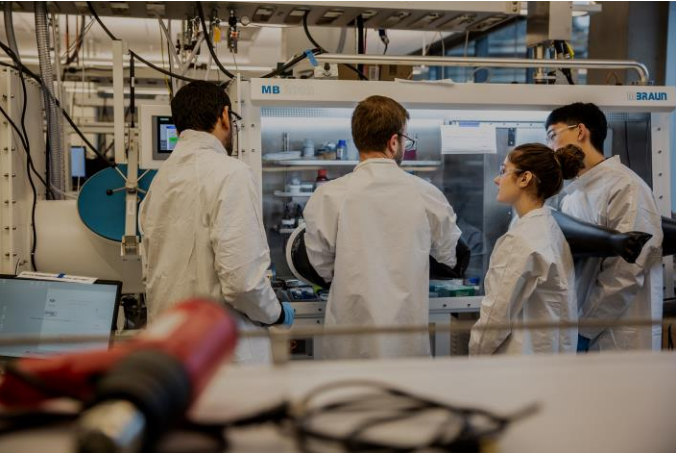


Transforming the Energy Innovation Enterprise

Enhancing the Pace, Agility, Effectiveness, and Efficiency of the
Department of Energy Management Structures and Processes

November 2023

2020s: a decade of opportunity on the frontiers of energy innovation



The “backroom” processes and mechanisms are the key enablers of successful energy innovation



Department of Energy (DOE)
Office of Clean Energy Demonstrations (OCED)

**Bipartisan Infrastructure Law:
Additional Clean Hydrogen Programs (Section 40314):
Regional Clean Hydrogen Hubs Funding Opportunity
Announcement**

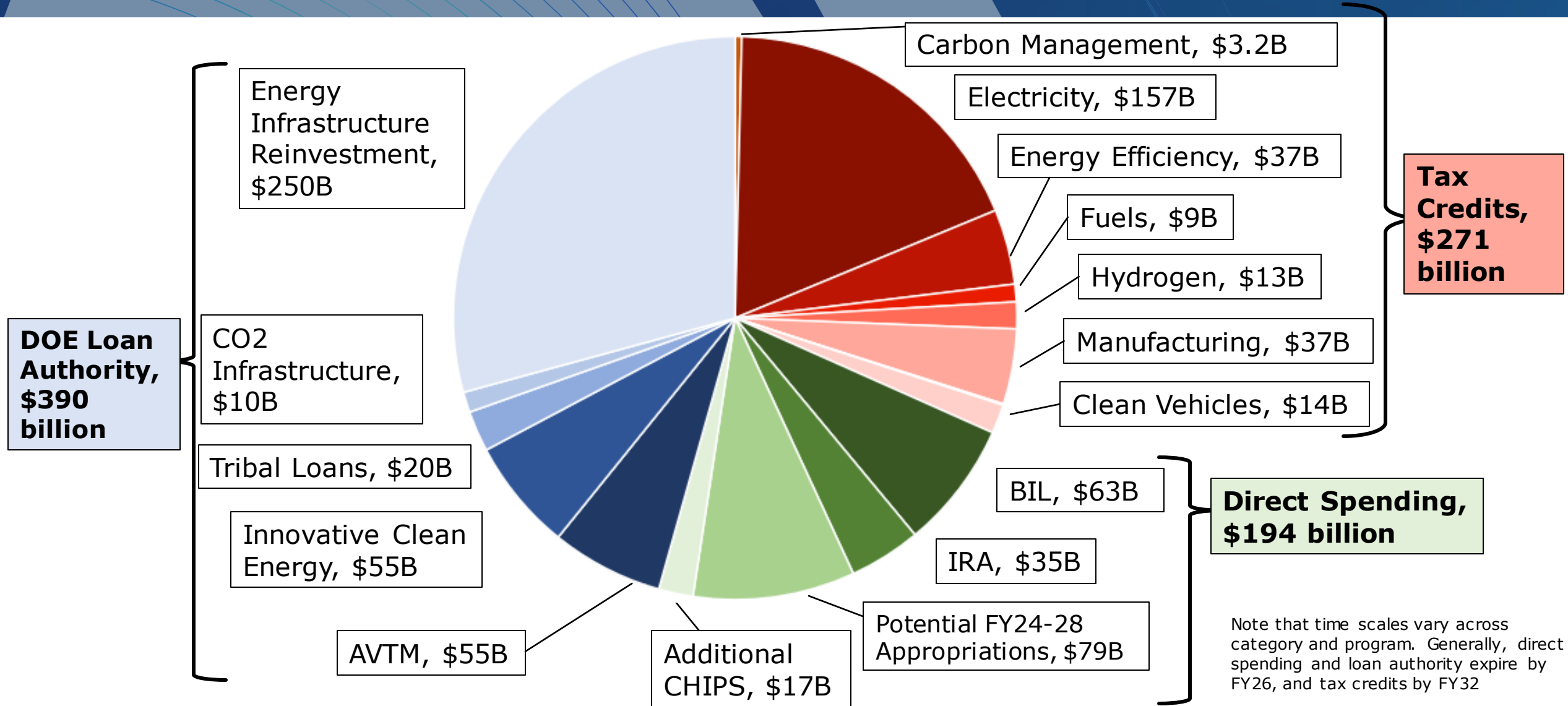
Funding Opportunity Announcement (FOA) Number: DE-FOA-0002779
FOA Type: **Mod 000002**
CFDA Number: 81.255

