



Takeaways from Small Business Engagement Roundtable on the Office of Clean Energy Demonstrations March 20, 2023

On March 20, 2023, the [Clean Energy Business Network](#) (CEBN) hosted 16 small business leaders working in clean energy for a roundtable discussion on technology demonstration and commercialization.

Co-moderated with representatives of the [Bipartisan Policy Center](#), this discussion focused on the gap for pilot and demonstration funding at the federal level and key considerations for a potential Small Business Innovation Research (SBIR) program within the Office of Clean Energy Demonstrations (OCED). Participants drew on their experience as successful recipients of Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Phase 1 and 2 grants. Many had direct experience pursuing pilot and demonstration project funding, with varying levels of success.

Key takeaways from the discussion are summarized below to inform program design for the new Department of Energy (DOE) Office of Clean Energy Demonstrations and other DOE offices. We hope such a program will effectively fill a defined gap in private and public funding for small-scale demonstrations and support impact-oriented small businesses.

A missing window from innovation to commercial liftoff

Following successful technology research and development, small businesses face financial barriers to scaling cleantech innovations. CEBN has frequently heard concerns from innovators that their technologies could be shelved despite successful SBIR/STTR development and testing, and never brought to market.

Unlocking private capital often hinges on de-risking the technology through pilot-scale demonstrations. As DOE is not a procurement agency, these projects are typically not funded by its SBIR/STTR program, aside for very rare follow-up grants unofficially dubbed as “Phase 3.”

Roundtable participants conveyed that without a pilot, innovators do not have sufficient data to prove the viability of their technologies to customers. In fact, commercial partners often require data obtained over a long period of time. Private investors are sometimes willing to finance demonstrations, but even venture capitalists can be wary of the combined technology and market risk of a new innovation, and it is challenging to marry together the willing customers and willing finance providers to build the first few projects.

This chicken-and-egg issue restricts innovations in clean energy. Small businesses need sufficient funding to develop pilots that will lead to ample data collection, and the customers that could potentially bankroll such pilots aren’t willing to do so without such data.

As Anna Douglas with Skynano said, “Funding opportunities for onsite demonstrations don’t exist in the way that R&D funding does.” For any relevant funding opportunities she has identified, aggressive cost-share requirements remain a barrier for her company.

What do small businesses do now?

Flash Steelworks, a small business based out of Michigan, worked through Congress to create a program for steel decarbonization through Congressionally directed spending under the DoD’s Industrial Base Analysis and Sustainment program. Flash Steelworks won a grant through this program for the next stage towards commercialization. The need to go this route demonstrates the lack of ongoing programs to address this funding gap.

Another roundtable participant with multiple smaller demonstrations under its belt says these projects were accomplished only through extensive collaboration with partners that were willing to donate labor and materials. The small business also bore a large share of the costs directly. Not every company was fortunate enough to have such generous collaborators.

Pioneer Energy provided a pilot unit to an oil and gas producer for free in order to generate the data and demonstrate the technology’s ability to reduce emissions. Even with the collected data from this demonstration, producers remained unwilling to purchase Pioneer’s product without even more data over a longer period of time, which the company could not finance on its own.

Companies with applications relevant to federal procurement agencies can sometimes leverage these opportunities for small-scale pilot demonstrations. One company received \$15M from the Department of Defense, and then other potential funders began reaching out to the business with interest.

These examples reflect bespoke solutions that were hard to come by, took years to implement, and that would not be broadly applicable to other projects. This piecemeal approach struggling to cobble together funds on a case-by-case basis inevitably leaves some promising technologies behind in the valley of death.

Multiple participants of the roundtable had looked into the DOE Loan Programs Office (LPO) or state programs. All the businesses found LPO loans inaccessible for projects below \$100 million. This leaves small businesses without a way to secure demonstrations for smaller scale projects, typically in the \$2-20M range. While a handful of states like California and New York have programs (such as RAMP and NYSERDA) supporting projects around \$1-5M, there is no federal program in that range.

As Evan Bierman with Smartville, Inc. asked, “Where is the government program to help us scale to get from that \$1M to that \$100M category?”

Recommendations for a Demonstration-Scale SBIR Program

The innovators and entrepreneurs that participated in this roundtable offered ample insights on how a federal initiative, such as an SBIR program within OCED, could be designed effectively to bridge the gap and support smaller-scale demonstrations on the order of \$50M or less. CEBN

would be interested in working with OCED to explore the feasibility of these recommendations, including identifying options under existing authority and those requiring authorization.

1. Applications should be accepted on a rolling basis with mechanisms to pre-qualify for expedited review.

Federal funding timelines often pose a barrier for small businesses with limited cashflow—especially those that are still pre-revenue. Many DOE funding solicitations operate on 12-month cycles—accepting applications at limited times of the year followed by months-long decision and funding timelines. Companies can die on the vine while waiting for an opportunity to apply or be awarded funding. Roundtable participants strongly advocated for rolling applications and shortening the period to funds disbursement as much as possible.

