



U.S. DEPARTMENT OF
ENERGY

Office of Clean Energy Demonstrations

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Bipartisan Infrastructure Law (BIL) Implementation



NOVEMBER 15, 2021
President Biden signs Bipartisan
Infrastructure Law

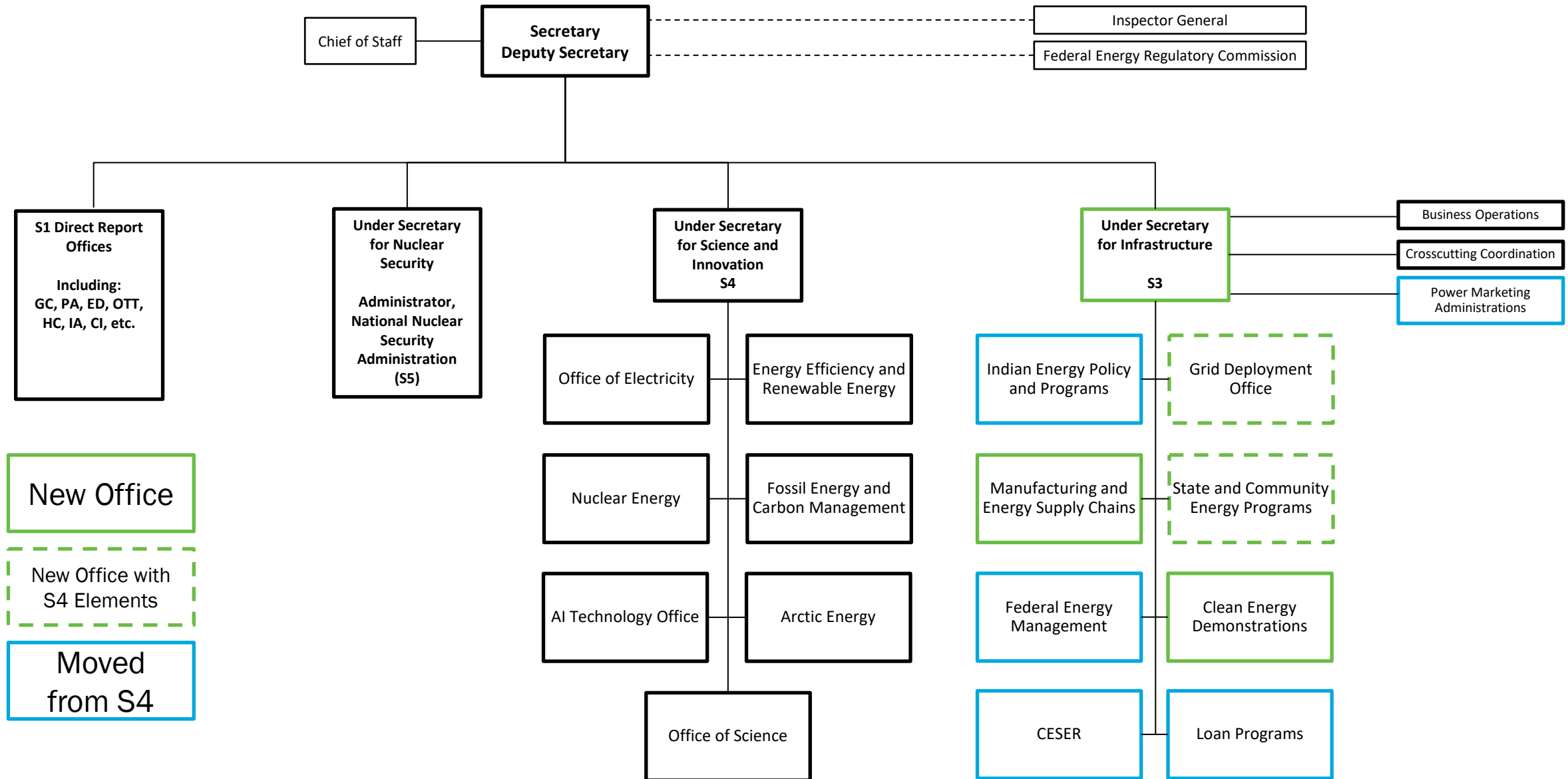


BRIEFING ROOM

**FACT SHEET: Biden-Harris
Administration Hits the Ground
Running to Build a Better America
Six Months into Infrastructure
Implementation**

