



**House Energy and Commerce Subcommittee on
Communications and Technology Hearing on:**

***“Launching Into The State Of The Satellite
Marketplace”***

February 2, 2023

Response to Questions for the Record:

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The Honorable Earl L. “Buddy” Carter

1. In your opinion, what is and isn't working for other countries with respect to licensing? How have other countries adapted their regulatory processes based on recent advancement in the satellite industry?

Response: In a December 2022 Center for Strategic and International Studies (CSIS) study on LEO broadband, “Low Orbit, High Stakes: All-in on the LEO Broadband Competition,” authored by my colleagues, we found that licensing and regulatory requirements are extensive and highly variable across different countries. These variations include different national regulatory structures and enforcement capabilities; protectionist or domestic preference policies; and different requirements involving landing rights, ground stations, and related infrastructures. For U.S. satellite operators seeking greater access in these international markets, licensing has become “one of the largest bottlenecks to market dominance in LEO broadband,” dampens their first-mover advantage, and results in greater business uncertainty and high compliance costs.¹ A further concern for U.S. operators is the asymmetry in market access requirements that lead to an uneven playing field. Some countries require new entrants to set up joint ventures or establish domestic companies as a prerequisite for market access, while the FCC often grants permission for U.S. market access to foreign-licensed commercial satellite operators.²

Chinese LEO satellite communications ventures, including SatNet (who manages the planned 13,000 GuoWang satellite constellation), China Aerospace Science and Industry Corporation (CASIC), China Aerospace Science and Technology Corporation (CASC)—all state-owned enterprises—benefit from significant regulatory leeway, nearly unrestricted funding, and municipal government support.

Some efforts are underway to better align technology control policies between the United States and its allies and partners. For example, in 2021, the European Union introduced revised regulations to “tighten controls on trade in dual-use items,” including space and aerospace technology.³ However, several of those friendly countries and others recognize the limitations that U.S. regulations, such as International Traffic in Arms Regulations (ITAR), place on U.S. space technology companies and have gone so far as to market “ITAR-free” space services and components.⁴

¹ Makena Young and Akhil Thadani, “Low Orbit, High Stakes: All in on the LEO Broadband Competition,” Center for Strategic and International Studies, December 14, 2022, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/221214_Young_LowOrbit_HighStakes.pdf?VersionId=vH11p3dD7VcHGRcvuF9OdzV2WJc_KG42.

² Ibid.

³ Press release, “Strengthened EU export control rules kick in,” European Commission, September 9, 2021, https://ec.europa.eu/commission/presscorner/detail/en/ip_21_4601.

⁴ Examples include small start-up companies manufacturing satellite components in the United Kingdom and Australia. Peter B. de Selding, “U.S. ITAR satellite export regime’s effects still strong in Europe,” Space News, April 14, 2016, <https://spacenews.com/u-s-itar-satellite-export-regimes-effects-still-strong-in-europe/>; Queensland launch companies rocketing into global space race,” Defence Connect, June 4, 2021, <https://www.defenceconnect.com.au/key-enablers/8161-queensland-launch-companies-rocketing-into-global-space-race>.

The Honorable Russ Fulcher

1. Are there on the ground permitting challenges particular to satellite, particularly with Low-Earth Orbit (LEO) satellite services? If so, can you address those challenges?

Response: The benefit of LEO broadband satellites systems is that they can provide connectivity to remote, hard-to-reach areas where building dedicated ground infrastructure, such as laying fiber-optic cables or building network towers, is unfeasible or too expensive. These LEO broadband systems rely on satellite terminals (or, receivers), a mostly unobstructed view of the sky, and an electric connection.

However, there are three broad challenges for LEO broadband, from a ground perspective. First, is the capital-intensive nature of satellite production and operations. As the CSIS study on LEO broadband found, deploying an operational LEO satellite constellation is estimated to be anywhere from \$5 to \$10 billion, according to McKinsey, and \$1 to \$2 billion per year in recurring operating and maintenance costs.⁵ This encompasses the design and development of satellites and user equipment (e.g., satellite receivers), which require large manufacturing facilities, as well as the development and operations of ground stations across the globe to maintain connection with, and relay commands to, the satellites.

The second broad challenge is licensing. A U.S. commercial operator must be licensed in a foreign country to provide satellite communications services to ground receivers there. As noted in the CSIS study, according to market assessment firm Quilty Analytics, “The most difficult aspect of building a [low Earth orbit] broadband system is acquiring the spectrum, not building and launching satellites.”⁶

The third broad challenge is affordability. Although LEO broadband has the potential to bridge the digital divide and to connect rural and underserved populations with internet connectivity, the service is still prohibitively expensive to many. For example, production costs range anywhere from \$1,000 for a home-use terminal to \$10,000 for an airborne terminal. These costs will need to further drop, which industry experts predict they will, to increase adoption and make them more competitive with other modes of internet service.

2. Are there areas where the U.S. should consider new export controls with respect to countries like China, given they have mapped out the “Space Dream” and that aerospace was designated as one of “10 top priorities” in China’s “Made in 2025” strategic plan, as you noted in your testimony? If not new export controls, would you recommend changes in international satellite consortiums, regimes?

⁵ Makena Young and Akhil Thadani, “Low Orbit, High Stakes: All in on the LEO Broadband Competition,” Center for Strategic and International Studies, December 14, 2022, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/221214_Young_LowOrbit_HighStakes.pdf?VersionId=vH11p3dD7VcHGRcvuF9OdzV2WJc_KG42.

⁶ Ibid.

Response: We are in a period of rapid technological change, with the commercial sector leading in many areas of technological innovation. I would encourage a re-examination of U.S. export controls accounting for the dual policy objectives of protecting technology and know-how from transferring to Beijing, while also encouraging a vibrant American technology innovation sector.

Space capabilities are soft power for the United States. Our alliances and partnerships are a competitive advantage and source of strength that the Chinese Communist Party (CCP) does not have. Space cooperation can be a strong feature of these relationships while also bolstering our private sector innovation base. I would far prefer American companies be the partner of choice for our allies and partners, than for them to go to China or elsewhere. However, as noted by private sector stakeholders in U.S. government forums such as the U.S.-EU trade and technology council export control working group in October 2021, U.S. export control policy “discourages European entities from collaborating with U.S. counterparts, creating incentives to avoid U.S. technology or, in some cases, hire U.S. persons.”⁷

Beyond export control policies, we need to continue educating the American public and businesses about the security and economic risks presented by the CCP – from Beijing’s laws and policies that compel the transfer of commercial technology and data to the government, to its collection of American technology through cyber espionage, front companies, talent recruitment programs, and other means. I would offer that a broad strategy with multiple components—ranging from sharing threat information with technology companies, illuminating supply chains, identifying trusted investment sources, increasing cyber security, and bolstering counterintelligence capabilities, among others—will be required.

Finally, U.S. leadership in international consortiums, like the International Telecommunications Union (ITU), matter. After eight years with a Chinese official at the helm of the ITU, a U.S. official now serves as its secretary-general. Such positions enable the U.S. to promote common international norms and standards regarding shared spectrum, while discouraging dishonesty and deceptive actions from actors with unclear motives.

⁷ Summary from the U.S.-EU Trade & Technology Council Stakeholder Meeting, U.S.-EU Trade & Technology Council (TTC) Export Control Working Group, October 27, 2021, <https://www.bis.doc.gov/index.php/policy-guidance/u-s-eu-ttc>.