REMARKS OF COMMISSIONER GEOFFREY STARKS AT THE
2023 U.S. TECH FOR CLIMATE ACTION CONFERENCE
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Thank you, Rebecca, and thank you Motis and Forum Global for convening this timely and important event. I'm thrilled to join you and such a stellar group of experts and advocates as we work not just to resolve but come out ahead in combating climate change. I'm especially honored to share the podium with Senator Whitehouse, Chair of the Senate Climate Change Task Force, who I understand will address the group later this afternoon, with Congressman Carter, Congresswoman Miller-Meeks, who you heard from this morning, and of course with Congresswoman Holmes-Norton, who showed the depth of her wisdom and experience with her remarks just moments ago.

Before I begin, I also wanted to call attention to just how far-reaching this group has turned out to be in its representation. Congress, as I mentioned, has shown up here today, from both parties. Other federal leaders have also shown up, from the Departments of Energy, State, and Transportation and my agency, the Federal Communications Commission. Our cities have shown up, from both coasts down to the Gulf and right here in the District of Columbia. Our universities and research centers—the lifeblood of U.S. innovation—also have shown up, as have civil society groups and the World Bank. We even have representatives from Austria, Canada, France, and Hungary participating here today. The breadth and diversity here is fitting, because climate is much more than just a "whole of government" effort. It's a whole of society effort, and we are seeing that with your mobilization today.

With that said, let me begin my remarks with a more macro-level observation. The story of American ingenuity is one of unparalleled success—and it is searching for its next chapter. We're seeing Web 2.0 and its ad-supported core grapple with concerns over safety, security, privacy, moderation, and competition. With eyes wide open about the technical and social challenges, we're seeing companies bet big on artificial intelligence while democratizing access to powerful AI systems, eyeing the potential to improve not just how we access the web but deliver health care and enhance American manufacturing, to list a few possibilities.

It's clear that big changes in tech lie just around the corner. I believe a clean energy economy could be one of its greatest new frontiers—if we empower it with the right connectivity.

Think about it this way. U.S. climate policy is on the move, building upon landmark legislation like the Inflation Reduction Act, Bipartisan Infrastructure Law, and the CHIPS and Science Act. Collectively, these initiatives will do much more than just mitigate climate change. They'll also seize the opportunity inherent in a global response to the crisis. That means fueling investments that position American workers and companies at the leading edge of clean energy production, intelligent infrastructure, advanced manufacturing, and sustainable building, up and down the supply chain. It means equipping our economy to thrive at a time when global demand for efficiency is set to soar.

Full implementation will take time, but these laws are making an impact already. High-tech supply chains are showing early shoots with battery plants planned in [Tennessee](), [Nevada](), [Kansas](), and [Michigan](). Investors are [moving their capital]() toward clean technologies, not simply to advance ESG but in search of the highest returns. Workers migrating from Big Tech to climate startups are also a notable trend and are expanding the workforce on this issue. All essential threads of a much larger, and longer term, rewiring of American innovation.

What does connectivity have to do this? Almost everything. The truth is that we're also seeing vast improvements in our network capabilities through 5G, fiber, gigabit Wi-Fi, and satellite, and through an architectural redraw that brings computing power closer to the edge and integrates once-competing technologies. At the same time, we're seeing a renewed sense of urgency to connect every community—and every person—in the country to quality, high-speed broadband. As I've said repeatedly since I joined the FCC, these advancements in connectivity are unlocking massive opportunities to decarbonize while also spurring jobs and growth in our economy. In fact, their largest proving ground sits directly on top of our climate policy field—on our grid, our roads, our factories, our farms, our cities, and our buildings.

Here are a few examples of the promise. 5G wireless supports higher speeds, lower latencies, and a much greater density of connected devices than its predecessors. With that capability, electric utilities can evolve from traditional power grids to grids that embrace two-way communications and exercise much more precise control over grid components. The potential result? More efficient power routing, more opportunities to tap renewable energy, greater resilience as products like EVs and heat pumps add electrical load, and ultimately less carbon and lower utility bills.

That's not all. 5G can also improve the scale and sophistication of smart vehicles and enhance our transportation infrastructure. Safety, here, is a big potential benefit. But so is energy efficiency. Real-time vehicle communications, smart cities, and connected infrastructure can reduce congestion and idling, make charging stations easier to find, use, and maintain, and even expand access to public transportation.

Then there's manufacturing, where fast, reliable wireless networks can help American industry do more with less. They empower factories to connect and sense the conditions around just about every piece of equipment—and monitor, or even digitally mirror, the entire production process. That can help manufacturers track performance and predict points of failure before they occur, leading to more productivity while drawing less power. Connectivity also creates new opportunities for optimization by helping manufacturers manage their inventory, and by driving better analytics about how plants operate and consume energy. And by ensuring that people and machines can communicate with each other at every step of the process, wireless can improve quality control, production scheduling, and response times if and when a problem does occur—all of which helps manufacturers make more with less energy and less material.

