

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

Grounds of Decision issued by the Competition and Consumer Commission of Singapore in relation to the combination of the mobility business of Siemens AG with Alstom S.A.

24 October 2018

Case number: CCCS 400/002/18

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 this Decision is denoted by [X].

TABLE OF CONTENTS

Contents

I.	Introduction	3
II.	The Parties to the Transaction	4
III.	The Proposed Transaction	7
IV.	Competition Issues	9
V.	Counterfactual	13
VI.	Relevant Markets	14
VII.	Market Structure	26
VIII.	Competition Assessment	42
IX.	Efficiencies	53
X.	Ancillary Restrictions	54
XI.	Conclusion	56

I. Introduction

The notification

1. On 16 July 2018, Siemens Aktiengesellschaft (“Siemens AG”) and Alstom S.A. (“Alstom”), (collectively, “the Parties”), pursuant to section 57 of the Competition Act (Cap. 50B) (“the Act”), jointly applied for a decision by the Competition and Consumer Commission of Singapore (“CCCS”) as to whether the proposed combination of Alstom and Siemens AG’s mobility business (“SMB”) by way of a contribution by Siemens AG of the SMB to Alstom in consideration for newly issued Alstom shares (hereinafter “the Proposed Transaction”), will infringe the prohibition in section 54 of the Act, if carried into effect. For the purposes of CCCS’s assessment, the Proposed Transaction would see Siemens AG acquire sole control of Alstom.¹
2. In reviewing the Proposed Transaction, CCCS contacted twenty-two (22) suppliers/potential suppliers of either metros, urban signalling systems, or rail electrification (i.e. contact lines and/or traction power supply systems)², and three (3) customers³ (collectively referred to as “third parties”).
3. Of the third parties contacted, eleven (11) replied⁴, seven (7) of whom provided substantive responses to CCCS’s questions.⁵ The views of the third parties who provided substantive responses were mixed. While three (3) of the third parties did not express any competition concerns⁶, four (4)⁷ indicated that they had competition concerns about the Proposed Transaction. In particular, concerns were expressed regarding competition in the market for the supply of urban signalling systems for Mass Rapid Transit (“MRT”) lines in Singapore. The competition concerns included that (i) the Parties are the key suppliers of urban signalling systems; (ii) the barriers to entry into the supply of urban signalling systems appear to be significant; and (iii) the Parties may leverage on the interoperability of their metros with their urban signalling systems to foreclose competition in the supply of metros in Singapore.
4. At the end of the consultation process and after evaluating all the information including the Parties’ submissions and the concerns raised by third parties,

¹ Paragraph 8.5 of Form M1.

² Suppliers: [X].

³ Customers: [X]. These customers are the only customers of rail transportation products in Singapore.

⁴ Customers: [X]. Suppliers: [X].

⁵ Customers: [X]. Suppliers: [X].

⁶ Customers: [X]. Suppliers: [X].

⁷ Customers: [X]. Suppliers: [X].

CCCS, on balance, concludes that the Proposed Transaction, if carried into effect, will not infringe section 54 of the Act.

II. The Parties to the Transaction

Siemens

5. Siemens AG is a stock corporation (*Aktiengesellschaft*) organised under the laws of Germany with its registered seat in Munich and Berlin, Germany. Its headquarters are at Werner-von-Siemens-Str. 1, 80333 Munich, Germany.⁸ Siemens AG is the ultimate parent of the Siemens group of companies⁹ (hereinafter, “Siemens”). Siemens AG’s shares are quoted on the Frankfurt am Main, Germany, and Xetra stock exchanges and are publicly held.¹⁰
6. Globally, Siemens manufactures the full range of mobility products for rail transportation (including different types of rolling stock, signalling solutions and rail electrification).¹¹ Siemens’s other businesses include systems and services for power generation, transmission and distribution, as well as energy-efficient products and solutions for production and building technology, and technologies for high-quality and integrated healthcare.¹² Siemens’s businesses are bundled into the following business divisions: Power and Gas¹³; Power Generation Services¹⁴; Energy Management¹⁵;

⁸ Paragraph 7.1 of Form M1.

⁹ The Siemens group of companies comprise of a number of entities worldwide, including Siemens Rail Automation Limited, Siemens Signalling Co. Ltd, and Aimsun Inc, etc. The entities within Siemens that are registered in Singapore include: (a) Aimsun Pte. Ltd.; (b) Atlantis Resource Ltd.; (c) Dresser-Rand Asia Pacific Sdn Bhd (Singapore Branch); (d) Flender Pte. Ltd.; (e) Mentor Graphics Asia Pte. Ltd; (f) Omnetric GmbH Singapore Branch; (g) Power Automation Pte. Ltd.; (h) Siemens Bank GmbH Singapore Branch; (i) Siemens Gamesa Renewable Energy Singapore Pte. Ltd.; (j) Siemens Gamesa Renewable Energy Pty. Ltd. Branch Office Singapore; (k) Siemens Healthcare Pte. Ltd.; (l) Siemens Industry Software Pte. Ltd.; (m) Siemens Mobility Pte. Ltd.; (n) Siemens Postal, Parcel & Airport Logistics Pte. Ltd.; and (o) Siemens Pte. Ltd.

¹⁰ Paragraph 7.2 of Form M1.

¹¹ Part 5 of Form M1.

¹² Part 5 of Form M1.

¹³ The Power and Gas Division offers a range of rotating equipment and solutions focusing on environmentally-compatible and resource-saving power generation.

¹⁴ The Power Generation Services Division offers expert factory or field service support, maintenance, repairs, replacements, modernisations and upgrades of components for gas and steam turbines as well as generators and compressors.

¹⁵ The Energy Management Division supplies products, systems, solutions and services for the efficient, reliable and intelligent transmission and distribution of electrical power.

- Building Technologies¹⁶; Mobility¹⁷; Digital Factory¹⁸; Process Industries and Drives¹⁹; Financial Services²⁰; Siemens Healthineers²¹; Siemens Gamesa Renewable Energy²² and Next47^{23, 24}
7. In Singapore, Siemens conducts the same business as it does globally.²⁵ In Singapore, the SMB has supplied rolling stock (metro trains)²⁶ and is now active in urban signalling, maintenance equipment, provision of services related to the supply of communication systems and traction power supply systems for rail electrification.²⁷
 8. The trading name used by the SMB in Singapore is “SIEMENS”.²⁸ The relevant Siemens entities in Singapore that currently hold the SMB are:²⁹
 - a. Aimsun Pte. Ltd; and
 - b. Siemens Pte. Ltd.
 9. The total (group) worldwide turnover for Siemens in the financial year ended 30 September 2017 is approximately €83 billion (approximately S\$131.29

¹⁶ The Building Technologies Division offers fire safety, security, building automation, heating, ventilation and air conditioning as well as energy management products and services.

¹⁷ The Mobility Division provides products, solutions and services regarding the transportation of people and goods by rail and road.

¹⁸ The Digital Factory Division offers a comprehensive portfolio of seamlessly integrated hardware, software, and technology-based services in order to support manufacturing companies worldwide in enhancing the flexibility and efficiency of their manufacturing processes and reducing the time to market of their products

¹⁹ The Process Industries and Drives Division helps companies improve the reliability, safety, and efficiency of their products, processes and plants.

²⁰ The Financial Services Division provides financial solutions for Siemens’s projects and products, opens the way for new business ideas such as pay-per-use financing models and public private partnerships, and signal confidence to the markets through long-term risk participation.

²¹ Siemens Healthineers supplies technology to the healthcare industry. It offers diagnostic imaging, laboratory diagnostics and advanced therapies and services.

²² Siemens Gamesa Renewable Energy supplies reliable, environmentally friendly and cost-efficient renewable energy solutions, in particular wind turbines

²³ Next47 is a unit to foster disruptive ideas more vigorously and to accelerate the development of new technologies.

²⁴ Paragraph 10.8 of Form M1.

²⁵ Paragraph 10.12 of Form M1.

²⁶ [§<] Response to CCCS’s Invitation to Comment dated 27 July 2018: Siemens’s metros are currently running on the North-South and East-West Lines.

²⁷ Paragraph 10.14 of Form M1.

²⁸ Paragraph 10.6 of Form M1.

²⁹ Paragraph 2.1 of the Parties’ Response to CCCS’s Information Request dated 27 July 2018; and paragraph 2.1 of the Parties’ Response to CCCS’s Information Request dated 5 September 2018.

billion).³⁰ The total (group) Singapore turnover for Siemens in the financial year ended 30 September 2017 is approximately [X].³¹

Alstom

10. Alstom is a French *société anonyme*, having its registered office at 48 rue Albert Dhalenne, 93400 Saint-Ouen, France, registered under number 389 058 447 RCS Bobigny.³² Alstom is the ultimate parent of the Alstom group of companies³³ (“the “Alstom Group”).³⁴
11. Alstom is a global player in the world rail transport industry, proposing a range of solutions (from high-speed trains to metros, trams and e-buses), related services (maintenance and modernisation) as well as offerings dedicated to passengers and infrastructure, digital mobility and signalling solutions.³⁵
12. In Singapore, Alstom only supplies rail mobility products being turnkey solutions³⁶, signalling, rolling stock and infrastructure for Singapore’s metro lines. In addition, Alstom also provides after sale services and third rails for rail electrification purposes to the rail operators in Singapore.³⁷
13. Alstom provides its products and services in Singapore under the brand name “Alstom”.³⁸ Its trading names include: “Alstom Transport (S) Pte. Ltd.”; “Alstom Singapore”; “Alstom Transport Singapore”; “ATSPL”; “Alstom Transport S.A.”; and “ATSA”.³⁹
14. The total (group) worldwide turnover for the Alstom Group in the financial year ended 31 March 2018 is approximately €8.0 billion (approximately

³⁰ Paragraph 13.1 of Form M1.

³¹ Paragraph 13.3 of Form M1.

³² Paragraph 7.4 of Form M1.

³³ The Alstom Group comprise of a number of entities worldwide, including Alstom Qingdao Railway Equipment Co Ltd Limited, Alstom Transport Service Ltd, Alstom Transport Holdings B.V., etc. Within the Alstom Group, Alstom Transport (S) Pte. Ltd is registered in Singapore.

³⁴ Paragraph 7.5 of Form M1.

³⁵ Paragraph 10.10 of Form M1.

³⁶ Turnkey solutions refer to projects that combine system integration and/or project management services, with at least two of rolling stock, signalling or rail electrification product packages. Turnkey projects are more common where customers want a completely new system, for example, where a city is developing an entirely new metro system or metro line. In Singapore, Alstom provided the Circle Line as a turnkey project. However, turnkey projects are an exception in Singapore.

³⁷ Paragraph 10.16 of Form M1.

³⁸ Paragraph 10.7 of Form M1.

³⁹ Paragraph 10.7 of Form M1.

S\$12.65 billion).⁴⁰ The total (group) Singapore turnover for Alstom Group in the financial year ended 31 March 2018 is approximately [X].⁴¹

III. The Proposed Transaction

Nature of the Proposed Transaction

15. The Proposed Transaction will be a combination of Alstom and the SMB, by way of Siemens AG contributing its SMB to Alstom in consideration for newly issued Alstom shares, in the order of no less than 50 per cent of the share capital.⁴² The Parties submitted that the Proposed Transaction will result in Siemens acquiring at least 50% of the share capital of Alstom and in Siemens having a majority of directors on the Alstom board of the combined entity (i.e. Alstom and Siemens' SMB), giving Siemens sole control of Alstom from a competition perspective.⁴³

Commercial Rationale of the Proposed Transaction

16. From the Parties' perspective, the strategic and economic rationale for the Proposed Transaction is described as follows:⁴⁴
 - a. The Proposed Transaction will combine two global railway players with particular customer value and operational potential. The combination of the Parties' experience, complementary product offerings and geographic footprints will enable the merging entity to compete effectively and respond to mobility challenges in the future while addressing the increasing competitive pressure from rapidly growing competitors, to the benefit of customers and consumers.
 - b. The Proposed Transaction combines the complementary businesses of the Parties to enable the merging entity to offer a significantly increased range of diversified offerings to meet multi-faceted, customer-specific requirements.
 - c. The Proposed Transaction is expected to increase the global footprint of the Parties, allowing the merging entity to access growth markets in the Middle East and Africa, India, and Central and South America

⁴⁰ Paragraph 13.2 of Form M1.

⁴¹ Paragraph 13.4 of Form M1.

⁴² Paragraph 8.7 of Form M1.

⁴³ Paragraphs 8.8, 8.9 and 11.1 of Form M1.

⁴⁴ Paragraphs 12.6 to 12.9 of Form M1.

where mainly Alstom is present, and China, the United States and Russia where mainly Siemens is present. Customers will significantly benefit from a well-balanced larger geographic footprint and potential for improved product offerings.

- d. The Proposed Transaction will allow the Parties to combine their experience and drive crucial cost efficiencies and innovation, allow the merging entity to better address customers' and consumers' needs. Overall, this will result in significant synergies that are important in securing a long term global competitive positioning in the face of increased competition. By decreasing its cost, the merging entity will be better placed to compete with low cost-based competition in particular in Eastern Europe and Asia, benefiting customers through lower prices.

