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# 5G POLICY PRIMER:
## THE GLOBAL STANDARDS PROCESS IS ROBUST AND EFFECTIVE IN ADVANCING U.S. GOALS

JANUARY 2020 UPDATE

**5G is built on global consensus standards and specifications informed by almost 600 organizations working to meet international expectations for the next generation of interoperable wireless communications. This Policy Primer answers several questions about the standards process and explains what this means for U.S. 5G policy.**

# WHY DO WE NEED GLOBAL STANDARDS?

Global standards for wireless telecommunications are critical for interoperability between networks and devices. They foster the economies of scale needed for global development of new technology. As people, data, and devices cross borders with increasing fluidity, we need neutral and common technical approaches that allow interconnection and predictable interfaces.

The benefits of global standards can be seen with today's 4G networks and technologies. The vast majority of the world's wireless services are built on the same global technology standard. That means that customers can make calls and access data in hundreds of countries across the globe.

Perhaps the most effective endorsement of global standards is a cautionary tale of the pitfalls of eschewing them. With past generations of wireless networks and technologies, we saw some companies launch proprietary technology in a race to be first, only later to have to backtrack, leaving customers with potentially obsolete equipment.[1]

Luckily, the global telecommunications ecosystem has a history of collaborating on standards. It is quite remarkable, really, how competitors and companies scattered across the world send their best minds to collaborate on the hardest technology challenges. Notably, this is not a government-driven process. It is left to the domain of private experts—engineers, scientists, and other builders who can debate problems and solutions, working toward consensus in a transparent way.

## HISTORY LESSON

China, a country that historically favored "indigenous" technologies and standards, has embraced international standards after poor experiences with China-specific standards in the development of earler wireless standards.


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# WHAT DOES THE STANDARDS PROCESS FOR 5G LOOK LIKE?

The standards community has been hard at work for several years to ensure that the major wireless players across the globe are aligned on new standards as the world transitions to the next generation of wireless—dubbed 5G. This was not a new endeavor. The same experts who led the wireless evolution from 1G to 4G and LTE have been working to refine and build protocols for the future; and indeed, 5G itself is an evolution from 4G and LTE.

A kickstart came in 2012 from the International Telecommunications Union (ITU), which launched a program to focus on International Mobile Telecommunications (IMT): "**IMT for 2020 and beyond**." This catalyzed dedicated 5G research and standards activities. To develop the needed technical specifications, **3GPP**, a longstanding leader in standards work for the telecom sector, took up the charge.


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# WHAT IS 3GPP?

3GPP is an umbrella partnership that draws on seven Organizational Partners from Asia, Europe, and North America—which are regional accredited standards developments organizations (SDOs) that have as their members wireless carriers, equipment manufacturers and other stakeholders. Companies contribute to 3GPP as Individual Members via their membership in a participating Organization Partner. There are approximately 600 members in 3GPP.

**Association of Radio Industries and Businesses (ARIB)** is a Japanese SDO with 27 Members of 3GPP.

**Alliance for Telecommunications Industry Solutions (ATIS)** is an SDO representing North America. 45 Members of 3GPP are from ATIS including U.S. carriers AT&T, Verizon, Sprint, and T-Mobile.

**China Communications Standards Association (CCSA)** is the SDO focused on China. There are 89 3GPP Members from CCSA.

**European Telecommunications Standards Institute (ETSI)** is Europe's SDO, which has 380 Members in 3GPP, some of which are related to companies in other regions.