Using similar principles, a robust IoT can drive efficiency through precision agriculture. By monitoring, measuring, analyzing, and adapting, farmers can grow more crop output from less input, reducing costs and carbon emissions. As a native Kansan, I can tell you that this is important. Investments in clean technology can and will expand opportunities in our rural areas.

While I've talked about 5G, I note that fiber, Wi-Fi, and satellite are equally essential. Satellites can keep the connection going through cellular dead zones—which include many parts of America's farms and roads, as you might imagine. At the same time, small satellites, or smallsats, are increasing access to low-cost earth observation and imaging, which can facilitate a better scientific understanding of our changing climate and help us verify industry carbon commitments. Fiber networks continue to expand and reach more commercial buildings—and with the efficiencies we can gain by monitoring and controlling mechanical systems, a connected building is often a greener one. Similarly, wider channels and more bandwidth for Wi-Fi are fueling fiber-like performance over the local area network, reducing barriers to entry and experimentation for building out energy efficiency use cases.

These connected capabilities are essential tools. A recent industry analysis suggests that 5G-enabled technologies alone could abate enough carbon to contribute a whopping 20% toward the United States' 2030 emission reduction targets. It's too soon to tell whether we'll reach that precise level of impact. But when you consider just how much we emit through transportation, energy production and distribution, agriculture, and the industrial process—and just how poised these sectors are for a connectivity-driven disruption—success of that magnitude lies within the realm of possibility.

I should note that just yesterday, the Biden Administration, through the NTIA, released a [request for comment](#) on the development of a National Spectrum Strategy. It seeks public input on how we can create a new pipeline of wireless spectrum for advanced technologies over the short, medium, and long term. As I've said before, making the most out of spectrum isn't just good telecom policy—it's a national economic imperative—and the transformation that connected technologies can bring to market, including in high-emission sectors, is a key reason why. That's why I was pleased to see the Administration ask specifically about the spectrum needs of use cases like "advanced transportation technologies," "smart cities," "climate monitoring and forecasting," and "industrial and commercial applications" in the "manufacturing, agriculture, and utilities" sectors, all of which, as I've mentioned, can drive decarbonization at real scale. If anyone in this room has knowledge to contribute, I hope you'll consider engaging in the proceeding.

Before I wrap up, let me close by saying that the telecom and technology companies can't just <u>drive</u> efficiency. They need to <u>embrace</u> it as well. There are many ways to do that, but I'd like to focus on one area of particular relevance to the agency I help lead. At the FCC, one of our primary objectives is to manage the airwaves so that new technologies can reach greater levels of performance. To carry out that objective, we've long championed spectral efficiency, which we've understood to mean putting unused spectrum to work and packing more users, and more information, into each unit of bandwidth.

That's an essential goal, but it can also raise energy consumption challenges. Because as a general rule, the more bandwidth you use, and the more data you send over a communications link, the more energy you consume in delivering your service. That is a cost issue for service providers. That is a heat, battery life, and form factor issue for consumers and the companies that make their devices. And that is a climate issue for us all, as we work collectively to become more energy efficient. Just as we pack more bits into each hertz—to be spectrum efficient—we

also need to pack more bits per second into each watt used for transmission—to be energy efficient. As I've said before, both types of efficiency are must-haves if we want to manage spectrum in the public interest.

Jumping from 4G to 5G, we managed to turn the general rule on its head. Even as performance climbed, we actually saw per-unit <u>increases</u> in energy efficiency, thanks to new power-saving techniques like idling and microsleep. We also expanded the bandwidth available for Wi-Fi networks, which operate at relatively low power, to ensure that wireless access points in our homes and businesses can keep up with 5G's greater performance—and do so efficiently. But wireless technology continues to evolve, and work on next-generation standards is well underway. In developing those technologies, the wireless industry will reach, as it should, for even greater possibilities in throughput—perhaps to include speeds measured in <u>terabits</u> per second one day. As it climbs, it needs to remain even more focused on the energy consumption issue.

The FCC's Technological Advisory Council—affectionately called the "TAC"—has a working group that focuses specifically on the challenges and promises of 6G wireless technology. The working group's charter, I'm pleased to note, directs it to consider use cases that drive efficiency, and its members have smartly focused on the energy use of the network itself. In all forums where experts convene to discuss the road ahead, I hope that they make the effort to document industry headway on "next G" energy efficiency efforts. To get to a place where wireless becomes an economic <u>and</u> environmental success, we need to know where we stand each step of the way, and we shouldn't shy away from measuring our progress.

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Thank you, again, for your time, and for you focus, thought, and attention to one of our nation's greatest challenges.