FOA Issue Date:	9/22/2022
Submission Deadline for Concept Papers:	11/7/2022 5:00pm ET
Concept Paper Encourage/Discourage Notifications:	December 2022
Submission Deadline for Full Applications:	4/7/2023 5:00pm ET
Expected Submission Deadline for Replies to Reviewer Comments:	5/31/2023 5:00pm ET
Pre-Selection Interviews:	Summer 2023
Expected Date for DOE Selection Notifications:	Fall 2023
Expected Timeframe for Award Negotiations:	Winter 2023-2024



Paper by 5:00pm ET on the due date listed above to
tion.
Just register with and submit application materials
oced-exchange.energy.gov, OCED's online
and backup points-of-contact in OCED Exchange with
product award negotiations. If an application is
is not a commitment to issue an award. It is
tee be responsive during award negotiations and
e to do so may result in cancellation of further award
selection.
system for Award Management (SAM) - Each applicant
vide a valid UEI number in its application. See Section

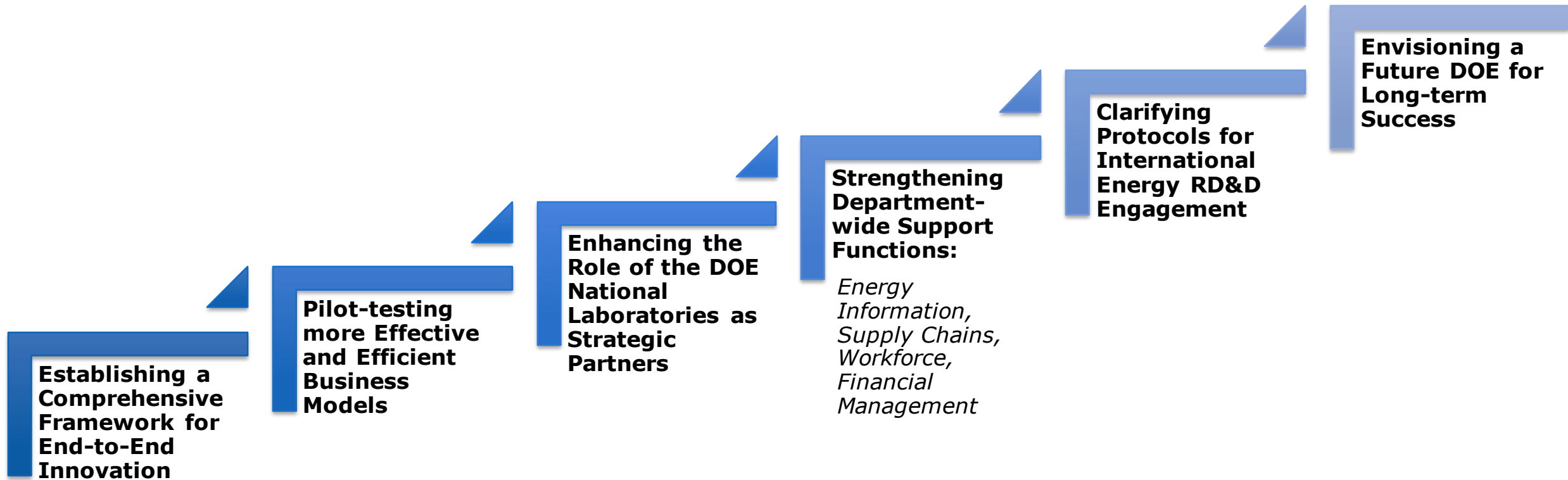
BIL/IRA has provided significant resources to accelerate and expand the innovation pipeline



DOE put in place the initial pieces necessary to accelerate the innovation process

