



MEDIA RELEASE

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CCCS Clears Proposed Acquisition by Advanced Micro Devices of Xilinx

The Competition and Consumer Commission of Singapore (“**CCCS**”) has cleared the proposed acquisition by Advanced Micro Devices, Inc. (“**AMD**”) of Xilinx, Inc. (“**Xilinx**”) (collectively, “**the Parties**”) (the “**Proposed Transaction**”).

2. Following its assessment, CCCS has concluded that the Proposed Transaction, if carried into effect, will not infringe the section 54 prohibition of the Competition Act (Cap. 50B) (the “**Act**”).

Background

3. CCCS accepted an application from AMD on 4 May 2021 for a decision on whether the Proposed Transaction would infringe section 54 of the Act, which prohibits mergers that have resulted, or may be expected to result, in a substantial lessening of competition within any market in Singapore.

AMD

4. AMD is a global semiconductor company headquartered in Santa Clara, California, USA, with 40 offices in North America, South America, Asia, Australia, and Europe. AMD is active in the supply of the following products globally (including to Singapore):

- a. Central processing units (“**CPUs**”), also known as microprocessors, based on the x86 instruction set;
- b. Discrete graphic processing units (“**GPUs**”);
- c. Accelerated processing units (“**APUs**”) that combine a CPU with a GPU on one chip; and
- d. Semi-custom System-on-Chip (“**SoC**”) products that comprise both CPUs and GPUs and are designed primarily for the gaming console market.

Xilinx

5. Xilinx is a global semiconductor company headquartered in San Jose, California, USA, with 12 offices in North America, Europe and Asia Pacific. Xilinx primarily designs and supplies the following products globally (including to Singapore):

- a. Field programmable gate arrays (“**FPGAs**”) which are a type of programmable logic device that can be configured by customers after fabrication to perform logic and processing tasks;
- b. Programmable FPGA-based SoCs and Smart Network Interface Cards (“**SmartNICs**”), which combine a FPGA with a processor in a single device¹; and
- c. Adaptive Compute Acceleration Platform (“**ACAP**”) which combine a FPGA, a processor and one or more hardware accelerators².

CCCS’s Assessment

6. CCCS conducted a public consultation from 12 May 2021 to 27 May 2021, and contacted 30 stakeholders including competitors and customers to gather relevant information necessary for CCCS’s assessment of the Proposed Transaction.

Relevant markets affected by the Proposed Transaction

7. CCCS determined that it is not necessary to conclude on the precise definition of the relevant markets as it does not affect the competition assessment of the Proposed Transaction. CCCS considered the following possible relevant markets in its assessment of the Proposed Transaction:

- a. Worldwide-to-worldwide supply of FPGAs with possible further segmentation by types of FPGAs (i.e., standalone FPGAs, FPGA-based SoCs, FPGA-based SmartNICs, ACAPs), performance characteristics and application segments (i.e., data centres and other segments);
- b. Worldwide-to-worldwide supply of CPUs (including APUs) with possible further segmentation by architecture as well as application segments; and

¹ An FPGA-based SoC combines a programmable logic core (i.e. the FPGA) with an Advanced RISC Machine CPU that optimises the FPGA for a specific use. An FPGA-based SmartNIC, on the other hand, combines a FPGA with a Network Interface Card.

² Accelerators can improve processing performance, specifically for compute-intensive applications, such as AI, data analytics, and scientific and engineering computing.

- c. Worldwide-to-worldwide supply of discrete GPUs with possible segmentation by application segments.

Competition Assessment

8. CCCS assessed that there is no horizontal overlap between the Parties' products. There is also no vertical relationship between the Parties as neither party is active in the supply of any products that are upstream or downstream relative to the products of the other party. However, there are possible complementary relationships between Xilinx's FPGAs and AMD's (i) CPUs (including APUs used in place of CPUs where relevant) and (ii) discrete GPUs, in data centre and some other application segments.

9. In finding that the Proposed Transaction is unlikely to give rise to a substantial lessening of competition ("**SLC**")³, CCCS found that the merged entity is unlikely to have the ability or incentive to foreclose competition in the markets for CPUs, discrete GPUs or FPGAs post-Proposed Transaction as:

- a. AMD does not have significant market shares in any markets for CPUs or discrete GPUs;
- b. Although Xilinx has significant market shares in the markets for FPGAs, there is presence of a strong competitor (i.e., Intel) and other smaller competitors which can continue to exert a competitive constraint on the merged entity;
- c. CPUs or discrete GPUs and FPGAs are not commonly purchased as a portfolio or bundle due to customers' strong preference to "mix and match" different products and presence of open interconnect standards; and
- d. The proportion of customers sourcing for both FPGAs and CPUs or discrete GPUs is relatively small compared to the overall number of CPUs customers.

³ As set out under paragraphs 6.22 and 6.23 of CCCS's *Guidelines on Substantive Assessment of Mergers*, conglomerate mergers rarely lead to a substantial lessening of competition ("**SLC**") solely because of their conglomerate effects except in exceptional circumstances such as where the products acquired are complementary to the acquirer's own products thus giving rise to so-called "portfolio power". When the market power deriving from a portfolio of products exceeds the sum of its parts, a firm may be said to have "portfolio power". A conglomerate merger may lead to a SLC if customers may have an incentive to purchase the portfolio from one supplier to reduce their transaction costs, and non-portfolio competitors, or those competitors that control only one or a few brands, do not impose an effective competitive constraint on the firm with "portfolio" power.

10. Further information on the notification and CCCS's Grounds of Decision will be made available in due course on [CCCS's Public Register](#) at www.cccs.gov.sg.

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About the Competition and Consumer Commission of Singapore (CCCS)

CCCS is a statutory board established under the Competition Act (Chapter 50B) on 1 January 2005 to administer and enforce the Act. It comes under the purview of the Ministry of Trade and Industry. The Act empowers CCCS to investigate alleged anti-competitive activities, determine if such activities infringe the Act and impose suitable remedies, directions and financial penalties. CCCS is also the administering agency of the Consumer Protection (Fair Trading) Act (Cap. 52A) which protects consumers against unfair trade practices in Singapore. Our mission is to make markets work well to create opportunities and choices for business and consumers in Singapore.

For more information, please visit www.cccs.gov.sg.

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