March 30, 2026

Office of Science and Technology Policy
The Subcommittee on Advanced Manufacturing
National Science and Technology Council

RE: Request for Information on the Development of a National Strategic Plan for Advanced Manufacturing

The Association for Competitive Technology (ACT) appreciates the opportunity to provide input to the Office of Science and Technology Policy (OSTP) on behalf of the Subcommittee on Advanced Manufacturing of the National Science and Technology Council regarding the development of the National Strategic Plan for Advanced Manufacturing (the Plan).[1]

ACT represents startups and small and medium-sized software application development companies and connected device makers creating the technologies driving the internet of things (IoT). Today, the ecosystem ACT represents—which we call the app economy—is valued at $1.8 trillion and is responsible for 6.1 million American jobs, while serving as a key driver of the $8 trillion IoT revolution.[2]

Alongside the world's rapid embrace of mobile technology, our members create the innovative solutions that power IoT across modalities and segments of the economy. The Plan, and the efforts of numerous agencies involved in manufacturing policy, research and development, technical standards, commercialization, and supply chains, directly impacts the small business innovators we represent. ACT supports the Administration's goal of revitalizing American manufacturing, creating new jobs, growing the economy, strengthening national security, and ensuring that the United States remains the world leader in advanced technologies.

Advanced manufacturing depends on the use and coordination of information, automation, computation, software, sensing, and networking. For this these reasons, software, AI, digital tools, and interoperable technical standards are not peripheral to

[1] Notice of Request for Information; National Strategic Plan for Advanced Manufacturing, 90 Fed. Reg. 26,335 (June 20, 2025).
[2] ACT | THE APP ASS'N, STATE OF THE APP ECONOMY (2022), https://actonline.org/wp-content/uploads/APP-Economy-Report-FINAL.pdf.

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advanced manufacturing: they are foundational to its continued growth and success. Federal policy should reflect that reality.

A critical but often overlooked dimension of advanced manufacturing policy is the licensing and enforcement of standard-essential patents (SEPs). Small and medium-sized manufacturers increasingly rely on technical standards such as 5G, Wi-Fi, and bluetooth to connect equipment, share data, operate efficiently, and ensure safety and efficacy. Because the small business innovators we represent are at the heart of America's supply chains and technology adoption, it is vital that voluntary promises made by SEP holders to license on fair, reasonable, and non-discriminatory (FRAND) terms can be counted on in product design and business planning, which is essential to manufacturing competitiveness, supply chain resilience, and national security.

ACT notes that OMB Circular A-119[3] is a cornerstone of U.S. manufacturing policy because it directs federal agencies to rely on voluntary consensus standards developed by industry, academia, and other stakeholders instead of creating unique government standards. This approach reduces duplication, lowers compliance costs, and accelerates innovation by aligning public policy with real world industrial practices. It is especially important for small and medium sized enterprises, which often lack the resources to navigate fragmented or conflicting requirements and depend on clear, widely accepted standards to compete, scale, and integrate into larger supply chains. For innovators operating globally, A-119 supports interoperability, market access, and competitiveness by harmonizing U.S. requirements with international norms. Alignment of the Administration's strategy to A-119 is more important than ever today as supply chains become more complex, emerging technologies evolve rapidly, and geopolitical competition intensifies. Consistent use of widely accepted standards is a strategic necessity to maintain U.S. leadership in advanced manufacturing, support resilient supply chains, and enable faster commercialization of critical technologies.

Many of the policy issues implicated by the Plan will affect a wide range of stakeholders. The workforce, infrastructure, data, technical standards, research, and commercialization issues associated with advanced manufacturing require strong coordination across federal agencies. A strategy that thoughtfully addresses these issues will help strengthen U.S. manufacturing competitiveness, improve supply chain resilience, support economic growth, and promote national security.

Below, ACT responds to the questions most relevant to the small business innovators we represent.

Question 1: Emerging technologies and barriers to adoption

[3] Office of Mgmt. & Budget, Exec. Office of the President, OMB Circular No. A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities (Jan. 27, 2016).

Artificial intelligence (AI) is key to the next generation of innovative advanced manufacturing technologies. In manufacturing settings, AI-driven tools and predictive analytics can improve quality control, predictive maintenance, logistics, process optimization, energy management, and supply chain resilience. These capabilities are increasingly embedded in robotics used to automate manufacturing, where AI converges with connectivity standards such as 5G, Time-Sensitive Networking (TSN), and OPC Unified Architecture to enable flexible, interoperable, and intelligent automation. More broadly, software-enabled manufacturing tools can help firms reduce downtime, improve throughput, enhance safety, and optimize use of resources.

