

OUR JOURNEY SO FAR

Enabling the Clean Energy Transition through Commercialization

OFFICE OF
Technology Transitions

In the history of the Department of Energy (DOE), there has never been a more exciting time for commercialization than now, with the passage of the **Bipartisan Infrastructure Law (BIL)**, the **CHIPS and Science Act**, and the **Inflation Reduction Act (IRA)**—which together represent roughly a half-trillion additional dollars to transform our energy economy.

On January 20, 2023, I celebrated two years as **DOE's Chief Commercialization Officer and Director of the Office of Technology Transitions (OTT)**, and we wanted to do a lookback on what OTT has achieved during this time. At OTT we are tasked with driving private sector uptake of clean energy technologies and stewarding commercialization activities across the DOE complex including the 21 [national labs](#), sites, and plants. In 2023, I will continue visiting the DOE national labs and learning how we can partner and steward commercialization.

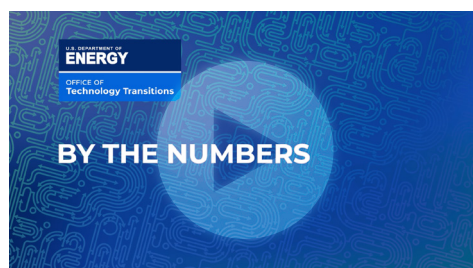
I am so proud of what the OTT team has accomplished for the American people during my tenure in this administration so far as we amplify the commercial impact of taxpayers' investments in DOE and the new opportunities from these three critical laws.

OTT has evolved. We have a diverse leadership team comprised of 60% women and 60% BIPOC, and we have tripled our staff size. We've built out our cross-cutting commercialization capabilities. We've amped up DOE's analytical horsepower to drive evidence-based decision-making. We've created new partnerships between government and industry. We've engaged hundreds of students—encouraging them to become the next generation of clean energy champions. And we're just getting started.

Vanessa Z. Chan

Chief Commercialization Officer &
Director, Office of Technology Transitions
U.S. Department of Energy

OTT By the Numbers Video



Ames National
Laboratory Visit, 2021
Ames, IA



Argonne National
Laboratory Visit, 2021
Lemont, IL



Brookhaven National
Laboratory Visit, 2023
Upton, NY

Stewarding Commercialization

At OTT, we're often asked, *"What role does government play in commercializing new technologies to market?"*

To achieve full-scale "commercial lift-off," the private sector must be willing to use their \$23 trillion to invest in clean energy technologies across the value chain. The often high risk profile of new technologies can make that challenging, but government can help navigate risks and accelerate technological progress across the four stages of commercialization -Research, Development, Demonstration, and Deployment (**RDD&D**).

At DOE, we harness our expanding relationships with industries, startups, investors, and partners to bring their knowledge and expertise into the commercialization process. Our programs catalyze innovation ecosystems, especially when commercialization risks are high. As the commercialization stewards at the Department, OTT is laser-focused on helping each stage of the clean energy RDD&D continuum and aligning to facilitate efficient commercialization.

Bringing Private Sector Data-Based Decision Making to DOE

It is critical that we ground commercialization in market realities. We must start with what the market needs, and then subsequently design technology-based solutions that meet those needs. As such, OTT has quarterbacked three important initiatives to drive market and private sector thinking across DOE, the federal government, and our partners:

1. In an Executive Order on America's Supply Chains, President Biden directed DOE to [examine critical supply chains for the energy transition](#). As a result of this guidance, DOE authored 13 reports. OTT led the [Competitiveness and Commercialization of Energy Technologies](#) report, which outlines a six-step structured approach to an economic analysis of whether a U.S.-based manufacturing asset is viable. Such analyses of the most at-risk supply chains can guide decision-making across the Department, government, and the private sector.
2. In partnership with the DOE's [Office of Clean Energy Demonstrations \(OCED\)](#), [Office of Policy](#), and the [Loan Programs Office](#), OTT is co-leading an effort to build a series of "**Pathways to Commercial Liftoff**." The first set of pathways address clean hydrogen, advanced nuclear, long duration energy storage, and carbon management, with more topics to be announced later this year. Each pathway will provide a common understanding of what it will really take to achieve private sector "liftoff," with a fact-based approach that addresses knowledge gaps around critical commercialization barriers. We're proud to have worked with more than 270 industry and government stakeholders and over 90 DOE colleagues to shape each pathway. These will be "living documents" that will be updated continuously as we learn more as technologies move through the commercialization continuum.
3. Managing technologies through Technology Readiness Levels (TRLs) alone is insufficient to drive full-scale commercialization. OTT has created a new framework of "[Adoption Readiness Levels \(ARLs\)](#)" characterizing risks that must be overcome for market deployment (e.g., regulatory, supply chain) and are not captured in TRLs. We have piloted this framework across several parts of DOE; for example, it will be a part of OCED's program design and execution going forward. The framework will be launched publicly later this year.



Industry Partners



Fermi National Accelerator
Laboratory Visit, 2021
Batavia, IL



OTT Public
Engagements



Los Alamos National Lab Visit,
2021, Los Alamos, NM

Driving Commercial Impact Through OTT Programs

OTT's funded commercialization programs catalyze technology transfer and commercialization between the Department of Energy, DOE's national labs, and the private sector. Programmatic examples include:

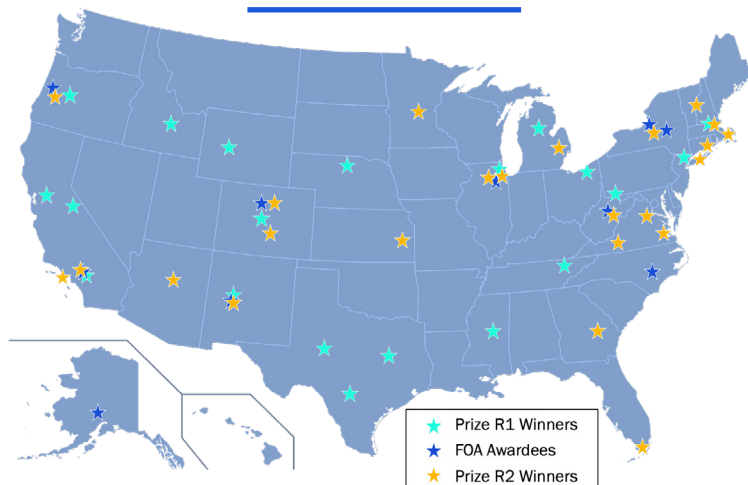
1. The [Technology Commercialization Fund](#) (TCF) accelerates and funds promising, cutting-edge technologies, helping them move from the development to the demonstration phase. We have spent the past two years redesigning TCF and launched a “**Core Lab Infrastructure for Commercialization**” program that is helping enhance how national labs, sites, and plants commercialize technologies. Examples of how we are achieving this include private sector matchmaking and new workflows to accelerate lab-to-market pathways. From 2021 to 2022, the TCF program awarded ~\$70 million in federal funds to ~130 funded projects across 18 national labs, sites, and plants and more than 121 private sector partners.

Through BIL, we're piloting new TCF-funded programming that can cut across multiple energy offices and help us address underexplored gaps. Under TCF BIL, OTT is cultivating a broader innovation network to enable faster replication and scaling of demonstration projects.

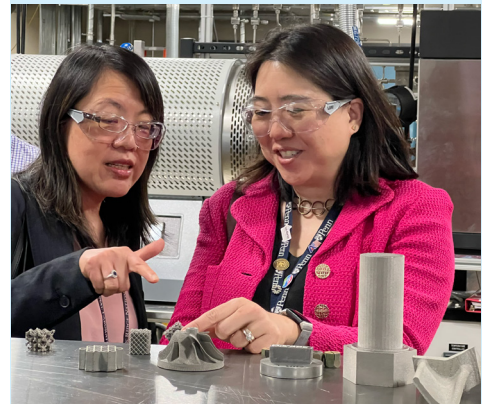
Learn more about [Base Annual Appropriated TCF](#) and [Bipartisan Infrastructure Law TCF](#).

