

April 13, 2020

Richard Obermann, Democratic Chief of Staff
Josh Mathis, Republican Chief of Staff
House Science, Space, and Technology Committee

Submitted through: SST.Stimulus@mail.house.gov

Dear Mr. Obermann and Mr. Mathis:

Attached you will find ITIF's initial recommendations on clean energy, small business, and manufacturing for inclusion in a possible stimulus package. Most of them fall into HSST's category 4, "Long-term Economic Stimulus/Recovery" to prepare for the possibility that the COVID-19 crisis will morph into a sustained economic downturn.

Our priorities in offering these items include:

- Supporting workers and companies most likely to be affected by such a downturn;
- Making public investments that will "crowd in" subsequent private investments during an economic recovery;
- Engaging existing and building new domestic supply chains; and
- Strengthening resilience so the nation can better withstand exogenous shocks in the future.

This list is not comprehensive, but rather reflects our previous and ongoing work on specific topics. We look forward to engaging with you further, as our thinking, along with everyone else's, continues to evolve.

Sincerely,

Robert D. Atkinson
President and Founder, The Information Technology and Innovation Foundation

1C. OPPORTUNITIES FOR ADDITIONAL R&D AND RELATED ACTIVITIES SPECIFIC TO COVID-19 RESPONSE AND RECOVERY – MANUFACTURING

1. Increase the allocations made under the CARES Act to the Manufacturing Extension Partnership (\$50 million) and Manufacturing USA (\$10 million). The COVID-19 crisis has revealed unacceptable vulnerabilities in the biomedical supply chain. The MEP network is helping small manufacturers to respond quickly to urgent demands. Models of the pandemic suggest that there may be recurrent demand surges in the coming year or two until vaccination against it becomes widespread. Manufacturing USA institutes will aid industries to innovate rapidly as treatment and prevention options emerge. Biomedical researchers are hard at work seeking such options; manufacturers need to be prepared to scale them when they succeed.

4A. LONG-TERM ECONOMIC STIMULUS/RECOVERY – NEW FUNDING

Electric Power

1. Expand investment in clean energy demonstration projects across a diverse portfolio including carbon-neutral fuels, grid modernization, long-duration energy storage, and natural gas carbon capture and sequestration (CCS). These projects will provide valuable but temporary economic lifelines to hard-hit communities during the construction phase. Projects that are successful will spark significant private follow-on investment and give U.S. suppliers an advantage in international competition. The bipartisan American Energy Innovation Act (S. 2657) includes an authorization of over \$2.2 billion in appropriations to support at least 17 demonstration projects. Immediate funding for Front End Engineering and Design (FEED) studies and initiatives to accelerate permitting processes will allow these projects to move to construction more quickly and enhance their impact on the recovery. Energy demonstration projects conducted under ARRA had a mixed record, due in part to the slow pace of moving from design to construction.¹ (Note: we recommend investments in demonstration projects in the manufacturing category below.)
2. Establish a national initiative on energy storage involving multiple federal agencies, states, the private sector, and academia. Energy storage is vital to ensure the resilience of an electric power system with high penetration of variable renewables. It can also provide critical back-up power during extreme weather events and other emergencies, which are becoming more frequent. The United States has

virtually no manufacturing capability in this industry, which is expected to grow rapidly in the coming decade. China has made massive investments in battery manufacturing and signaled that it seeks to dominate the global energy storage industry. Federal investment, cost-shared with industry, is required to reduce the risk for follow-on private investment. An increase in federal spending in this field to about \$1 billion annually would allow a broad-based initiative that encompasses multiple applications, manufacturing, and research.² (Note: we recommend the creation of a manufacturing innovation institute for batteries in the transportation section below.)