Merger under Section 54 of the Competition Act

17. The Parties submitted that the Proposed Transaction falls within section 54(2)(b) of the Act, as Siemens AG will acquire sole control over Alstom from a competition perspective.⁴⁵
18. The Parties submitted the following diagram to represent the proposed ownership structure pre and post-Transaction:⁴⁶

Table 1: Proposed Ownership Structure pre and post-Transaction

[REDACTED]

CCCS's Conclusion on whether the Proposed Transaction constitutes a Merger under the Act

19. Based on the Parties' submissions regarding the structure of the Proposed Transaction, CCCS is of the view that the Proposed Transaction constitutes

⁴⁵ Paragraphs 8.9 and 11.2 of Form M1. The Parties submitted [REDACTED]:

(a) The Board of the merging entity will consist of 11 members and will be comprised of (i) six directors designated by Siemens; (ii) Four independent directors designated by Alstom and approved by Siemens; and (iii) the CEO of Alstom. The current CEO of Alstom, Henri Poupart-Lafarge, will continue to lead Alstom as the CEO and will be a board member.

(b) [REDACTED]

(c) [REDACTED]

⁴⁶ Paragraph 8.6 of Form M1.

a merger pursuant to section 54(2)(b) of the Act as Siemens has acquired direct control over Alstom.

IV. Competition Issues

20. In evaluating the Proposed Transaction, CCCS will identify overlapping products/services provided by the merging parties. The Parties submitted that Siemens and Alstom overlap only in the supply of urban signalling.⁴⁷ CCCS, however, notes that the Parties can, and/or have supplied rolling stock and rail electrification (e.g., traction power supply systems and contact lines) in the past.⁴⁸

Urban Signalling

21. The Parties submitted that Siemens and Alstom overlap only in the supply of urban signalling.⁴⁹ Urban signalling is a system that prevents metros and light rail vehicles (“LRVs”)⁵⁰ circulating within and around cities from colliding by preventing two vehicles from meeting on the same section of track.⁵¹ Urban signalling also manages railway traffic and improves rail network efficiency.⁵² Siemens’s turnover in respect of the supply of urban signalling in Singapore for the financial year ended 30 September 2017 is [X].⁵³ Alstom’s turnover in respect of the supply of urban signalling in Singapore for the financial year ended 31 March 2018 is approximately [X].⁵⁴

Metros

22. The Parties submitted that for the purpose of completeness of this notification, Siemens AG and Alstom do not overlap in the supply of rolling stock in Singapore in general or in the metro sub-segment⁵⁵ more specifically.⁵⁶ Metros are motorised units which consist of one or several permanently coupled individual units which are operated in major metropolitan areas on

⁴⁷ Paragraph 15.1 of Form M1.

⁴⁸ Paragraphs 15.5, 15.6, 15.8 and 15.10 of Form M1.

⁴⁹ Paragraph 15.1 of Form M1.

⁵⁰ Trams/ LRVs are urban railway vehicles powered by electricity running on tracks along the street or on a segregated right of way (i.e., on segregated tracks separated from road traffic lanes).

⁵¹ Paragraphs 15.3 and 18.6 of Form M1.

⁵² Paragraphs 15.3 and 18.6 of Form M1.

⁵³ Paragraph 16.1 of Form M1.

⁵⁴ Paragraph 16.1 of Form M1.

⁵⁵ In Singapore, metros are employed for use as part of the MRT, a rapid transit system forming a major component of the public transport network in Singapore.

⁵⁶ Paragraph 15.5 of Form M1.

tracks separate from railway networks and road traffic, often running underground.⁵⁷ Other types of urban rolling stock include trams/Light Rail Vehicles (“LRV”)⁵⁸, and People Movers (“PM”)⁵⁹.⁶⁰ The Parties submitted there is no overlap for the following reasons:

- a. Siemens has not won a contract for the supply of metros in Singapore since 1993 (Contract 651) [§<], and it last participated in tenders for metros in Singapore in 2014 (Contract T251, which it did not win).⁶¹
 - b. Siemens has not supplied PMs or LRVs in Singapore.⁶²
 - c. Alstom currently supplies metros in Singapore. Alstom was awarded contracts for the supply of metros in Singapore in 2012 (Contract 830C) and in 2018 (Contract 851E).⁶³
 - d. Alstom has not supplied PMs or LRVs in Singapore.⁶⁴
23. CCCS considers that there is no overlap between the Parties in the supply of PMs or LRVs. CCCS, however, considers that the Parties overlap in the supply of metros given that both Parties are active in participating in tenders for metros in Singapore. In this regard, CCCS notes that while Siemens had not participated in 2012 for Contract 751C and Contract 830C, in 2015 for Contract 151C and in 2018 for Contract 851E and Contract R151, it had participated in Contract T251 for the supply of metros in 2014.⁶⁵ Metros supplied by Siemens currently run on the North-South and East-West Lines.⁶⁶ CCCS further notes that [§<].⁶⁷

⁵⁷ Paragraph 18.4 of Form M1.

⁵⁸ Trams/ LRVs are urban railway vehicles powered by electricity running on tracks along the street or on a segregated right of way (i.e., on segregated tracks separated from road traffic lanes).

⁵⁹ People Movers are lower capacity electric vehicles, typically forming part of an integrated transit system, operating in city centres, airports and/or theme parks, malls, etc. Singapore’s LRT falls within the PM category.

⁶⁰ Paragraph 18.3 of Form M1.

⁶¹ Paragraph 15.5 of Form M1. Since Siemens’s last participated in tenders for metros in Singapore in 2014, there has been three other tenders for metros in Singapore. This includes Contract R151, Contract 851E and Contract 151C.

⁶² Paragraph 17.2 of the Parties’ Response to CCCS’s Information Request dated 27 July 2018.

⁶³ Paragraph 25.2 of Form M1.

⁶⁴ Paragraphs 17.3 to 17.5 of the Parties’ Response to CCCS’s Information Request dated 27 July 2018.

⁶⁵ Paragraph 25.2 of Form M1; and paragraph 1 of [§<] Response to CCCS’s Information Request dated 27 July 2018.

⁶⁶ Paragraph 21 of [§<] Response to CCCS’s Invitation to Comment dated 27 July 2018.

⁶⁷ Paragraph 17.1 of the Parties’ Response to CCCS’s Information Request dated 27 July 2018.

24. Siemens has no turnover in respect of the supply of metros in Singapore for the financial year ended 30 September 2017⁶⁸. Alstom's turnover in respect of the supply of metros in Singapore for the financial year ended 31 March 2018 is approximately [X].⁶⁹

Rail electrification

25. In relation to rail electrification⁷⁰, the Parties submitted that they do not consider that their respective activities relating to rail electrification result in an overlap, as the Parties do not supply the same type of rail electrification projects to customers in Singapore.⁷¹ Rail electrification refers to the process of supplying electric power to the rail network in order for electrified rolling stock to function. Rail electrification includes (i) traction power supply (including train power control and protection systems); and (ii) contact line systems (which provides power via overhead contact lines (“OHCLs”) or at ground level using an extra third rail close to the tracks (“third rail”)).⁷² The Parties submitted there is no overlap for the following reasons:
- a. **Traction Power Supply Systems:** Siemens is active only in the supply of traction power for rail electrification projects in Singapore.⁷³ Traction power supply systems are systems that draw power from a power network to supply the rail line with electricity.⁷⁴ Alstom has not participated in any tenders or otherwise secured contracts for traction power supply systems since 2013.⁷⁵ [X].⁷⁶
 - b. **Contact Lines:** Siemens has not supplied third rails or OHCLs in Singapore. OHCLs are contact line systems where electricity is provided to the train from above. Third rails are contact line systems

⁶⁸ Paragraph 16.3 of Form M1.

⁶⁹ Paragraph 16.3 of Form M1.

⁷⁰ The primary objective of rail electrification systems is to safely provide uninterrupted and reliable electrical energy to power rolling stock. There are generally two primary components in a rail electrification system which are not substitutable with one another and customers can source for these different elements from different suppliers:

(a) Traction power supply systems which draw power from the national power network to supply the rail electrification network by means of power supply points, known as substations and

(b) Contact lines systems which transmit electrical power from the rail network to the rolling stock vehicles plying the network either by way of overhead contact lines system or at ground level using an extra third rail close to the tracks.

⁷¹ Paragraph 15.6 of Form M1.

⁷² Paragraph 15.7 of Form M1.

⁷³ Paragraph 15.8 of Form M1.

⁷⁴ Paragraph 19.6 of Form M1.

⁷⁵ Paragraph 14.1 of Form M1.

⁷⁶ Paragraph 16.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

where electricity is provided to the train from below.⁷⁷ [REDACTED].⁷⁸ Alstom is currently only active in relation to third rails in Singapore.⁷⁹ While Alstom last supplied OHCLs in 2012 (Contract 759A), [REDACTED].⁸⁰

26. In relation to the supply of traction power supply systems, CCCS considers that there is no overlap between the Parties [REDACTED]. In any event, CCCS notes that competition concerns are unlikely to arise in respect of the supply of traction power supply systems in Singapore, given that there is significant competition from numerous global suppliers including CTCI Corporation, Meidensha Corporation and Colas Rail S.A..⁸¹ Moreover, feedback from third-parties including suppliers and customers did not indicate competition concerns.⁸²
27. Similarly, in relation to the supply of contact lines, CCCS considers that there is no overlap between the Parties given that Siemens has never supplied OHCLs or third rails in Singapore. While [REDACTED], CCCS notes that [REDACTED].⁸³ In any event, CCCS notes that competition concerns are unlikely to arise in respect of the supply of contact lines in Singapore, given that there is significant competition from numerous global suppliers including CTCI Corporation, Meidensha Corporation, and Colas Rail S.A..⁸⁴ Moreover, feedback from third-parties including suppliers and customers did not indicate competition concerns.⁸⁵
28. Given the above, CCCS has focused its assessment of the Proposed Transaction on the supply of urban signalling and metros in Singapore. In evaluating the potential impact of the Proposed Transaction, CCCS considered whether the Proposed Transaction will lead to coordinated, non-coordinated, and/or vertical effects that would substantially lessen competition or raise competition concerns in any market(s) in Singapore.

⁷⁷ Paragraph 21.9 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

⁷⁸ Paragraph 15.12 of Form M1.

⁷⁹ Paragraph 15.12 of Form M1.

⁸⁰ Paragraph 15.12 of Form M1 and paragraph 15.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

⁸¹ Paragraph 24.7 of Form M1.

⁸² Paragraph 2 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 2 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 2 of [REDACTED] Response to CCCS's Invitation to Comment dated 18 June 2018 and paragraph 10 of the Notes of Meeting between CCCS and [REDACTED] dated 6 July 2018.

⁸³ Paragraph 15.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

⁸⁴ Paragraph 24.7 of Form M1.

⁸⁵ Paragraph 2 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 2 of [REDACTED] Response to CCCS's Invitation to Comment dated 18 June 2018 and paragraph 9 of the Notes of Meeting between CCCS and [REDACTED] dated 6 July 2018.

V. Counterfactual

29. As stated at paragraph 4.14 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*, 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.
30. The *CCCS Guidelines on the Substantive Assessment of Mergers 2016* also states that in most cases, the best guide to the appropriate counterfactual will be 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.⁸⁶

The Parties’ submissions

31. The Parties submitted that in the absence of the Proposed Transaction, they would continue to operate separately and independently.⁸⁷
32. In the absence of the Transaction, the Parties submitted that there would be a loss in opportunity for the Parties to rationalize, and achieve the efficiencies which are expected to result from the Proposed Transaction.⁸⁸ Accordingly, the Parties will be less capable of competing effectively against Chinese and other Asian players that are aggressively seeking to enter the rolling stock and signalling markets.⁸⁹ Similarly, the Parties’ ability to compete against well established players such as Bombardier, Thales, and Hitachi/Ansaldo could be adversely impacted.⁹⁰

CCCS’s Conclusion on the Relevant Counterfactual

33. CCCS has considered the Parties’ submissions and is of the view that relevant counterfactual for the purposes of CCCS’s competition assessment is that, absent the Proposed Transaction, the Parties will continue their

⁸⁶ Paragraph 4.16 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.

⁸⁷ Paragraph 23.1 of Form M1.

⁸⁸ Paragraph 23.1 of Form M1.

⁸⁹ Paragraph 23.1 of Form M1.

⁹⁰ Paragraph 23.3 of Form M1.

business operations and compete in the supply of urban signalling systems and metros in Singapore.

VI. Relevant Markets

34. The Parties submitted that the relevant product market for the purpose of this notification is urban signalling.⁹¹
35. For completeness and to facilitate CCCS's holistic review of the Proposed Transaction, the Parties further submitted that they consider the relevant product market in relation to metros to be the supply of metros.⁹² The Parties also submitted that it is not necessary for the CCCS to assess a separate market for the supply of maintenance and repair services for signalling systems or metros.⁹³

(a) Product Market

(i) Urban signalling systems

The Parties' submissions

36. The Parties submitted that signalling activities can generally be sub-segmented into the categories (i) mainline signalling⁹⁴; and (ii) urban signalling. For Singapore, the Parties submitted that only urban signalling is relevant as urban signalling systems can be distinguished from mainline signalling systems by the following factors:⁹⁵
- a. Different interoperability requirements: mainline signalling projects typically require installation of systems compatible with the signalling system on the wider network. Conversely, urban signalling projects typically concern closed loop systems (either the entire urban network or an independent part thereof such as a single line or a group of lines);
 - b. Different technical requirements: signalling projects for mainline and urban transport differ in technical specifications and complexity; and

⁹¹ Paragraph 20.1 of Form M1.

⁹² Paragraph 20.2 of Form M1.

⁹³ Paragraphs 15.13 and 15.14 of Form M1.