2. The [Energy Program for Innovation Clusters](#) (EPIC) is a funding program for regional incubator teams across the country to develop and implement support for energy start-ups and entrepreneurs. These incubators provide entrepreneurs with mentorship, technology validation, business development, and more to strengthen the nation's clean energy future. We are proud to support more than 50 incubators through OTT's first Funding Opportunity Announcement and two Prizes. Last year, [we launched EPIC Prize Round 2](#), and [announced the 24 incubators](#) and accelerators that reached the semifinal round. In March, we'll host a first-of-its-kind national startup pitch competition. DOE's Office of Fossil Energy and Carbon Management has also leveraged the EPIC framework to announce their new [Direct Air Capture Prize](#).
3. The [COVID Technical Assistance Program](#) (CTAP) allowed lab researchers to support their communities in the fight against COVID-19. CTAP provided targeted funding for DOE's national labs for coronavirus-related projects. Project examples include evaluating an [ozone-gas based system](#) for protective equipment sterilization and testing a reusable, affordable, and effective [COVID-19 protective shield](#)

EPIC Prize Winners



Facilitated Through Technology Commercialization Fund



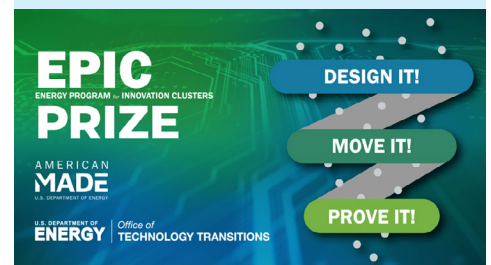
Oak Ridge National
Laboratory Visit, 2022
Oak Ridge, TN

2022 Technology Commercialization Fund Selections Roundtable



Technology Commercialization Fund | U.S. DEPARTMENT OF ENERGY | Office of TECHNOLOGY TRANSITIONS

TCF Webinar 2022



EPIC Prize Program Announcement 2022

Building Key Partnerships

As integrators, OTT's commercialization executives look for white spaces where internal and external partners can connect to drive commercial impact. Last spring, we brought together partners from the DOE's [Vehicle Technologies Office](#), [Office of Electricity](#), [Office of Policy](#), national labs, state and local governments, labor unions, utilities, and private entities to sign a new [Vehicle-to-Everything Memorandum of Understanding](#). This MOU represents a growing collaborative public/private approach to researching and developing novel technologies and markets for the bidirectional electric vehicle space, which will be a cornerstone to Virtual Power Plants. Together, we plan to prove out the business case to support a decentralized, clean, and resilient grid.

At OTT we *love* building partnerships and bringing communities together:

1. We joined with DOE's [Arctic Energy Office](#) to host [ArcticX](#), part of the InnovationXLabs series, on the Arctic's vast untapped potential for clean energy technology innovation and commercialization, as well as the unique challenges it faces. Remarks from [U.S. Secretary of Energy Jennifer Granholm](#), [U.S. Secretary of Interior Deb Haaland](#), [Deputy Secretary of Energy David Turk](#) brought senior federal leadership to discuss [why DOE is interested in the Arctic](#), and [more](#). Our team also facilitated a [memorandum of understanding](#) between Sandia National Laboratories and the Port of Alaska to evaluate the potential for renewable energy resources and markets to improve power systems within Alaska's Upper Cook Inlet.
2. We helped support the global charge to launch clean energy development and deployment at the [Global Clean Energy Action Forum](#) (GCEAF), including [welcoming attendees](#); participating in sessions about technology commercialization at DOE's national labs; and a fireside chat with John Podesta, White House Senior Advisor to the President for Clean Energy Innovation and Implementation; and moderating a closed-door roundtable on the Net Zero Built Environment.
3. At [CERAWeek 2022](#), we joined a panel discussion on investing in early-stage companies and spoke on OTT's mission and broader technology commercialization at additional events.
4. OTT led the DOE engagements at [CES® 2023](#), including a booth showcasing national labs technologies and a mainstage event in which Secretary Granholm discussed the Inflation Reduction Act, including new [consumer tax credits](#). We also had the pleasure of hosting multiple members of Congress at our DOE OTT booth.
5. At the 2022 [SelectUSA Investment Summit](#), we connected with international entities, investors, companies, economic development organizations, and industry experts to spread the word on our mission, DOE funded technologies and programs, and the opportunities for investors in clean energy commercialization.