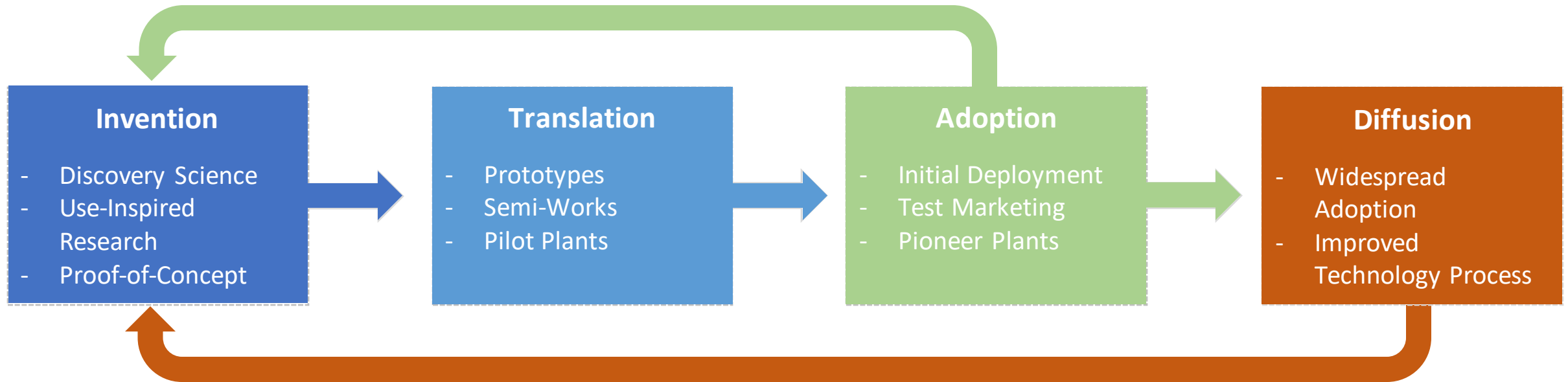


Steps to Build Upon DOE Progress



Accelerating innovation requires end-to-end strategies

Learning by Doing



Learning by Using

Build Connective Tissue to support end-to-end strategies

- Enhance learning by doing, with a key role for National Labs
- Fast track program to advance technologies to demonstration
- Transform SBIR and STTR grants to increase flexibility
- Regional and place-based innovation

Piloting more efficient and effective business models



Objectives:

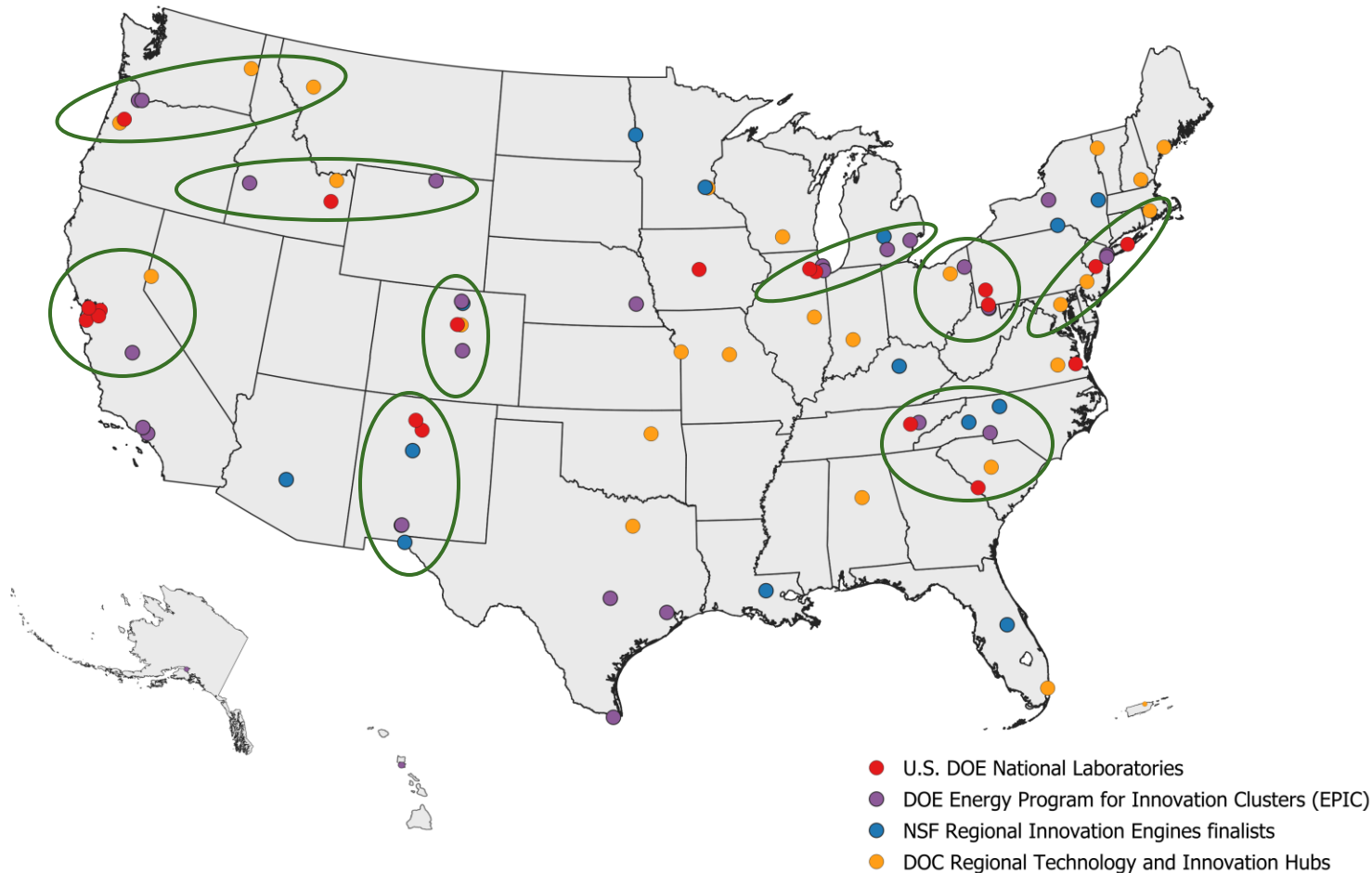
1. Reflect new environment of higher interest rates and legacy inflation
2. Facilitate partnerships with an expanded suite and players