⁹⁴ Mainline signalling systems include a variety of systems used to direct railway traffic circulating around and between cities, including across different countries, while keeping the trains clear of each other at all times. These systems are focused on providing safety controls on high speed and mainline railways.

⁹⁵ Paragraph 19.13 of Form M1.

- c. Differences in tendering: urban signalling projects are usually for complete signalling systems whereas mainline signalling projects tend to be more frequently separated into multiple tenders.
37. Currently, the Parties supply urban signalling systems in Singapore.⁹⁶ CCCS notes that the urban signalling systems for the North-East Line, Thomson and East Coast Line, Circle Line are provided by Alstom, while the urban signalling system for the Downtown Line is provided by Siemens.⁹⁷ Only the urban signalling systems for the North-South and East-West Lines are not provided by the Parties, rather these are provided by Thales.⁹⁸
38. Urban signalling systems, which prevent metros and LRVs⁹⁹ circulating within and around cities from colliding by preventing two vehicles from meeting on the same section of track, are typically closed systems with little or no need for interoperability between networks or lines.
39. The Parties submitted that signalling projects usually comprise a complete signalling system including all relevant sub-systems and components.¹⁰⁰ Urban signalling is principally a project-based business. Projects typically include project specific engineering, development and project management, manufacturing and/or procurement of equipment, installation and testing, and sometimes maintenance services. In addition, projects typically comprise a signalling system including multiple sub-systems and are typically procured for a line or group of lines in their entirety including all the necessary elements to run that line.¹⁰¹
40. The Parties submitted that urban signalling systems for MRT lines may utilise either Communications-Based Train Control (“CBTC”)¹⁰² or

⁹⁶ Paragraph 15.2 of Form M1.

⁹⁷ Paragraph 5 of [§<] Response to CCCS’s Invitation to Comment dated 27 July 2018.

⁹⁸ Paragraph 18 of the Notes of Meeting between CCCS and [§<] dated 6 July 2018.

⁹⁹ LRVs are light rail vehicles powered by electricity, running on tracks along the street or on a segregated right of way.

¹⁰⁰ Paragraph 18.7 of Form M1.

¹⁰¹ Paragraph 19.3 of Form M1.

¹⁰² CBTC is an automated train control signalling system that relies on communication systems to connect with the track equipment and to ensure the safe operation of rail vehicles. CBTC systems employ the use of moving block signalling technologies to reduce the distance between two trains without comprising safety.

conventional signalling systems¹⁰³. All MRT lines in Singapore now utilise the CBTC technology.¹⁰⁴

41. Under the New Rail Financing Framework¹⁰⁵, the LTA is the sole customer for all operating assets for Singapore's metro network.¹⁰⁶ The LTA's procurement for urban signalling in Singapore is generally conducted by way of open tender. All bidders that meet the eligibility criteria and requirements under the LTA's terms of tender can bid. Such eligibility criteria could include proven expertise and experience. Suppliers may also be required to meet certain certification criteria under global standards, such as the International Organization for Standardization ("ISO") standard or International Railway Industry Standard ("IRIS").¹⁰⁷
42. The LTA usually issues tenders for entire signalling systems.¹⁰⁸ The LTA may also tender for signalling products for maintenance or refurbishment purposes but it does not source for different components or services required to assemble an entire signalling system from different suppliers.¹⁰⁹ While urban signalling systems generally include multiple sub-systems (such as interlocking systems, automatic train protection systems and operation and control systems), the Parties submitted that the market is not narrower than the supply of urban signalling systems as the sub-systems are generally procured by the LTA at the same time from the same supplier.¹¹⁰
43. From a demand-side perspective, the Parties submitted that there are no close product substitutes for urban signalling systems as urban signalling systems are highly specialised in terms of specific use from the customer's point of

¹⁰³ A conventional signalling system divides the track into segments (typically called "blocks"). Sensors (either track circuits or axle counters) are then placed on the track to determine whether a train is occupying any part of a block. Until the first train has cleared the block, the next train is prohibited from entering the block. This system creates a fixed safety buffer between trains as the following train will be unable to enter an entire block until the whole of the previous train has exited the block.

¹⁰⁴ Paragraph 14.1 of the Parties' Response to CCCS's Information Request dated 5 September 2018.

¹⁰⁵ Under the New Rail Financing Framework, capital investments in operating assets (including trains and signalling systems) will be made by the LTA, and the LTA will own the operating assets and retain the ability and flexibility to make decision on capital investments, undertake integrated and holistic long-term planning, and effect the timely purchase of more assets to enhance carrying capacity. The operators will operate under an asset-light model, focusing on two main areas: providing quality service to commuters and maintaining the trains to ensure smooth operations.

¹⁰⁶ Paragraph 18.15 of Form M1.

¹⁰⁷ Paragraph 24.9 of Form M1.

¹⁰⁸ Paragraph 19.4 of Form M1; and paragraph 24 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

¹⁰⁹ Paragraph 19.4 of Form M1.

¹¹⁰ Paragraph 26.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

view, and there are unlikely to be any substitutes to achieve the same functions.¹¹¹

44. From a supply-side perspective, the Parties submitted that there is some degree of supply-side substitution between mainline systems and urban signalling systems and most suppliers are active in relation to both types of signalling systems. However, the Parties are of the view that mainline signalling systems and urban signalling systems fall into separate product markets for the reasons set out in paragraph 36 above.¹¹²
45. In relation to the substitutability between urban signalling systems for MRT lines and Light Rail Transit (“LRT”) lines, the Parties submitted that from the supply-side perspective, suppliers of urban signalling systems are generally able to supply urban signalling systems to both MRT and LRT lines in Singapore given the large degree of automation of both lines in Singapore. In Singapore, while existing LRT lines use conventional systems, this is likely to change in the future as the LTA has recently awarded Bombardier with a contract to replace the Bukit Panjang signalling system with a CBTC signalling system.¹¹³
46. From the demand-side perspective, the Parties submitted that there are no differences in demand as both urban signalling for metros and PM projects require a high degree of automation and complexity.¹¹⁴ Accordingly, the Parties have considered the relevant market to be urban signalling systems given the same customer and competitor set and the significant degree of supply side substitution between the different urban signalling systems.¹¹⁵

CCCS’s assessment in relation to urban signalling systems

47. The CCCS has considered the possibility of narrower and/or broader product market definition in relation to the supply of urban signalling systems.
48. Feedback from third parties indicated that mainline signalling systems are not used in Singapore, and that the MRT and LRT lines in Singapore only use urban signalling systems.¹¹⁶ CCCS also notes from the Parties’ submissions that from the demand-side perspective, there are no close

¹¹¹ Paragraph 19.14 of Form M1.

¹¹² Paragraph 19.25 of Form M1.

¹¹³ Paragraph 2 of the Parties’ Responses to CCCS’s Clarification Email dated 1 October 2018.

¹¹⁴ Paragraph 12.2 of the Parties’ Response to CCCS’s Information Request dated 30 August 2018.

¹¹⁵ Paragraph 12.1 of the Parties’ Response to CCCS’s Information Request dated 30 August 2018.

¹¹⁶ Paragraph 16 of the Notes of Meeting between CCCS and [X] dated 6 July 2018.

- product substitutes for urban signalling systems as they are highly specialised in terms of specific use.¹¹⁷ Third party feedback also confirms that urban signalling systems cannot be replaced with other products (e.g., mainline signalling systems, as the requirements and the types of signalling products deployed are different.¹¹⁸
49. Third party feedback also indicated that the LTA does not procure different components for urban signalling systems (e.g., route control, train control, interlocking system) separately. Rather, urban signalling systems are procured as one system altogether.¹¹⁹
50. CCCS, however, notes from third party feedback that there is differentiation between signalling systems for MRT lines and LRT lines, and signalling systems for MRT lines are more complex.¹²⁰ The urban signalling systems used for MRT lines and LRT lines also differ in terms of their software and hardware.¹²¹ CCCS further notes that the urban signalling systems used for the Bukit Panjang LRT line and Sengkang-Punggol LRT line are provided by Bombardier and MHI respectively, rather than the Parties.¹²²
51. With regard to supply-side substitution, CCCS notes the Parties' submissions that there is some degree of supply-side substitution between mainline systems and urban signalling systems and most suppliers are active in relation to providing both types of signalling systems. Third party feedback confirms that some suppliers of mainline signalling systems also supply urban signalling systems.¹²³ Third party feedback had not revealed any suppliers that only supply mainline signalling systems and not urban signalling systems. In any case, if there are any suppliers that only supply mainline signalling systems and are able to switch to supplying urban signalling systems in Singapore, it would only increase the competition for the supply of urban signalling systems in Singapore. Moreover, as noted in paragraph 36 above, urban signalling differs in its characteristics from mainline signalling.
52. Third party feedback also indicated that with regard to urban signalling, suppliers generally are also able to provide both signalling systems for MRT

¹¹⁷ Paragraphs 19.13 and 19.14 of Form M1.

¹¹⁸ Paragraph 8 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹¹⁹ Paragraph 24 of the Notes of Meeting between CCCS and [REDACTED] dated 10 September 2018.

¹²⁰ Paragraph 5 of the Notes of Meeting between CCCS and [REDACTED] dated 30 August 2018.

¹²¹ Paragraph 1 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹²² Paragraph 6 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹²³ Paragraph 1 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 1 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

lines and LRT lines because the core architecture for the signalling systems are the same.¹²⁴

53. In view of the fact that urban signalling systems cannot be replaced with mainline signalling systems and that the Parties have not supplied mainline signalling systems and urban signalling systems for LRT lines in Singapore, CCCS considers that mainline signalling systems is not a relevant market. CCCS also considers that it is unnecessary to consider whether urban signalling systems for LRT lines should be included in the relevant market. Accordingly, CCCS is of the view that the relevant product market in respect of urban signalling systems for the competition assessment of the Proposed Transaction is the market for the supply of urban signalling systems for MRT lines.

(ii) Metros

54. The Parties submitted that rolling stock products can generally be divided into two categories: (i) mainline rolling stock¹²⁵; and (ii) urban rolling stock¹²⁶. Both the MRT and the LRT lines in Singapore are urban networks.¹²⁷ As noted in paragraph 23 above, CCCS notes that both Parties are/have been active in participating in tenders for metros in Singapore, which fall under the category of urban rolling stock. The Parties have not supplied LRVs/PMs or trams to Singapore.¹²⁸
55. In Singapore, metros are employed for use as part of the MRT, forming a major component of the public transport network.¹²⁹ Similar to urban signalling systems, the procurement for metros in Singapore is generally conducted by the LTA by way of open tender.¹³⁰ Typically, tenderers are required to meet LTA's eligibility criteria pertaining to (i) the financial health of the company; (ii) whether the company is de-barred; and (iii) whether the

¹²⁴ Paragraph 5 of the Notes of Meeting between CCCS and [X] dated 30 August 2018.

¹²⁵ Mainline rolling stock are trains circulating around and between cities, including across different countries. They operate on large networks typically shared between several rail service operators, and are used for transporting both passengers and freight. Mainline rolling stock include high-speed trains and mainline trains.

¹²⁶ Urban rolling stock refer to trains operating within cities, and typically on closed networks – separate from mainline networks. Urban rolling stock is characterised by lower speeds, more frequent stops, and/or high passenger capacity.

¹²⁷ Paragraph 22.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹²⁸ Paragraphs 17.2, 17.4 and 17.5 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹²⁹ Paragraph 19.5 of Form M1.

¹³⁰ Paragraph 24.17 of Form M1.

- company has the proven technical and project management track record and experience.¹³¹
56. The Parties submitted that the supply of metros is typically project-based and customers in Singapore usually have tenders for complete trainsets rather than standalone components.¹³²
57. From a demand-side perspective, the Parties submitted that there are no close product substitutes for metros, which are highly specific in terms of use from a customer's point of view.¹³³ From a supply-side perspective, the Parties noted there may be an extent of flexibility for a supplier of other products within passenger (rail) vehicles, such as high-speed trains, Electric Multiple Units ("EMU"), Diesel Multiple Units ("DMU"), passenger coaches and LRVs, to switch from the production of such other products to the production of metros.¹³⁴

CCCS's assessment in relation to metros

58. CCCS has considered the possibility of narrower and/or broader product market definition in relation to the supply of metros.
59. CCCS notes the Parties' submissions that from the demand-side perspective, there are no close product substitutes for metros, which are highly specific in terms of use from the customer's point of view. Third party feedback also confirms that metros are not substitutable with other rolling stock products (e.g., PMs).¹³⁵ Third party feedback also suggested that metros are procured as a whole.¹³⁶
60. From the supply-side perspective, CCCS notes that the Parties are of the view that there is flexibility to a certain extent for a supplier to switch production between different types of passenger (rail) vehicles. Third party feedback also confirms that suppliers of other types of rolling stock are able to supply metros.¹³⁷

¹³¹ Paragraph 49.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹³² Paragraph 22.4 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹³³ Paragraph 19.15 of Form M1.

¹³⁴ Paragraph 19.16 of Form M1.

¹³⁵ Paragraph 1 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹³⁶ Paragraph 8 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 5b of [REDACTED] Response to CCCS's Invitation to Comment dated 18 June 2018.

¹³⁷ Paragraph 1 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 1 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

61. CCCS finds it unnecessary to consider whether other types of passenger (rail) vehicles should be included in the relevant market as CCCS has not found a substantial lessening of competition by considering a narrower product market concerning the supply of metros. Accordingly, CCCS will base its assessment of the Proposed Transaction on the market for the supply of metros.

