vessel classes that do not satisfy the left interval of the smallest of the four size categories).

Vessel class				Size category		
Type	**Class name**	**Length (average)**	**Breadth (average)**	**Cat.#**	**Length (lower cutoff)**	**Breadth (lower cutoff)**
Pure Car Carriers	PCC 20,000+ DWT	205.1	33.3	4	193.4	26.3
Bulk Carrier	Handymax Bulkers 40-64,999 DWT	194.1	32.3	4	193.4	26.3

ANNEX D: REVISED RSI METHODOLOGY

1. The revised RSI methodology proposed by CCCS is a sequential allocation process where available balanced capacity is allocated to demand sequentially (starting from the largest to the smallest). Once an amount of capacity has been allocated to demand in one stage, it is deducted and cannot be used in the next stage. The revised RSI analysis is performed in five steps:

First step – Identification of capacity of each shipyard

2. CCCS examined two categories of capacity to measure and allocate capacity, namely the "base" capacity and "balanced" capacity.

Base capacity

3. CCCS computed the difference between the output relative to a given size category and that relative to the immediately larger size category for which each shipyard has capability. This output would therefore be entirely attributable to the relevant vessel size category (eliminating any overlap between size categories). CCCS defines this level of output as *incremental base capacity*, as there is no overlap in the shipyard's base capacity for a relevant vessel class with another.

Balanced capacity

4. CCCS proceeded to compute the *incremental balanced capacity* of each shipyard for the vessel classes that it is capable of producing by taking the incremental base capacity net of the typical level of production[596] of all the vessel classes in the same size category, other than the specific relevant vessel class for which the RSI is computed for.

5. The incremental balanced capacity is then converted into units of average capacity vessels. This conversion is based on the average capacity per vessel (in CGT)[597]

[596] Typical levels of output are adjusted for expectations which may lead to the estimation of negative balanced capacities.

Similar to KSOE's methodology, the revised RSI analysis considers that all negative incremental balanced capacity is absorbed by the Parties' competitors as well. That is, before demand is allocated the overall level of negative capacity for each class is distributed among the remaining shipyards based on the weight of their capacity on the overall (positive) capacity of that vessel class.

[597] This is done dividing the base capacity, the typical capacity and the forecasted demand by the average capacity per vessel class computed.

for each relevant vessel class based on historical deliveries in the period 2004-2018.[598]

6. CCCS highlights that while fractions of demand are disregarded, fractions of capacity are not eliminated *at this stage* as it might be possible that these fractions contribute to the production of full vessels if they are combined with capacity transferred from other vessel classes.

Second step – allocating demand for relevant vessel classes

7. CCCS converted the demand for each relevant vessel class into units of average capacity vessels. This conversion is based on the average capacity per vessel (in CGT) for each vessel class based on historical deliveries in the period 2004-2018.

8. CCCS allocated industry demand to shipyards competing with the Parties starting from larger vessel size categories. In any given size category, whole units of average-sized vessels (in CGT) are aggregated across shipyards to offset industry demand. Demand allocation is carried out in an aggregated fashion – i.e., based on the order of allocation. The order at which shipyards are considered to satisfy demand in a given vessel class is meant to promote the reduction of capacity wastage.[599]

Third step – transferring unused capacity from larger to smaller vessel classes

9. After all balanced capacity has been allocated for the largest relevant vessel class, unused capacity at the shipyard level for that class is computed (taking into account both fractions and whole units of average-sized vessels that the yard did not use to satisfy industry demand). This remaining unused capacity can in fact be used to meet demand of smaller vessels that the shipyard is capable to produce.

[598] CCCS notes that the Parties' RSI model determines the annual average demand forecasts based on the ***deliveries***. That is, there is no consideration of the time for construction and the model only relies on the fact that in a given year, a shipyard can concur to satisfy deliveries for a certain number of full-sized vessels. Therefore, CCCS is of the view that when the fractional capacity at a shipyard level is not optimally allocated, it is more likely kept idle and only contributes to deliveries in the years to come, but not in the current year. Hence, capacity is converted to units of average-sized vessels (in CGT).

[599] The idea underlying is also that some shipyard may be highly focused in one or in a limited number of classes, which may reflect higher specialisation. As an example, in the allocation of a given vessel class, shipyards that do not have capability in the immediately smaller vessel classes come first. For LNG carriers an additional ranking criterion is used, that also corresponds to the same idea of prioritising specialized shipyards, as explained in the text.

When capacity is transferred to a different vessel class it is then converted into units of average-sized vessels of that class.[600]

10. At the stage at which demand specifically for LNG carriers is allocated to shipyards, the overall available capacity of shipyards that do not have a direct track record of deliveries or contracts for LNG carriers is discounted by 20%. However, the allocation order is such that demand is first allocated to shipyards with direct capability for LNG carriers.[601] As in the other stages, any capacity that is left after the allocation of demand for LNG carriers can contribute to the allocation of demand for the smaller relevant vessel classes[602] for which yards have the capability. Before the allocation process of the demand for the lower vessel classes is started, however, this remaining unused capacity is converted back to its undiscounted amount as the discounting factor is only applied to LNG carriers.

