



IEEE-USA  
Comments for the  
Office of Science and Technology Policy

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**Input for OSTP's Strategy for American Innovation**

**Challenges for the progress of the US in the world economy**

We appreciate the opportunity to comment on the update of the "Strategy for American Innovation" by the Office of Science and Technology Policy and the National Economic Council. Our comments represent a summary of the inputs of IEEE members in the United States, and in particular members that own or work in Small to Medium size Technology Enterprises (SMTEs) or technology startups. Our members contribute to American innovation and exports by starting, owning or working for technology companies.

Our findings indicate that government activities, policies, initiatives have a major impact on the formation and growth of small to medium technology companies. Therefore, we applaud the effort by the Office of Science and Technology Policy and the National Economic Council to identify ways in which the government can change its behavior to improve innovation in the United States. We hope that our comments will help in shaping those changes.

Small to Medium size Enterprises (SMEs) and SMTEs in the United States are major contributors to employment and innovation in our country. Some statistics:

1. In 2011, according to the US Census Bureau, SMEs in the United States made up 99.7% of employer firms.
2. In 2008, SME produced 46% of the private nonfarm GDP.
3. From 1993 to 2013, 63% of new job creation in the US came from SME according to the SBA.
4. According to the SBA, SMTEs produce 16 times more patents per employee than large patenting firms.
5. In 2011, SMEs were responsible for 33% of exported products, according to the International Trade Administration.

However, changes in the economic climate and US Law make the path to founding and growing technology enterprises more difficult. Other issues such as government funding, regulations, and export incentives have not been addressed adequately in the past and they have the potential to significantly increase the performance of SMTEs as innovators, job creators, and exporters.

**Funding**

Currently, more so than in the past, entrepreneurs have difficulty finding the capital they need to fund start-ups and to raise additional capital for healthy growth. Since the 2008 financial crisis banks have been even more reluctant to loan money to startups and small enterprises. One of the difficulties banks cite in evaluating the risk of a loan to a technology company is the bank's inability to accurately assess the value of intellectual property. A recent IEEE Survey of Members who are SMTEs reported the vast majority, 74%, of their company's pre-revenue dollars were

acquired through bootstrap financing. While the Government has tried to open up funding, the IEEE-USA report revealed only 2.2% of pre-revenue funding came from government agencies. R&D investments also tend to favor large corporation rather than SMTEs.

Even after SMTEs start to grow and earn a profit, the majority of funding (52.2%) still comes from bootstrap sources. Angels and VC's make up less than one percent (1%) of the funding for mature SMTEs, while government programs come in at less than 2%. Exporting by SMTEs is greatly hampered by the difficulty these businesses have obtaining trade credit insurance, working capital loans guarantees, and delivering products to other countries because of weak shipping infrastructure and difficulty understanding export restrictions. The inability to export can block SMTEs from some 95% of their potential markets, according to the Department of Commerce.

## **Health Care**

Healthcare costs are a major burden to growth and job creation as smaller enterprises see higher healthcare costs absorb more and more of their profits as they become larger. The new healthcare laws, while possibly intended to help small enterprises, have in fact created uncertainties and bureaucracies that are difficult to navigate for companies that do not have staff dedicated to human resources and employees' healthcare.

## **Intellectual Property**

IEEE-USA's latest survey indicates that intellectual property is important to 32.1% of small businesses run by IEEE members. For many, their innovative ideas represent the majority of their assets. Small business owners must not only have innovative ideas, but also be able to legally protect those ideas if they are to turn their ideas into growth and revenue. This process involves two distinct, but equally important steps:

1. Small businesses must be able to secure copyrights, trademarks and patents for their ideas and inventions quickly and inexpensively. In many fields, technology becomes obsolete within a few years, making a three-year patent application process less than optimal.
2. Once acquired, intellectual property protection must be easily enforceable. Given how precious cash is to small companies, it cannot be wasted on expensive, lengthy legal battles.

Recent and ongoing changes to IP laws may have a negative effect on U.S. leadership in innovation as they progressively make it more difficult to obtain and protect patents, particularly for small entities that cannot afford costlier patents nor enforcement actions against infringers. Recent changes and proposed changes include:

1. Loss of a clear grace period (American Invent Act of 2011)
2. Inability to enforce patents and get injunctions for clear cases of infringement (Innovation Act of 2013)
3. Primacy of filing date (American Invent Act of 2011)
4. Discounting ability to rely on provisional patent applications (American Invent Act of 2011)
5. Lack of clarity on patenting of secret commercial use and commercial exploitation (American Invent Act of 2011)

## Regulations

38.1% of IEEE entrepreneurs report being hindered by standards and regulations in their effort to innovate and grow. Their main complaints are the high cost of product certification, multiple standards, conflict between national and international standards, and the complexity of navigating multiple inconsistent requirements for compliance with standards and certification by the government branches.