Maintenance, repair and spare parts for urban signalling systems and metros are not separate markets

62. CCCS has also considered whether there are separate markets for the provision of (i) maintenance and repair services; and (ii) spare parts for urban signalling systems and metros.

(i) Maintenance and repair services

63. In respect of maintenance and repair services, CCCS notes the Parties' submission that they supply maintenance, repair services for the signalling systems and metros they have each previously supplied to the LTA in Singapore. However, the commitment to supply¹³⁸ such services is part of the procurement contracts and the Parties do not maintain or repair products manufactured by other suppliers in Singapore. Specifically, any maintenance and repair services provided by Siemens and Alstom are limited to instances where either Siemens or Alstom is the original equipment manufacturer ("OEM").¹³⁹
64. CCCS further notes the Parties' submission that maintenance and repair works are usually either part of the original tender or customers have the capabilities to provide maintenance services in-house. For that reason, there is only limited scope of such work to be provided by third parties.¹⁴⁰ If and when the LTA decides to rely on third parties for maintenance services, it will tender a maintenance services contract. Usually, at the start of a new project, the LTA will seek simultaneously with the supply of metros or signalling systems, maintenance services, which consists of spares and sometimes engineering services, for the period after the warranty period.¹⁴¹ In Singapore, the MRT operators have in-house maintenance teams and

¹³⁸ Commitment to supply refers to any obligation under any ongoing procurement contracts to supply maintenance, repair services and spare parts for the signalling systems, metros and rail electrification systems the Parties have each previously supplied to the LTA in Singapore.

¹³⁹ Paragraph 15.13 of Form M1.

¹⁴⁰ Paragraph 44.4 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹⁴¹ Paragraph 44.5 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

perform all maintenance in-house.¹⁴² This is corroborated with third party feedback which indicates that maintenance services are under the purview of the railway operators (i.e. SMRT and SBST), and not the LTA.¹⁴³ Specifically, all maintenance is carried out in-house by the operators.¹⁴⁴

65. Accordingly, CCCS is of the view that it is not necessary for the purposes of its assessment of the Proposed Transaction to define separate relevant product markets for the supply of maintenance and repair services as these are performed in-house by the operators.

(ii) Spare Parts

66. In respect of spare parts, CCCS notes the Parties' submission that they supply spare parts for the signalling systems and metros they have each previously supplied to the LTA in Singapore. There is no separate market for the Parties' spare parts as they only supply their OEM spare parts for the systems that they had supplied to the LTA. The supply of such OEM spare parts are therefore not contestable and do not form a separate market. Instead, the LTA, in selecting a supplier for the entire system during the tender process, will take into consideration its subsequent needs for spare parts.¹⁴⁵
67. CCCS further notes the Parties' submission that the supply of commodity (i.e., non-OEM) parts, such as fibre glass seats or LED lighting can be procured from many third-parties, or even handled by the customers themselves.¹⁴⁶ As such, for the purpose of the Proposed Transaction, any analysis on the supply of commodity spare parts as a separate market is not relevant as the Parties generally do not supply such spare parts.¹⁴⁷
68. Based on third party feedback, CCCS notes that approximately [§<] of spare parts for urban signalling systems are proprietary in nature and have to be procured from the OEM. For metros, although components such as the air-conditioning, brake system, doors, propulsion system, auxiliary power supply, passenger information system, interior furnishings and seats are manufactured by third-parties, the majority of the components still have to be supplied by the OEM.¹⁴⁸

¹⁴² Paragraph 16.1 of the Parties' Response to CCCS's Information Request dated 30 August 2018.

¹⁴³ Paragraph 25 of the Notes of Meeting between CCCS and [§<] dated 6 July 2018; and paragraph 23 of [§<] Response to CCCS's Invitation to Comment dated 18 June 2018.

¹⁴⁴ Paragraph 12 of [§<] Response to CCCS's Invitation to Comment dated 16 August 2018.

¹⁴⁵ Paragraph 8.2 of the Parties' Response to CCCS's Information Request dated 5 September 2018.

¹⁴⁶ Paragraph 8.3 of the Parties' Response to CCCS's Information Request dated 5 September 2018.

¹⁴⁷ Paragraph 8.3 of the Parties' Response to CCCS's Information Request dated 5 September 2018.

¹⁴⁸ Paragraphs 25 and 26 of the Notes of Meeting between CCCS and [§<] dated 10 September 2018.

69. Third party feedback also indicated that some contracts between the LTA and their suppliers currently provide for a commitment on the duration of supply of spare parts.¹⁴⁹ The contracts also include an option for [X].¹⁵⁰ CCCS also notes from third party feedback that there is a move towards taking into account the lifecycle costing of products by the LTA in its tenders, as opposed to in the past where the tenders only consider the upfront capital costs.¹⁵¹ The LTA also indicated that it is looking to [X] in order to avoid the problem of spare parts obsolescence as far as possible.¹⁵²
70. Based on the above, CCCS is of the view that urban signalling systems and metros, together with their respective spare parts should be considered as a single systems market, rather than two separate markets.

Overall assessment of relevant product markets

71. In view of paragraphs 36 to 70 above, CCCS is of the view that the relevant product markets for the competition assessment of the Proposed Transaction are:
- a. the market for the supply of urban signalling systems for MRT lines; and
 - b. the market for the supply of metros.

(b) Geographic Market

The Parties' submissions

72. In respect of urban signalling systems, the Parties submitted that the relevant geographic market for urban signalling is global or no narrower than the global supply of urban signalling to Singapore. This is in view of the fact that global players can and do qualify, participate and secure supply contracts for urban signalling and that most components required to execute a signalling project can be imported. However, given that the LTA imposes specific

¹⁴⁹ Paragraphs 27 and 29 of the Notes of Meeting between CCCS and [X] dated 10 September 2018; and paragraph 13b of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹⁵⁰ Paragraph 27 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

¹⁵¹ Paragraph 15 of the Notes of Meeting between CCCS and [X] dated 30 August 2018.

¹⁵² Paragraph 28 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

- requirements for projects in Singapore and requires national homologation, the market characteristics are particular to Singapore.¹⁵³
73. The Parties also submitted that Siemens's signalling equipment used in Singapore is produced outside Singapore and imported from [X]. For Alstom, the signalling equipment used in Singapore [X].¹⁵⁴
74. In respect of metros, the Parties submitted that the relevant geographic market is global, in view of the fact that (i) global players can and do qualify, participate and secure supply contracts for metros; and (ii) most components required to execute a metro project can be imported. In this regard, the Parties noted that metro tenders in Singapore have attracted a significant number of credible bidders.¹⁵⁵
75. The Parties further submitted that the metros previously sold by Siemens in Singapore were [X]. The metros supplied by Alstom in Singapore were [X].
76. The Parties also submitted that suppliers of urban signalling and metros are in a position to tender for contracts and supply in Singapore regardless of their location in the world, provided they are committed to dedicate resources to Singapore in case of a successful bid.¹⁵⁶ While the components required to execute a project are imported into Singapore, there is an increasing emphasis from the LTA on the localisation¹⁵⁷ of post-project maintenance support, especially in relation to metros and urban signalling which are the most technically complex and labour intensive areas and thus require significant spending by the LTA.¹⁵⁸ In this regard, the supplier will typically require a local team to service the LTA.¹⁵⁹

¹⁵³ Paragraph 20.3 of Form M1.

¹⁵⁴ Paragraph 19.9 of Form M1.

¹⁵⁵ Paragraph 20.4 of Form M1.

¹⁵⁶ Paragraph 19.29 of Form M1.

¹⁵⁷ Significant projects may require investment in creating dedicated engineering and technical expertise teams to be able to manage future extensions, maintenance and upgrades locally at assembly site. However, a company can ensure that a bid meets these requirements by showing that if a project is won it will set up new facilities in Singapore or expand existing facilities. A company would not be expected to manufacture all components in Singapore. Accordingly, the localisation requirements do not impose a barrier or prevent suppliers present outside Singapore from winning contracts in Singapore.

¹⁵⁸ Paragraph 19.29 of Form M1; and paragraph 27.1 of the Parties' Response to CCCS's Information request dated 27 July 2018.

¹⁵⁹ Paragraph 19.29 of Form M1.

CCCS's assessment

77. CCCS notes from third party feedback that urban signalling systems and metros are typically manufactured globally.¹⁶⁰ However, third party feedback also indicated that the LTA requires local presence for tenderers beginning from the project phase and would prefer suppliers to have an office in Singapore, with recent tenders from the LTA including local support as a factor of technical evaluation.¹⁶¹ In this regard, all tender participants must have offices in Singapore including all major suppliers. Third party feedback also indicated that new entrants would usually find a local partner to bid and open an office in Singapore if they are awarded the tender as the value of the tender would be sufficient to justify the cost of opening an office in Singapore.¹⁶²
78. Based on the above, CCCS is of the view the relevant geographic market for the supply of both urban signalling systems for MRT lines and metros to be Singapore. It is not necessary to examine whether the relevant geographic market is wider as this will not affect CCCS' assessment of the Proposed Transaction.

(c) Conclusion on Relevant Markets

79. Given the considerations set out above, CCCS assessed that the relevant markets for the competition assessment of the Proposed Transaction are:
- a. The market for the supply of urban signalling systems for MRT lines in Singapore; and
 - b. The market for the supply of metros in Singapore.
80. CCCS will assess the impact of the Proposed Transaction on competition within these relevant markets, in connection with the competition issues identified in paragraph 28 above.

¹⁶⁰ Paragraph 8 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 8d of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹⁶¹ Paragraph 11 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 11 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 11 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 35 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

¹⁶² Paragraphs 36 and 37 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

VII. Market Structure

(a) Market shares and market concentration

(i) Market for the supply of urban signalling systems for MRT lines in Singapore

The Parties' submissions

81. The Parties submitted that order intake data aggregated over a six-year period provides a more accurate representation of the market position of various market players relative to market shares for individual years. This is because the demand in the Singapore railway industry is “lumpy” and there are years in which the LTA issues no new contracts for the supply of urban signalling. As such, annual market shares are of limited value as they are particularly volatile and depend on the number of tenders offered in any particular year.¹⁶³
82. The Parties hence submitted estimates of the total market size and market shares, based on the order intake values over a six-year period from 2012 to 2017. The Parties explained that the estimates for the total market size for urban signalling systems are sourced from market data published by the Union des Industries Ferroviaires Européennes (“UNIFE”) as they are not aware of any reliable third party market data dealing with market shares for urban signalling for competitors. Accordingly, the market share estimates for competitors are based on the Parties’ best estimates.¹⁶⁴
83. The market share estimates by the total order intake won between 2012 to 2017 for the supply of urban signalling systems for MRT lines in Singapore are set out in **Table 2** below.

Table 2: Market Shares for Supply of Urban Signalling Systems for MRT lines in Singapore Based on 2012 – 2017 Estimated Aggregated Order Intake Value¹⁶⁵

Firm	Estimated Order intake (EUR million)	Market Share (%)
Alstom	[X]	[30-40]
Siemens	[X]	[10-20]

¹⁶³ Paragraph 21.3 of Form M1.

¹⁶⁴ Paragraph 21.20 of Form M1.

¹⁶⁵ Paragraph 23.5 of the Parties’ Response to CCCS’s Information Request dated 30 August 2018.

Parties' Combined	[X]	[40-50]
Thales	[X]	[40-50]
Hollysys	[X]	[0-10]
Others	[X]	[0-10]
Total	[X]	100

CCCS's assessment

84. CCCS agrees with the Parties that annual market shares may be of limited value given the “lumpiness” in the railway industry where the number of tenders across multiple years could have a large variance. Annual market shares may therefore not be representative of the competitive constraints faced by market players during the bidding process. Accordingly, CCCS has based its assessment on market shares on order intake data aggregated over the period between 2012 to 2017.
85. As set out in the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*, CCCS is generally of the view that 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% and 40% and with a post-merger CR3 at 70% or more.¹⁶⁶
86. Based on the market share figures submitted by the Parties, CCCS notes that the Parties are currently the 2nd and 3rd largest players in the market for the supply of urban signalling systems for MRT lines in Singapore. The Proposed Transaction will result in the Parties becoming the largest player in the market with a market share of [40-50]%, which exceeds CCCS's indicative thresholds of a merger situation that may raise competition concerns. CCCS also notes that post-merger, the Parties' combined market share is close to that of their closest competitor, Thales, which has a market share of [40-50]%.
87. Post-merger, the Proposed Transaction will result in an increase in the CR3 of the market for the supply of urban signalling systems for MRT lines in Singapore, from [80-90]% to [90-100]%.

¹⁶⁶ Paragraph 5.15 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.

(i) Market for the supply of metros in Singapore

The Parties' submissions

88. The Parties submitted that Siemens and Alstom keep records of rolling stock projects based on internal information and the publicly available information that they are able to gather. The market shares and total market size were calculated based on the combined project list collated by the Parties.¹⁶⁷
89. The Parties further submitted that they are generally unaware of all projects executed by their competitors. In particular, they are generally not aware of the value of any changes to the orders, contractual options, and follow-on projects awarded to competitors and which are normally not communicated to the market. Accordingly, the estimated market shares by the Parties may overestimate the Parties' shares and underestimate competitor shares.¹⁶⁸
90. The market share estimates based on order intake won between 2012 to 2017 for the supply of metros in Singapore are set out in **Table 3** below.