Fourth step – returning any unused transferred capacity back to vessel class of origin

11. CCCS notes that the capacity that was transferred from a larger relevant vessel class to a smaller relevant vessel class may not be used eventually by the smaller vessel class to satisfy demand (as there might be excess capacity even after meeting all demand for the smaller vessel class). As such, the unused transferred capacity would then be returned back to the vessel class of origin, so that the index properly reflects the residual capacity attributable to that vessel class. This adjustment is necessary to avoid underestimating the RSI of larger classes and overestimating the RSI of smaller classes.

12. As a result, CCCS is able to identify the shipyards' excess capacity that can be attributed to each of the four relevant vessel classes for the following observations:

For observations relative to the <u>smallest vessel class</u> that each shipyard is capable to produce

(a) CCCS compared the unused capacity in a relevant vessel class to the capacity inherited from the larger relevant vessel classes. If the difference between

[600] This is implemented by converting shipyards' unused capacity into CGT and converting it back into units, based on the average capacity per vessel (in CGT) of the vessel class of origin and destination. Following this procedure, only the fractions that are not sufficient to build an average-sized vessel (in CGT) of any relevant vessel class are discarded.

[601] In other words, shipyards that receive the know-how for building LNG carriers from other shipyards in their shipbuilding group contribute to the allocation of demand only if their (discounted) capacity is necessary to satisfy demand.

[602] At this stage, the only remaining smaller relevant vessel class would be the LPG Carriers 60,000+ cu.m.

the two is positive, the yard did not need to use the inherited capacity to satisfy demand, therefore all inherited capacity can be returned to the immediately larger relevant vessel class that the yard can produce.[603]

(b) On the contrary, a negative difference between the unused and inherited capacity implies that the yard did use at least part of the capacity inherited from larger relevant vessel classes. In this case, all unused capacity is returned to the immediately larger relevant vessel class and the excess capacity of the yard for its smallest vessel class is zero.

For observations relative to the other vessel classes that each yard is capable to produce

(a) The capacity that was transferred back from the immediately smaller relevant vessel class (if any) is compared to the capacity that the yard may have inherited from larger relevant vessel classes to infer whether inherited capacity contributed to satisfy demand. The excess capacity of each yard is equal to the difference between the two (transferred back *minus* inherited) if this difference is positive (and the inherited capacity is fully returned to the immediate larger relevant vessel class).

(b) Otherwise, the excess capacity is equal to zero (and the unused portion of the inherited capacity is returned to the immediate larger relevant vessel class).

Fifth step – computing the RSI values

13. CCCS notes the computation of the RSI value in the situation of excess capacity and excess demand differs slightly.

(a) For relevant vessel classes for which the allocation process resulted in an excess demand, i.e. demand for units of vessels that could not be met through available capacity, the RSI is equals to:

[603] For instance, assume that yard A is capable to produce all four relevant vessel classes, while yard B can only produce UL/VLCC 200,000+ DWT (size category 2) and LPG carrier 60,000+ cu.m. (size category 4). If neither of them used any of its inherited capacity to satisfy demand for LPG carriers, yard A's inherited capacity will be returned to LNG carrier 40,000 cu.m. (size category 3), while yard B's inherited capacity will be returned to UL/VLCC 200,000+ DWT (size category 2).

$$RSI = 1 + \frac{excess\ capacity - excess\ demand}{total\ demand}$$

(b) For the relevant vessel classes for which demand was fully allocated, and thus there is excess capacity, the RSI is instead equal to:

$$RSI = 1 + \frac{excess\ capacity}{total\ demand}$$

In this case, the RSI is necessarily greater than or equal to 1.

ANNEX E: PARTICIPATION AND WIN-LOSS RATIO

Table E1a: Participation rates for the tenders in which KSOE participated in[604]

[✂]

Table E1b: Participation rates for the tenders in which KSOE participated in (continued)[605]

[✂]

Table E2a: Participation rates for the tenders in which DSME participated in[606]

[✂]

Table E2b: Participation rates for the tenders in which DSME participated in (continued)[607]

[✂]

Table E3a: Win-loss rates for the tenders in which KSOE participated in[608]

[✂]

Table E3b: Win-loss rates for the tenders in which KSOE participated in (continued)[609]

[✂]

Table E4a: Win-loss rates for the tenders in which DSME participated in[610]

[✂]

[604] Table 23 of Annex A, in Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[605] Paragraph 40.2 of KSOE's responses dated 12 March 2020 to Question 40(b) of CCCS's RFI dated 4 March 2020.
[606] Table 24 of Annex A, in Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[607] Paragraph 40.3 of KSOE's responses dated 12 March 2020 to Question 40(b) of CCCS's RFI dated 4 March 2020.
[608] Table 25 of Annex A, in Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[609] Paragraph 40.2 of KSOE's responses dated 12 March 2020 to Question 40(b) of CCCS's RFI dated 4 March 2020.
[610] Table 26 of Annex A, in Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

Table E4b: Win-loss rates for the tenders in which DSME participated in (continued)[611]

[✂]

[611] Paragraph 40.3 of KSOE's responses dated 12 March 2020 to Question 40(b) of CCCS's RFI dated 4 March 2020.