One example is 49 FR 8326. On March 6, 1984, the Occupational Safety and Health Administration proposed a comprehensive overhaul of its regulatory procedures related to OSHA's requirements for safety testing or certification of certain workplace equipment and materials (49 FR 8326). The goals of the proposal were to:

1. Ensure that products certified and marked as meeting a safety standard in fact were consistently tested to all the requirements of the standard through an accreditation process, and
2. Encourage the creation of more testing entities, Nationally Recognized Testing Laboratories (NRTLs), and through competition reduce the costs and speed of testing and certification. Delays in the ability to sell a product because of testing and testing costs affect innovation and growth, particularly for SMTEs and entrepreneurs relying on timely ROI from their R&D and cash flow.

A number of NRTLs now exist, all capable of testing products and certifying that standards are met. The issue of certification delays and high cost remains as each NRTL has its individual mark. Buyers can require that products be certified by a specific NRTL (perhaps an older better known one), thus limiting competition. With limited competitive pressure, costs and performance, particularly response times, have not improved. While all NRTLs are accredited, they are not equal.

The second issue manifests itself when more than one standard can be used to certify safety of a product by a NRTL. Currently the standard used by the better known or better connected NRTL will become the de-facto standard

## Exporting

The International Trade Administration reports that Small Entities (up to 50 employees, a much lower number than that used by other agencies) were responsible for 24% of goods exports in 2011, and that small enterprises could sharply boost exports by entering new markets. Overall, SMEs were responsible for 33% of goods exports in 2011. Most of this was without meaningful support from the Export-Import Bank or other government agency. With support, SMEs could be exporting far more than they already are.

## Doing Business with the Government

54% of respondents to our recent survey said that encouraging the government and government contractors to buy more products from small businesses was the best way to create additional market opportunities for small technology companies. 28.2% of respondents said "Insufficient opportunities to sell products or services from small businesses" was one of the top obstacles to their growth.

## Availability of Talent

33% of IEEE members in our survey said they were having difficulty finding qualified people, especially technical/professional talent, with 16% saying "lack of talent" was the biggest challenge they face bringing a new product to market. Technology companies are uniquely dependent on a skilled workforce, since their products are ideas more than physical things. Without skilled workers to develop and produce their products, small technology companies cannot exist.

The United States produces, through our universities, the majority of the world's top engineering and technical talent. The problem is, much of that talent lacks American citizenship.

But international students who earn degrees from our universities are usually off-limits to small technology companies because our immigration system is so expensive, complicated and slow. Large corporations have experts to navigate this system, the patience to wait for it to function, and the finances to afford to pay for it.

Small companies do not.

As a consequence, some of the most innovative companies in our economy are effectively cut-off from many of the most innovative students graduating from our universities. This same immigration system makes it inordinately difficult for international graduates to start companies on their own, depriving the United States of one of the world's best sources of successful entrepreneurs.

## **Recommendations**

### **Data Collection**

Currently, different government agencies classify SMTEs in different way, sometimes including enterprises of up to 1,500 employees. Other agencies limit companies to less than 50 employees. Consistent classification of the data collected by the Census and other government agencies when dealing with the private sector and the economy would allow government agencies to tailor their services, activities, initiatives, and funds to those entities that most contribute to the American economy, worldwide competition, innovation, and standard of living.

We suggest that the government adopt a version of the following classification structure: Companies with up to 5 employees, 5 to 15 employees, 15 to 50 employees, 50 to 100 employees and 100 to 500 employees. The government should also distinguish between small to medium-size entities (SMEs) and small to medium size technology entities (SMTEs), as well as exporting and non-exporting entities.

### **Funding**

Address the issue of funding startups and SMTEs by various government and private sources:

1. Identify the issues that discourage commercial lenders from extending loans to SMTEs and modify or create new initiatives to help identify, quantify, and review risks to those lenders, including:
  - a. Create a system for valuing intellectual property tied to technological innovations for the purpose of helping small technology companies secure loans. This system could either be run by the SBA or privately run with SBA support and oversight. Some entities such as the Licensing Executives Society already evaluate IP for royalties, acquisitions etc. Evaluating IP (patents specifically) will require:
    - i. Feasibility of the invention from a technical prospective
    - ii. Strength of the patent from a legal prospective
    - iii. Marketability of the product/service derived from the invention
  - b. Prioritize SMTEs (representing the entities most likely to grow by innovation, to create high-quality jobs, and to export), in programs including SBA loan guarantees, SBIR, and DARPA.
  - c. Create incentives through tax exemptions (such as the Section 179 deduction), loan guarantees, etc. for SMTEs and support the private sector sources of capital such as Angels, venture capitalist, and crowd funding entities to focus their effort on SMTEs.