Table 3: Market Shares for Supply of Metros in Singapore Based on 2012 – 2017 Estimated Aggregated Order Intake Value¹⁶⁹

Firm	Estimated Order intake (EUR million)	Market Share (%)
Alstom	[X]	[20-30]
Siemens	0	0
Parties' Combined	[X]	[20-30]
CRRC/ Kawasaki	[X]	[60-70]
Bombardier	[X]	[0-10]
Total	[X]	100¹⁷⁰

CCCS's assessment

91. While CCCS considers that the Parties overlap in the supply of metros given that both Siemens and Alstom are active in participating in tenders for metros in Singapore, CCCS notes that the Proposed Transaction does not give rise

¹⁶⁷ Paragraph 21.7 of Form M1.

¹⁶⁸ Paragraph 21.7 of Form M1.

¹⁶⁹ Paragraph 36.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹⁷⁰ The Parties submitted that the market share figures add up to 100.1% due to rounding error.

to an incremental increase in the Parties' combined market shares, given that Siemens currently has an estimated market share of 0%.

92. CCCS also notes that the Parties' combined market shares of [20-30]% is low and does not exceed CCCS's indicative thresholds of a merger situation that may raise competition concerns. Furthermore, CCCS notes that the Parties combined market shares may be even lower if order intake won in 2018 is included. This is in view of the tender for metros which was recently awarded to Bombardier, for a contract value worth up to \$1.2 billion to supply 66 new trains.¹⁷¹
93. CCCS notes that pre-Transaction, the CR3 of the market for the supply of metros in Singapore is 100%. However, the Proposed Transaction would not lead to a change in the CR3 of the market.

(b) Barriers to entry and expansion

94. In assessing barriers to entry and expansion, CCCS considers whether entry by new competitors or expansion by existing competitors may be sufficient in likelihood, scope and time to deter or defeat any attempt by the merger parties or their competitors to exploit the reduction in rivalry flowing from the transaction in question (whether through coordinated or non-coordinated strategies).¹⁷²

The Parties' submissions for urban signalling systems and metros

95. In relation to the markets for the supply of urban signalling systems for MRT lines and metros in Singapore, the Parties submitted that there are no significant or insurmountable barriers to entry.¹⁷³ In respect of the market for the supply of urban signalling systems for MRT lines in Singapore, there are no specific factors such as technology, R&D requirements, regulatory barriers, import restrictions, intellectual property ("IP") rights, availability of raw materials or length of contracts that may prevent new entry for the supply of urban signalling.¹⁷⁴ This is also the case for the supply of metros in Singapore, as long as the supplier is able to meet the LTA's requirements.¹⁷⁵

¹⁷¹ *New fleet to replace 66 oldest MRT Trains from 2021*, Channel News Asia, 25 July 2018.

¹⁷² Paragraph 5.46 of *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

¹⁷³ Paragraph 28.1 of Form M1.

¹⁷⁴ Paragraph 28.1 of Form M1.

¹⁷⁵ Paragraph 28.1 of Form M1.

96. In respect of intellectual property (“IP”) rights, the Parties submitted that IP rights are not a significant barrier to entry for any of the existing global competitors in Singapore for the supply of urban signalling or metros.¹⁷⁶ IP rights only play a limited role in the railway industry and largely depend on the individual suppliers’ approach to IP protection/patenting strategy.¹⁷⁷
97. In relation to the eligibility criteria imposed by the LTA, the Parties submitted as set out in paragraph 41 above that such eligibility criteria could include proven expertise and experience. Suppliers may also be required to meet certain certification criteria under global standards, such as the ISO standard, or IRIS standard.¹⁷⁸ These criteria can be met by a large number of actual and potential bidders in Singapore.¹⁷⁹ While there are strict requirements on technology and quality imposed by the LTA, global competitors can, and do, qualify and participate in tenders called by the LTA for the supply of urban signalling and metros.¹⁸⁰
98. The Parties submitted that it is not meaningful to consider the capital expenditure required for a new entrant to gain a foothold in the market for supply of urban signalling systems, as new entry in Singapore arises from existing global competitors who qualify and participate in open tenders called by the LTA.¹⁸¹ For existing suppliers, given that most services and components required are imported into Singapore, no capital expenditure (other than obtaining certification) is required to secure a five per cent share in the market for the supply of urban signalling systems in Singapore.¹⁸² This also holds true for the supply of metros.¹⁸³
99. In relation to urban signalling systems, the Parties submitted that there is no material incumbency effect in respect of tenders for new lines and/or significant refurbishments.¹⁸⁴ Given that metro lines in Singapore are currently all closed loops (i.e., metros on one line are not used on any other lines) and there does not appear to be any intention for this to change, there is little need for interoperability between suppliers’ systems or a need for different lines to interface with each other. Accordingly, urban signalling for different MRT lines may be supplied by different suppliers. Where a line is

¹⁷⁶ Paragraph 28.3 of Form M1.

¹⁷⁷ Paragraph 28.4 of Form M1.

¹⁷⁸ Paragraph 24.9 of Form M1.

¹⁷⁹ Paragraph 24.9 of Form M1.

¹⁸⁰ Paragraph 28.3 of Form M1.

¹⁸¹ Paragraph 26.1 of Form M1.

¹⁸² Paragraph 26.2 of Form M1.

¹⁸³ Paragraph 26.3 of Form M1.

¹⁸⁴ Paragraph 55.1 of the Parties’ Response to CCCS’s Information Request dated 27 July 2018.

- being significantly upgraded or replaced at the end of its lifespan (usually thirty years), the urban signalling systems can be provided by a different supplier.¹⁸⁵
100. On the other hand, in respect of tenders for minor upgrades and/or tenders for signalling systems for line extensions, the urban signalling systems is most likely to be supplied by the same supplier who provided the original signalling system due to the fact that signalling system designs are proprietary in nature and there are software compatibility issues to resolve for certain components supplied by another supplier.¹⁸⁶
101. The Parties also submitted that in relation to urban signalling systems, new entry in Singapore arises from existing global competitors who qualify and participate in open tenders called by the LTA. Global competitors do participate in the LTA's tenders including Bombardier, Thales and Hitachi/Ansaldo. In the future, bids can be expected from competitors such as CRSC, CRSC, Beijing Traffic Control Technology Co., Ltd ("Beijing TCT"), Nippon Signal Co., Ltd ("Nippon Signal"), Hyundai Rotem, MHI and Hollysys.¹⁸⁷ The Parties also submitted that within narrower sub-segments of urban signalling, Stadler, a relatively new entrant in the European market, is considered to be a likely entrant in CBTC, as it is more than likely to have the resources and ability to enter the market.¹⁸⁸ CAF has also announced that it will be developing CBTC systems.¹⁸⁹
102. In relation to the supply of metros, the Parties submitted that they face competitive pressure from a number of competitors, including CRRC/Kawasaki and Bombardier, which have successfully bid in recent metro tenders in Singapore.¹⁹⁰ The Parties also submitted that in the European metro market, Stadler is a relatively new entrant and has been very successful in winning a number of important metro orders in Europe in the last three years. The Parties expect that Stadler will expand its international metro activities further (including Singapore) in the coming years.¹⁹¹

¹⁸⁵ Paragraph 24.14 of Form M1.

¹⁸⁶ Paragraph 24.15 of Form M1.

¹⁸⁷ Paragraph 26.1 of Form M1.

¹⁸⁸ Paragraph 58.3 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹⁸⁹ Paragraph 58.3 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹⁹⁰ Paragraph 59.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

¹⁹¹ Paragraph 58.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

Feedback from third parties for urban signalling systems and metros

103. In relation to the market for the supply of urban signalling systems for MRT lines in Singapore, third party feedback indicates that in an environment requiring strong safety requirements such as the railway market, the track record of a company is a crucial factor taken into consideration when the LTA assesses the tenders.¹⁹² Given that Singapore uses almost exclusively driverless systems, a higher safety standard is required.¹⁹³ Customers commonly request the track records of the company as part of the pre-qualification or tender process for metro projects.¹⁹⁴ This presents a barrier to entry for suppliers who do not have projects of a similar scope in service where previous customers are willing to confirm good performance.¹⁹⁵
104. However, third party feedback also indicated that as long as new entrants could certify compliance with international standards for safety and substantiality of system design, and as long as they have a proven track record, they would be viable competitors.¹⁹⁶ Companies such as Hollysys Automation Technologies have been identified as having maturing technologies which could compete with the Parties in the future.¹⁹⁷
105. While one competitor indicated that the Singapore market is sufficiently transparent and fair and presents no particular barriers to new entrants¹⁹⁸, feedback from some competitors also suggest that the incumbent supplier could benefit from significant advantages it may leverage on to increase its chances of success in a tender. For instance, if a supplier has a longstanding commercial relationship with the customer (i.e. if the supplier has already supplied urban signalling systems to the same customer), this will be key criterion in its selection in future tenders.¹⁹⁹ Furthermore, the signalling systems provided by different suppliers are generally not interoperable.²⁰⁰ The lack of interoperability standards presents a barrier to entry (i) where an

¹⁹² Paragraph 16 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 14 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹⁹³ Paragraph 17 of the Notes of Meeting between CCCS and [X] dated 6 July 2018.

¹⁹⁴ Paragraph 16 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 14 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹⁹⁵ Paragraph 14 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹⁹⁶ Paragraph 17 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 34 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

¹⁹⁷ Paragraph 17 of the Notes of Meeting between CCCS and [X] dated 6 July 2018.

¹⁹⁸ Paragraph 22 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

¹⁹⁹ Paragraph 14 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 22 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁰⁰ Paragraph 22 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 22 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

- existing metro line is extended and there is a requirement to interface with existing signalling systems and trains; and (ii) where a supplier does not have the full signalling solutions.²⁰¹
106. Third party feedback also indicated that substantial investment would be required for new entrants to participate in tenders. From a financial perspective, a new entrant would require large financial solidity to invest in developing signalling systems, which are associated with long development cycles.²⁰² New entrants for urban signalling projects would also require time and cost to build customer relationships and to gain creditability. It is estimated that at least 4-5% of project costs need to be dedicated to bidding for new projects in new countries, given the need to build customer knowledge before a new entrant can win a project.²⁰³
107. Based on third party feedback, there are at least three existing alternative suppliers for signalling systems, i.e. Thales, Bombardier and Hitachi/Ansaldo.²⁰⁴ As noted in paragraph 104 above, Chinese suppliers such as Hollysys Automation Technologies have also been identified as having maturing technologies which could compete with the Parties in the future, provided that they are able to certify compliance to the international standard in terms of safety, sustainability of their system design.²⁰⁵
108. In relation to the market for the supply of metros, third party feedback indicates that both quality and the price offered by bidders are crucial factors taken into consideration by the LTA, and third parties opined that the LTA prefers to have “value for money” along with the best quality.²⁰⁶
109. One competitor indicated that the lack of interoperability of metros with existing signalling systems may be a barrier to entry for metro suppliers. In order for metros to be deployed for use on the MRT lines, the metros would have to be interoperable with the existing signalling systems. In other words, the metros would be required to have on board equipment that is compatible with the existing signalling systems. While the incumbent supplier of the existing signalling systems can ensure that their metros are interoperable with the signalling systems, other suppliers of metros may be refused access

²⁰¹ Paragraph 22 of [X] Response to CCCS’s Invitation to Comment dated 27 July 2018; and paragraph 22 of [X] Response to CCCS’s Invitation to Comment dated 27 July 2018.

²⁰² Paragraph 22 of [X] Response to CCCS’s Invitation to Comment dated 27 July 2018.

²⁰³ Paragraph 22 of [X] Response to CCCS’s Invitation to Comment dated 27 July 2018.

²⁰⁴ Paragraph 15 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

²⁰⁵ Paragraph 17 of the Notes of Meeting between CCCS and [X] dated 6 July 2018; and paragraph 17 of [X]’s Response to CCCS’s Invitation to Comment dated 27 July 2018.

²⁰⁶ Paragraph 10 of [X] Response to CCCS’s Invitation to Comment dated 27 July 2018.

to the on board technology, and consequently may not be able to supply metros.²⁰⁷

110. However, feedback from the LTA indicated that the concerns in respect of the interoperability of metros with the signalling systems is unlikely to happen in Singapore.²⁰⁸ The LTA has [redacted] to ensure interoperability. These [redacted] by the LTA compel the signalling systems supplier to ensure interoperability with whatever brand of metros that is purchased.²⁰⁹ In this regard, the LTA has used metros from different suppliers for the same MRT line. For example, the Downtown Line (“DTL”) uses Siemens’s signalling system but Bombardier’s metros²¹⁰ and the North-South and East-West Lines uses Thales’s signalling system but Bombardier’s, Kawasaki’s and Siemens’s metros.²¹¹
111. Third party feedback further indicates that besides the merging entity, the LTA has a number of other train manufacturers to work with.²¹² In respect of metros, there are multiple suppliers including lesser known ones such as [redacted].²¹³

CCCS’s assessment on barriers to entry in the market for the supply of urban signalling systems for MRT lines in Singapore

112. In respect of the supply of urban signalling systems for MRT lines in Singapore, CCCS is of the view that the barriers for a new potential supplier to supply urban signalling systems for MRT lines in Singapore are significant given the LTA’s criterion of a track record in safety and design. However, barriers to expansion for existing suppliers are less significant given that they have the proven track record to supply urban signalling systems.
113. CCCS notes that incumbent suppliers of urban signalling systems tend to have a strong advantage in brownfield projects (e.g., extensions to existing MRT lines), given the need for interoperability of the urban signalling systems. The design lifespan of urban signalling systems is generally fifteen

²⁰⁷ Paragraph 19 of Notes of Meeting between CCCS and [redacted] dated 30 August 2018.