At the same time, successful integration and widespread adoption of emerging technology in manufacturing will depend on whether federal policy reduces barriers to development and adoption rather than creating them. The Plan should support and facilitate research and development of advanced manufacturing technologies by prioritizing and providing sufficient funding while also ensuring adequate incentives are in place to encourage private sector research and innovation. It should also maximize the ability of innovators and researchers to collect and process data from a wide range of sources, while ensuring proper protections for privacy, security, and intellectual property.

The primary barriers that need to be addressed include cost, infrastructure, workforce readiness, interoperability, access to data, and uncertainty regarding how responsibility should be allocated across the AI value chain. Additionally, a significant barrier is the lack of predictability in licensing SEPs that underpin the connectivity and interoperability technical standards essential to advanced manufacturing systems. Once a manufacturer adopts a standard, it becomes locked in, and SEP holders therefore gain inherent dominant market position which enables the exploitation of this rule can exploit by threatening injunctions and demanding supra-FRAND licensing rates. This "patent hold-up" risk is particularly acute for small and medium-sized manufacturers, who lack the resources to litigate or negotiate complex licensing terms as compared to their larger competitors. Information asymmetry compounds the problem: licensors have full visibility into their portfolios, while licensees often cannot determine which patents are truly essential or what a fair royalty would be. Supra-FRAND royalties impose costs that small firms cannot easily absorb and create uncertainty that discourages investment in new manufacturing technologies. The Plan must address these barriers by promoting transparency and fairness in SEP licensing, ensuring that the foundational technical standards for advanced manufacturing remain available to American innovators.

Our members are also downstream innovators, who integrate components containing standardized technologies into their products. When a component manufacturer licenses SEPs at a supra-FRAND rate, that cost is passed down to its customers. Small and medium-sized innovators operate on thin margins and higher component costs can make innovators abandon entire product lines or leave the market entirely. In some industries where patent licensing indemnities are widely relied upon, abusive SEP licensor behavior can upend supply chains altogether.

ACT's AI Roles & Interdependency Framework,[4] explains that AI governance should reflect the distinct roles and interdependencies of actors across development, distribution, deployment, and end use, including developers, deployers, users, technical standards bodies, certification and test beds, and academic institutions. Consistent with that framework, the Plan should ensure that those in the value chain with the ability to minimize risks based on their knowledge and ability to mitigate have appropriate responsibilities and incentives to do so, and that requirements placed on small business developers and users are based on demonstrated harms and proportionate oversight.

The Plan should also encourage the design of systems informed by real-world workflows, human-centered design and usability principles, and end-user needs. In manufacturing, this means solutions should be fit for purpose, support safe and effective use in operational environments, and reflect the practical realities of deployment. Collaboration among users, technology developers, manufacturers, and other stakeholders will be important to ensuring that advanced manufacturing tools are effective and broadly usable.

Question 3: Near-term and long-term R&D priorities, challenges, and metrics

The Plan should support and facilitate research and development of advanced manufacturing technologies by prioritizing and providing sufficient funding while also maximizing the ability of innovators and researchers to collect and process data from a wide range of sources. Near-term priorities should include practical manufacturing applications of AI, software-enabled automation, digital twins, cybersecurity for industrial systems, interoperability tools, and test beds that help small and medium-sized manufacturers adopt advanced technologies. A critical near-term priority is the development of intellectual property policies for federally funded manufacturing research that account for FRAND-committed SEPs, even when licensed through pools, and contribute to needed certainty from innovators that such a commitment is one they can rely upon in their own product design and business planning processes. Longer-term priorities should include the infrastructure, compute, technical standards, workforce development, and public-private research capabilities needed to sustain U.S. leadership over time.

Research on the costs and benefits of transparency should also remain a priority, particularly where transparency can improve safety, reliability, testing, adoption, and trust without forcing the disclosure of trade secrets. In the SEP licensing context, transparency is urgently needed. Federal R&D programs should fund research on essentiality verification tools, SEP transparency databases, and methodologies for determining FRAND rates, reducing the information asymmetry that currently disadvantages small and medium-sized innovators. Encouraging technology developers to utilize rigorous procedures and document their methods and results can support quality assurance and commercialization without imposing one-size-fits-all mandates that smaller firms cannot absorb.

[4] Appendix.