## **Health Care**

Lower the cost of healthcare to SMTEs by simplifying the current system and providing easy ways for SMTEs to become part of larger risk groups. Our small business members would benefit from simpler and clearer regulations associated with the process of obtaining healthcare.

## **Intellectual property**

Help small businesses protect their intellectual property by facilitating the acquisition of patents, trademarks and copyrights and by helping to ensure that the rights conferred by these protections can be enforced by small companies. Review the impact of the American Invent Act of 2011, and the proposed Innovation Act of 2013 as well as some recent Supreme Court decisions such as Alice Corporation v. CLS Bank International on the availability of intellectual property protection and enforcement to all American innovators, and particularly SMTEs and writers of innovative software.

The USPTO can mitigate the chilling effect of these new developments on American innovation and the ability of innovators to obtain funds to start and grow new enterprises. Legislative efforts will eventually be required to correct some of the unexpected consequences of the recent legislation and Supreme Court decisions.

## **Regulations**

Enable OSHA to oversee NRTLs and assure that all products tested and certified safe by accredited NRTLs are not discriminated against on the safety issue alone. This flaw in the current safety assurance process (standards and testing) is hurting SMTE that do not have the resources to get certification from multiple NRTLs or from a specific NRTL in a non-competitive testing environment.

A relatively simple solution would be to allow testing to multiple safety standards and then requiring a Collective Mark be used to indicate product certification regardless of which NRTL performed the product testing. Buyers and insuring agencies then should not be concerned about accepting only products tested and certified by a specific NRTL. Having more choices of testing entities will reduce testing costs and delays. It will also alleviate the difficulties caused by different NRTLs using more than one standard.

## **Exporting**

Congress should enact the following reforms to help the Export-Import Bank be more useful to small and new businesses.

1. Require the Bank to treat all applications from small businesses, including micro businesses, equally. Companies should not be placed at a disadvantage because they only need a small amount of assistance.
2. Require the Bank to devote more of its resources to its Small Business Group, and increase the visibility and authority of that group. The Small Business Group ought to operate as an advocate for small businesses within the Bank and should be instructed to focus most of its efforts on the smallest and newest companies.
3. Require the bank to devote a larger percentage of its resources to contracts worth less than \$5 million to encourage companies that do not currently export to begin to do so.

IEEE-USA believes that, with these reforms, the Export-Import Bank will be able to play an even more constructive role in promoting American exports and creating American jobs than it already does.

## **Doing Business with the Government**

Small companies want to do more business with the federal government and its contractors, but doing so will require more than statements of support from the government. One relatively easy way to help facilitate commerce between the two would be to establish an organization within the government that would help small businesses navigate and interact with government agencies.

This office's mandate ought to extend beyond just offering advice into actively facilitating commerce between companies and the government. Specific activities should include:

1. Helping small companies provide information to multiple agencies. For example, when companies have to provide patent information to multiple departments, the forms required differ by department – but the patent information is the same. The office could take the patent information from a small business once, and then distribute it to all necessary agencies on the company's behalf.
2. Explaining reporting requirements. Different agencies require different paperwork before completing a contract. It is not always clear what these requirements are, nor how similarly sounding requirements differ from one agency to the next. Small businesses should have a central place they can go to get accurate information on what forms need to be submitted to which offices.
3. Advocating for inter-government standardization. If the DOD, DOE and DOS all require companies to prove they pay fair wages before buying from a company, the form used to prove this should be the same. In fact, demonstrating basic information about a business ought to only require one form, which can be shared with all relevant agencies. This new office ought to be tasked with leading efforts to enact these simple, but enormously important endeavors.

## **Availability of Talent**

The best and easiest way to provide all businesses with access to the talented students graduating from American universities is to expand the EB green card system so that every international student who earns a Masters or PhD in a STEM field to get a green card within one year of graduating. Students can already use OPT status for that year. Such a proposal is part of the Senate's comprehensive immigration reform bill and was passed by the House of Representatives in 2012.

It is important to note that expanding the H-1B temporary visa program will not help small businesses. H-1B visas are temporary, whereas small businesses need permanent access to skilled workers. H-1B visas are expensive, difficult and time consuming to acquire and demand on-going paperwork and fees to maintain. While many small businesses have ideas to spare, few have extra money, time or energy. Lastly, H-1B visas may not be used by entrepreneurs to start companies, making them completely useless to international students who want to found their own businesses.

Expanding the politically popular and much more useful EB program would give small technology companies access to the talent graduating from our universities.

Small technology companies have been, and remain, the source of a disproportionate amount technological innovation in the American economy. We believe that, by taking the steps outlined above, the government can help our small technology companies succeed and thrive – creating jobs and economic growth for all Americans in the process.