ANNEX F1: DISTRIBUTION OF KSOE'S EXPECTED GROSS AND PROFIT MARGINS PER VESSEL ACROSS ALL VESSEL TYPES AND CLASSES

Figure F1a: Distribution of KSOE's expected gross margins by vessel type, 2009-2019[612]

[✂]

Figure F1b: Distribution of KSOE's expected profit margins by vessel type, 2009-2019[613]

[✂]

Figure F1c: Distribution of KSOE's expected gross margins by vessel class, 2009-2019[614]

[✂]

Figure F1d: Distribution of KSOE's expected profit margins by vessel class, 2009-2019[615]

[✂]

[612] Figure 1, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[613] Figure 2, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[614] Figure 3, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[615] Figure 4, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

ANNEX F2: EVOLUTION OF KSOE'S EXPECTED GROSS AND PROFIT MARGINS PER VESSEL ACROSS THE FOUR RELEVANT VESSEL TYPES AND CLASSES

Figure F2a: Evolution of KSOE's expected gross margins by vessel type and tender type, for the period 2009-2019[616]

[✂]

Figure F2b: Evolution of KSOE's expected profit margins by vessel type and tender type, for the period 2009-2019[617]

[✂]

Figure F2c: Evolution of KSOE's expected gross margins by vessel class and tender type, for the period 2009-2019[618]

[✂]

Figure F2d: Evolution of KSOE's expected profit margins by vessel class and tender type, for the period 2009-2019[619]

[✂]

[616] Figure 5, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[617] Figure 6, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[618] Figure 7, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[619] Figure 8, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

ANNEX F3: RELATIONSHIP BETWEEN KSOE'S BID PRICES AND EXPECTED VARIABLE COSTS

Figure F3a: Relationship between HHI's bid prices and expected variable costs by vessel type, 2009-2019[620]

[✂]

Figure F3b: Relationship between HHI's bid prices and expected variable costs by vessel class, 2009-2019[621]

[✂]

[620] Figure 9, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[621] Figure 10, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

ANNEX G1: RELATIONSHIP BETWEEN KSOE'S BID PRICES AND NUMBER OF PARTICIPANTS IN THE TENDER

Table G1a: KSOE's weighted average gross margins by number of participants, in the markets where the Parties mainly overlap in (i.e. oil tankers, containerships, LNG carriers and LPG carriers), 2009-2019[622]

[✂]

Table G1b: KSOE's weighted average gross margins by number of participants, by vessel type, 2009-2019[623]

[✂]

Table G1c: KSOE's weighted average gross margins by number of participants, by vessel class, 2009-2019[624]

[✂]

[622] Table 9, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[623] Table 10, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[624] Table 11, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

ANNEX G2: RESULTS OF KSOE'S REGRESSION ANALYSIS ON WHETHER THE NUMBER OF PARTICIPANTS IN A TENDER IS ASSOCIATED WITH DIFFERENCES IN KSOE'S BID PRICES AND EXPECTED MARGINS

Table G2a: Results for the regression analysis on all vessel types where the Parties mainly overlap in (i.e. oil tankers, containerships, LNG carriers and LPG carriers)[625]

[✂]

Table G2b: Results for the regression analysis on all vessel types where the parties mainly overlap in, excluding LNG carriers[626]

[✂]

Table G2c: Results for the regression analysis on only LNG carriers[627]

[✂]

[625] Table 15, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[626] Table 16, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[627] Table 17, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

ANNEX H1: IMPACT OF DSME'S PARTICIPATION ON KSOE'S EXPECTED GROSS MARGINS

Table H1a: KSOE's weighted average gross margins by DSME's presence, in the markets where the Parties mainly overlap in (i.e. oil tankers, containerships, LNG carriers and LPG carriers), 2009-2019[628]

[✂]

Table H1b: KSOE's weighted average gross margins by DSME's presence, by vessel type, 2009-2019[629]

[✂]

Table H1c: KSOE's weighted average gross margins by DSME's presence, by vessel class, 2009-2019[630]

[✂]

[628] Table 12, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[629] Table 13, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[630] Table 14, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.

ANNEX H2: RESULTS OF KSOE'S REGRESSION ANALYSIS ON WHETHER DSME'S PRESENCE IS ASSOCIATED WITH LOWER EXPECTED MARGINS AND BID PRICES FOR KSOE

Table H2a: Results for the regression analysis on all vessel types where the Parties mainly overlap in (i.e. oil tankers, containerships, LNG carriers and LPG carriers)[631]

[✂]

Table H2b: Results for the regression analysis on all vessel types where the Parties mainly overlap in, excluding LNG carriers[632]

[✂]

Table H2c: Results for the regression analysis on only LNG carriers[633]

[✂]

[631] Table 18, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[632] Table 19, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.
[633] Table 20, Annex 1 of KSOE's Second Supplementary Submissions dated 2 June 2020.