May 23, 2022

Submitted via www.regulations.gov

Thea D. Rozman Kendler
Assistant Secretary for Export Administration
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Re: Docket No. 220217-0051, Request for Public Comments on Supply Chain Issues to Support the U.S.-EU Trade and Technology Council Secure Supply Chains Working Group, RIN 0694-XC089

Dear Assistant Secretary Kendler:

The American Chemistry Council (ACC) is pleased submit the following comments in response to the Bureau of Industry and Security ("BIS") Request for Information ("RFI"), published on April 6, 2022, to advance supply chain resilience and security in key sectors to inform the work of the United States-European Union Trade and Technology Council (TTC) Secure Supply Chain Working Group.

The ACC represents a diverse set of companies engaged in the business of chemistry, an innovative, $486 billion enterprise. We work to solve some of the biggest challenges facing our nation and our world and are committed to fostering progress in our economy, environment, and society.

The business of chemistry:

- Drives innovations that enable a more sustainable future.
- Provides 529,000 skilled good paying jobs—plus over 3.6 million related jobs—that support families and communities.
- Enhances safety through our diverse set of products and investments in R&D.

Every year, the chemistry industry invests billions of dollars to help make the products that make modern living possible and safer for our communities and the environment. Chemistry makes it possible to meet the needs of a growing population. Our products help protect our food supply, air, and water, make living conditions safer, and provide access to efficient and affordable energy sources and lifesaving medical treatments in communities in the United States and around the globe. To enable these ongoing innovations, we advocate for public policies that support the

creation of groundbreaking products to improve lives, help protect our environment, and enhance the economic vitality of communities.

ACC Support of the United States-European Union Trade and Technology Council (TTC)

ACC and the European Chemical Industry Council (Cefic) strongly support the revival of closer transatlantic coordination on key global technology, economic, and trade issues. We hope that the TTC will lead to a deepening of transatlantic trade and economic relations and address the critical issues arising from the nexus of trade with climate change and environmental sustainability, innovation and technology, open strategic autonomy, and supply chain resiliency.

The TTC meeting comes at a transformative time for the global chemicals industry. ACC and Cefic are actively working together to identify areas where we can put the power of chemistry to work on behalf of this initiative. For example, our members are committed to reducing greenhouse gas emissions associated with our operations while enabling the entire manufacturing value chain to reduce their own carbon footprints by using energy-saving and emissions-reducing technologies and materials made possible by chemical innovations.

With the right policies in place, we look forward to being able to deploy the innovative products of chemistry around the globe that are designed to help protect our food supply, air, and water, make living conditions safer, and provide access to efficient and affordable energy sources and lifesaving medical treatments. We look forward to continuing to work with the U.S. and the EU governments to achieve our common objectives.

The following comments reflect those of the American Chemistry Council (ACC).

Chemistry is Core to Semiconductor Manufacturing Supply Chain Resiliency and Security

U.S. chemical manufacturers and workers supply important value-added materials to the semiconductor supply chain. For example, in 2021, the business of chemistry in the United States supported 367,000 workers in the semiconductor and electronic component industry, $45.4 billion in payroll, and $52.5 billion in value-added. Chemicals are essential in the manufacture of semiconductors, printed circuit boards, and other microelectronic devices. Among them are cleaners, developers, dopants, encapsulants, etchants, photoresists, specialty polymers, plating solutions, and strippers. Such products serve major markets such as computers, telecommunications equipment, automotive, and medical devices.

Minimizing contamination is a central discipline of semiconductor manufacturing. The needs for higher data transmission rates and improved signal integrity require smaller integrated circuits and contaminant-free manufacturing processes. Fluoropolymers are a key material for avoiding contaminants in semiconductor manufacturing because they exhibit a unique combination of properties, including resistance to chemical, thermal, and physical degradation that can withstand the semiconductor manufacturing process. Fluoropolymers are critical components of fab equipment (fittings, valves, wafer carriers), consumables (high purity air filters, lubricants), and chemical storage transport equipment (tanks and pipes), and are a fundamental material used for infrastructure in all fabs.

There are also other chemistries used in the manufacturing process that are in need of capacity expansion in order to support continued growth in the electronics market. Such chemistries include but are not limited to P-Series Glycol Ethers, E-Series Glycol Ethers, Amines, and Oxo Solvents. Such products are sold into several markets outside of the electronics market and their availability is often constrained due to strong demand with limited production, especially for P-Series Ethers. As chips get smaller and more advanced, more process chemicals with higher purity will be required; we hope that the TTC can help to addresses such challenges.

Secure and Resilient Supplies of Critical Minerals are Essential to Chemical Manufacturing

Critical minerals are crucial to modern life as they are used in everything from vehicles and jet engines; to clean technology products; to mobile phones, consumer electronics and cameras; to medical imaging products and other healthcare applications; and safety equipment. U.S. chemical manufacturers use many of these minerals – and others – to produce important chemistries of value in a wide range of products used by downstream sectors. Certain minerals allow chemical manufacturers to power innovation in areas like the auto industry, energy generation and storage, and military applications. And they are critical to the future of U.S. energy security. But before any of these products can be produced, the constituent materials and chemistry must be shepherded through the process from design to large scale production, commercialization, and mass marketing.

The economic contributions of rare earth chemistry extend downstream as well. Rare earth products are an essential input in magnets and magnetic powders, catalysts, metallurgical additives, polishing powers, phosphors, glass additives, ceramics, and other engineered rare earth materials as well as batteries, motors and generators, lasers, drives, sensors, and other components and systems used in a variety of industries producing intermediate goods. In turn these products are used in health care, clean energy, automotive, lighting, communications, audio equipment, defense technologies, other electronics, advanced optics, oil refining, and a variety of other economic activity.