Metrics should focus not only on federal R&D inputs, but also on whether innovations are translating into commercialization, manufacturing scale-up, and broader adoption across firms of different sizes. The Plan should adopt metrics that track whether standards developed with federal support are accompanied by clear IP policies, and whether small and medium-sized manufacturers can obtain SEP licenses on FRAND terms without facing discriminatory rates or the threat of injunctions. Progress should be assessed in part by whether these manufacturers can use and deploy the technologies being prioritized.

Question 4: Public-private partnerships

Public-private partnerships may be particularly well suited to address challenges involving advanced manufacturing infrastructure, test beds, workforce development, standards implementation, data access, and technology transition to market. These are all areas where there is a clear public interest and where participation and substantial support from industry are also likely.

To foster successful collaboration, partnerships should be structured to reduce administrative burden, enable participation by small and medium-sized firms, protect confidential and proprietary information, and focus on practical pathways to deployment and commercialization. Partnerships should adopt uniform IP policies requiring that SEPs developed with federal support and essential to manufacturing. Partnerships concerning standards be licensed on FRAND terms. These policies should also encourage transparency regarding which patents are covered by the standard and the methodology used for essentiality verification. They should also promote stakeholder engagement and remain open to a range of participants across the manufacturing ecosystem, not only large incumbents.

Small firms are often the ones identifying new and novel opportunities where the responsible use of AI and software-enabled tools can solve expensive problems and provide new efficiencies. Partnership structures should reflect that reality. Federal agencies can also support voluntary test beds, sandboxes, and certification pathways that help evaluate the usability and performance of advanced manufacturing technologies and provide an appropriate degree of assurance regarding reliability and efficacy.

Question 5: Technology transfer, commercialization, and scale-up

A major challenge in translating research findings into commercially viable manufacturing processes and products is that policy discussions often focus on invention without sufficient attention to adoption, integration, and scale-up. For smaller innovators, the barriers are often not just whether a technology exists, but whether they can afford it, integrate it into existing workflows, comply with overlapping requirements, and compete on reasonable terms.

Moreover, the Plan should recognize that, for small innovators, the availability of FRAND licenses on SEPs can be the difference between entering a market and being excluded. Federal policy should therefore support the formation of SEP licensing policies that recognize the role of both contract and competition law in addressing SEP holder abuses that distort supply chains and upend America's national economic and national security goals, including by working to ensure that pools discouraging discriminatory use-based pricing, coordinated litigation campaigns, and other harmful tactics designed to extract supra-FRAND royalties.

At the same time, the federal government should promote appropriate data access, including open access to suitable machine-readable public data and secure mechanisms for sharing data where doing so supports innovation and commercialization.

Question 7: Clusters and technology hubs

The federal government can assist in the development of advanced manufacturing clusters and technology hubs nationwide by doing more than funding physical infrastructure. It can improve coordination, reduce friction for collaboration, support technology transfer, encourage voluntary consensus standards, and create conditions that enable cooperation among policymakers, technology developers, manufacturers, academia, and the public.

There is value in both industry-specific clusters and technology hubs centered on advanced technologies, critical components, and materials. But whichever structure is emphasized, federal incentives should be designed so that smaller firms can participate meaningfully. Hubs should not become vehicles that primarily advantage the largest incumbents. They should instead support practical collaboration, commercialization, supplier development, and adoption pathways across the broader manufacturing ecosystem.

Question 8: Supply chain vulnerabilities and domestic resilience

Primary vulnerabilities in current domestic supply chains include overdependence on foreign sources for critical inputs, concentration in key infrastructure and components, fragility in standards-dependent technology markets, and barriers that prevent smaller firms from joining or remaining in resilient domestic supply chains.

Programs and policies to support a resilient domestic advanced manufacturing supply chain and industrial base should include support for open and interoperable technologies, better conditions for domestic commercialization and scale-up, and policies that enable small and medium-sized firms to use the tools and standards necessary to compete. The Plan should recognize that standards can promote interoperability and enable healthy competition between innovators. It is also critical that standards remain usable to American small business innovators through a balanced approach to standard-essential patent licensing.

Technical standards developed through open, consensus-based processes bring significant value by promoting interoperability while enabling innovation and competition. Many such standards include patented technologies, and standard-setting organizations require licensing commitments on FRAND terms. That balance is important. However, that balance is undermined when SEP holders use the threat of injunctions, coordinated litigation, or discriminatory pricing to extract supra-FRAND royalties through leveraging the inherent market power a SEP holder possesses. As courts have documented, smaller licensees often pay rates many times higher than large firms—and in some cases, licensors target small businesses not for revenue but to create "comparable" licenses to use against larger companies. Abusive SEP licensing practices can undermine healthy competition, distort the standards ecosystem, and impose disproportionate burdens on small businesses that cannot afford prolonged litigation or operate under the threat of injunctions. Such practices ultimately undermine U.S. national economic and security priorities.

