

# Biden Administration Restricts U.S. Exports of Advanced Computing and Semiconductor Manufacturing Equipment, Software, and Technology to China

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On October 7, 2022, the Biden Administration announced new restrictions on exports to China of advanced integrated circuits (“ICs”), computers and components containing advanced ICs, semiconductor manufacturing equipment, and related software and technology. The new measures expand U.S. export controls under the Export Administration Regulations (“EAR”) to new items destined for China and also create new “foreign direct product” rules under the EAR to restrict non-U.S. activities that could support China’s semiconductor and supercomputing manufacturing capabilities. The Administration also expanded targeted export sanctions against certain named Chinese entities that are engaged in research and development of supercomputers.

Citing a need for urgent action due to the grave national security issues involved, BIS published an interim final rule (“Interim Rule”) with some of the new restrictions taking effect immediately and other restrictions having different effective dates as explained below. However, the public can still comment on these new EAR rules by submitting such input to the U.S. Department of Commerce Bureau of Industry and Security (“BIS”) on or before December 12, 2022.

## **New Controls in Context.**

These new EAR export controls are part of a larger U.S. policy trend aimed at inhibiting China’s technological growth and limiting China’s use of electronic manufacturing capabilities to bolster its military or other security forces. As we previously described in the CHIPS and Sciences Act of 2022 - The Impact on China, the U.S. Congress had enacted the Chips and Science Act of 2022 (“Chips Act”) on August 9, 2022, which aims to expand support for U.S. manufacturing of semiconductors and to promote domestic U.S. research and development in science and technology. Additionally, the Chips Act also seeks to restrict the ability of persons and companies with certain ties to China from access to such authorized federal funds or tax credits.

BIS has identified several reasons to target China specifically with these new export

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## **Related Capabilities**

- Asia-Pacific
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controls. Chief among these expressed concerns is that China could use such exports to establish or expand its domestic capabilities in artificial intelligence (“AI”) items that would have military as well as commercial applications. BIS states that China has “announced its intent to become the world leader in [artificial intelligence] by 2030.” In addition, according to BIS, China could use advanced data processing and analysis for its on-going military modernization, such as “improv[ing] the speed and accuracy of military decision making, planning, and logistics, as well as of its autonomous military systems...” Finally, BIS also cited U.S. human rights concerns with China’s use of advanced data systems to “monitor, track, and surveil its citizens, among other purposes.” BIS thus asserted that all of these factors justified adoption of such broader export controls in the national security interests of the United States.

BIS published the Interim Rule with certain portions taking immediate effect rather than a more typical proposed rule for notice and comment for future adoption and implementation. BIS stated that an interim final rule was necessary because of the “urgent need” to impose new controls on exports to China. Notably, BIS also did not publish a new proposed rule as an “emerging or foundational technology” control under the Export Control Reform Act of 2018, which had been widely anticipated since the enactment of that law. As noted above, the public can still comment on the new restrictions on or before December 12, 2022, even though the Interim Rule already has taken effect.

### **New Export Controls on ICs, Computers Containing ICs, and Semiconductor Manufacturing Equipment.**

The Interim Rule adds new Export Control Classification Numbers (“ECCNs”) or sub-provisions of existing ECCNs to the Commerce Control List (“CCL”), which is Supplement No. 1 to EAR Part 774. These new controls will require export licenses for exports to China or other embargoed destinations, as summarized below. To implement the controls, BIS added a China-specific entry to the regional security (“RS”) controls to restrict the export of the following commodities to China. In addition, these same commodities are restricted for export to so-called anti-terrorism countries under the EAR, i.e., to Cuba, Iran, North Korea, and Syria (collectively, the “AT Countries”). Finally, under the new export restrictions on Russia and Belarus, these new ECCNs would also prevent exports of items subject to the EAR to Russia and Belarus.

The following new ECCNs or additions to existing ECCNs went into effect on October 7, 2022.

- **Integrated Circuits (ECCN 3A090):** This new control restricts exports to China of certain ICs programmable to an aggregate bidirectional transfer rate over all inputs and outputs of 600 Gbyte per second or more and having certain processing performance capabilities specified in ECCN 3A090. This added ECCN covers monolithic ICs, hybrid ICs, multichip ICs, full-type ICs, optical ICs, three-dimensional ICs, and monolithic microwave ICs. BIS has said the ICs specified in ECCN 3A090 have significant AI applications.
- **Certain Computers, Components and Assemblies (ECCN 4A090):** This new control restricts exports to China of certain computers, components, and assemblies

that contain ICs meeting or exceeding the specifications in ECCN 3A090.