MAY 15, 2022
180 Days into
BIL Implementation

New DOE Structure



Background

- The BIL more than triples DOE's annual funding for energy programs, including significantly expanded research and development (R&D) and entirely new demonstration and deployment missions
- DOE announced the establishment of OCED in December 2021 to deliver \$21.5 billion provided by the BIL to support large-scale clean energy demonstration projects
- OCED will build on DOE's long-standing position as the premier international driver for clean energy research and development, expanding DOE's scope to fill a critical innovation gap on the path to carbon-free electricity in the U.S. by 2035 and a net-zero economy by 2050
- OCED will help bridge the gap between research and development to validate technologies in real-world conditions and provide confidence that the technology works as intended

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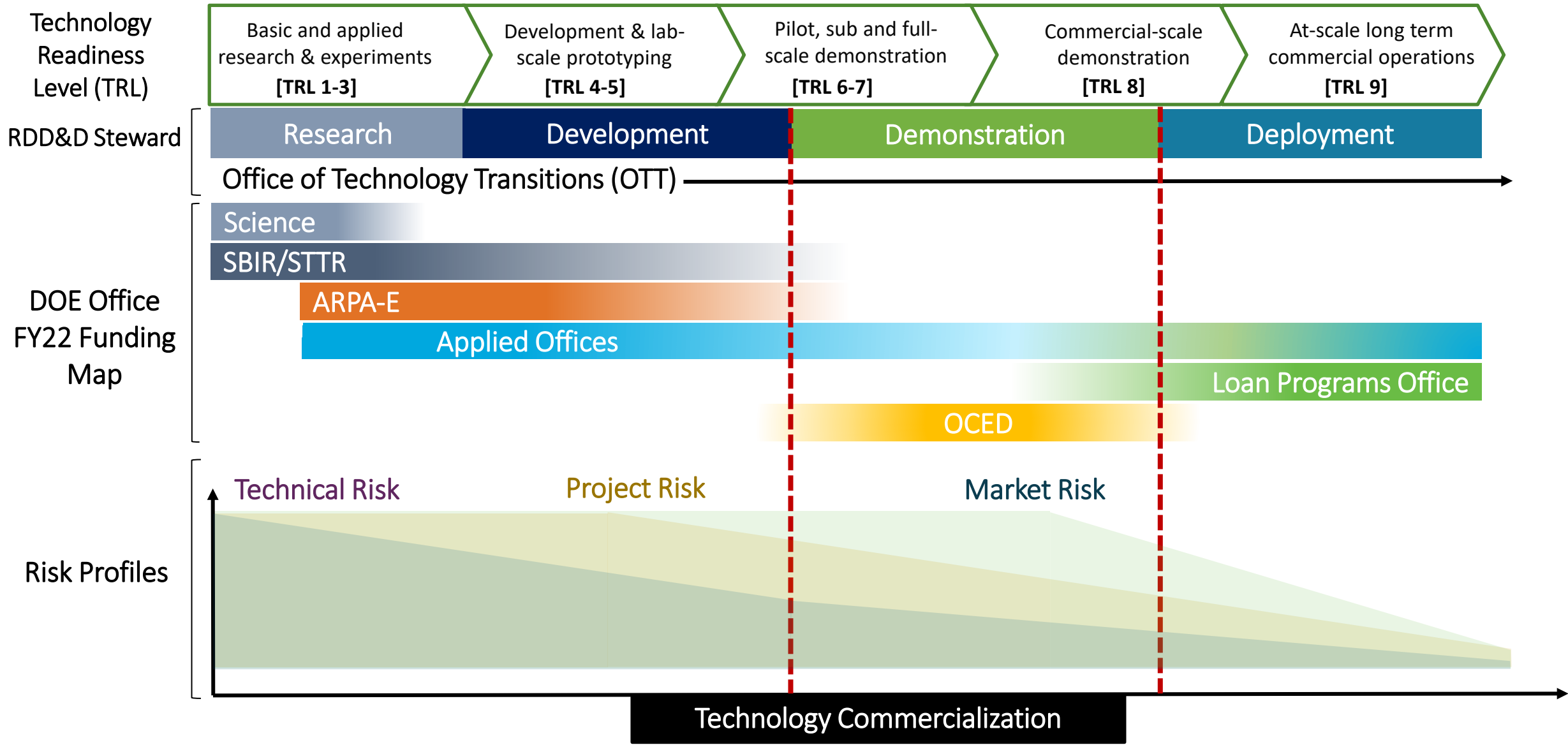
“Deliver clean energy technology demonstration projects at scale in collaboration with the private sector to accelerate deployment, market adoption, and the equitable transition to a decarbonized energy system.”

