

Overview of Energy Storage at the DOE and Office of Electricity

Office of Electricity
Energy Storage Division

January 2023

Energy Storage Grand Challenge Map of DOE Storage Activities

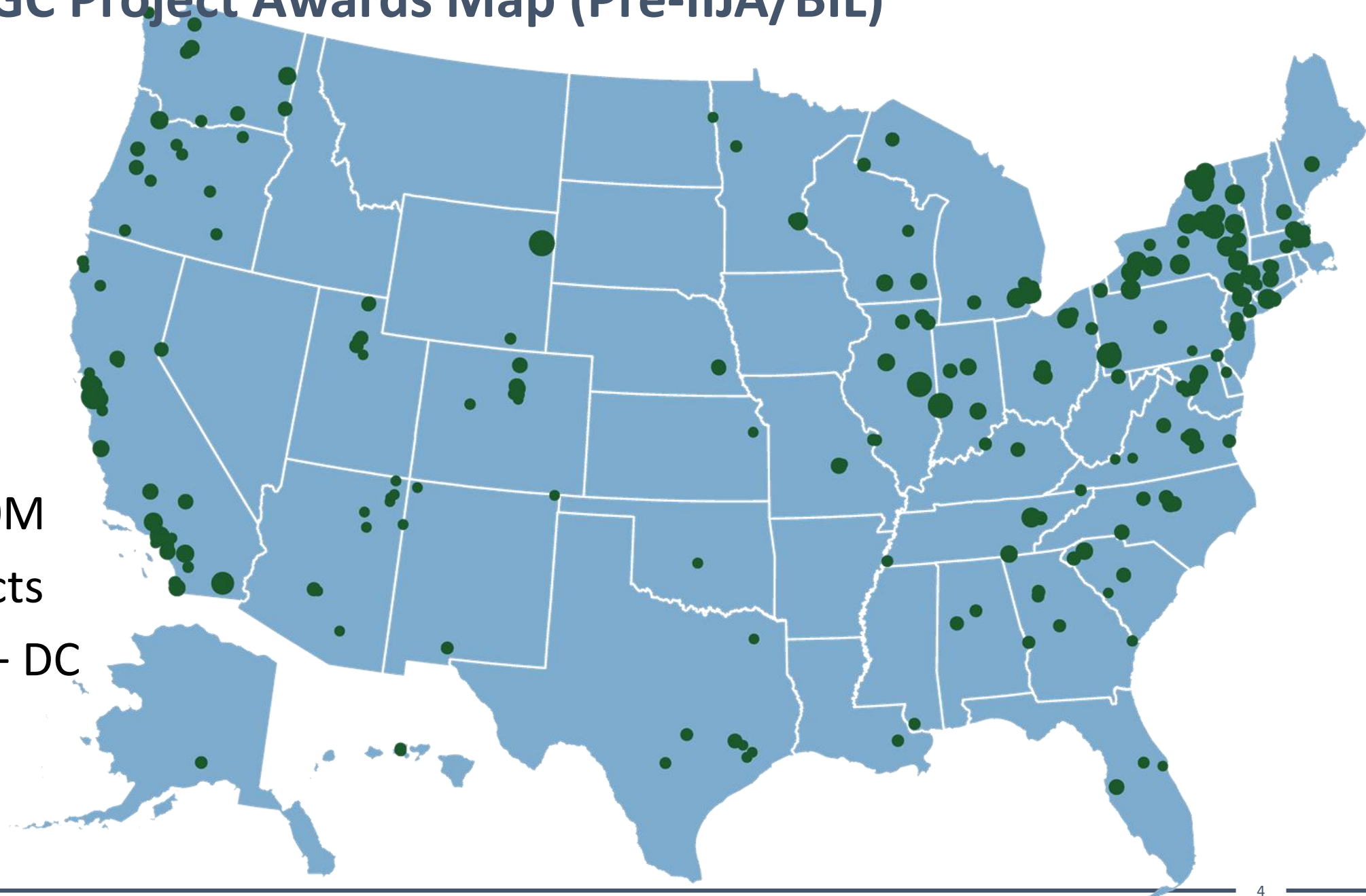
	Materials	Components & Devices	System Design	Grid & System Integration	Supply Chain & Manuf.	Operations	End of Life	Investment & Finance	Markets & Value	Workforce
Electro-chemical	VTO, ARPA-E, OE, SC-BES	AMO, VTO, ARPA-E, OE	VTO, ARPA-E, . OE SETO	AMMTO, VTO. OE	AMMTO, MESC	OE, OCED	VTO	LPO, OTT, OCED, OE, AMMTO, LPO, SETO	OE, OTT, EERE-SA, GTO, WPTO, SETO, IEDO, BTO	AMMTO, VTO, OP, OTT
Electro-mechanical	ARPA-E, WPTO	ARPA-E, WPTO	ARPA-E, WPTO	WPTO, OE	WPTO, AMMTO	OCED				
Thermal	ARPA-E, SETO, SC-BES, BTO	SETO, BTO	SETO, BTO	SETO, BTO	AMMTO, BTO	OCED, SETO	SETO			
Chemical	HFTO, SC-BES, ARPA-E	HFTO	HFTO	HFTO	AMMTO	OCED				
Power Electronics	SC-BES, OE, ARPA-E	ARPA-E, AMMTO, OE,VTO	AMO, OE, VTO, CESER	VTO, OE, CESER	AMMTO	OE				