In the advanced manufacturing context, these problems can also disrupt innovation and weaken critical supply chains. When standards-based manufacturing technology supply chains are subjected to anticompetitive SEP licensing practices, domestic reshoring efforts falter and U.S. manufacturers remain dependent on foreign suppliers who may be subject to different licensing terms. The Plan should therefore support the development and use of voluntary consensus standards and recognize that balanced SEP policy is relevant to manufacturing competitiveness, supply chain resilience, and national security.

Question 9: Small and medium-sized manufacturers

The biggest obstacles faced by small and medium-sized manufacturing companies in adopting advanced technologies to increase efficiency and productivity are cost, access, infrastructure, workforce capacity, legal uncertainty, and lack of practical support for deployment. Significant resources may be required to scale systems.

Additionally, many small and medium-sized manufacturers incorporate standardized technologies into their products, unaware of the complex web of SEP licensing obligations that may be involved. When approached by licensors, these small firms face a stark choice: pay supra-FRAND royalties (often at rates far higher than what large licensees pay) or risk costly litigation and the threat of an injunction that could shut down their entire product line. Because the transaction costs of negotiating or litigating a SEP license often dwarf the potential royalty exposure, small innovators are systematically disadvantaged. Some licensors refuse to negotiate with them at all, forcing them into patent pools with non-negotiable rates, while others use small firms as leverage to establish inflated rate benchmarks for larger disputes.

A fundamental driver of this disadvantage is profound information asymmetry. SEP holders know the full scope, validity, and essentiality of their patent portfolios, while small manufacturers typically do not. They cannot easily determine which patents are

truly essential to a standard, whether those patents are valid, what rates comparable licensees actually pay, or what constitutes a FRAND royalty. In a 2023 report on SEPs, 100 percent of licensees reported insufficient information about FRAND royalties and 97 percent reported insufficient information about the SEP landscape, while only a small fraction of SEP licensors claimed the same.[5]

This asymmetry is compounded by the fact that standard-setting organizations rarely require patent holders to disclose essentiality determinations, and patents declared essential may not be actually essential. Yet small manufacturers typically lack the vast resources and in-house expertise to conduct essentiality analyses or to challenge inflated royalty demands. The result is that they often pay royalties bearing no reasonable relation to the value of the patented technology. Some licensors target small firms and use the resulting agreements as leverage to demand inflated rates from larger licensees. Federal agencies can assist these companies by reducing barriers to development and adoption, supporting commercialization pathways, encouraging fit-for-purpose design, improving data and infrastructure opportunities, and ensuring that risk management frameworks are scalable. Specifically, the federal government should: (1) expand Manufacturing Extension Partnership (MEP) services to include SEP advisory and essentiality assessment support for small and medium-sized manufacturers; (2) provide guidance that the seeking of injunctions against licensees in FRAND-encumbered contexts is an abuse of the standards system; and (3) use federal procurement to ensure that federal supply chains are not disrupted by abusive SEP licensor practices. Such frameworks must ensure that data is properly protected while also allowing the responsible flow of information necessary to support high-quality tools and applications.

Federal programs should also avoid assumptions that only firms with large compliance teams or hyperscale resources can participate. Small and medium-sized firms should be able to participate in robust and resilient domestic manufacturing supply chains without being overwhelmed by administrative or legal burdens unrelated to demonstrated harms.

Question 10: Models that could be expanded

Models that could be expanded include public-private research partnerships, industry-led standards development, voluntary certification and conformity assessment activities, test beds, and regionally anchored collaboration structures that connect researchers, developers, manufacturers, and workforce providers. These models work best when they are practical, open, and designed for broad participation.

[5] Eur. Comm'n., *Commission Staff Working Document: Impact Assessment Report* at 20 (Apr. 27, 2023), https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13109-Intellectual-property-new-framework-for-standard-essential-patents_en.

The federal government should support the development and use of voluntary consensus standards, consistent with longstanding federal standards policy. It should also support transparent and reliable processes for conformity assessment and foster environments that help evaluate the usability and performance of emerging manufacturing technologies.

ACT appreciates the opportunity to submit these comments and stands ready to engage further as OSTP and the Subcommittee on Advanced Manufacturing continue developing the National Strategic Plan for Advanced Manufacturing.

Sincerely,

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