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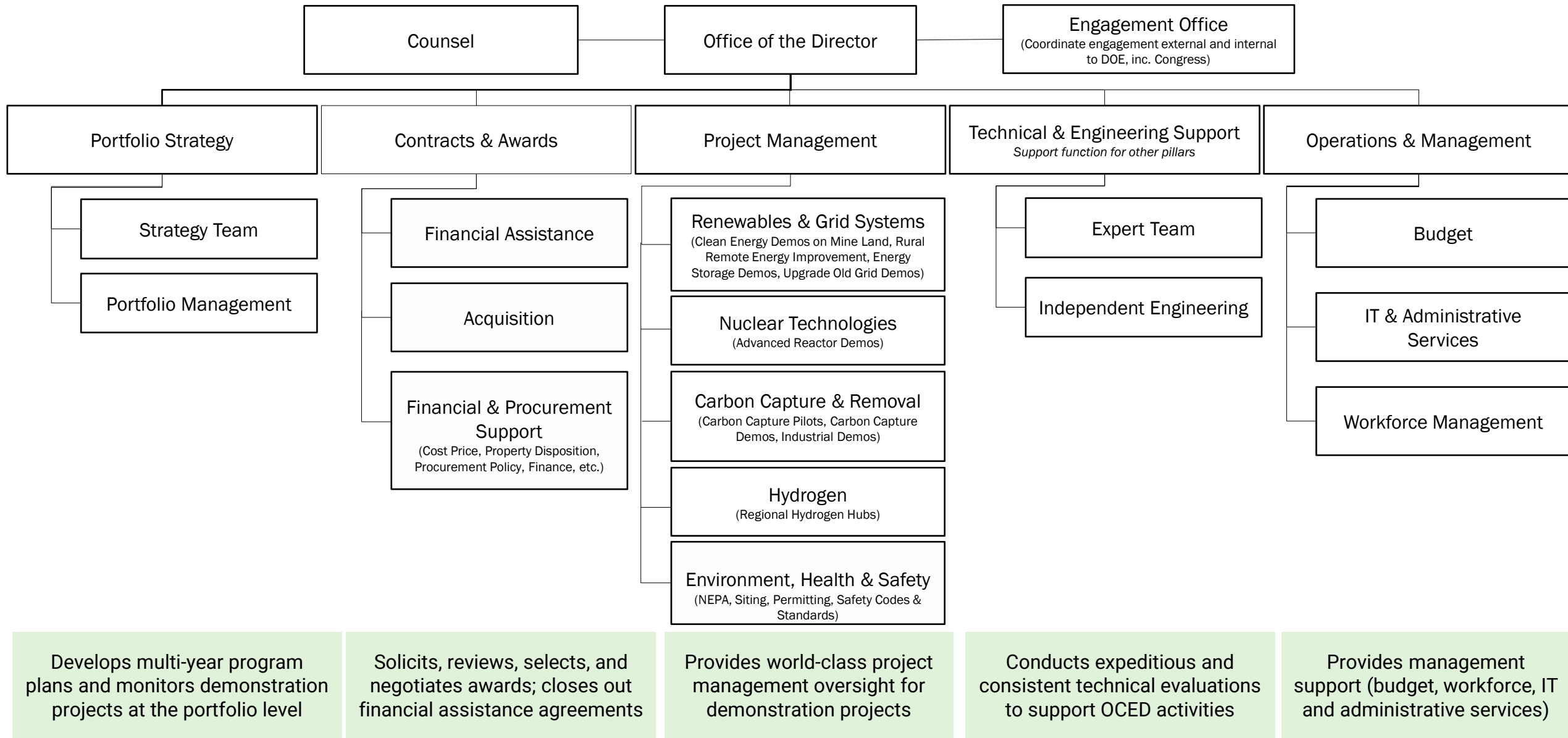
OCED Mandate

1. **Serve as primary office in DOE for delivering full scale clean energy demonstration projects and for demonstration project management oversight excellence**
2. **Help enable 100% clean electricity by 2035 and net zero emissions by 2050 through an equitable energy transition**
3. **Collaborate with stakeholders to unlock trillion-dollar scale clean energy investment from the private sector and other sources of capital**
4. **Maintain risk-based, balanced, and defensible portfolio of investments**
5. **Leverage private sector knowledge and broader ecosystem engagement to inform OCED and DOE technology commercialization efforts**