²⁰⁸ Paragraphs 6 and 9 of Notes of Meeting between CCCS and [redacted] dated 10 September 2018.

²⁰⁹ Paragraph 6 of Notes of Meeting between CCCS and [redacted] dated 10 September 2018.

²¹⁰ Paragraph 8 of Notes of Meeting between CCCS and [redacted] dated 10 September 2018.

²¹¹ Paragraph 4 of [redacted] Response to CCCS’s Invitation to Comment dated 27 July 2018; and paragraphs 6 and 21 of [redacted] Response to CCCS’s Invitation to Comment dated 27 July 2018.

²¹² Paragraph 2 of [redacted] Response to CCCS’s Invitation to Comment dated 18 June 2018.

²¹³ Paragraph 13 of the Notes of Meeting between CCCS and [redacted] dated 6 July 2018.

years, and LTA generally [REDACTED].²¹⁴ Where line-extensions are concerned, the lack of interoperability of different urban signalling systems provided by different providers would create a barrier to entry for new entrants.²¹⁵ However, in respect of tenders for the urban signalling systems for new lines and/or tenders for a complete overhaul of signalling systems for existing lines, it is not necessary for the LTA to select the same provider for urban signalling systems.

114. CCCS observes that while the barriers to entry are significant, there has been a new entrant which has had the proven track record in supplying urban signalling systems in other geographical markets, Thales, which successfully entered the urban signalling systems market in Singapore six years ago.²¹⁶ CCCS also notes that Chinese suppliers such as Hollysys Automation Technologies have been identified as having maturing technologies which could compete with the Parties in the future, provided that they are able to certify compliance to the international standard in terms of safety, sustainability of their system design.²¹⁷
115. Further, as noted in **Table 4** below, there are a number of existing potential urban signalling systems suppliers that have participated in the LTA's tenders.

Table 4: Details of public tenders in Singapore which involved the participation by at least one Party, and awarded between 2012 and 2018 in respect of urban signalling systems²¹⁸

S/N	Contract description	Tenderers	Outcome
1	1652A and 1652B Replacement signalling system for the North-South and East-West Lines Signalling system for Tuas West Extension	Alstom Bombardier (Singapore) Pte Ltd Invensys Rail (Singapore) Pte. Ltd. Ansaldo STS France / Keppel FMO Pte Ltd Consortium Siemens Singapore Technologies Electronics Ltd Consortium Thales Solution Asia Pte Ltd	Thales secured the supply contracts through its local subsidiary, Thales Solution Asia Pte Ltd in 2012

²¹⁴ Paragraph 4 of the Notes of Meeting between CCCS and [REDACTED] dated 10 September 2018; paragraph 20 of Notes of Meeting between CCCS and [REDACTED] dated 6 July 2018.

²¹⁵ Paragraph 22 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 22 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

²¹⁶ Paragraph 24 of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

²¹⁷ Paragraph 17 of the Notes of Meeting between CCCS and [REDACTED] dated 6 July 2018; and paragraph 17d of [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

²¹⁸ Paragraph 25.1 of Form M1.

S/N	Contract description	Tenderers	Outcome
2	T252 Signalling system (including platform screen doors) for Thomson Line	Alstom Bombardier (Singapore) Pte Ltd Consortium GE Hitachi Asia Ltd. Siemens Thales Solutions Asia Pte Ltd	The GE Transportation Systems Global Signalling LLC Consortium secured the supply contract in 2014

116. CCCS observes that about five to six suppliers participated in each of the LTA's tenders for urban signalling systems and the bidders that participated from tender to tender may vary.²¹⁹ An existing potential urban signalling supplier may therefore not face significant difficulties in meeting the LTA's criteria to participate in tenders to supply urban signalling systems for MRT lines in Singapore.
117. Given the above, CCCS considers that the primary barrier to entry for the supply of urban signalling systems for MRT lines in Singapore arises from the stringent standards imposed by the LTA, in particular the need for a proven track record. In respect of brownfield projects, the barriers to entry are significant regardless of the Proposed Transaction. In respect of tenders for the urban signalling systems for new lines and/or tenders for a complete overhaul of signalling systems for existing lines, the barriers to entry could be significant for new entrants, but could be less significant for existing potential suppliers that have the proven track record in supplying urban signalling systems.

CCCS's assessment on barriers to entry for the market for the supply of metros in Singapore

118. In respect of the supply of metros in Singapore, CCCS is of the view that the barriers for a new potential metro supplier to supply metros to Singapore are significant given the LTA's eligibility criteria includes proven expertise and experience. However, barriers to expansion for existing suppliers are less significant given that they have the proven track record to supply metros in Singapore.
119. Notwithstanding this, CCCS notes from **Table 5** below that there are a number of existing potential metro suppliers that have participated in the

²¹⁹ Paragraph 25.1 of Form M1.

LTA's tenders between 2012 and 2018, including Hyundai Rotem and CAF.²²⁰

Table 5: Details of Public Tenders in Singapore which involved the participation by at least one Party, and awarded from 2012 to 2018 in respect of metros²²¹

S/N	Contract description	Tenderers	Outcome
1	751C Trains for North East Line	Alstom Hyundai Rotem Kawasaki CAF CSR Zhuzhou electric Locomotive Co., Ltd	Alstom secured the contract in 2012
2	830C Trains for Circle Line	Alstom Hyundai Rotem Kawasaki CAF CSR Zhuzhou electric Locomotive Co., Ltd	Alstom secured the contract in 2012
3	151B Trains for North-South/East-West Lines and Tuas West Extension	CSR Zhuzhou electric Locomotive Co., Ltd / Siemens Consortium Kawasaki Bombardier / Changchun Bombardier Railway Vehicles Company Ltd Consortium CAF	Kawasaki secured the contract in 2012
4	T251 Trains for Thomson Line	Alstom Bombardier / Changchun Bombardier Railway Vehicles Company Ltd Consortium CAF Hyundai Rotem Kawasaki / CSR Qingdao Sifang Co., Ltd. Consortium Siemens / CSR Zhuzhou Electric Locomotive Co., Ltd Consortium	Kawasaki/ CSR Qingdao Sifang consortium secured the contract in 2014

²²⁰ Paragraph 25.2 of Form M1.

²²¹ Paragraph 25.2 of Form M1.

S/N	Contract description	Tenderers	Outcome
5	151C Trains for North South/East-West Lines	Hyundai Rotem Kawasaki / CSR Qingdao Sifang Co., Ltd. Consortium CSR Zhuzhou Electric Locomotive	Kawasaki consortium secured the contract in 2015
6	851E Trains for Circle Line Stage 6	Alstom	Alstom secured the contract in 2018

120. CCCS observes that generally, three to six bidders participated in each of the LTA's tenders and the number of bidders that participate from tender to tender may vary. An existing potential metro supplier may therefore not face significant difficulties to meet the LTA's criteria to participate in tenders to supply metros in Singapore.
121. Given the above, CCCS considers that the primary barrier to entry for the supply of metros in Singapore arises from the stringent standards imposed by the LTA, in particular the need for a proven track record. The barriers to entry could be significant for new entrants, but could be less significant for existing potential suppliers that have the proven track record in supplying metros.

(c) Countervailing Buyer Power

The Parties' submissions for urban signalling systems and metros

122. The Parties submitted that the LTA is the primary customer in Singapore who procures urban signalling systems and metros.²²² Prior to the implementation of the New Rail Financing Framework,²²³ the MRT operators were also involved in the procurement process.²²⁴
123. The Parties submitted that the LTA is able to exercise significant bargaining power as it is able to choose from a wide number of suppliers.²²⁵ Based on the Parties' experience, the LTA frequently leverages its significant

²²² Paragraph 31.1 of Form M1; and the Executive Summary of the Competitive Assessment Section in Form M1

²²³ The New Rail Financing Framework became effective as of 1 October 2016 and 1 April 2018 for SMRT and SBS respectively.

²²⁴ Paragraph 31.1 of Form M1.

²²⁵ Paragraph 32.2 of Form M1.

- bargaining position to extract better terms from suppliers, and will not hesitate to switch suppliers in response to more favourable terms.²²⁶
124. Specific to the procurement of urban signalling systems across different metro lines, or for significant refurbishments of urban signalling systems, the Parties submitted that there are generally no restrictions for the LTA to switch between different suppliers of urban signalling systems.²²⁷
125. The Parties, however, submitted that within the same metro line, a minor upgrade or extension to an existing signalling system is most likely to be supplied by the same supplier who provided the original signalling system due to the fact that signalling system designs are proprietary in nature and there are software compatibility issues to resolve for certain components supplied by another supplier.²²⁸ In this regard, the Parties noted that the LTA's preference is to partner with the supplier of a signalling system to provide maintenance support for the signalling system in question until the end of its lifespan.²²⁹ This means that the Proposed Transaction does not impact the signalling systems that have already been awarded and installed prior to the Proposed Transaction as competition for the supply of these signalling systems has concluded and precedes the Proposed Transaction.²³⁰
126. In relation to the procurement of metros, the Parties submitted that there are no technical restrictions preventing the LTA from sourcing from different suppliers of metros for trains plying the same metro line.²³¹
127. The Parties also submitted that the LTA imposes stringent requirements, including on quality, safety, certification and testing, which bidders compete to meet, and the LTA does not negotiate with bidders on such requirements.²³²
128. In view of the LTA's strong ability to switch freely between suppliers and to dictate the terms of tender, the Parties submitted that the LTA, as the primary customer for urban signalling systems has, and will, continue to constrain the actions of the merging entity post-transaction.²³³

²²⁶ Paragraph 34.8 of Form M1.

²²⁷ Paragraph 32.2 of Form M1.

²²⁸ Paragraph 24.15 of Form M1.

²²⁹ Paragraph 24.15 of Form M1.

²³⁰ Paragraph 24.15 of Form M1.

²³¹ Paragraph 32.3 of Form M1.

²³² Paragraph 34.7 of Form M1.

²³³ Paragraph 34.8 of Form M1.

Feedback from third parties for urban signalling systems and metros

129. Feedback from third parties indicate that the LTA enjoys strong countervailing buyer power as it is the primary customer in Singapore and suppliers leverage on the fact that they supply to Singapore to assist in marketing their products to other countries.²³⁴
130. However, in respect of the market for the supply of urban signalling systems for MRT lines in Singapore, the LTA's bargaining power may be reduced, given the reduction in the number of viable suppliers as a result of the Proposed Transaction.²³⁵ One third party also indicated that if the market becomes limited to the extent that the LTA is restricted to only one to two suppliers, new suppliers will not be as incentivised to put their best foot forward.²³⁶ CCCS, however, notes that there are at least three alternative suppliers for signalling systems, i.e. Thales, Bombardier and Hitachi/Ansaldo.²³⁷
131. In respect of the market for the supply of metros, third party feedback suggests that the LTA's ability to bargain is unlikely to be affected by the Proposed Transaction. This is because it is possible for the LTA to use different brands of metros at the same time for each MRT line.²³⁸ Furthermore, the LTA has a number of other train manufacturers besides the merging entity to work with.²³⁹

CCCS's assessment on countervailing buyer power in the market for the supply of urban signalling systems for MRT lines in Singapore

132. In respect of the supply of urban signalling systems for MRT lines in Singapore, CCCS notes from the Parties' submission that the LTA decides on the eligibility criteria and requirements on quality, safety, certification and testing, and that the LTA does not negotiate with bidders on such requirements.

²³⁴ Paragraph 32 of the Notes of Meeting between CCCS and [X] dated 30 August 2018; and paragraph 21 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

²³⁵ Paragraph 21 of [X] Response to CCCS's Invitation to Comment dated 18 June 2018; and paragraph 14 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

²³⁶ Paragraph 32 of the Notes of Meeting between CCCS and [X] dated 30 August 2018.

²³⁷ Paragraph 14 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

²³⁸ Paragraph 14 of the Notes of Meeting between CCCS and [X] dated 6 July 2018. For example, the Downtown Line ("DTL") uses Siemens's signalling system but Bombardier's metros. and on the North-South and East-West Lines uses Thales's signalling system but Bombardier's, Kawasaki's and Siemens's metros.

²³⁹ Paragraph 2 of [X] Response to CCCS's Invitation to Comment dated 18 June 2018.

133. As noted in paragraph 115 above, CCCS observes that the LTA has attracted five to six bidders in the open tenders it has awarded for urban signalling systems from 2012 to 2018.²⁴⁰ There are at least three alternative suppliers for signalling systems, i.e. Thales, Bombardier and Hitachi/Ansaldo.²⁴¹ CCCS also understands from market feedback that the LTA is able to exercise bargaining power over suppliers, given that suppliers leverage on the fact they supply to Singapore to assist in marketing their products to other countries.²⁴²
134. Given the above, CCCS is of the view that the LTA, as the sole customer of urban signalling for MRT lines in Singapore, is generally able to exercise bargaining power against suppliers of urban signalling systems (in respect of the procurement of urban signalling systems across different metro lines, or for significant refurbishments). In respect of the procurement of urban signalling systems for MRT line extensions, the LTA has limited bargaining power over suppliers in respect of the procurement of urban signalling systems for MRT line extensions given that the LTA is constrained to, and will almost always use the same urban signalling supplier for MRT line extensions, irrespective of the Proposed Transaction. The Proposed Transaction will not affect this dynamic.