Methods:

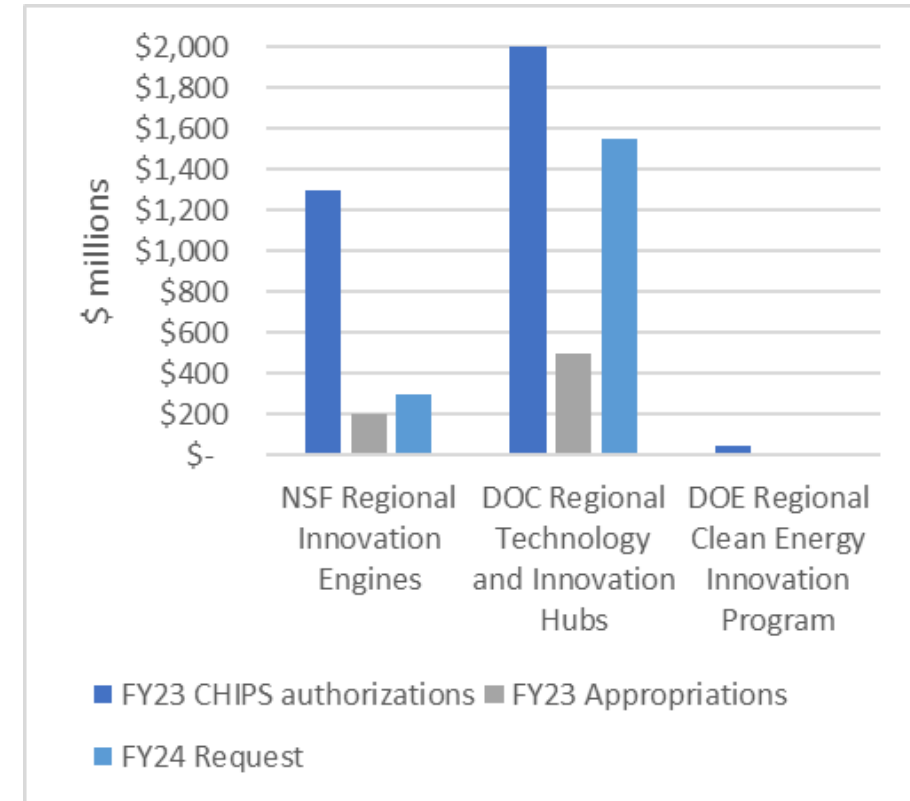
- Blended and stacked finance—grants, loans, tax credits
- Flexible cost-sharing
- Use OTAs and prizes to simplify and speed up paperwork—greater focus on performance requirements rather than procedural compliance
- Stand up FESI to extend DOE funded programs

Foster regional innovation ecosystems

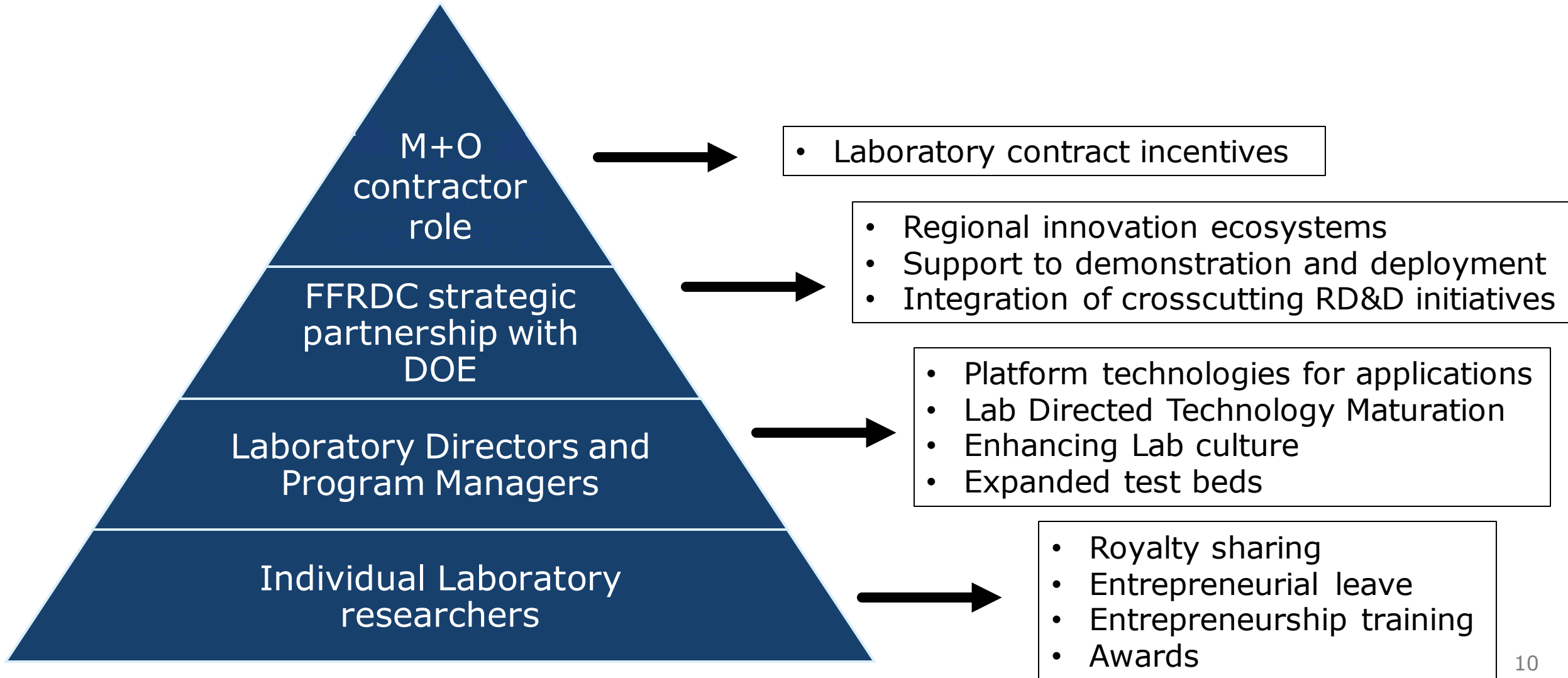
Location of current and future regional and place-based innovation initiatives