- **IC Production Equipment (ECCN 3B090):** This new control restricts exports to China of a variety of semiconductor manufacturing deposition equipment, including the following equipment if they meet or exceed certain specifications in ECCN 3B090: equipment that deposits cobalt through electroplating, chemical vapor deposition equipment, metal fabricating equipment that uses one processing chamber, metal fabricating equipment that uses a vacuum environment or operates in a vacuum, equipment for depositing cobalt metal layers selectively in a vacuum environment, physical vapor deposition equipment, atomic layer deposition equipment, copper fabricating equipment capable of operating in a vacuum environment, selective deposition equipment, and atomic layer deposition equipment that can produce a void or seam free fill of tungsten and cobalt.
- **Related Software and Technology (ECCNs 3D001, 3E001, 4D001, 4E001):** These new controls add restrictions to existing ECCNs for exports to China of software and technology for the development or production of items subject to ECCNs 3A090, 3B090, or 4A090. In addition, technology for the “use” of computers, components or assemblies covered by ECCN 4A090 is controlled under ECCN 4E001. Section 772 of the EAR defines “use” as technology for the operation, installation, maintenance, repair, overhaul, and refurbishing of a product.
- **License Exceptions:** BIS will allow certain exports to be made in reliance on license exceptions for certain replacement (“RPL”), certain software and technology (“TSU”), and to government and international institutions (“GOV”) under limited circumstances for items covered by ECCNs 3A090, 4A090, 3D001, 3E00a, 4D090, or 4E001. However, exporters will need to examine each such license exception carefully to see if those limited authorizations are actually applicable. For example, license exceptions RPL and TSU each require that the equipment to be replaced or updated must have been previously exported in accordance with the EAR, which could limit the scope of transactions that would qualify for export under such license exceptions, given the new rules.
- **ICs & Related Controls to AT Countries (ECCNs 3A991.p, 4A994.I, 3D991, 3E991, 4D994, and 4E992):** These new controls also expand the scope of certain existing ECCNs to restrict exports to the AT Countries and to Russia and Belarus. In particular, ECCN 3A991.p controls exports to these particular destinations of ICs with a process performance of 8 Tera Operations Per Second (“TOPS”) or more or an aggregate bidirectional transfer rate over all inputs and outputs of 150 Gbytes per second or more. ECCN 4A994.I further controls exports to these countries of computers, components, and assemblies containing ICs specified in ECCN 3A991.p. In addition, the export to these countries of technology and software relating to these ICs and computers, components, and assemblies containing such ICs are controlled under ECCNs 3D991, 3E991, 4D994, and 4E992.

### **New Prohibition Targeting Semiconductor Manufacturing End Use.**

Effective October 7, 2022, new EAR Section 744.23 forbids the export of items where the known end use is the development or production of ICs in China under any of the following parameters:

- All items subject to the EAR where the exporter knows the end use will be for IC development or production in China that meet certain specified technical parameters;
- Any item in CCL Category 3 that has an ECCN with the capital letter B, C, D, or E in its alphanumeric code where the exporter knows the end use will be for IC development or production in China but does not know whether those ICs will meet those specified technical parameters; and

- All items subject to the EAR where the exporter knows the end use will be for the development or production in China of parts, components, or equipment controlled under ECCNs 3B001, 3B002, 3B090, 3B611, 3B991, or 3B992.

An exporter may not rely on any license exception for any transaction that falls under this new Section 744.23 rule. Moreover, if an exporter applies for an export license under these new restrictions, BIS will review such an application under a presumption of denial unless the end user in China is headquartered in the United States or in a Country Group A:5 or A:6 country (i.e., certain U.S. allies and partners).

### **New Prohibition on U.S. Person “Support” of IC Development or Production.**

In addition, BIS also added new controls in EAR Section 744.6 on the activities or services of any “U.S. person” that could support or facilitate the development or production of ICs in China. Under the EAR, a “U.S. person” is any U.S. citizen or permanent resident (located anywhere in the world), any protected person under U.S. immigration law, any entity formed under U.S. law or any person within U.S. territory. These new “U.S. person” restrictions will apply to the development or production of certain ICs in China, including logic ICs meeting certain specifications, memory ICs meeting certain specifications, and dynamic random-access memory (“DRAM”) ICs meeting certain specifications. These controls extend to any U.S. person involvement, facilitation, or servicing of items where that U.S. person knows that the end-use will relate to any of the ICs specified in these new end-use controls. Furthermore, this new rule will apply even when the U.S. person does not know whether the resulting ICs developed or produced in China would actually meet or exceed the specified thresholds.

These controls extend to activities of U.S. persons worldwide, and thus they could impact companies in China or in other third countries who employ U.S. persons, even where the underlying activities involve products, software, or technology that are not themselves subject to the EAR. Under this new rule, a U.S. person may not provide any service or support to such an IC production facility in China regardless of whether the technical content of that service or support involves any hardware, software or technology subject to the EAR. Furthermore, if the U.S. person is unable to determine the technical specifications of the resulting downstream IC product, the U.S. person may need to refrain from participating in related services.