CCCS's assessment on countervailing buyer power in the market for the supply of metros in Singapore

135. In respect of the supply of metros in Singapore, CCCS notes from the Parties' submission that the LTA decides on the eligibility criteria and requirements on quality, safety, certification and testing, and that the LTA does not negotiate with bidders on such requirements.
136. As noted in paragraph 119 above, CCCS observes that the LTA has attracted three to six bidders in the open tenders it awarded for metros from 2012 to 2018.²⁴³ CCCS further notes that there are multiple suppliers of metros, including CRRC/Kawasaki and Bombardier, which have successfully bid in recent metro tenders in Singapore.²⁴⁴ Based on market feedback, the LTA is able to exercise bargaining power over suppliers of metros, given that suppliers leverage on the fact they supply to Singapore to assist in marketing

²⁴⁰ Paragraph 25.1 of Form M1.

²⁴¹ Paragraph 15 of the Notes of Meeting between CCCS and [REDACTED] dated 10 September 2018.

²⁴² Paragraph 32 of the Notes of Meeting between CCCS and [REDACTED] dated 30 August 2018; and paragraph 21 of the Notes of Meeting between CCCS and [REDACTED] dated 10 September 2018.

²⁴³ Paragraph 25.2 of Form M1.

²⁴⁴ Paragraph 59.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

their products to other countries.²⁴⁵ The LTA also indicated that it is unlikely that the Proposed Transaction would affect its bargaining power for the purchase of metros.²⁴⁶

137. Given the above, CCCS is of the view that the LTA, as the sole customer of metros for MRT lines in Singapore, is generally able to exercise bargaining power against suppliers of metros.

VIII. Competition Assessment

(a) Non-coordinated effects

138. Non-coordinated effects may arise where, as a result of the Proposed Transaction, the merging entity finds it profitable to raise prices (or reduce output or quality) because of the loss of competition between the merged entities.²⁴⁷ In markets that involve a bidding process, a merger between two competing suppliers could reduce the alternatives available to a customer and reduces the ability for a customer to negotiate between both firms in order to obtain a better price through the bidding process. The loss of two competing choices could enhance the merging entity's ability to profitably increase prices.²⁴⁸

The Parties' submissions for urban signalling systems and metros

139. The Parties submitted that the Proposed Transaction would not give rise to non-coordinated effects in the market for the supply of urban signalling systems and metros for the following reasons:²⁴⁹
- a. The tender process for the supply of urban signalling systems and metros in Singapore is structured to promote competition. Procurement is primarily conducted by the LTA, which regulates and oversees public transportation in Singapore, through open tenders. The LTA has a policy to actively encourage new suppliers to enter the Singapore market. Apart from global competitors who have qualified and participated in open tenders in Singapore, there are a large number of globally active potential suppliers that could enter and supply urban signalling systems and metros in Singapore.

²⁴⁵ Paragraph 32 of the Notes of Meeting between CCCS and [X] dated 30 August 2018; and paragraph 21 of Notes of Meeting between CCCS and [X] dated 10 September 2018.

²⁴⁶ Paragraph 15 of the Notes of Meeting between CCCS and [X] dated 10 September 2018.

²⁴⁷ Paragraph 5.21 of CCCS *Guidelines on the Substantive Assessment of Mergers 2016*.

²⁴⁸ Paragraph 5.27 of CCCS *Guidelines on the Substantive Assessment of Mergers 2016*.

²⁴⁹ Paragraphs 34.1 to 34.11 of Form M1.

- b. There is strong countervailing buyer power. As the primary customer for urban signalling and metros in Singapore, the LTA has, and will continue to constrain the actions of the merging entity post-transaction, in view of its strong ability to switch between suppliers and to dictate the terms of tender. Based on the Parties' experience, the LTA frequently leverages its significant bargaining position to extract better terms from suppliers, and will not hesitate to switch suppliers in response to more favourable terms.
 - c. There are alternative suppliers and no insurmountable barriers to entry. Large global players can, and do, qualify and participate in open tenders called by the LTA in Singapore. The Parties' competitors have previously been successful in winning significant tenders.
140. The Parties submitted that they would continue to face strong competition from global and local competitors who were actively participating in tenders conducted in Singapore, in respect of urban signalling and metros.²⁵⁰

Feedback from third parties for urban signalling systems and metros

141. In relation to the market for the supply of urban signalling systems for MRT lines in Singapore, third parties indicated that there is a possibility that prices may be raised as the merging entity will be in a market leading position.²⁵¹ Currently, the companies that have supplied urban signalling systems for the MRT lines in Singapore include:²⁵²
- a. Thales for the North-South and East-West Lines;
 - b. Alstom for the North East Line, Circle Line and Thomson-East Coast Line; and
 - c. Siemens for the Downtown Line.

²⁵⁰ Paragraph 33.3 of Form M1.

²⁵¹ Paragraph 3 of [X] Response to CCCS's Invitation to Comment dated 18 June 2018; paragraph 3 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; paragraph 26 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 2 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁵² Paragraphs 5 and 6 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

142. Third parties, however, indicated that it is unlikely that the high quality standards set and demanded by the LTA will be lowered as a result of the Proposed Transaction.²⁵³
143. Third party feedback further indicated that it is difficult for the LTA to switch between suppliers and brands for signalling solutions, especially in brownfield projects (e.g., extensions to existing MRT lines) due to the proprietary nature of the system.²⁵⁴ [X].²⁵⁵
144. In respect of the procurement of new urban signalling systems across different metro lines, or for significant refurbishments, feedback from third parties indicate that [X] would likely result in LTA switching suppliers.²⁵⁶
145. In respect of the market for the supply of metros in Singapore, third parties generally opined that the impact of the Proposed Transaction on competition is minimal given that the LTA has a number of other train manufacturers to work with.²⁵⁷ Further, as noted in paragraph 109 above, while one competitor indicated that the lack of interoperability of metros with existing signalling systems may be a barrier to entry for metro suppliers, feedback from the LTA indicated that the concerns in respect of the interoperability of metros with the signalling systems is unlikely to happen in Singapore.²⁵⁸ The LTA has [X] to ensure interoperability. CCCS also notes that the North-South and East-West Lines is currently using metros from at least four different suppliers.²⁵⁹
146. Feedback from third parties also suggest that it is relatively easy for the LTA to switch suppliers of metros, given that it is possible for the LTA to use different brands of metros at the same time for each MRT line.²⁶⁰

CCCS's assessment and conclusion on non-coordinated effects for the supply of urban signalling systems for MRT lines in Singapore

147. In respect of the supply of urban signalling systems for MRT lines in Singapore, CCCS notes that the estimated CR3 is high at [80-90]%, which may suggest high concentration in the relevant market. Moreover, the third

²⁵³ Paragraph 2 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁵⁴ Paragraph 6 of [X] Response to CCCS's Invitation to Comment dated 18 June 2018; and paragraph 14 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁵⁵ Paragraph 6 of [X] Response to CCCS's Invitation to Comment dated 18 June 2018.

²⁵⁶ Paragraph 22 of the Notes of Meeting between CCCS and [X] dated 6 July 2018.

²⁵⁷ Paragraph 2 of [X] Response to CCCS's Invitation to Comment dated 18 June 2018.

²⁵⁸ Paragraph 6 of Notes of Meeting between CCCS and [X] dated 10 September 2018.

²⁵⁹ Paragraph 9 of [X] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁶⁰ Paragraph 14 of the Notes of Meeting between CCCS and [X] dated 6 July 2018.

biggest supplier of urban signalling systems only has a market share of [0-10]%).

148. However, as noted in paragraph 121, while barriers to entry could be significant for new entrants, it could be less significant for existing potential suppliers that have the proven track record in supplying urban signalling systems. CCCS observes that the market for the supply of urban signalling systems is contestable and open to new entrants, despite having significant barriers to entry. In particular, CCCS notes there has been a new entrant, Thales, which successfully won a tender for the urban signalling system on the North-South and the East-West MRT Lines in Singapore six years ago.²⁶¹ CCCS also notes that Chinese suppliers such as Hollysys Automation Technologies have been identified as having maturing technologies which could compete with the Parties in the future, provided that they are able to certify compliance to the international standard in terms of safety, sustainability of their system design.²⁶² These competitors would be able to act as a competitive constraint on the merging entity post-Transaction.
149. CCCS also notes that the LTA, as the sole customer of urban signalling for MRT Lines in Singapore, is generally able to exercise bargaining power against suppliers of urban signalling systems in respect of the procurement of urban signalling systems across different metro lines, or for significant refurbishments. Should the merging entity raise prices post-Transaction, the LTA would be able to switch to purchasing urban signalling systems from other suppliers.
150. In respect of the procurement of urban signalling systems for MRT line extensions, CCCS notes that it would be difficult and prohibitively costly for the LTA to switch to purchasing urban signalling systems from alternative suppliers irrespective of the Proposed Transaction.
151. Given the above, CCCS is of the view that non-coordinated effects are unlikely to arise in the market for the supply of urban signalling systems for MRT lines in Singapore.

²⁶¹ Paragraph 24 of [§<] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁶² Paragraph 17 of the Notes of Meeting between CCCS and [§<] dated 6 July 2018; and paragraph 17 of [§<] Response to CCCS's Invitation to Comment dated 27 July 2018.

CCCS's assessment and conclusion on non-coordinated effects for the supply of metros in Singapore

152. In respect of the supply of metros in Singapore, while the estimated CR3 is 100%, there is no incremental increase in the CR3 from the Proposed Transaction. This is because Siemens has not won a tender for the supply of metros since 1993.²⁶³
153. Similar to the market for the supply of urban signalling systems for MRT lines in Singapore, the barriers to entry could be significant for new entrants, but it could be less significant for existing potential suppliers that have the proven track record in supplying metro systems. CCCS observes that the market for the supply of metros is contestable and open to new entrants, despite having significant barriers to entry. As noted in paragraph 119, a number of existing potential metro suppliers that have participated in the LTA's tenders between 2012 and 2018, including Hyundai Rotem and CAF.²⁶⁴ These competitors, who have already met the LTA's technical requirements, would be able to act as a competitive constraint on the merged entity post-Transaction.
154. CCCS also notes that the LTA, as the primary customer in Singapore, is generally able to exercise bargaining power against suppliers of metros. Furthermore, it is possible for the LTA to use different brands of metros at the same time for each MRT line.²⁶⁵ Should the merging entity raise prices post-Transaction, the LTA would be able to switch to purchasing metros from alternative suppliers.
155. Given the above, CCCS is of the view that non-coordinated effects are unlikely to arise in the market for the supply of metros in Singapore.

(b) Coordinated effects

156. A merger may also lessen competition substantially by increasing the possibility that, post-Transaction, firms in the same market may coordinate their behaviour to raise prices, or reduce quality or output. 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. Coordinated effects may arise where a merger reduces competitive constraints from actual or potential

²⁶³ Paragraphs 14.1 and 21.8 of Form M1.

²⁶⁴ Paragraph 25.2 of Form M1.

²⁶⁵ Paragraph 14 of the Notes of Meeting between CCCS and [X] dated 6 July 2018.

competition in a market, thus increasing the probability that competitors will collude or strengthening a tendency to do so.²⁶⁶

The Parties' submissions for urban signalling systems and metros

157. The Parties submitted that the Proposed Transaction will not give rise to coordinated effects for the supply of urban signalling or metros in Singapore, in view of:²⁶⁷
- a. the structure of the tender market encourages intense competition;
 - b. the large number of existing and potential global competitors who can, and do, qualify and participate in open tenders called by the LTA in Singapore, and who will thereby be able to disrupt any coordinated behaviour;
 - c. the presence of global competitors facing mature home markets who have the ability and incentive to compete to win tenders in Singapore;
 - d. the large size of tenders and their infrequent nature which further incentivises intensive competition for each bid; and
 - e. the strong countervailing buyer power of the LTA, who will be able to disrupt any coordinated behaviour.

Feedback from third parties for urban signalling systems and metros

158. Third party feedback indicates that suppliers of urban signalling systems and metros do not face capacity constraints and would be able to transfer resources internationally to meet increased demand in Singapore.²⁶⁸ However, the Proposed Transaction will result in a reduction of the number of competitors for the supply of metros and urban signalling systems.²⁶⁹

CCCS's assessment and conclusion on coordinated effects for the supply of urban signalling systems for MRT lines in Singapore

159. In respect of the supply of urban signalling systems for MRT lines in Singapore, the estimated CR3 is high at [80-90]%, which may suggest high

²⁶⁶ Paragraph 5.35 of the *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.

²⁶⁷ Paragraph 35.1 of Form M1; and the Executive Summary of the Competitive Assessment Section in Form M1.

²⁶⁸ Paragraph 25 of [3<] Response to CCCS's Invitation to Comment dated 27 July 2018; and paragraph 26 of [3<] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁶⁹ Paragraph 26 of [3<] Response to CCCS's Invitation to Comment dated 27 July 2018.

concentration in the relevant market. Moreover, the third biggest supplier of urban signalling systems only has a market share of [0-10]%. CCCS is mindful that the Proposed Transaction would solidify the merging entity's position, particularly in the market for the supply of urban signalling systems for MRT lines in Singapore.

160. Nonetheless, CCCS notes that the procurement urban signalling systems (which is conducted primarily through infrequent open tenders) increases the difficulty for suppliers coordinating their behaviours in the market. Further, given that a supplier could benefit from significant advantages from being an incumbent supplier, there is strong incentive for suppliers to aggressively compete for tenders.
161. While the barriers for a new potential urban signalling supplier to supply urban signalling systems for MRT lines in Singapore is high given the LTA's stringent eligibility criteria, the barriers to entry/expansion are less significant for existing potential urban signalling suppliers who have a proven track record. CCCS notes that the LTA has a policy to actively encourage new suppliers to enter the Singapore market for urban signalling. This would also help to mitigate against the risk of suppliers coordinating their behaviour in this market.
162. In light of the above, CCCS concludes the Proposed Transaction is unlikely to raise concerns of coordinated effects.