**Telecommunications Standards Development Society (TSDSI)**, India's SDO, has 18 3GPP Members.

**Telecommunications Technology Association (TTA)**, a Korean SDO, has 20 3GPP Members.

**Telecommunications Technology Committee (TTC)**, a Japanese SDO, has 9 3GPP members.

## 3GPP also works with Market Representation Partners representing global industry concerns.

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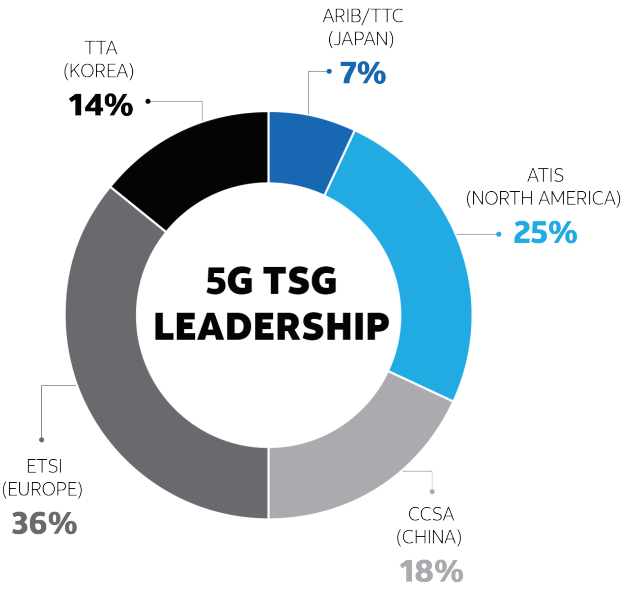
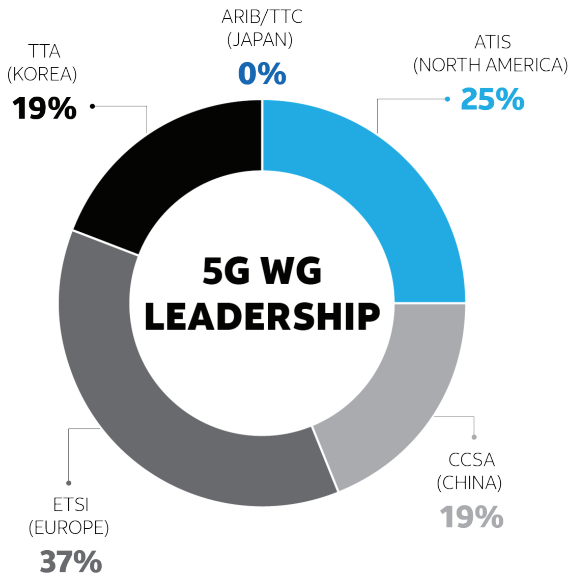
# WHO RUNS THE 3GPP?

**No one. And everyone.** 3GPP operates under detailed procedural rules to ensure **regional balance** and transparency. Hundreds of members work through seven Organizational Partners. The work in 3GPP is done in various Working Groups that formed under Technical Specification Groups (TSGs). Each TSG is led by a Chair and up to two Vice-Chairmen elected by the Individual Member representatives, with term limits and regional diversity requirements.

3GPP has three TSGs: Radio Access Networks (RAN), Service & Systems Aspects (SA), and Core Systems and Terminals (CT). 3GPP protects against "severe company or geographical imbalance" and requires that the "chairman and vice chairmen should not usually be from the same region, organizational partner, or from the same group of companies."[2] Under each TSG are Working Groups that have their own elected leaders. The leadership of the TSGs and the WGs show that 3GPP's goal of regional balance is being met.[3]





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# HOW ARE SPECIFICATIONS DEVELOPED?

In a word? Consensus. The 3GPP process is transparent, collaborative, and consensus-based. No country can dominate its activities or its outputs. Consensus is a core value of 3GPP, and the focus on agreement and refinement of approaches ensures that no region, industry segment, or company can run the table.

3GPP initiates projects which are proposed by a minimum of five supporting companies either as feasibility studies ("study items") or actual specification development ("work items"). Any member may offer "contributions," or "Tdocs," toward specific study or work items—written suggestions for aspects of specifications; they can be detailed or modest. Typically, contributions will be offered by more than one supporting company. Contributions are the basis for working group activity, deliberation, and ultimate output. Working groups meet regularly to address contributions and refine approaches. They come together for quarterly TSG Plenary meetings, where their work is presented for information, discussion, and approval.

*"Voting on technical issues is rare in 3GPP. This is because 3GPP places a heavy emphasis on reaching compromises and achieving consensus. While the consensus approach can be slower in the short term it has been successful in preventing the fragmentation of the GSM (and its successors) ecosystem."*
**3GPP Working Culture**

## MYTH: CHINA IS DOMINATING THE STANDARDS PROCESS BECAUSE ITS COMPANIES MAKE SO MANY CONTRIBUTIONS.

**REALITY:** The raw number of contributions tells observers little. Many contributions are supported by numerous other members. There is no "quality-control" for submissions, so not all initial contributions, or "Tdocs," should be valued the same. Indeed, some contributions are duplicative or redundant. And importantly, contributions do not automatically become part of a specification; they must go through the rigorous consensus process.