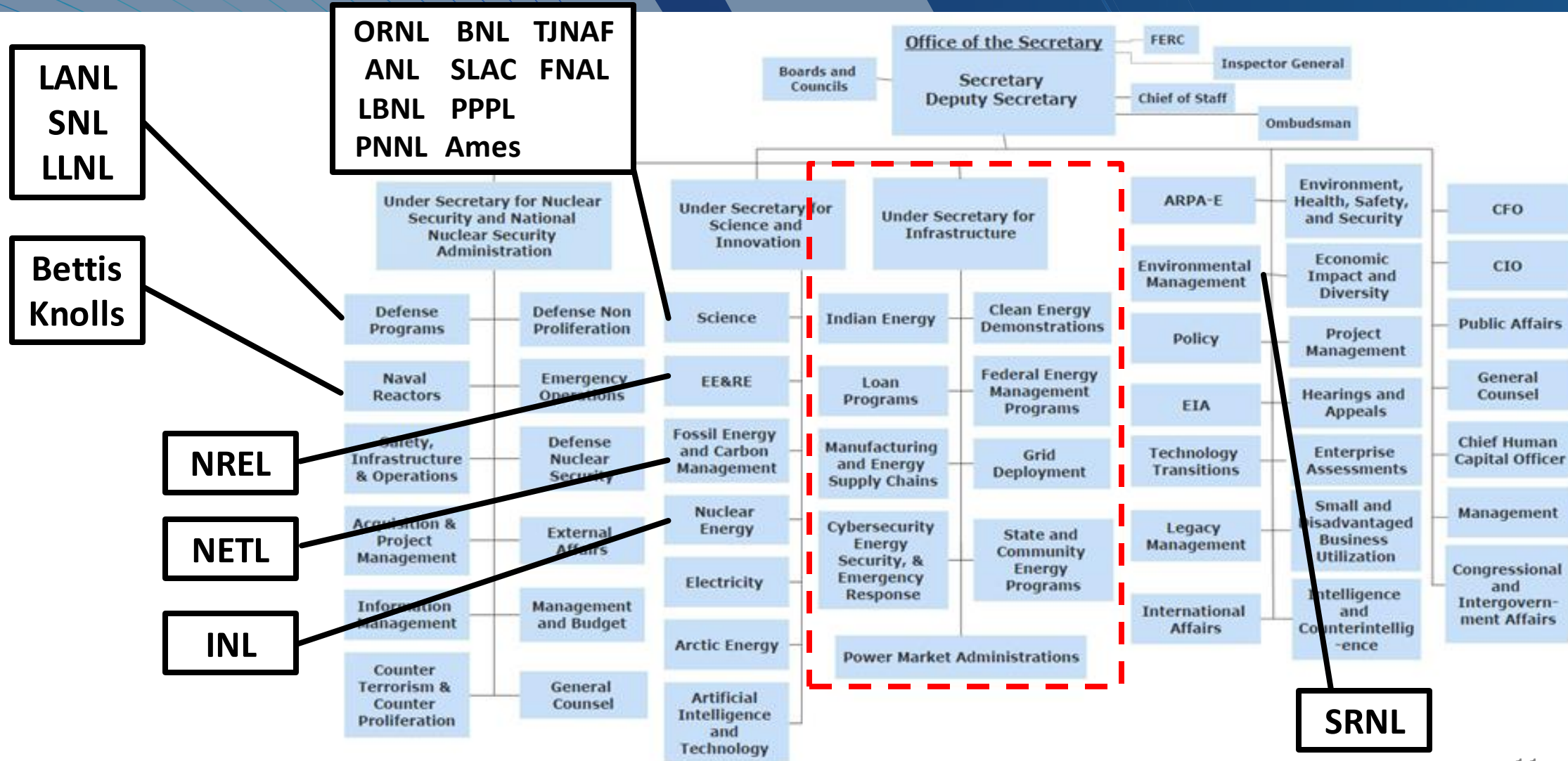
Funding for new regional innovation initiatives