CCCS's assessment and conclusion on coordinated effects for the supply of metros in Singapore

163. In respect of the supply of metros in Singapore, the estimated CR3 is 100%. While high, there is no incremental increase in the CR3 from the Proposed Transaction.
164. CCCS also notes that the coordinated effects are likewise unlikely for the same reasons set out in paragraphs 160 and 161 above in relation to urban signalling. Namely, the procurement is conducted primarily through infrequent open tenders increases the difficulty for suppliers coordinating their behaviours in the market and this creates a strong incentive for suppliers to vigorously compete with each other. Furthermore, there are a number of train manufacturers besides the merging parties for the LTA to work with.²⁷⁰ This includes existing potential metro suppliers that have participated in the

²⁷⁰ Paragraph 2 of [S<] Response to CCCS's Invitation to Comment dated 18 June 2018.

LTA's tenders between 2012 and 2018, such as Hyundai Rotem and CAF.²⁷¹ The LTA's policy of encouraging new suppliers to enter the Singapore market for metros would also help to mitigate the risk of suppliers coordinating their behaviour in this market.

(c) Vertical effects

165. A merger may allow the merged entity to foreclose rivals from either an upstream market for selling inputs or a downstream market for distribution or sales. For example, if the merged entity supplies a large proportion of an important input to a downstream process where it also competes, it may be able to dampen competition from its rivals in the downstream market, such as by diverting its production of the input entirely to its own downstream process.²⁷²
166. CCCS has considered whether, post-Transaction, the Parties would be able to foreclose competition in the downstream provision of urban signalling systems.

The Parties' submissions

Mobility inputs

167. The Parties submitted that they manufacture products that function as inputs for products and services supplied within the mobility sector including the rolling stock, signalling and rail electrification segments ("mobility inputs"). While the Parties and other global competitors are able to manufacture all the mobility specific components for the mobility products they each supply globally, suppliers may use components manufactured by their competitors where doing so is more efficient or where end-customers have expressed a preference for a particular component manufactured by a third party.²⁷³
168. The Parties submitted that instances of the Parties sourcing for components from each other or their competitors and vice versa is not common for signalling systems supplied in Singapore, and such supply, when it occurs, is usually limited in both value and quality.²⁷⁴

²⁷¹ Paragraph 25.2 of Form M1.

²⁷² Paragraph 6.11 of the *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

²⁷³ Paragraph 36.1 of Form M1.

²⁷⁴ Paragraph 36.2 of Form M1.

169. With respect to metros, Alstom has not sourced inputs from and has not supplied inputs to other competitors, including Siemens, in Singapore.²⁷⁵ Similarly, Siemens does not purchase rolling stock components from Alstom in Singapore or elsewhere.²⁷⁶
170. In Singapore, Alstom has sold only [X] inputs to competitors:²⁷⁷
- a. [X].
 - b. Alstom purchases [X] from Siemens and [X]. The purchases from Siemens [X].
171. In Singapore, Siemens sales of mobility products to other competitors are limited to:²⁷⁸
- a. [X]; and
 - b. [X].
172. In respect of mobility-specific inputs, the Parties submitted that the Proposed Transaction will not give rise to foreclosure concerns as:²⁷⁹
- a. There are often a number of component suppliers active on the market, giving downstream competitors multiple alternative sources of supply. In addition, many mobility suppliers currently produce components for their own use and can easily extend their supply to other mobility suppliers downstream.
 - b. Most downstream competitors are also vertically integrated and produce components in-house, making them independent of external supply.
 - c. Even in those markets where certain downstream mobility competitors are not vertically integrated and the number of component suppliers with homologated products is limited, the existence of powerful buyers would defeat any attempted foreclosure strategy.

²⁷⁵ Paragraph 60.3 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

²⁷⁶ Paragraph 60.3 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

²⁷⁷ Paragraph 36.5 of Form M1.

²⁷⁸ Paragraph 36.6 of Form M1.

²⁷⁹ Paragraph 64.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

- d. Mobility products typically represent only a minimal fraction (often <1 per cent) of the costs of a total signalling project or rolling stock. Thus, even if product price increases were possible (which is not the case given competitive constraints and buyer power), they would provide no appreciable advantage in terms of increasing downstream rivals' costs. Given the very limited product-related revenues, the absence of benefits for downstream competition and the risk of upsetting the end-customer with long-term adverse consequences for the high revenue downstream project business, increasing component prices with a view to foreclosure competitors would not be an economically rational strategy for the merging entity to pursue.

Non-mobility inputs

173. The Parties further submitted that Siemens, as a highly diversified industrial group, manufactures various products which are not specific to the mobility sector but which are supplied as an input product into many industries, including but not limited to the mobility sector (“non-mobility inputs”).²⁸⁰ Alstom does not sell any non-mobility specific inputs in Singapore or elsewhere.²⁸¹ Given the generic nature of such sales and the wide number of alternative suppliers unconnected to the mobility sector, such sales are considered of little relevance and would not allow Siemens to restrict competition in the downstream mobility markets in any way. Moreover, Siemens' sales of non-mobility inputs to mobility suppliers represent only a fraction of its overall sales of such products.²⁸²
174. The Parties submitted that the main categories of non-mobility inputs are produced by the Energy Management²⁸³; Digital Factory²⁸⁴ and Process Industries and Drives²⁸⁵ divisions.

²⁸⁰ Paragraph 36.12 of Form M1.

²⁸¹ Paragraph 36.11 of Form M1.

²⁸² Paragraph 36.12 of Form M1.

²⁸³ Energy Management: High-voltage-circuit breakers, instrument transformers, brushings, surge arresters, HVDC Transmission solutions, flexible AC Transmission Systems (“FACTS”), substation automation & protection, control centers and grid applications.

²⁸⁴ Digital Factory: A comprehensive portfolio of seamlessly integrated hardware, software and technology-based services in order to support manufacturing companies worldwide in enhancing the flexibility and efficiency of their manufacturing processes and reducing the time to market of their products.

²⁸⁵ Process Industries and Drives: products/services that help companies improve the reliability, safety, and efficiency of their products, processes and plants.

175. In respect of non-mobility inputs, the Parties submitted that the Proposed Transaction will not give rise to vertical concerns as there is no risk of input and/or customer foreclosure for the following reasons:²⁸⁶
- a. These upstream products are not mobility-specific and many of them are commodity-type products which typically attract multiple suppliers.
 - b. The Proposed Transaction will not result in any incremental increase in the level of concentration on these markets, as only Siemens is active for non-mobility inputs. The number of available competitive alternatives²⁸⁷ will remain unchanged. The competitive pressure that the merging entity will face on the upstream markets would prevent any foreclosure attempts by the merging entity.
 - c. Foreclosure attempts would also be defeated by the existence of large customers with significant countervailing buyer power and their corresponding ability to sanction any foreclosure strategies that have the potential of reducing their choice of suppliers.
 - d. The merging entity will have no ability or incentive to foreclose customers to other component suppliers. The Parties' combined purchases of non-mobility inputs for mobility purposes represent only a minimal fraction of the total supply as these products are sold in multiple markets and industries.

Feedback from third parties

176. Feedback from third parties suggests that the risk of input foreclosure is low. In respect of mobility inputs, market feedback suggests that the merging entity would continue supplying mobility inputs to other suppliers.²⁸⁸ Given that there are multiple suppliers of mobility inputs, it would be feasible to switch to alternative suppliers for such components.²⁸⁹ However, the products would need to be homologated at a national level, which could, in the end, have an impact on price and on the delivery time.²⁹⁰ Feedback from third parties did not reveal any concerns on the foreclosure of non-mobility inputs.

²⁸⁶ Paragraph 36.16 of Form M1.

²⁸⁷ Major global suppliers of non-mobility inputs include ABB Group ("ABB"), Schneider Electric SE ("Schneider Electric"), Legrand Group ("Legrand"), Crompton Greaves Limited, Mitsubishi Group and Caterpillar Inc ("Caterpillar").

²⁸⁸ Paragraph 19(a) of the [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁸⁹ Paragraph 19(b) of the [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

²⁹⁰ Paragraph 19(b) of the [REDACTED] Response to CCCS's Invitation to Comment dated 27 July 2018.

CCCS's assessment

177. CCCS notes from third party feedback that there are multiple suppliers of mobility inputs and competitors would be able to switch to alternative suppliers for such components. In respect of non-mobility inputs, CCCS further notes that the Proposed Transaction will not result in any incremental vertical effects, as only Siemens is active for non-mobility inputs. There is no change in the number of competitors for non-mobility inputs.
178. In view of the above, CCCS is of the view that the Proposed Transaction does not give rise to vertical effects that would raise competition concerns in the downstream markets for urban signalling systems or metros.

IX. Efficiencies

The Parties' submissions

179. The Parties submitted that the combination of the Parties' experience, complementary product offerings and geographic footprints will enable the Parties to invest into the digital technology needed for mobility challenges in the future and to address the increasing competitive pressure from rapidly growing competitors, to the benefit of customers and consumers.²⁹¹
180. From the Parties' perspective, the Proposed Transaction is expected to result in significant synergies, notably in the following two broad areas: (i) functional synergies; and (ii) industrial synergies.²⁹²
181. The Parties submitted that the functional synergies are expected to have a pro-competitive effect for each of the different synergy categories²⁹³:
- a. Sourcing/procurement: [REDACTED].
 - b. Indirect (overhead) expenses: [REDACTED].
 - c. Selling and bidding: [REDACTED].
 - d. R&D: [REDACTED].

²⁹¹ Paragraph 42.1 of Form M1.

²⁹² Paragraph 70.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

²⁹³ Paragraph 70.2 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

182. The Parties further submitted that the merging entity can achieve industrial synergies through the optimisation of the rolling stock production footprint. The industrial synergies will allow the merging entity to significantly improve its cost base and secure its long term global positioning in the face of ever increasing competition from the low-cost base competitors throughout Europe and worldwide.²⁹⁴

CCCS's assessment

183. 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.²⁹⁵

184. Given that the above competition assessment did not point to an SLC, CCCS is of the view that it is not necessary to make an assessment on the claimed efficiencies by the Parties.

X. Ancillary Restrictions

185. Paragraph 10 of the Third Schedule to the Act states that the “*section 34 prohibition and the section 47 prohibition shall not apply to any agreement or conduct that is directly related and necessary to the implementation of a merger*” (“Ancillary Restriction Exclusion”).

186. In order to benefit from the Ancillary Restriction Exclusion, a restriction must not only be directly related, but also necessary to the implementation of the merger.²⁹⁶ A restriction is not automatically deemed directly related to the merger simply because it is agreed at the same time as the merger or is expressed to be so related²⁹⁷ but needs to be connected with the merger and subordinate to its main object.²⁹⁸ In determining the necessity of the restriction to the implementation of the merger, considerations such as whether its duration, subject matter and geographical field of application are proportionate to the overall requirements of the merger will be taken into account. CCCS will consider all these factors in the context of each case.²⁹⁹

²⁹⁴ Paragraph 70.3 of the Parties' Response to Information Request dated 27 July 2018.

²⁹⁵ Paragraph 7.3 of *CCCS Guidelines on the Substantive Assessment of Mergers 2016*.

²⁹⁶ Paragraph 9.6 of *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

²⁹⁷ Paragraph 9.9 of *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

²⁹⁸ Paragraph 9.7 of *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

²⁹⁹ Paragraph 9.10 of *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

187. The Parties submitted that there are no ancillary restrictions in the Proposed Transaction. However, for completeness, the Parties noted that [REDACTED].³⁰⁰

[REDACTED]

188. The Parties submitted that [REDACTED].³⁰¹

189. The Parties also submitted that [REDACTED].³⁰²

190. The Parties submitted that [REDACTED].³⁰³

CCCS's assessment regarding the Parties' non-compete obligation

191. The *CCCS Guidelines on the Substantive Assessment of Mergers 2016* state that non-compete clauses, if properly limited, are generally accepted as essential if the purchaser is to receive the full benefit of any goodwill and/or know-how required with any tangible assets. CCCS will consider the duration of the clause, its geographical field of application, its subject matter and the persons subject to it. Any restriction must relate only to the goods and services of the acquired business and apply only to the area in which the relevant goods and services were established under the previous/current owner.³⁰⁴

192. CCCS notes that given that the entirety of Siemens Mobility Business is to be transferred to Alstom, [REDACTED].³⁰⁵

193. In view of the above, CCCS is satisfied that [REDACTED].

³⁰⁰ Paragraph 43.1 of Form M1.

³⁰¹ Paragraphs 43.3 and 43.4 of Form M1.

³⁰² Paragraph 71.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

³⁰³ Paragraph 43.5 of Form M1.

³⁰⁴ Paragraph 9.12 of *CCCS Guidelines on the Substantive Assessment of Merger 2016*.

³⁰⁵ Paragraph 71.1 of the Parties' Response to CCCS's Information Request dated 27 July 2018.

XI. Conclusion

194. For the reasons above and based on the information available, CCCS has assessed that the Proposed Transaction, if carried out into effect, will not infringe section 54 of the Act.
195. 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.



Toh Han Li
Chief Executive
Competition and Consumer Commission of Singapore