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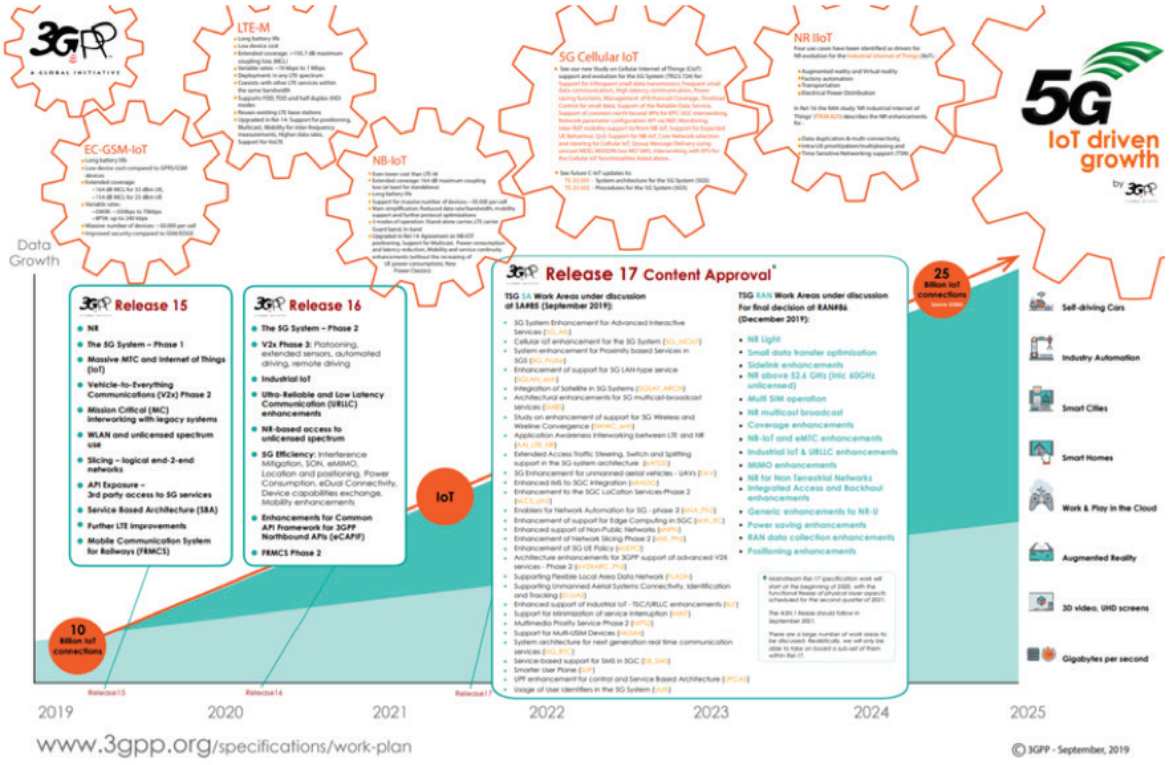


# HOW HAS THE 5G PROCESS UNFOLDED?

Wireless technology evolves as features are introduced by 3GPP via Releases. This has been done since the advent of 2G. Releases are not rigidly timed, and work is done on multiple Releases simultaneously, in different phases. When a Release is finished, it indicates that new features are ready for implementation by carriers and manufacturers around the world. Releases are iterative in that they build on previous Releases.

For 5G, 3GPP decided to break the initial 5G **Release 15** into three drops in order to release key components on an accelerated timeline to enable chipset development, which has a long lead time. 3GPP completed **Release 15** in these three phases: the "early drop" in December 2017, the main drop in June 2018, and the "late drop" in June 2019. **Release 16** is the next milestone projected for June 2020. 3GPP is done with **Release 15** and is working on **Release 16**, with **Release 17** planning underway.

The 5G process has more input than past specifications because operators and manufacturers have recognized the importance of contributing to a global standard. Hundreds of companies participate in the 3GPP process to vet contributions and develop standards. It is driven by engineers, in which good ideas thrive and weak ones fail.


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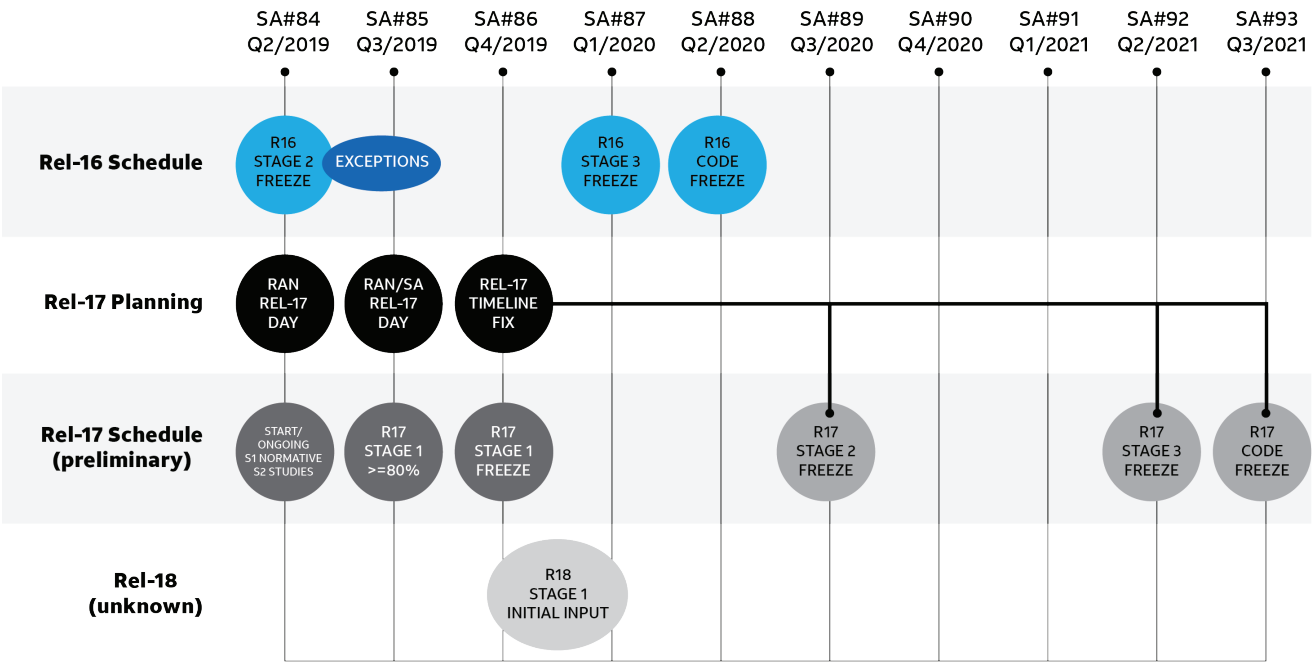
# IS 3GPP ON TRACK TO MEET THE ITU'S TIMELINE, AND WHAT COMES NEXT?