Enhancing the National Laboratories to support accelerated end-to-end energy innovation



National Laboratory Linkages to DOE Organizational Structure



Managing Energy Supply Chains

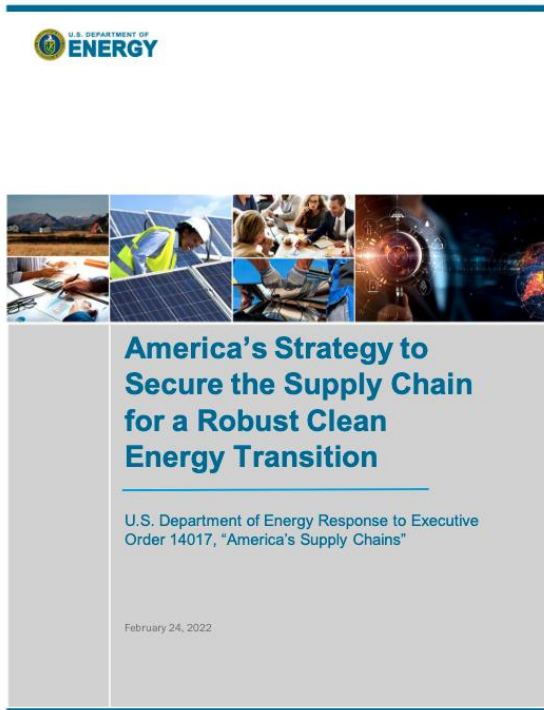
DOE Actions

EFI-recommended next step

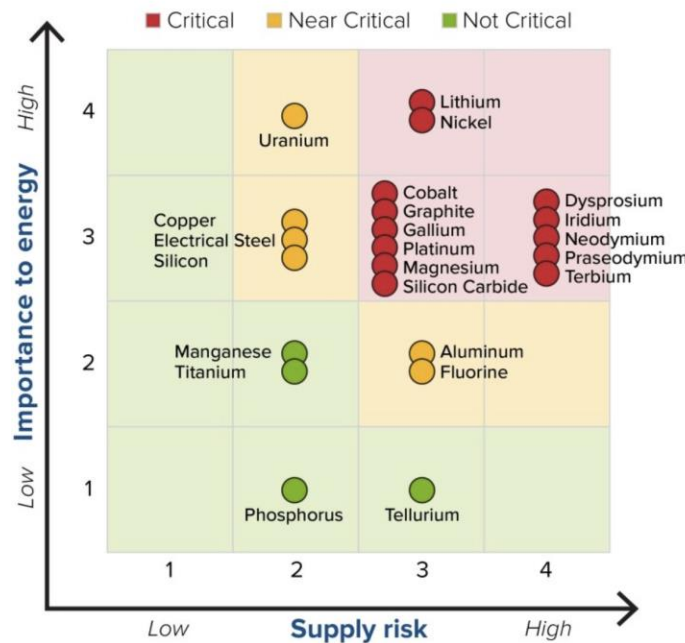
2022 DOE Supply Chain Strategy

2023 DOE Critical Materials Assessment

Critical Materials Supply Chains Roadmap (proposed)



MEDIUM TERM 2025-2035



The DOE Manufacturing and Energy Supply Chain (MESC) office should develop a critical materials supply chain roadmap... The roadmap should expand upon the supply-focused issues in the DOE supply chain strategy report and critical materials assessment to also address opportunities for critical materials recycling and substitution.

Expanding Energy RD&D crosscuts



Office	Biotechnology	Carbon Dioxide Removal*	Clean Energy Technology Manufacturing (formerly Advanced Manufacturing)*	Critical Minerals and Metals	Energy Storage*	Water-Energy Nexus	Grid Modernization	Hydrogen*	Industrial Decarbonization*	Subsurface Innovations*	Affordable Home*
ARPA-E	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
EERE	\$\$	\$	\$\$ ◇	\$\$ ◇	\$\$ ◇	\$\$ ◇	\$\$ ◇	\$\$ ◇	\$\$ ◇	\$\$ ◇	n/a
FECM		\$\$ ◇	\$ ◇	\$ ◇	\$		\$	\$\$ ◇	\$\$ ◇	\$	
NE			\$	\$\$ ◇	\$	\$	\$	\$	\$		
SC	\$\$	\$\$	\$	\$	\$\$	\$		\$	\$\$	\$	n/a
OCED		◇	◇		◇			◇	\$\$ ◇		
OE					\$\$		\$\$ ◇				
GDO							\$\$ ◇				
OTT					\$			\$			n/a
CESER							\$				
NNSA	\$										
SCEP											n/a
ED											n/a
FEMP											n/a
OP											n/a
FY24 Proposed Total	907.2	188.0	464.2	403.6	619.7	146.8	785.9	381.7	1257.9	247.3	n/a
FY23 Appropriations	839.2	163.9	354.9	363.4	600.5	100.6	944.1	417.5	1006.5	191.2	n/a