One idea raised was offering a prequalification program to allow projects meeting pre-defined criteria to undergo expedited reviews. For example, companies that are already underway in SBIR Phase 1 or 2—or meet other criteria to establish a track record of progress—might be able to secure OCED demonstration funding more quickly. One small business leader suggested that ideally, the demonstration phase could be eligible to start and run concurrently with SBIR Phase 2 so companies could complete full field testing and be ready for deployment at the end of this period. With these considerations in mind, some participants still cautioned that an OCED SBIR program should remain open to new applicants outside of the existing SBIR pipeline.

Participants also suggested reducing the amount of upfront information required for SBIR applications as a way to streamline the process. One participant relayed experience with private sector venture capital as a model for how to stage award applications. As a company advances through various stages of the application process, it is asked to provide additional material for consideration. This relieves the burden on small businesses with few staff to deliver unmanageable amounts of application material in a short period of time, and avoids wasted time by reviewers in looking at materials for companies that are deemed a poor fit.

2. Flexibility should be built into award management.

The theme of flexibility also arose in consideration to award management, including budget revisions. Inflation, supply chain disruptions, and the COVID-19 pandemic are just a few factors that upended the initial budget that one company had set for a 3-year, federally funded pilot project at the beginning of 2020. It was challenging to meet that budget in a completely different economic landscape than when the grant began.

One participant suggested a phased approach. She recommended that the initial phase be a smaller amount that allows the business to develop a proposal and secure a buyer—one of the hardest parts of the demonstration process. In the subsequent phase, the funding amount should be sufficient for building out an actual pilot demonstration. Participants pointed out that various Department of Defense (DoD) funding programs require innovators to demonstrate potential customer sign-off, which could be a model used for phased stages of funding.

Essentially, participants felt OCED should evaluate any steps that can build off incremental success and help a business accelerate its pace and move to the next steps of its project.

3. Demonstration projects should include commercialization assistance.

The SBIR program nominally aims to commercialize innovative technologies by the end of Phase 2. One way a demonstration program could do so more effectively would be to match companies with end users. Successful commercialization support would involve leveraging the convening power of the Department of Energy to attract relevant private sector and public sector stakeholders that could potentially serve as initial customers. One example raised of a valuable tech-to-market incubator was the Incubating Market-Propelled Entrepreneurial-Mindset at the Labs and Beyond (IMPEL).

4. Funding should be provided upfront rather than reimbursed.

Phase 2 SBIR is reimbursable, which forces startups to find working capital at the beginning of the project and then get repaid later with the grant. This is difficult for many cleantech startups that are not yet generating revenue. This would be even more challenging for demonstration projects at larger amounts. Instead, some participants advocated for a firm fixed-price model, as DoD often uses.

5. Solicitations should allow some open topics that are not technology- or sector-prescriptive.

One concern frequently cited with the DOE's SBIR program (and federal grants in general) is when eligibility is restricted to narrowly defined technologies. Many of the companies involved in the roundtable—despite having all won SBIR awards—spoke of instances where they felt their innovations didn't fit neatly into prescribed topic areas for an SBIR funding round or other DOE solicitation.

For example, Pioneer Energy has developed a skid type that could reduce emissions at oil and gas wells by up to 90%, yet they are now struggling to find demonstration funding inclusive of their sector. Creating more open-ended opportunities in an OCED SBIR program could help advance outside-the-box technologies that have the potential to be disruptive and powerful tools for decarbonization.

6. OCED SBIR should work in concert with other demonstration funding mechanisms at DOE.

Some participants suggested creation of a revolving fund for standing up pilot manufacturing facilities. This may be outside the purview of an OCED SBIR program but could be explored via other mechanisms within DOE or even the newly-created Foundation for Energy Security and Innovation. By investing in small facilities costing orders of magnitude less than what LPO provides, this fund could have an outsized impact, launching new technology into the market and leading to larger projects down the line.

With multiple new programs established in recent legislation, there is an unprecedented opportunity to explore how all these initiatives might work in concert to address barriers to the deployment of innovative technologies.

Thank you in advance for your consideration. We look forward to further discussing these recommendations with you. Please feel free to reach out to CEBN as a resource for policy design and connections to small businesses.

Roundtable Participants:

Aayush Thakur, Fr8relay

Anna Douglas, SkyNano

Bruce & Anne Kania, Floating Island Integration

Daniel Emmett, NEXT Energy Technology

Evan Bierman, Smartville Inc

Gary Cola, FlashSteel Works

Gecheng Zha CoFlow

Jeff Horowitz, NEXT Energy

Julian Yao, PetroLern

Matias Machado and David Berney

Needleman, Leap Photovoltaics

Mitch Odinak, Molecule Works

Mike Simon, RockeTruck

Nancy Min, EcoLong

Nicole Lane, Pioneer Energy