**Yes.** 3GPP has completed the initial detailed technical specifications for 5G, which are in the process of being delivered to the ITU-R as a candidate IMT-2020 technology. Future release will look at system enhancements and a focus on verticals.




## MYTH: CHINA IS BEATING THE UNITED STATES IN THE "RACE" TO 5G.

**REALITY:** The standards process confirms this fear is a myth. All countries and companies must wait for the same standards to be developed to manufacture equipment and deploy 5G. Any non-standard deployment will not be scalable or interoperable with other networks.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# WHAT ARE THE POLICY IMPLICATIONS OF STANDARDS WORK FOR THE UNITED STATES?

**The U.S. government should not engage in top-down control of 5G networks.**

The United States should resist any urge toward national control of U.S. network deployment, which may be driven by concerns that other governments are heavily investing in 5G networks and their carriers. A top-down, government driven approach to 5G deployment is unlikely to efficiently allocate resources or prioritize innovations that will revolutionize the digital future. U.S. carriers are already well under way with their 5G plans, and undue government involvement, or even an attempt to "nationalize" the U.S. 5G network, will only result in delay. U.S. carriers, not the government, are in the best position to drive 5G deployment.

**The U.S. government has a role to play, such as investing in private sector participation in standards work and promoting R&D in technology.**

U.S. policy has, to date, appropriately focused on making spectrum available and removing domestic barriers to deployment. This created an environment that enabled the United States to build the world's most vibrant and innovative technology sector. The federal government should continue to support private, robust networks built on consensus-based global standards driven by the private sector and aggressively remove local barriers to deployment.

*Investing in Private Sector Participation.* To maintain leadership in global standards work, we need commitment by more North American organizations to become contributing standards members. Standards development driven by the private sector will ensure robust participation and foster U.S. technological leadership for the next decade and beyond. Importantly, it also will transfer institutional knowledge as longstanding corporate representatives train junior experts to carry forward this important work. This is particularly vital as standards work relies on relationships of trust built on shared expertise and collaboration.

*Fostering R&D.* Investment in R&D inevitably drives future releases of global standards work, which relies on peer reviewed and innovative research. As many western countries are cutting back on government-encouraged research and development, China is making substantial investments. The United States should carefully consider what role it wants domestic industry and innovation to play in long-term technology leadership and standards development, and how to ensure that the incentives for R&D are in place.


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## NOTES

**1** Andre Fuetsch, Accelerating 5G:  Faster Timeline Means First Standardized Mobile 5G Services Coming as Soon as Late 2018, AT&T Innovations Blog (March 14, 2017), https://about.att.com/innovationblog/standardized_5g.

**2** 3GPP PCG Meeting, Fort Lauderdale, Florida, March 1999.

**3** We consider ***5G Working Group Leadership*** to be comprised of 16 elected officials across the six principal working groups in the RAN TSG from the following operational parties: ETSI (6); ATIS (4); CCSA (3) TTA (3); ARIB/TTC (0). Similarly, we consider ***5G TSG Leadership*** to include these elected officials and the leadership of three TSGs for a total of 28 members from the following operational parties:  ETSI (10); ATIS (7); CCSA (5); TTA (4); ARIB/TTC (2). The full list of TSG  Working Group and RAN TSG leadership positions can be found here: http://www.3gpp.org/specifications-groups;


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