Engaging Across the Department

DOE is committed to being straightforward to navigate and making it as easy as possible for external entities to engage with us. That means we'll continue to improve our stakeholder engagement. This includes helping the public understand the capabilities of and collaboration opportunities with the national laboratories and DOE offices ([check out this convenient *Founder's Guide to the DOE*](#)). Some examples include:



Vehicle-to-Everything
Memorandum of Understanding
2022, Los Angeles, CA



ArcticX 2022
Anchorage, AK



GCEAF 2022
Pittsburgh, PA



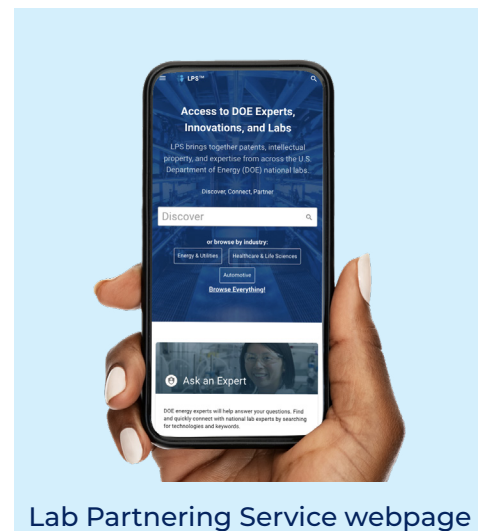
CES® 2023
Las Vegas, NV

1. Our [Lab Partnering Service](#) (LPS), is a front-door portal to DOE that facilitates connections to national lab facilities, intellectual property, lab experts, and research areas. We've improved the LPS with new tools including a state-of-the-art Visual Patent Service and we launched curated topics for hydrogen, carbon dioxide removal, and energy storage. We've engaged 180,000 users and reached more than 500,000 page views. Next, we will expand outreach efforts to maximize public use of the platform and further integrate LPS with existing national lab tools and capabilities.
2. The CHIPS and Science Act legislated the creation of a DOE agency-related foundation, the **Foundation for Energy Security and Innovation** (FESI) which is directed by Congress to, among its charges, support our mission to accelerate the commercialization of energy technologies. Together with Senior Advisor to the Secretary of Energy, Karen Skelton, OTT co-chairs an internal working group helping to establish FESI.
3. We are helping DOE enhance its use of flexible authorities like Other Transaction Authorities (OTAs) and **Partnership Intermediary Agreements** (PIAs). These structures can streamline and ease burdens for small businesses and non-traditional entities who want to work with DOE. We engaged more than 50 stakeholders including DOE program offices, national labs, and government agencies; held a webinar to share our findings; released a broad agency announcement to collect papers from potential partners and supported the establishment of an internal Innovative Financing Mechanisms working group which will launch the first DOE-wide PIA in the coming year.

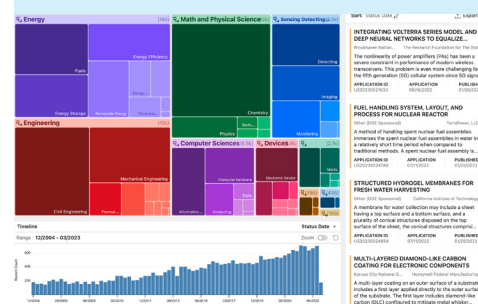
Creating a Diverse Pipeline for the Next Generation of Climate Champions

DOE is focused on attracting diverse thinkers and doers to become part of our [Clean Energy Corps](#) and we are proud that we are walking the walk at OTT where our leadership team is 60% women and 60% BIPOC. At OTT, inclusive talent programs are a key strategy for growing the next generation of leaders both within the DOE and externally:

1. OTT's popular [Energy I-Corps](#) program trains national lab researchers to assess real-world opportunities for their research while building commercialization and entrepreneurial skills. Since the program's inception, we've trained 191 teams across 12 national labs who have raised more than \$150 million in outside external funding.
2. Programming for students is a new area for OTT. We are thrilled to have created two programs to inspire and train up the next generation of innovators:
 - [EnergyTech UP](#) or the Energy Tech University Prize is a collegiate competition that challenges student teams to develop business plans for energy technologies including those developed at DOE's national labs. Last year, we [welcomed 180 teams to the inaugural competition](#) comprising 550 students from 113 schools across 42 states. [Three teams and six bonus prize winners](#) were selected and this funding has already catalyzed real-world commercialization. For example, the Pantheon team ([2022 cohort](#) – State University of New York at Binghamton) developed methods to process contaminated glass from recycling facilities into a cement replacement for use in concrete. The team also participated in Lawrence Berkeley National Laboratory's [Incubating Market-Propelled Entrepreneurial-mindset at](#)



Lab Partnering Service webpage



LPS Visual Patent Search



Energy I-Corps Cohort 15 Announcement 2022



Energy I-Corps Cohort 15 Graduation 2022 Washington, DC

[the Labs and Beyond](#) program (IMPEL). While still in school, the team has since [formed a company](#) and have been awarded a \$500,000 grant from the U.S. Environmental Protection Agency to continue developing their technology. The team's city of Binghamton has also started a pilot program to build stronger, more sustainable sidewalks using the team's products.

- The [Technology Commercialization Internship](#) (TCI) pairs undergraduate students with mentors, networks, and cutting-edge technologies at DOE's national labs. The program culminates in the presentation of students' findings to a panel of commercialization experts and OTT leaders. Our 2021 and [2022 summer cohorts](#) welcomed 34 students from 33 universities with more than 60% of the interns from disadvantaged communities.
3. As part of our Practices for Accelerating Commercialization of Technologies (PACT) program, OTT helped fund DIVERSE-W, which advances professional development of women researchers at DOE's national labs. Through technology transfer and entrepreneurial training, equity workshops, and a speaker series highlighting women leaders, DIVERSE-W increases awareness of and participation in DOE and national lab commercialization efforts by identifying, targeting, and supporting this untapped talent pool.

Looking Forward to the Next Two Years

Today, DOE is focused on enacting an equitable, clean energy transition to meet our ambitious climate goals with a team led by a Secretary of Energy whose priority is to "deploy, deploy, deploy." DOE is building new programs through our [Office of Clean Energy Demonstrations](#), [Grid Deployment Office](#), [Office of Manufacturing and Energy Supply Chains](#), [Office of State and Community Energy Programs](#), including new leadership positions such as the [Undersecretary of Infrastructure](#), and continuing to build a team focused on the season of implementation.

The last two years have flown by. We are excited about the groundwork that's been laid to improve the Department's ability to drive private sector uptake of clean energy technologies as well as catalyze the commercialization of technologies developed at DOE's national labs, sites, and plants.

We look forward to working with other federal agencies and the private sector to reach commercial lift-off of clean energy technologies so that together we can transform our energy economy and achieve a clean, innovative energy future for America.

In addition to [subscribing to our mailing list](#), you can reach us at OTT@hq.doe.gov and engage with us through active opportunities where we need your help:

- [We're Hiring! Learn About Open OTT Positions and Apply](#)
- [Respond to the Foundation for Energy Security and Innovation RFI by March 27](#)
- [Respond to the Place-Based Regional Innovation RFI by March 28](#)
- [Help Improve Our Programs. Become an OTT Application Reviewer](#)
- [Learn More About OTT's Funded Programs](#)



Interns from TCI Cohort 1, 2021



Interns from TCI Cohort 2, 2022



TCI Cohort 2 Graduation & Tour of Lawrence Berkeley National Lab, 2022, Berkeley, CA



Sandia National Laboratory Visit, 2021, Albuquerque, NM