* Also an Energy Earthshot

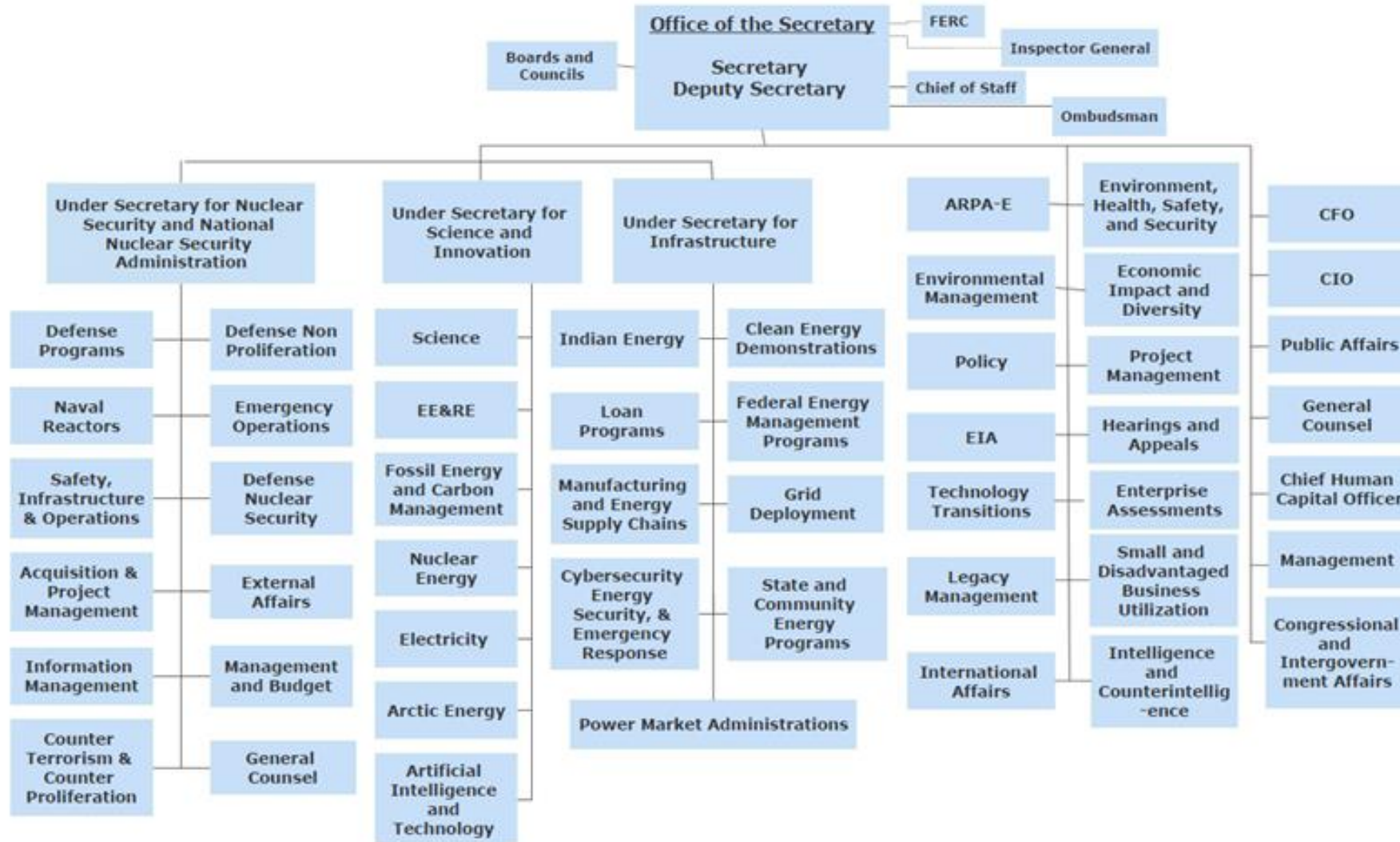
▲ TBD (ARPA-E funding determined annually based on priorities)

\$ <\$50 million requested in FY24
 \$\$ >\$50 million requested in FY24
 ◇ Received BIL/IRA Funding

Effective Crosscutting Initiatives: 7 Essential Elements



Hybrid DOE Organizational Structure: Fuels, Technologies, Innovation, End Uses



Functional taxonomy of current DOE Program Organizations

Fuels

- Nuclear
- Solar
- Wind
- Water
- Coal
- Petroleum and Natural Gas
- Geothermal
- Bioenergy

Technologies and Crosscuts

- Electricity and Grid Technologies
- Cybersecurity, Energy Security, and Emergency Response
- Energy Storage
- Carbon Management
- Artificial Intelligence and Technology
- Arctic Energy
- State and Community Energy Programs
- Materials

Stage of Innovation

- Science
- OCED
- ARPA-E
- OTT
- LPO
- FEMP

End Uses

- Building Technologies
- Vehicle Technologies
- Advanced Manufacturing
- Industrial Efficiency and Decarbonization
- Indian Energy
- Grid Deployment Office