Transportation

1. Provide financial and technical assistance to states and localities as they deploy charging infrastructure for electric vehicles (EVs), integrate EVs with distribution grids, and undertake associated regulatory reforms. EVs are rapidly becoming the backbone of a decarbonized transportation sector globally, but their diffusion in the United States is constrained by limited charging infrastructure. Building out this infrastructure will create jobs immediately, while also laying the foundation for the growth of the EV manufacturing industry in the years to follow. Because each local and regional grid is unique, the federal government has an important role to play in developing generic solutions, sharing lessons, and strengthening the capabilities of state and local agencies.³
2. Enable the creation of a domestic supply chain for batteries and other EV components by supporting private investments in manufacturing and R&D. The creation of an EV charging infrastructure, as recommended above, will not have as significant an impact on job creation if the major components of EVs, particularly batteries, are not sourced domestically. The United States currently has very limited battery manufacturing capacity; much of what it does have owes its existence to investments made under ARRA by the DOE Loan Program Office. China continues to make massive investments in order to create a globally-competitive EV battery industry, and the European Union has responded in kind. The United States risks losing out on one of the biggest growth industries of the 21st century, which is vital to national security as well. A Manufacturing USA innovation institute for batteries should be funded as part of this initiative, in order to leverage new technologies emerging from federally-funded R&D.⁴

Small Business and Technology Entrepreneurship

1. Enact a national small business innovation voucher program to provide \$25,000-\$50,000 grants for small businesses to partner with an institution of higher education or research laboratory in the pursuit of commercialization or R&D activities. R&D-intensive small businesses are the most potent job creators in the U.S. economy and have the potential to spark new growth sectors. However, many such businesses struggle to access vital talent and infrastructure to solve problems that would allow them to bring new goods and services into the market. The program should be administered by the Small Business Administration (SBA) and be authorized at the level of \$10 million annually from 2021 to 2025.⁵
2. Appropriate \$30 million annually to revitalize, restructure, and extend DOE's Small Business Vouchers across all DOE national laboratories. The national labs offer a particularly rich set of expertise and facilities for research-intensive small businesses to draw upon. In addition to punching above their weight in job creation as noted above, research-intensive small businesses accessing the national labs will also contribute to solutions to key challenges in national security, energy, and the environment. DOE's Small Business Voucher pilot program created a successful model, built around a single national competition that matched small businesses with promising near commercial projects to partners within the lab complex using agreements that were easy and rapid to execute. The pilot program received a positive external evaluation, which found (among other things) that "a statistically significantly higher proportion of awardees advanced at least one level on the technology readiness level scale than non-participants."⁶
3. Appropriate \$50 million annually and expand the Lab-embedded Entrepreneurship Programs (LEEP) to all DOE National Laboratories. Currently, these programs are established at three of the national laboratories: Cyclotron Road at Berkeley Lab, Chain Reaction Innovations at Argonne, and Innovation Crossroads at Oak Ridge. This expansion would allow more first-time entrepreneurs with deep technical expertise to access extraordinarily high-value equipment, expertise, and training over the course of two years in residence. These teams and technologies tend to emerge in an excellent position to form companies and compete for grants and investment. As noted above, such businesses are critical contributors to job creation, national security, and energy and environmental technologies. LEEP competitions have been substantially oversubscribed, indicating that there are many more qualified applicants than can be supported at present.⁷

4. Authorize an Energy Technology Commercialization Foundation to work closely with DOE and jumpstart it with an initial \$30 million appropriation. Such a foundation would make it easier for technology entrepreneurs to access to DOE’s world-class technical expertise and facilities and encourage DOE-funded researchers to seek commercial applications for their discoveries more aggressively. These steps would help to close the commercialization gap that results in many discoveries made in the United States being scaled up abroad, leading to lost jobs and investment. This foundation would build on precedents established by other agency-related foundations, such as the Foundation for the National Institutes of Health and the Foundation for Food and Agriculture Research.⁸

