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U.S. Department of Commerce
Bureau of Industry and Security, Office of Technology Evaluation
Docket No. 210915-0189, RIN 0694-XC084
Request for Public Comments: Risks in the Semiconductor Manufacturing and Advanced Packaging Supply Chain

Submitted via: Regulations.gov

Re: *Verizon Comments to the Request for Public Comments on Risks in the Semiconductor Supply Chain*

Introduction

Verizon appreciates the Biden Administration's continued attention to the challenges in the supply chain for semiconductors. As the effects of the COVID-19 pandemic continue to ripple through the global economy we agree that there are likely both short- and long-term implications for the global semiconductor supply chain. Verizon's customers depend on the semiconductors present in network infrastructure equipment and consumer devices to work, learn, communicate, shop, and play. The pandemic drove increased demand for our services as people's daily connectivity needs became increasingly tied to their home or other non-traditional office location, even as Verizon's networks also continued to support public safety and first responder services. As the nation, and the world, emerge from the pandemic, demand for semiconductors is increasing across the economy while production constraints limit the ability to increase supply in the short term, resulting in shortages of semiconductors across all segments of the economy.

Even while operating under pandemic conditions, Verizon has continued building a world-leading 5G network that will propel U.S. economic opportunity, growth, and job creation into the future. While managing the supply chain for this advancement in network capability is critically important to Verizon, we must underscore that we are a consumer of equipment and devices that contain semiconductors; we are neither a semiconductor designer/fabricator, nor an ICT equipment/device manufacturer. This means that our ability to answer the questions posed in the RFI[1] is limited, not to mention constrained by the commercially sensitive nature of some of the information being requested.

[1] Department of Commerce Bureau of Industry and Security, *Notice of Request for Public Comments on Risks in the Semiconductor Supply Chain*, Docket No. 210915–0189, 86 FR 53031 (Sept. 24, 2021) ("RFI").

As we have previously stated, the Administration should view the state of the semiconductor supply chain from both a short-term and long-term perspective.[2] While the short-term challenges are real for all segments of the market, given the realities of expanding production in the semiconductor industry, the Administration's ability to increase output in ways that could alleviate the current shortages is limited. Furthermore, the Administration must ensure that any policies enacted in reply to the short-term challenges do not create new disruptions or make worse shortages being experienced in other sectors of the economy, potentially impeding the path to post-pandemic economic growth. Longer term, we applaud the Administration's support for funding the CHIPs Act[3] as an important tool to expand the supply of semiconductors and incentivize the diversification of semiconductor manufacturing.

Short Term

The widely reported supply chain shortage that exists today is the result of multiple factors. For example, slowdowns and closures of semiconductor manufacturing facilities due to the pandemic and other factors have exacerbated the supply shortage while demand for electronics increased due in part to more consumers working and playing from home. Even as the global economy began to re-open (corresponding with the rise in vaccination of the world's population), demand did not diminish – in part also due to the growing use of semiconductors in many different products that increasingly have computational functionality and/or Internet connectivity built in.

Semiconductors are a critical component of numerous infrastructure equipment and consumer devices that enable connectivity, including mobile devices, wireless routers and radios, and network switches and routers. As noted above, pandemic-related shutdowns and stay-at-home orders spurred demand for goods and services that relied on semiconductors. Network equipment and devices that are vital to keeping people working, learning and playing during non-pandemic times have taken on added importance as the nation and the world have coped with the distributed work/learn from home environment forced by the pandemic. Another factor contributing to increasing demand for semiconductors is the growing number of connected devices being used by consumers and enterprises in Internet of Things applications. This portends increasing demand over time, particularly as 5G deployments enable new capabilities for services provided to consumers and businesses.