OCED Role Across Research, Development, Demonstration & Deployment (RDD&D) Continuum



OCED Programs Advance Demonstration Goals



OCED Scope

- Regional Clean Hydrogen Hubs (\$8 billion)
- Upgrading Grids Demonstrations (\$5 billion)
- ***Advanced Reactor Demonstrations (\$2.5 billion)***
- Carbon Capture Demonstrations (\$2.5 billion)
- Carbon Capture Large-Scale Pilot Projects (\$937 million)
- Energy Improvement in Rural and Remote Areas (\$1 billion)
- Industrial Emissions Demonstrations (\$500 million)
- Clean Energy Demonstrations on Mine Lands (\$500 million)
- Energy Storage Demonstration and Pilot Grants (\$355 million)
- Long Duration Demonstration Initiative and Joint Program (\$150 million)

Advanced Reactor Demonstrations (\$2.5 B)

Building two advanced nuclear reactors to reduce risks for less mature designs and help the next generation of American nuclear reactors make the transition from concept to demonstration: TerraPower Natrium Reactor and the X-energy Xe-100 (pictured below).

Current Status

- Awarded \$2.5 billion in ARDP funding through the BIL
- Both projects are successfully achieving early milestones and slightly underspending



Advanced Reactor Demonstration Program



Overview

- Program established by Congress in the FY2020 DOE budget
- Focuses DOE and non-federal resources on **actual construction** of real demonstration reactors
- Establishes ambitious timeframe for two demonstration reactors – **five to seven years** from award, including design, licensing, construction and start of operations
- Supports development of future demonstrations by reducing risk for less mature advanced designs

Desired Outcomes

- Support **diversity of advanced designs** that offer significant improvements to current generation of operational reactors
- Enable a market environment for commercial products that are **safe** and **affordable** to both construct and operate in the near- and mid-term
- **Stimulate** commercial enterprises, including supply chains

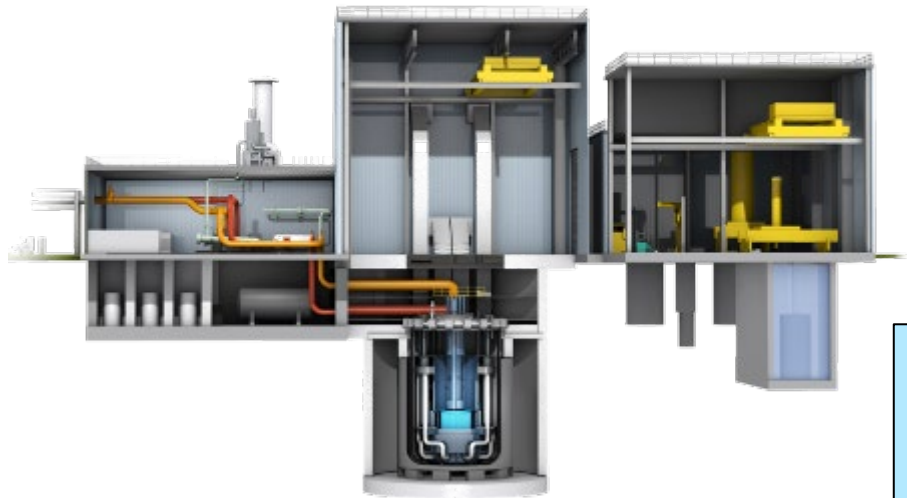
Funding Opportunity Announcement (FOA) Supported Three Maturity Pathways

- **Demos:** Test, license and build operational reactors within 5-7 years
- **Risk Reduction:** Solve technical, operational & regulatory challenges to support demos within 10-14 years
- **Advanced Reactor Concepts 2020 (ARC-20):** Progress technology for potential demos by mid-2030s

