



POSITION STATEMENT

SUPPORT OF INNOVATION AND JOB CREATION

*Approved by the IEEE-USA
Board of Directors (3 October 2018)*

IEEE-USA supports the federal government's role in creating, fostering, and maintaining U.S. innovation. Federal funding of basic and applied research has led to many discoveries in engineering and the sciences, new industries, and an improved standard of living. Yet, federally funded R&D could do much more to foster innovation by incentivizing innovation and job creation, supporting commercialization programs, fostering skill training for innovation, and developing a validated framework showing the relationships between innovation and domestic job creation. Also, budding entrepreneurs need the resources and support to innovate and become successful companies creating jobs. IEEE-USA strongly recommends the following:

- The federal government should incentivize innovation and job creation through improved commercialization of federally funded research performed at colleges and universities, government owned laboratories, and federally funded research and development centers (FFRDCs).
- Companies, colleges, universities, government-owned laboratories, and FFRDCs that receive federal R&D funding should strongly encourage student internships, in-house education and training for innovation and commercialization, and participation in innovation competitions and challenges.
- Federal and state governments should increase support for developing skills for the evolving needs of industry via innovative academic programs, including continuing education. Coordination between public and private activities in innovation and job creation should also be supported.
- The federal government should increase support for research to develop a validated and quantitative framework showing the relationships between innovation and domestic job creation.

- Federal and state governments should work toward a one-stop source for legal, regulatory, administrative, general business management, and resource availability information relating to starting and running a business anywhere in the United States.

This statement was developed by the IEEE-USA Research and Development Policy Committee and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good and promotes the careers and public policy interests of the nearly 180,000 engineering, computing and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of IEEE, or its other organizational units.

BACKGROUND:

Job Creation: Job creation and economic security are consistently a top priority of voters and nations around the world; consequently, governments that wish to be responsive to public need must also prioritize job creation in the private sector. Job creation is one issue that both political parties in the United States agree is a very high priority.

Federal laboratories and FFRDCs could do more to help create jobs in the private sector. Initiatives should be undertaken to identify the ways and means that federal laboratories could support private sector job creation.

Economic Growth: Economic growth through innovation is generally accepted as one of the most promising ways to improve our quality of life. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs¹ have been highly successful, and these and similar programs should be fostered and grown. In addition, continued research similar to that done by the Institute for Research on Innovation and Science² (IRIS) is needed to further demonstrate the value to economic growth through research and innovation.

Innovation: The U.S. economy has become more and more innovation-driven. Creating new wealth requires discovering and developing new ideas, and turning these ideas into private sector jobs.

Market-creating innovation built on identification of unfilled customer needs does create new jobs and economic growth. While many entrepreneurs focus on introducing products and services into existing, established markets, market-creating innovation is

¹ For more information on the federal SBIR and STTR programs, see: www.sbir.gov.

² See, generally, Institute for Research on Innovation and Science (<http://iris.isr.umich.edu>). Also see, 'Science Funding and Short-Term Economic Activity', *Science* 04 Apr 2014: Vol. 344, Issue 6179, pp. 41-43; 'Measuring the Results of Science Investments,' *Science* 11 Feb 2011: Vol. 331, Issue 6018, pp. 678-680]. *Advancing Concepts and Models for Measuring Innovation: Proceedings of a Workshop*, The National Academies Press, 16 Sept 2016.

built on targeting unfulfilled needs in new markets. Training programs are needed to teach entrepreneurs how to see such opportunities, and estimate the rewards of filling them.³

Regional economic ecosystems, such as those found in Silicon Valley, Greater Boston, Salt Lake City, and Austin, are a principal source of innovations, leading to much of the U.S. job creation. In most cases, the hub for these ecosystems is a major university. Colleges and universities have the diversity of talent to encourage entrepreneurship, job creation and economic development through education programs and experiential learning opportunities.

Job Retention: It is not enough for the United States to create new jobs. Those jobs must remain in the United States. Active partnerships between academia, industry and government can help ensure that American workers have the skills *that* businesses need, so that those businesses do not need to look elsewhere for skilled employees. The government must also take active steps to encourage businesses to remain in the United States.

Innovative Academic Curriculum: Colleges and universities currently provide excellent undergraduate curriculum in preparation for a possible research career or graduate degree. However, industry, particularly for Information Technology jobs, needs large numbers of personnel trained in practical skills besides theory.⁴ The students who graduate from our colleges and universities need to have advanced level practical skills, in addition to sound theoretical knowledge.⁵ Federal programs that encourage and accelerate the modernizing of educational curriculum and models toward these goals should be encouraged and fostered.⁶ Innovative academic curriculum imparting skills that match the current demands of industry will help align supply and demand. Support for continuing education is also essential to prepare workers with the skills needed, as companies incorporate new technologies and innovations. Similar innovations that address innovations in the K-12 pipeline should also be encouraged.

Support for New Entrepreneurs: Many aspiring entrepreneurs have good ideas but do not always know all the steps and processes involved in starting and successfully operating a new business. Islands of information are already available, but more efficient and effective availability of this information, such as one-stop location of these

³ Bryan C. Mezue, Clayton M. Christensen and Derek van Bever, The Power of Market Creation: How Innovation Can Spur Development, *Foreign Affairs*, January/February, 2015.

⁴ 'Why the Tech Skill Shortage is About to Get Worse', BusinessNewsDaily.Com (1 Aug. 2013)(accessible at: www.Businessnewsdaily.com/4856-information-technology-demand).

⁵ Promising Practices for Strengthening the Regional STEM Workforce Development Ecosystem, The National Academies Press, 2016. (accessible at: <https://www.nap.edu/catalog/21894/promising-practices-for-strengthening-the-regional-stem-workforce-development-ecosystem>)

⁶ Notable examples are NSF's Revolutionizing Engineering and Computer Science Departments (RED) and Improving Undergraduate STEM Education (IUSE) programs.

support services, is needed, incorporating links to the Small Business Administration (SBA), as well as to state sites to provide all regulatory information (city, state, federal, labor, etc.) related to starting and running a business anywhere in the United States. It should be easy to find such information, given a location of proposed business; or it should be possible to identify the best locations, based on user-provided criteria, goals and objectives. Funding opportunities for small businesses, such as those provided by the Small Business Administration (SBA)⁷ and many state agencies⁸ could also be listed.

⁷ <https://www.sba.gov/loans-grants/see-what-sba-offers/sba-loan-programs>

⁸ <https://www.usa.gov/state-business>