U.S. Senate Finance Committee

Hearing on:

"American Made: Growing U.S. Manufacturing through the Tax Code"

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Chairman Wyden, ranking member Crapo and members of the Committee, thank you for the invitation to testify today. My name is Shannon Janis, Vice President of Global Tax at **onsemi**. I am here today to share what we do at **onsemi** and discuss how U.S. tax policy shapes our decisions regarding domestic manufacturing.

onsemi is a Fortune 500 semiconductor company with over 4,000 employees in the U.S. and 31,000 employees worldwide. We are headquartered in Scottsdale, AZ and specialize in delivering industry-leading intelligent power and sensing solutions that greatly improve the safety, sustainability and power efficiency of end-products in the automotive and industrial markets.

In the automotive market, our products enable lighter and longer range EVs, increased gas mileage in traditional vehicles, deploy automatic emergency braking and pedestrian detection systems, and adaptive headlights to reduce blinding drivers in oncoming traffic, to name a few.

With respect to the industrial market, our products are used to enable highly efficient energy storage and renewable energy systems, EV charging infrastructure, industrial automation, smart cities and buildings, motor control and robotics, hearing health, and diagnostic therapy and monitoring for chronic disease such diabetes.

We also manufacture products used in end-use applications related to computing, consumer networking and communications such as 5G base stations and smart phones.

To support these applications, we offer a robust portfolio of semiconductor products and technologies that include Silicon Carbide, Image Sensors, Power Modules, Wireless Connectivity and more. These applications help our customers create cutting-edge products that solve challenging problems, enhance safety standards and support the transition to electrification for a more sustainable future.

Manufacturing and Site Operations at onsemi
We operate 19 manufacturing sites across 8 countries worldwide – including the United States; these sites consist of front-end materials and wafer fabrication facilities (known as fabs) as well as back-end assembly and test site factories.

In the U.S., our materials and fab operations are located in five states; Oregon, Idaho, Pennsylvania, New York and New Hampshire. Each of these factories are an integral part of **onsemi's** in-house global manufacturing network.

Gresham, Oregon
onsemi's Gresham wafer fab is the third largest fab globally, employing more than 600 people. Over 50% of Gresham's volume supports the automotive market with over 35 different technologies manufactured at this site. This fab has been accredited by the U.S. Defense Department as a Category 1A Trusted Foundry and is ITAR registered.

Nampa, Idaho
The Nampa wafer fab employs over 260 people and supports our award winning and lifesaving image sensor business. Image sensors are a key component in machine vision cameras, including digital cameras and security cameras. Today, **onsemi** is a leading producer of image sensors, inductive and ultrasonic sensors used in advanced safety, Advanced Driver Assist Systems (ADAS) and Autonomous Vehicle (AV) technologies.

Mountain Top, Pennsylvania
Our Mountain Top fab employs over 240 people making power semiconductors for automotive and other applications and is the only union fab in the U.S.

East Fishkill, New York (EFK)
EFK is **onsemi's** largest manufacturing facility in the U.S. employing over 1,000 people and it is the only 12-inch power discrete and image sensor fab in the U.S.

Hudson, New Hampshire
Our Hudson facility is the cornerstone to **onsemi**'s Silicon Carbide products. Through a rigorous proprietary process, crystals are converted to valuable Silicon Carbide boules which are further processed at other factories into Silicon Carbide power devices for use in

high-power and high-efficiency applications. Today, **onsemi** is the only U.S.- based company that has fully integrated end-to-end Silicon Carbide manufacturing.

And why is this important?

Silicon Carbide semiconductors play a pivotal role in enabling the transition to electric vehicles and renewable energy systems. Manufacturing silicon carbide semiconductors is more complex than traditional silicon semiconductors due to higher temperatures, specialized equipment and unique expertise. We are proud that our New Hampshire site enables our network of factories to deliver the end-to-end Silicon Carbide power solutions from crystal growth to fully integrated power modules necessary for EVs, hybrid vehicles and renewable energy.

In addition to our fabs, we have Solution Engineering and Design Center operations in nine U.S. states that include Arizona, California, Idaho, New York, Oregon, Pennsylvania, Rhode Island, and Texas as well as design centers located in 18 other countries.

Workforce Talent at onsemi

The importance of hiring and retaining a skilled workforce in the semiconductor industry cannot be overemphasized. At **onsem**i we proactively seek new candidates and talented individuals to enrich our innovative, diverse and inclusive work environment. To achieve this, we developed an extensive U.S. workforce strategy that includes:

- **Outreach Programs:** We engage with high schools, community colleges, universities and other organizations, including our military.

- **Country-wide and Local Initiatives:** Our talent acquisition efforts extend beyond traditional channels. We operate both country-wide programs as well as local programs near our facilities.

- **University Collaboration:** We collaborate closely with university faculties, particularly those in semiconductor-related fields. Through workshops, capstone projects, and student events, we actively engage students and recruit graduating students through career fairs and online advertisements.