Demonstration Pathway: Selected Technologies

TerraPower LLC – Sodium Reactor

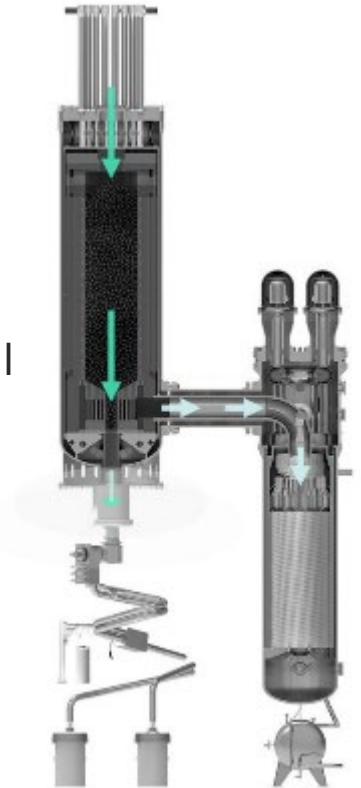
- Sodium-cooled fast reactor that leverages decades of development, including fuel
- High temperature reactor coupled with thermal energy storage for flexible electricity output
- New metal fuel fabrication facility
- Visit: <https://natriumpower.com/>



Natrium Reactor

X-energy – Xe-100 Reactor

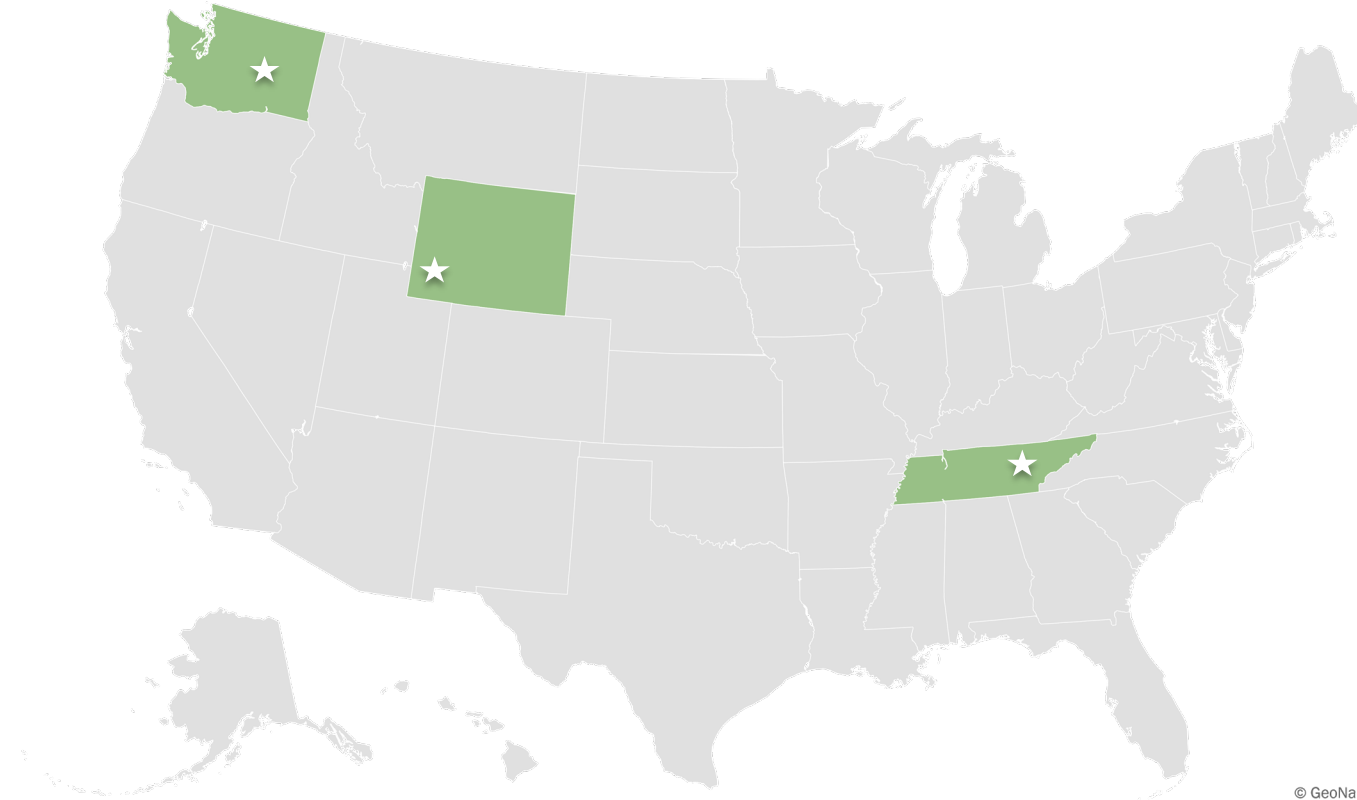
- High-temperature gas-cooled reactor that leverages decades of development and robust fuel form
- Provides flexible electricity output and process heat for a wide range of industrial heat applications
- Commercial scale TRISO fuel fabrication facility
- Visit: <https://x-energy.com/>