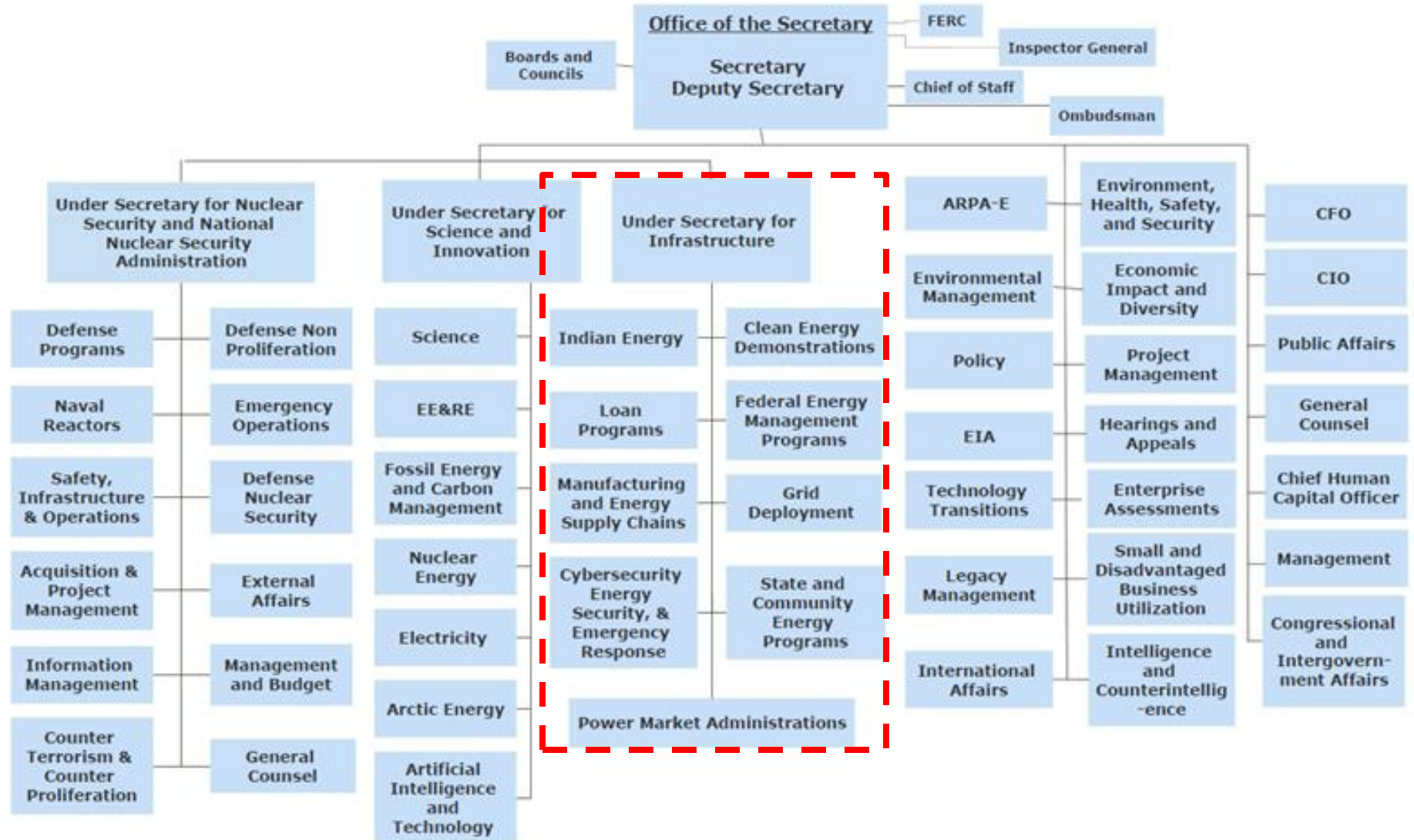
Move toward organizational structure based on end-use markets over time?

DOE organizational changes focus on near term implementation of BIL and IRA



DOE organizational structure is increasingly hybrid mix of fuels, technologies, innovation states, and end uses

Under Secretary for Infrastructure responsible for \$84 Billion BIL and IRA portfolio



Industrial innovation: uniquely complex challenge

Comprehensive crosscutting RD&D strategy

Multiple objectives

- Market dynamics (including disruptive change)
- Product quality
- Potential future innovation
- Productivity
- Competitiveness and trade
- Supply chain risk
- Workforce requirements
- Community impacts
- Stranded asset risk (e.g., fossil fuel ban)

Multiple technologies

- Industrial CCS
- Electrification of process heating
- Industrial heat pumps
- Clean hydrogen
- Nuclear heat
- Biochemical process change
- Lower temperature thermochemical processes

Multiple DOE organizations

- FECM
- IEDO
- OCED
- AMMTO
- MESC
- HTFC
- NE
- SC
- ARPA-E

Application of platform technologies, such as AI, computing and simulation, synthetic biology, micro nuclear reactors, etc., could lead to disruptive change