- **Investing in Education:** Recently, we announced a commitment to donate $500,000 over ten years to Rochester Institute of Technology in New York. This investment supports semiconductor educational programming and research,

benefiting both students and faculty with increased co-op opportunities and new research initiatives.[1]

Importance of the CHIPS Act and its Incentives for the U.S.

As this Committee is aware, the steady decline in United States-based semiconductor manufacturing capacity poses a risk to America's supply chain and national security. This decline has been decades in the making and will require persistent attention to achieve a sustainable reversal. A key contributing factor to the decline has largely been due to the substantial manufacturing incentives provided by the governments of our global competitors. These incentives have placed the U.S. at a competitive disadvantage in attracting new construction of semiconductor manufacturing facilities. [2]

Although the U.S. has taken the initial steps to curb this decline, other countries both within the European Union as well as countries such as South Korea, Japan, and China are significantly increasing their investments in the semiconductor industry and its workforce. Many of these countries have legislation similar to the CHIPS Act to support their domestic companies as well as incentivizing other companies to invest in their regions. The CHIPS Act, and in particular the Section 48D advanced manufacturing tax credit has played a critical role in enhancing the global competitiveness of the U.S.

However, there is a noteworthy disparity: federal investments in semiconductor research have historically remained flat as a share of GDP. While other country governments have prioritized investments in R&D initiatives to strengthen their semiconductor capabilities, our U.S. R&D tax incentives lag behind those of our international counterparts.

Semiconductor companies carefully evaluate multiple factors in making investment decisions. These include overall business conditions, regulatory environmental compliance, supplier networks, site availability, infrastructure, and the access to a skilled workforce. Given this, rebuilding the semiconductor supply chain in the U.S. is not an easy task. The complex technology, and advanced process of designing and manufacturing semiconductors requires high levels of sustained investment in people, fabs, and equipment due to the sophistication of the technology and the rigorous and exacting standards needed for construction, equipment, and infrastructure.

Additionally, the cost of a fab can range from $1 billion to $20 billion depending on the type and scale of the project plus it can take anywhere from two to five years to complete

[1] Onsemi to donate $500,000 to RIT to further semiconductor educational initiatives | RIT

[2] See "Government Incentives and US Competitiveness in Semiconductor Manufacturing," by Antonio Varas, Raj Varadarajan, Jimmy Goodrich, and Falan Yinug, September 2020, available at Government-Incentives-and-US-Competitiveness-in-Semiconductor-Manufacturing-Sep-2020.pdf (semiconductors.org)

construction. Furthermore, fab construction requires a highly skilled workforce to build and install support systems and advanced structures that deliver high purity gases, ultra-pure water, and state-of-the-art air recirculation systems. With the U.S. workforce talent being more expensive than other low-cost countries, incentives are critically needed to help offset these costs and enable competitive pricing.

On another crucial front, the U.S. has set aggressive targets to reduce greenhouse gas emissions by 50% by 2030 and achieve net-zero economy-wide by 2050. Meeting these timelines will require the U.S. to make significant investments in clean energy and power efficiency – all dependent on semiconductors that go into the design of electronic applications. With the government's support, **onsemi** will continue to drive innovation across our portfolio of products and increase the energy-efficiency and reduce carbon emissions in key sectors that extend from electricity generation, transportation, industry and agriculture – which all play a pivotal role in helping the U.S. achieve these goals.

Preliminary reports appear to indicate that investments from the industry, facilitated by incentives under the CHIPS Act, are working to grow domestic semiconductor manufacturing and strengthen the resiliency of our supply chains. With the help of the U.S. CHIPS Act, the U.S. is expected to attract roughly one-quarter of total global semiconductor investment. But areas of vulnerability in the ecosystem remain and additional work is needed to maintain this momentum and further strengthen key areas of the chip supply chain. Policymakers in the United States and elsewhere should consider additional measures to maintain momentum in strengthening the semiconductor supply chain and ensuring increased resilience in the future.

In Conclusion

As a US-based company, **onsemi** welcomes the opportunity to expand and bring new domestic production onshore. We are committed to implementing projects that will keep **onsemi** competitive in the long term – which is a core responsibility to our shareholders, employees, suppliers, communities, and other stakeholders.

The enactment of the CHIPS and Science Act was a landmark step towards reinvigorating domestic semiconductor manufacturing and innovation. The mission is clear: establishing our leadership role is vital for the U.S. to win the global technology race in the semiconductor industry. Ongoing support from the CHIPS Act with its Section 48D advanced manufacturing tax credit will enable companies like **onsemi** to continue to invest in the U.S., compete with companies that are located offshore, and strengthen the resiliency of our critical supply chains.

Mr. Chairman, I appreciate your calling for this hearing and this committee's support of the U.S. semiconductor industry. Thank you for the opportunity to testify at today's hearing.