4C. MANUFACTURING

1. Support large-scale demonstration projects for decarbonization technologies in high-emissions industrial sectors, such as cement, iron and steel, and chemicals (including carbon-neutral fuels). These commodities are likely to be in strong demand during the recovery, particularly if the stimulus includes a significant investment in traditional infrastructure. They also face growing pressure globally to become cleaner. The United States can take a leadership position in this international technology race if the federal government partners with industry. Key areas for investment include carbon capture, utilization, and storage, which may be the only option for mitigating process emissions like those from the calcination of limestone for cement-making, and new methods for generating high-temperature heat like combustion of “green” hydrogen.⁹
2. Substantially increase investment in federal manufacturing R&D programs, including through the National Institutes of Standards and Technology (NIST) as well as DOD, DOE, and NSF. The manufacturing sector is likely to be hard-hit by a sustained downturn, when consumers defer durable goods purchases and business investment falls. R&D budgets are among the first to be cut when manufacturers retrench. If the federal government does not invest in manufacturing innovation and foster complementary private investment, significant portions of the U.S. industrial base will be at risk. Key areas of focus should include development and use of advanced manufacturing technologies like robotics, “smart manufacturing systems,” and additive manufacturing, which will increase production flexibility so factories can more easily switch to producing items needed during crises, such as ventilators.¹⁰

3. Expand the Manufacturing USA network by adding 2-3 new institutes focused on biomedical manufacturing (as well as the battery manufacturing innovation institute recommended above). COVID-19 has revealed the dependence of the United States on imports of vital medical supplies. These new innovation institutes would aid in re-establishing state-of-the-art domestic capacity in fields like advanced medical equipment and active pharmaceutical ingredients, complementing the existing BioFabUSA and NIIMBL institutes. The institutes should receive initial federal investments of at least \$100 million each over 5 years, which would be matched (at a minimum) by private and state co-investment, and an ongoing annual investment of \$10-15 million after that. The new institutes should be seen as further steps toward building a network of 45 Manufacturing USA institutes, which may be supplemented by authorizing the Secretary of Commerce to designate organizations substantially similar to existing institutes as affiliates.¹¹
4. Create a 401(K) program so that small manufacturers can make tax-advantaged investments in R&D, workforce retraining, or new plant and capital equipment. Each business would be allowed to place up to \$1 million into a tax-deferred, investable account. This program would strengthen domestic supply chains across the manufacturing sector, which have suffered from under-investment for many years.¹²
5. Establish a “U.S. Manufacturing Digitalization Investment Fund” that would make low-interest loans to small manufacturers to finance the purchase of digital manufacturing technologies and solutions. The fund should receive a \$150 million annual appropriation, which would leverage a 1:1 match from participating states, who would also administer the program. This program would reduce the lag in adoption of technologies by smaller firms who have limited access to capital and are more risk-averse than their larger competitors.¹³
6. Double the funding of the Manufacturing Extension Partnership (MEP), which provides technical assistance to small manufacturers that seek to upgrade their operations and accelerate innovation. MEP funds have a 32:1 benefit-cost ratio. MEP touches about 25,000 U.S. SME manufacturers each year (nearly 10 percent of the total) but could do much more if it were robustly funded. The reality is that the United States substantially underinvests in MEP relative to both its own historical norms and compared to investments made by competitor nations. As a share of GDP, the United States invested almost twice as much in supporting its SME manufacturers in 1998 as it did in 2019. This proposed increase would put funding back in line with historical norms and allow MEP centers to develop new programs on rapid commercialization and scaling as well as digital manufacturing and cybersecurity.¹⁴

7. Broaden the DOD-operated Manufacturing Engineering Education Program by providing at least \$100 million to establish programs at 20 universities. This program, which is authorized by the 2017 National Defense Authorization Act, supports industry-relevant, manufacturing-focused, engineering training at U.S. institutions of higher education, universities, industry, and not-for-profit institutions. While DOD has launched the program, it remains essentially a pilot. It received an initial appropriation of just \$10 million in fiscal year 2017 and \$15 million more in FY 2019.¹⁵

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