Xe-100

- Advanced Reactor Demonstration projects awarded as cost-shared (50/50%) cooperative agreements
- Represent a total project cost of over \$6.4B

Project Status and Engagement



We welcome input and feedback from Tribes and internal and external stakeholders to improve our efforts to execute the program.

Both projects are currently working on siting activities.

TerraPower: Sodium Reactor | Kemmerer, Wyoming

X-energy: Xe-100 Reactor | Grant County, Washington; Fuel Fabrication Facility | Oak Ridge, Tennessee

How to Engage with DOE on These Projects

- Continue to voice concerns and request direct consultation as needed
- Continue NETWG participation
- Become involved in the NEPA review process
- Explore Community Benefits and Workforce Agreements frameworks
- Learn about other clean energy deployment opportunities related to the Bipartisan Infrastructure Law and provide inputs:
 - Hydrogen Hubs
 - Carbon Capture
 - Grid Demonstrations
 - Industrial Emissions Demonstrations



Thank you!

For additional updates and information, visit
<https://www.energy.gov/office-clean-energy-demonstrations>

Email: Christina.Walrond@hq.doe.gov



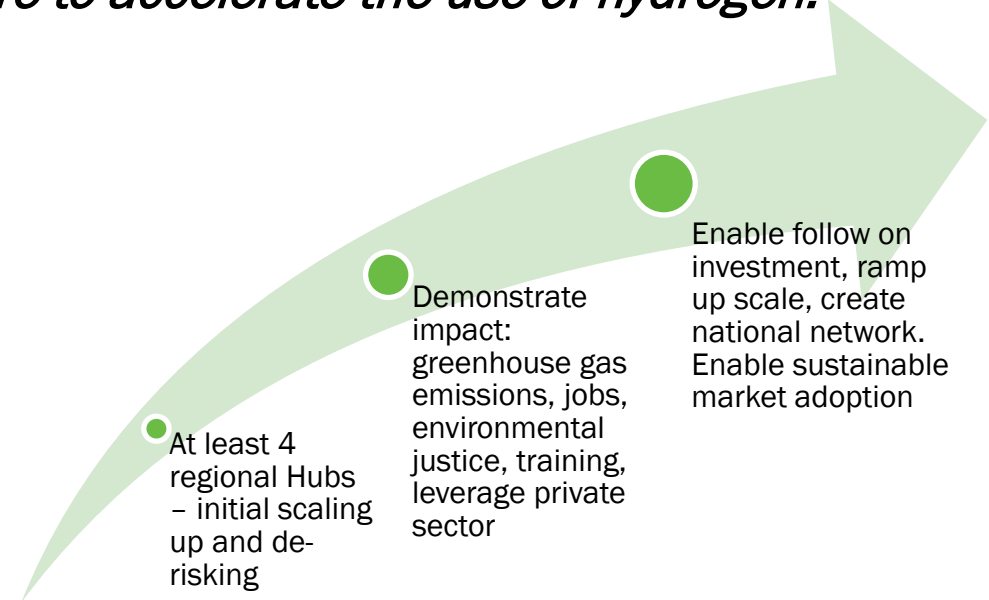
Regional Clean Hydrogen Hubs (\$8 B)

Building at least four regional clean hydrogen hubs across the country to create networks of hydrogen producers, consumers, and local connective infrastructure to accelerate the use of hydrogen.

- Feedstock diversity
- End use diversity
- Geographic diversity
- Employment and training

Current Status

- Issued a Request for Information (RFI) in March 2022
- Conducted stakeholder workshops and webinars
- Issued a Notice of Intent on June 6, 2022
- Planning a funding announcement in the September/October 2022 timeframe



Upgrading Grids Demonstrations (\$5 B)

Demonstrating innovative approaches (1) with electric sector owners and operators to improve resilience and reliability of transmission, storage and distribution infrastructure; and (2) with states and public and rural electric cooperatives to enhance regional grid resilience.