In addition, U.S. chemical manufacturers play an important role in multiple stages of the critical mineral supply chain including extraction of raw materials, concentration and purification of those materials, conversion of material into derivatives, manufacturing of derivatives into chemical products, and recycling critical minerals to high purities and grades for use in new applications.

Chemistry is also Fundamental to Lithium-Ion Battery and Solar Panel Production

High-Capacity Batteries (HCBs) are crucial to modern life as they are used in everything from vehicles to mobile phones to cameras to pacemakers. Today the predominant HCB is the lithium-ion battery, which is a liquid-state battery. In the future, solid-state batteries may gain greater market share. Solid-state batteries that use innovative electrolytes promise greater energy density, conductivity, power, safety, and performance potential relative to lithium-ion batteries – at lower weight and cost.

Fluoropolymers enable advanced energy storage and conversion technologies and are key components of lithium-ion batteries. They offer unique performance benefits over other energy storage materials due to their innate resistance to high operating temperatures, chemical corrosion, and abrasion. They enable battery systems that are more efficient, consistent, and durable. Fluoropolymers are also essential chemical technology for flow batteries, which allow utilities and building and homeowners to store energy for use at more optimal times and play critical roles in renewable energy production and overall grid management. Standard appliance batteries (dry cells) and lithium battery cells use short chain (c6) fluorosurfactants as a corrosion inhibitor at the electrodes

The products of chemistry also help support other battery technologies. For example, bromine-based storage technologies are another electro-chemical energy storage solution, providing a range of options to successfully manage energy from renewable sources, minimizing energy loss, reducing overall energy use and cost and safeguarding security of supply. Typical bromine-based flow batteries include zinc-bromine (ZnBr2) and more recently hydrogen bromide (HBr). Other variants in flow battery technology using bromine are also under development. Bromine-based storage technologies are typically used in stationary storage applications for grid, facility or back-up/stand-by storage.

The energy sector also plays a major role in sustainability through its development of renewable energy sources. Solar panels are an important source of renewable energy, and silicones are a major component of solar panel production. In solar panels, the mechanical and chemical properties in silicones' encapsulants help reduce repair costs and achieve a long-lasting use. Electrically conductive silver lines on the front face of the solar panels, made out of metallization pastes, create electrical contacts that allow photons, or particles of light from the sun, to knock electrons free from atoms, generating a flow of electricity.

The Chemistry Industry will be Crucial to Advance Supply Chain Resiliency and Security

The U.S. and EU chemistry industries will be crucial to the advancement of supply chain resiliency and security in these and other sectors currently being studied by the TTC Secure Supply Chain Working Group. We would encourage the BIS to promote the development of the correct incentives to produce chemistries crucial to the manufacturing and R&D of these goods. These incentives include:

- Abundant sources of natural gas and natural gas liquids, the primary feedstocks and energy sources for manufacturing chemicals;
- Timely review and approval of new chemistries under regulatory agencies;
- Low cost imported intermediate inputs into manufacturing of chemicals;
- Facilitation of high skilled labor, including through immigration;
- Access to worker training/retraining programs;
- Strong protection of intellectual property rights, including trade secrets;
- Public-private partnerships for research and development of new materials and technologies; and
- High standard protections for human health, safety, and the environment.

We would also encourage the BIS to work closely with the chemistry industry, U.S. state and local governments, and other U.S. Government agencies to ensure these incentives are put in place. In particular, we think it will be important to explore with U.S. regulatory agencies the impact of ongoing assessments on chemicals relevant to manufacturing, performance and safety of semiconductors. These assessments include those related to N-Methylpyrrolidone (NMP), Octamethylcyclotetra-siloxane (D4, 4,4′-(1- Methylethylidene)bis[2, 6-dibromophenol] (TBBPA), Fluorinated Chemistries, Hydrofluorocarbons, and Phenol Isopropylated Phosphate (3:1) (PIP (3:1)).

In addition, a key point that could significant and negatively affect the supply chain of lithium-ion batteries, is an overly broad definition of per- and polyfluoroalkyl substances (PFAS). Certain overly broad definitions of PFAS will capture fluoropolymers themselves – products that are essential to the manufacture of lithium-ion batteries. Simply put, lithium-ion batteries cannot be manufactured without fluoropolymers and unnecessary and inadvertent restrictions on fluoropolymers that would result from of an overly broad PFAS definition would have a catastrophic impact on the EV battery business.

Finally, many critical minerals are produced and processed outside the United States and European Union. Both the import of critical minerals and development of a domestic supply chain by those seeking to produce and process in the U.S. and EU could face regulatory barriers. Therefore, ACC advocates for an efficient new chemical review and approval process so as to support innovation around chemistries containing critical minerals. For example, the Administration is increasing its efforts to develop a domestic manufacturing ecosystem for high-capacity batteries to support its broader electric vehicle and electricity storage goals. Because high-capacity batteries rely on chemicals containing critical minerals, ensuring an efficient and operational new chemicals review program would be essential to innovation in this area

Conclusion

U.S. chemical manufacturers, our customers, and workers have benefited from global supply chains and recognize that certain risks can arise that must be mitigated. We welcome the Administration and BIS's focus on risks to the supply chain for these critical goods, of which the business of chemistry is a vital part. In BIS's review, we encourage a holistic examination of risks that includes trade policy and regulation. Robust interagency and stakeholder consultation will be key to arriving at effective recommendations that are fit for purpose and support free and open trade and investment. ACC is ready to serve as a source of information and experience regarding the role of the business of chemistry in enabling a more vibrant, resilient, and secure manufacturing industry.

Sincerely,

Jason Bernstein

Jason Bernstein
Director, Global Affairs
American Chemistry Council