20th June 2022

Confidential: Qualcomm Technologies Ltd response to BEIS Committee Call for Evidence: The Semiconductor Industry in the U.K.

Qualcomm Incorporated[1] (together with its subsidiaries, "Qualcomm") is the world leader in developing the foundational technologies and semiconductor designs that serve as the basis of 5G cellular ecosystem; powering the Internet of Things ("IoT"), artificial intelligence ("AI"), and a new era of intelligent, connected devices. Since its founding in 1985, Qualcomm has invested over $75 billion in R&D to develop these groundbreaking technologies.

Our decades of experience have made Qualcomm the world's largest fabless semiconductor company by revenue. We supply customers across the globe in several sectors, from mobile, IoT, and automotive to virtual and augmented reality. This includes our VMW (Voice, Music & Wearables) business, which is based almost entirely in the U.K. at our Belfast, Bristol and Cambridge sites.

We welcome the opportunity to respond to Committee's Call for Evidence on the semiconductor industry in the U.K. Qualcomm was one of the first semiconductor companies to move to an entirely fabless business model to focus our resources on inventing and designing semiconductors.

Semiconductors have become an area of intense geopolitical interest, with many governments looking at ways to boost domestic capabilities to meet the increasing demand for chips. An increase that is driven by the digitisation of all aspects of our lives and has only been accelerated by the COVID19 pandemic. We expect this demand to continue at pace.

Qualcomm believes the U.K. will be well-positioned to realise the economic benefits of digitisation and ensure access to chips if the Government recognises both the global nature and competitiveness of the semiconductor supply chain.

In our response below we make some general recommendations on the areas we believe U.K. policymakers should prioritise to help achieve its ambitions. However, we welcome further questions from the committee.

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[1] Qualcomm Technologies, Inc., a subsidiary of Qualcomm Incorporated, operates the Qualcomm CDMA Technologies ("QCT") semiconductor business, which develops and supplies integrated circuits and system software based on 3G/4G/5G and other technologies for use in mobile devices, wireless networks, devices used in the Internet of Things, broadband gateway equipment, consumer electronic devices, and automotive systems for telematics, connectivity, and digital cockpit (also known as infotainment). Qualcomm Incorporated includes Qualcomm's licensing business, Qualcomm Technology Licensing ("QTL"), and the vast majority of its patent portfolio.

Demand for semiconductors

1. Semiconductors are ubiquitous in today's economy. They provide the enabling hardware to power virtually all modern electronics and technologies, from automobiles and medical devices to smartphones and computers. The COVID-19 pandemic has heightened this demand further, with communications technology fueled by semiconductors connecting people for work, school, and family functions.

2. The demand for semiconductors is set to continue at pace, driven mainly by 5G connected IoT devices, which are projected to grow by 173% from 2021 to 2026, to approx. 34.6 million non-mobile 5G IoT devices (ABI, 2026). It is further estimated that IoT could enable up to $12.6 trillion in global economic value by 2030, while 5G could generate more than $13.2 trillion in global economic activity by 2035.

Access to semiconductors - promote a geo-diversified supply-chain

3. The semiconductor supply chain is highly interdependent through a collaborative manufacturing process, with many essential partners such as foundries, Outsourced Assembly and Test (OSAT) firms, and Electronic Design Automation (EDA) firms based in countries across the globe.

4. As such, since the supply chain is so integrated and globalised, the semiconductor shortages faced by the U.K. reflects those faced by most countries across the world, meaning a coordinated response among allies is necessary to meet increasing demand.

- **Increasing foundry capacity:** The U.K. must work with its allies to look at ways to incentivise foundry capacity across the globe, particularly for communications devices, which will be integral to unlocking the economic value of 5G and IoT.

- **Leading edge and legacy nodes:** In a similar vein, the U.K. must work with its allies to ensure access to leading-edge and legacy nodes and a resilient long-term semiconductor supply chain. Semiconductors produced on leading and legacy process technology nodes continue to power thousands of critical technologies. For example, of the roughly 169 semiconductors in a typical smartphone, approximately 73% are made using legacy node processes. See image 1 in the annex.

5. Coordination and cooperation amongst allies will be essential to creating a resilient long-term semiconductor ecosystem that helps meet future demand and an environment where the U.K. semiconductor sector can compete.

Supporting the U.K. semiconductor -sector

6. Qualcomm agrees that the U.K. Government's ambition to focus its efforts on the semi-design sector is essentially the right one. Semiconductor design companies such as Qualcomm and

those based around Cambridge and Wales provide the foundations for the entire semiconductor supply chain that power the development of critical technologies, such as 5G, advanced wireless communications, and AI.[2]

7. However, semiconductor design is highly capital intensive and requires significant investment in long-term R&D without the guarantee of a return. To promote the U.K. semiconductor sector, the U.K. policymakers should look at ways in which they can:

- **Reward risky R&D:** incentivise investment in risky R&D. This includes but is not limited to looking at further tax incentives such as further R&D tax credits and ways to facilitate collaborative research within the semiconductor industry.

- **Support innovation**: look at ways in which they can help strengthen intellectual property rights ("IPRs"), including patents, trade secrets, and standards protections, all of which are vital to a vibrant innovation ecosystem.

8. Rewarding risky R&D and legally protecting the rights of inventors incentivises high-risk, long-horizon investments necessary for innovation, provides monetary rewards for resource-intensive R&D and facilitates commercialisation, collaboration, and follow-on innovation by disclosing the invention in return for the protection of the invented technology.

Creating a pipeline of talent

9. Accordingly, the need for talent in the U.K. and globally has increased dramatically as the sector has grown and the demand for semiconductors has rocketed.
10. While we welcome the U.K. Government's plans to make it easier to bring in talent from abroad, if the U.K. is to achieve its ambition of becoming a science and technology superpower, it needs to also look at ways to encourage more homegrown talent.
11. Policymakers should implement national strategies to increase the number of people, including women and other underrepresented minorities, graduating in STEM fields to build a pipeline of diverse inventors.

Conclusion

12. The U.K. Government has been clear about its ambitions to become a science and technology superpower. Access to semiconductors will be essential to this achieving this and the immense economic benefits generated by 5G and IoT.

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[2] John VerWey, *The Health and Competitiveness of the U.S. Semiconductor Manufacturing Equipment Industry*, at 2, USITC OFFICE OF INDUS. (July 2019) (finding that semiconductor design on average accounts for more than half of the value of any semiconductor chip).

13. While support for the U.K.'s domestic semiconductor design sector will be necessary, if the Government wants to achieve its ambitions and benefit economically from further digitisation, it must work with its allies and industry to deliver a semiconductor ecosystem that is resilient, secure and globally diversified.

Annexe

Image 1 – Leading Edge Vs. Legacy Node for smartphones