

## Defining “Emerging Technologies”: Industry Weighs In on Potential New Export Controls

*What exactly would qualify as “emerging technologies,” and how would the United States go about placing export controls on them? Feedback from industry and other stakeholders continues to inform this rulemaking process.*

**By Peter Lichtenbaum, Victor Ban, and Lisa Ann Johnson**

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In November 2018, Peter Navarro, a leading White House advisor on China trade policy, [delivered a talk](#) expounding on a central tenet of the Trump Administration’s economic policy: revitalizing American manufacturing is critical not only to spurring economic growth, but also to strengthening the defense industrial base. Warning against China’s perceived technological ambitions, Navarro [explained](#) that the emerging industries of the future will provide “good jobs at good wages” for Americans for generations to come. Keeping these jobs in the United States would minimize the security risk of being “dependent on foreigners” for critical skills or technology. This melding of economic and national security, reflecting thinking broadly shared in the defense and intelligence communities, may be animating the implementation of [new legislation](#) calling for potential new export controls on “emerging and foundational technologies.”

Major companies and trade associations, however, are concerned about where this effort may lead. Which industries would new controls impact most significantly? How might additional controls affect strategy and operations across supply chains, human resources, R&D, and other functions? Will controls in this new space be properly calibrated to realize national security objectives while minimizing unintended costs to sectors fueled by new technology? Companies across a range of sectors with interests in China are grappling with these and other questions.

### **Legislative Framework—ECRA and FIRRMA**

US export controls, administered by the Commerce Department, restrict the release of sensitive technologies outside the United States or to non-US persons, including a release within a corporation to a non-US subsidiary or employee. While China has long been a focus of US export controls, Congress recently moved to expand controls in order to inhibit China’s access to

cutting-edge technology. Previously, the Commerce Department's Bureau of Industry and Security (BIS) could impose temporary controls on certain technologies that provide a significant military or intelligence advantage to the United States, whereas longer-term control required permanent Commerce Control List classification. In 2018, new legislation set out a blueprint for enhanced export controls, which the Trump Administration is now beginning to put into action.

The [Export Control Reform Act](#) of 2018 (ECRA) began an interagency process to identify and control emerging and foundational technologies that are “essential to the national security of the United States.” The statute also mandates a review of export controls on countries subject to a comprehensive arms embargo, a requirement likely motivated by concerns about China.

Congress's interest in potential new export controls evolved through efforts to craft another piece of legislation passed at the same time—the Foreign Investment Risk Review Modernization Act (FIRRMA). The framers of FIRRMA were concerned about the leakage of technology abroad, particularly after the Chinese government's 2015 announcement of its Made in China 2025 strategy, which targets several advanced industries for rapid development, as discussed in a January 2018 [Defense Department report](#). An [early](#) version of FIRRMA originally sought to expand the authority of the Committee on Foreign Investment in the United States, which screens transactions for national security concerns, to review outbound transfers of intellectual property, but this provision was later [dropped](#) in favor of modifications to US export control law. In enacting ECRA, Congress [mentioned](#) “aggressive attempts by China and other countries to obtain [US] technologies.”

### **“Emerging Technologies” Rulemaking—What Industry Is Saying**

On the immediate horizon is the complex task of deciding an appropriate definition of “emerging technologies.” Congress left this term undefined when it passed ECRA, and now the Trump Administration must give it meaning. In November 2018, as a first step, BIS asked the public for input on how it should define the term, sources for identifying relevant technologies, and the impact of potential controls on US technological leadership, among other topics. The request listed several wide-ranging “representative technology categories”—many of which were related to sectors identified in the Made in China 2025 strategy—such as biotechnology, artificial intelligence (AI) and machine learning technology, microprocessor technology, quantum computing and sensing technology, and additive manufacturing (e.g., 3D printing). BIS also made clear that a separate notice regarding “foundational technologies” would follow later.

The public comment period closed in January 2019, and to date, over 230 comments have been [posted publicly](#). These comments offer insights along two dimensions—the task of crafting a workable definition of “emerging technologies” and operational issues presented by potential new controls.

#### *Defining “Emerging Technologies”*

The definitional task presented by ECRA is novel and in many ways unprecedented. The comments reflect a keen awareness of the complexity of this challenge and concern for the risk of drawing overly broad or amorphous boundaries. Taken collectively, many comments have asked BIS to adopt these five approaches to circumscribing the scope of emerging technologies:

- Ensure a distinction between emerging and mature technologies:** Many comments recommended that BIS take care to exclude mature technologies from the scope of what it deems “emerging.” [Genentech](#) noted that the field of biotechnology is already global in scale and no longer “emerging.” Similarly, [Amazon](#) explained that five of the categories identified in Commerce’s request were “not emerging,” but rather “ubiquitous” products of decades of development—citing AI and machine learning, data analytics, microprocessors, robotics, and advanced computing. [Boeing](#) suggested that technology already subject to an export control regime, or “ubiquitous in the US or globally,” should be excluded from the definition of “emerging.”
- Tailor new controls only to technologies “essential” to national security objectives:** Several commenters emphasized the importance of defining “essential” strictly and narrowly, including the [Information Technology Industry Council](#). The [Alliance of Automobile Manufacturers](#) (Auto Alliance) and [United Technologies](#) went further and proposed that any technologies included in new controls must be “required” for developing “specific and identifiable” weapons, intelligence collection applications, or other tools.
- Account for foreign availability:** Many commenters urged that any new definition be crafted with the foreign availability of technology in mind, as US controls on technologies that are already widely available abroad would serve no practical purpose. Further, the Biotechnology Innovation Organization ([BIO](#)) and [Auto Alliance](#) suggested BIS should avoid imposing controls that would not prevent a comparable technology from being developed or acquired in a country of concern. The [National Foreign Trade Council](#) proposed that BIS determine whether a technology is available abroad by asking companies about foreign competitors that could “step in and fill the gap.”
- Measure impact on US economy and technology leadership:** An expansion of export controls could impose obstacles to growth and investment; several commenters such as [Qualcomm](#) and [Amazon](#) urged BIS to weigh the potential costs carefully. Where research and development are already globalized, such as in the biotechnology industry, further controls could drive investments to other markets and harm domestic technology development, as noted by [Genentech](#).
- Avoid unilateral approaches:** ECRA provides that the United States will unilaterally define controlled technologies first before seeking multilateral alignment, which could result in an uneven playing field for a considerable period, perhaps indefinitely. Many commenters, including the [Semiconductor Industry Association](#), shared concerns about the potential for US unilateralism to fragment the regulatory landscape and increase friction for businesses navigating inconsistent export control regimes. [Tesla](#) and the [National Foreign Trade Council](#) both called for a formal review process involving members of the multilateral export control regimes.

### *Operational Issues*

Beyond definitional issues, many commenters offered suggestions on implementation. Companies and trade associations argued that any new controls should be applied with sensitivity to the realities of global business, underscoring these points:

- **Controls need to permit continued intra-company collaboration and R&D:** [Facebook](#) underscored that much of the R&D surrounding artificial intelligence in particular is “inherently international.” Similarly, [BIO](#) and [Genentech](#) stressed that biotechnology as an industry is global in nature. Biotech products are often researched and produced in multiple locations; additional controls could potentially disrupt supply chains. As a solution, [Microsoft](#) proposed tailoring any new controls to specific end uses or end users, rather than impairing the ability of industry to work collaboratively and exchange information. [Google](#) sought an exemption for “deemed exports,” i.e. the release of controlled information to foreign persons in the US, citing barriers to recruitment and retention of top talent.
- **Regular reviews will ensure continued relevance of any new controls:** Citing ECRA’s mandates, the [Semiconductor Industry Association](#) called for a “broader systematic effort” to review the Commerce Control List, and also suggested the creation of a channel for exporters to request modifications to controls inconsistent with ECRA. Similarly, the [National Association of Manufacturers](#) explained that any new controls should be systematically “reviewed, updated, and, for items that no longer serve a specific national security interest, removed.”
- **Continued private sector engagement:** As the request recognizes, the effective regulation of emerging technologies will benefit from the expertise of companies that are innovating and developing these technologies. The [National Association of Manufacturers](#) requested the creation of means for “ongoing” communication between BIS and industry. [Google](#) also stressed that BIS should endeavor to look to industry for input on “economic implications and technical aspects of technologies.” Many companies highlighted the importance of enabling the private sector to place business proprietary information on the rulemaking record, including [Applied Materials](#) and [Qualcomm](#).

## Looking Ahead

Once BIS has reviewed comments, it will work with other US agencies (principally the Departments of Defense and State) to issue a proposed rule for public comment anticipated around the end of the summer, with a final rule to follow likely no earlier than the end of 2019. Rather than wait to comply with new export controls, companies and trade associations may want to seek an understanding of the likely direction of this important rulemaking and, where possible, to shape the rules by engaging throughout the public comment process. In the near term, companies can take several actions:

- Review comments filed by others regarding their industry sector to understand the points being conveyed to the government, and keep close contact with private sector stakeholders to coordinate positions as appropriate;
- Engage with the relevant agencies to understand their perspectives on these issues, and to share the company’s own perspective; and
- Develop good sources of information on the relevant issues, both within the company and externally, e.g. relating to foreign availability, the technology development path, the role of non-US locations and employees, etc.

Once a proposed rule is published, for either “emerging” or “foundational” technologies, companies may want to review any relevant controls carefully in order to assess the potential impact on their current business and technology development path. Companies can then determine whether to submit detailed comments to BIS and whether to take any additional steps beyond these comments.

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The extent to which any new “emerging technologies” export controls could further disrupt the US-China economic relationship is uncertain at present.

Firms are understandably concerned about the scope of technologies subject to potential new controls and how new controls will affect their ability to grow and invest in US-based innovation. Awareness, resilience, and agility with respect to the compliance environment will be critical competitive traits during this period of regulatory uncertainty and risk.

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