At the same time, structural issues related to the costs and complexity involved in manufacturing semiconductors have not changed. Semiconductors are built with different performance and tolerance characteristics depending on their application. Fabs that produce one type of chip cannot easily be converted to produce a different type of chip without significant investments in equipment

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[2] Comments of Verizon, *Wireless Telecommunications Bureau Seeks Comment on the Impact of the Global Semiconductor Shortage on the U.S. Communications Sector*, WT Docket No. 21-195 (FCC Filed June 10, 2021) ("Verizon Comments").
[3] CHIPS for America Act, H.R. 7178, 116th Cong. (2020) ("CHIPS Act").

and time. Therefore, retooling a factory to produce a different type of semiconductor chip can take months, and, if done in an unplanned manner, cause that factory to be offline and disrupt existing supply chains.

Even as the global market recovery continues, therefore, there is unfortunately little the U.S. government can likely do to address the current supply constraints in the short term. Any efforts to redirect production or sale of semiconductors to help one industry, will only lead to disruptions in other sectors. The challenges of the current supply shortage are grounded fundamentally in the costs and complexities involved in manufacturing semiconductors, which has led to the concentration of manufacturing in a very small number of global manufacturers. The cost barriers and lead times (measured in years) to bring new manufacturing capacity online make it very difficult for manufacturers to increase output when they are running at full capacity, as is the case today.

As the world moves beyond the pandemic and the markets adjust, we expect supply to gradually come into balance with demand. Supply chain decisions will become clearer for different industries as they gauge demand for their products/services as the pandemic fades. Current shortages will only be exacerbated and only create more disruptions if governments try to intercede in the market in favor of one economic sector or another.

Given the global supply chain challenges, Verizon has taken steps to mitigate the effects of supply chain disruptions. To secure supply, we have extended our forecasts to anticipate demand, extended lead times for purchase orders, and worked with our suppliers and sub-suppliers to better understand their constraints. While not without risk, these steps have been essential to ensuring enough supply as we move through this uncertain period and push forward in building out our 5G network, while maintaining and improving on the high-quality services our customers expect. While supply chain constraints for semiconductors and other products in the economy are very real, Verizon has taken the necessary steps to manage through them. However, any attempt by governments to redirect supply has the potential to adversely impact market signals that every company carefully monitors, interprets and uses for critical decision-making in a competitive market economy. Such an outcome could potentially prolong the current shortages despite the best intentions of the Administration to try to alleviate them.

Long Term

Mitigating risks to the semiconductor supply chain in the future requires policies that address some of the underlying structural issues inherent in large scale semiconductor manufacturing. Over the years, many of the world's leading semiconductor companies have become "fabless," where they outsource manufacturing of their design to another company. This fabless/foundry model may account for up to 80% of all semiconductor manufacturing volume today – and most of that foundry volume is manufactured in Asia. Given the increasing complexity and associated costs of building ever smaller, more powerful semiconductors for high performance applications, production has shifted to a small number of manufacturers who can balance the enormous investments required

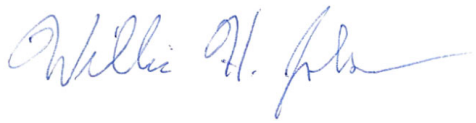
with large scale production. While those producers have met the global demand up to now, the current shortage and increasing geo-strategic considerations necessitates finding a way to inject greater competition and diversification of production of semiconductors.

To help mitigate future risks to the supply of semiconductors, Verizon supports policies like those created by the CHIPS Act - passed in 2020 but awaiting Congressional funding. Government support for private investments in semiconductor manufacturing in the United States will help to lower the risk of future supply chain disruptions nationally and globally. We applaud the Administration's support for Congressional funding of the CHIPS Act and encourage consideration of other incentives that may be helpful in this regard.

Conclusion

Verizon appreciates the Biden Administration's focus on the shortages in the semiconductor supply chain. As the U.S. emerges from the COVID 19 pandemic, we believe the supply chain shortages currently being felt in the semiconductor space and elsewhere will ease. Unfortunately, there is little the government can do in the short term to address this shortage without disrupting the supply of semiconductors in other industries with potentially harmful consequences – such as impacting the ability to support and expand remote working/learning solutions and deploy advanced 5G infrastructure. Albeit not a solution for today's issues, a longer-term policy of incentivizing the manufacture of semiconductors in the U.S. will help mitigate today's shortage from happening in the future, while also addressing larger geo-strategic concerns.

Yours sincerely,



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