Current Status

- Conducting stakeholder engagement



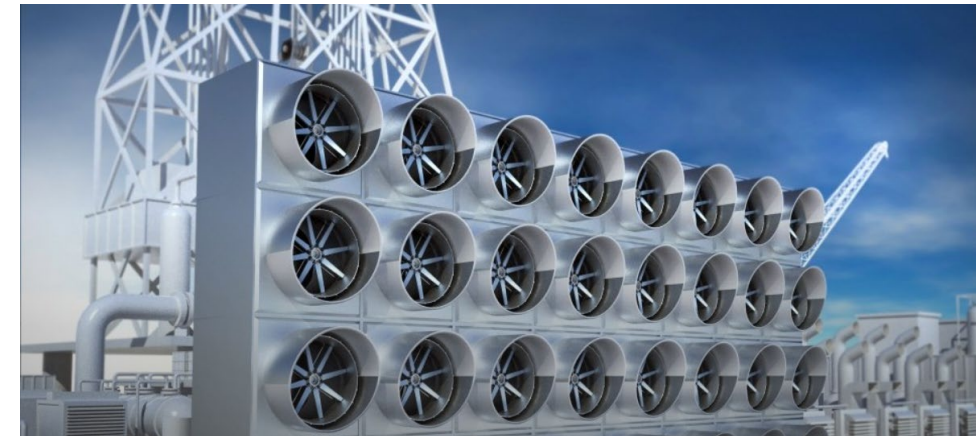
Carbon Capture Demonstrations (\$2.5 B)

Developing six carbon capture facilities to improve the costs, emissions reductions, and environmental effects from coal and natural gas.

- Two projects for natural gas electric generation facility
- Two projects for coal electric generation facility
- Two projects for industrial facility not purposed for electric generation

Current Status

- Reviewing responses to the RFI to inform program design
- Planning a funding announcement in FY 2022
- Conducting stakeholder engagement, including four workshops in April



Carbon Capture Large-Scale Pilot Projects (\$937 M)

Testing innovative carbon capture pilot projects that are large enough to support new processes and technology improvements at scale. This program also aims to improve the costs, emissions reductions, and environmental effects of coal and natural gas.

Current Status

- Reviewing responses to the RFI to inform program design
- Planning a funding announcement in FY 2022
- Conducting stakeholder engagement, including four workshops in April

Energy Improvement in Rural and Remote Areas (\$1 B)

Improving the resilience, safety, reliability, and availability of energy in rural or remote areas and increasing environmental protection from the adverse impacts of energy use, in coordination with the Department of Interior.

- Rural and remote is defined as cities, towns, or unincorporated areas with less than 10,000 inhabitants

Current Status

- Conducting stakeholder outreach



Industrial Emissions Demonstrations (\$500 M)

Establishing demonstration projects that test and support technologies that reduce industrial emissions.

- Reduce emissions in industrial and chemical production processes, and heat generation
- Leverage smart, digital and sustainable manufacturing to develop new technologies and practices
- Increase energy efficiency of industrial processes

Current Status

- Conducting stakeholder outreach



Clean Energy Demonstrations on Mine Land (\$500 M)

Carrying out five clean energy projects on current and former mine land to show their technical and economic feasibility.

- Two solar projects and three other clean energy projects
- Focus on economic development and environmental justice

Current Status

- Conducting outreach and planning workshops to bring together fullest possible range of stakeholders to discuss best ways to shape this program for community benefit and replicability
- Planning to issue an RFI in the summer of 2022



Energy Storage Demonstration and Pilot Grants (\$355 M)

Building three energy storage system projects to improve grid security and reliability and facilitate more clean energy on the grid, including to:

- Supply energy at peak periods of demand on the electric grid
- Reduce peak loads of homes and businesses
- Provide ancillary services for grid stability
- Integrate renewable energy resources
- Increase the feasibility of microgrids
- Integrate fast charging of electric vehicles
- Improve energy efficiency

Current Status

- Issued an RFI that closes in mid-June 2022
- Held a webinar on June 7 and conducting stakeholder outreach



Long Duration Demonstration Initiative & Joint Program (\$150M)

Constructing long-duration energy storage technologies at different scales and supporting new, innovative long-duration energy storage technologies become commercially viable. DOE is also collaborating with the Department of Defense under the Joint Program for long-duration demonstrations on government facilities.

Current Status

- Issued an RFI that closes in mid-June 2022
- Held a webinar on June 7 and conducting stakeholder outreach