This new “U.S. person” activity rule is an extraordinary and unprecedented assertion of jurisdiction over U.S. persons within the framework of the EAR because this new prohibition applies even if the U.S. person might only provide something that is explicitly “not subject to the EAR.” It remains to be seen how broadly BIS intends to apply this new rule and whether this rule is consistent with the EAR’s other long-established provisions in Part 740 that delineate the scope of the EAR. For example, what would be the consequence under this new prohibition if a U.S. person were simply to email a copy of a published microelectronics journal article – which would be something expressly “not subject to the EAR” under EAR Section 740.7’s “published information” exclusion – to an engineer who works at an IC production facility in China?

## **New Foreign Direct Product (“FDP”) Rules.**

To further enhance the force of these new restrictions, BIS also announced a series of FDP rules, significantly expanding the scope of items that are subject to export control under the EAR. Codified under EAR Section 734.9, and taking effect on October 21, 2022, these FDP rules also apply the ECCN-based controls above to items made outside the United States and that rely upon either U.S.-origin software and technology listed above or on manufacturing equipment that is itself the direct product of such software and technology. These FDP rules differ in the scope of covered products and the software and technology involved. To facilitate compliance, BIS has provided a template end user certification but notes at the same time that such a certification will not by itself fulfill a party’s compliance obligations under the new FDP rules. In other words, an exporter may not rely on the new certification as a safe harbor and must still perform appropriate due diligence for each such export transaction.

- Footnote 1 to the Entity List. Before the Interim Rule, BIS had already applied U.S. export sanctions against entities affiliated with Huawei Technologies Co., Ltd. (“Huawei”) under an FDP rule that restricted their access to certain third country equipment and components that Huawei could use to produce 5G telecommunications products. BIS had imposed these Huawei-specific restriction by adding these entities to its Entity List, which is a sanctions list that restricts their ability to receive exports of any items subject to the EAR. BIS designated those Huawei entities on the Entity List with a footnote 1 restriction, indicating that those entities are also to be subject to the Huawei FDP rule. The new Interim Rule retains that existing restriction.
- New Footnote 4 to the Entity List. BIS has revised 28 existing entries of Chinese entities on the Entity List by adding a separate Footnote 4 designation to indicate those 28 Chinese entities are now subject to a new FDP rule that imposes similar restrictions as have been placed on the Huawei entities.
- Advanced Computing FDP Rule. The Interim Rule implements the new controls described above by restricting the export of certain items that are useful for advanced computing. This new restriction will apply whenever the exporter knows that the ultimate destination of the FDP is China, the incorporation of the FDP into a CCL-controlled item that is destined for China occurs, or the FDP is technology developed by an entity headquartered in China for the production of an IC mask, wafer, or die.
- Supercomputer FDP Rule. This new rule restricts the provision of certain items whenever the exporter knows that the end use relates to a supercomputer that either is in China or is destined for China. The rule also applies if the exporter knows that the FDP is destined for incorporation into an item that is for a supercomputer in China or that is destined for China. To implement this FDP rule, BIS is adding a new definition for supercomputer to EAR Section 772.1.

## **Revision to Unverified List Policy.**

On the same day that BIS issued the Interim Rule, it also published an update to its Unverified List (“UVL”) and guidance on the standards for adding entities to its Entity List. The UVL is a list of entities for which BIS has been unable to determine their *bona fides* and their willingness to comply with applicable U.S. export control restrictions. Although the UVL does not by its terms prohibit the export of items to UVL-listed entities, it does impose additional due diligence requirements because BIS has determined those entities

are subject to a heightened risk of diversion to unauthorized destinations or end uses. Exporters dealing with a UVL-listed entity may not rely on any license exceptions to make any exports and must also obtain a special signed statement from the UVL-listed entity about its commitment to comply with U.S. export control laws and regulations as a prerequisite to any export transaction.

In addition, under the new guidance, if the host government of an UVL-listed entity fails to cooperate with BIS in investigating the export practices of such an entity within 60 days, then BIS will transfer that entity to its Entity List. Unlike the UVL, the Entity List does impose sharp restrictions on the items that U.S. persons may export to the listed entity, potentially including all items that are subject to the EAR or those that are subject to any of the FDP rules described above.

### **Harbingers of Further Expansions in U.S. Export Controls?**

The October 2022 National Security Strategy (“NSS”) released by the White House had highlighted a number of key scientific and technological sectors where the Administration expects the United States and China will be in direct competition in the coming decades. Apart from advanced ICs and supercomputers, the NSS also acknowledged growing concerns about such U.S.-China rivalry in other fields such as quantum technologies, artificial intelligence, biotechnology and biomanufacturing, advanced telecommunications and clean energy technologies. Presumably, these new export controls on ICs and supercomputers and their enabling technologies signal that BIS is contemplating a whole new generation of parallel restrictive measures that will target these other identified areas of science and technology for export to China. Such new rules could constrain U.S. person “support” of such activities in China and may include FDP rules to third countries that rely on U.S.-origin equipment, software or other technology to limit their engagement with China. In addition, the Biden Administration has signaled it is considering further expanded rules on ICs, supercomputers, and other related technology, both within the context of the announced Interim Rule and public comment process described above and possibly as new, add-on rules that go beyond those described above.