ARPA-E: Advanced Research Projects Agency–Energy, AMMTO: Advanced Materials and Manufacturing Technologies Office, BTO: Building Technologies Office, FE: Office of Fossil Energy, GTO: Geothermal Technologies Office, HFTO: Hydrogen and Fuel Cell Technologies Office, IEDO: Industrial Efficiency and Decarbonization Office, OE: Office of Electricity, OP: Office of Policy, SETO: Solar Energy Technologies Office, LPO: Loan Programs Office, SC-BES: Office of Science Basic Energy Sciences, VTO: Vehicle Technologies Office, WETO: Wind Energy Technologies Office, WPTO: Water Power Technologies Office

Office of Electricity: Focus on Storage for the Grid

	Materials	Components & Devices	System Design	Grid & System Integration	Supply Chain & Manuf.	Operations	End of Life	Investment & Finance	Markets & Value	Workforce	
Electro-chemical	Cost-Competitive LDES		Grid & Field Validation			Reliability & Safety					
Electro-mechanical	<ul style="list-style-type: none"> Increased energy density, cell sizes, etc. for Sodium, Aqueous Soluble Organic, Zinc, Redox Flow battery chemistries 		<ul style="list-style-type: none"> New demo systems in IA, AL, NM, WA 								
Thermal						<ul style="list-style-type: none"> Emergency response training support for utilities, fire departments Expertise for ESS Fire Codes & Standards (NFPA, IFC, UL) 			Storage Analytics		
Chemical	<ul style="list-style-type: none"> World's first high power modular GAN-based inverter 						Developing operational standards : <ul style="list-style-type: none"> IEEE 1547.9 ES Interconnection IEEE P2686 BMS IEEE P2688 EMS 				<ul style="list-style-type: none"> QuEst: An open-source tool for Energy Storage financial evaluation Storage tutorials to commissions in IL, PA, MI, UT, IN
Power Electronics	Cost-Competitive LDES		Grid & Field Validation			Reliability & Safety					

DOE-Wide ESGC Project Awards Map (Pre-IIJA/BIL)



2020-2021

- Over \$550M
- 250 projects
- 45 states + DC

Recent and Ongoing Storage (or Related) Opportunities

Name and Link	Offices	Closing	Amount	Storage
Grid Resilience Utility and Industry Grants	GDO	12/16/2022	\$2.5B	Eligible
Storage Innovations 2030 Prize	OE	12/16/2022	\$300K	Targeted
Long-Duration Energy Storage Demonstrations	OCED, OE	12/22/2022	\$349.0M	Targeted
Innovations to Accelerate Energy Storage Deployment	SC, OE	1/3/2023	\$500K	Targeted
Grid Innovation Program	GDO	1/13/2023	\$5.0B	Eligible
AMMTO-BTO and OE FY22 Multi-Topic FOA	EERE	2/3/2023	\$17.5M	Eligible
Distributed BESS Integration and Coordination	EERE	2/7/2023	\$6.0M	Targeted
Innovative Pumped Storage Hydropower Technologies	EERE	3/6/2023	\$6.0M	Targeted
Energy Earthshot Research Centers	SC	3/7/2023	\$200M	Targeted
Clean Energy Demos on Current and Former Mine Land	OCED	TBD	\$500.0M	Eligible
Underserved and Indigenous Community Microgrids	OE	TBD	\$9.1M	Eligible

LONG DURATION STORAGE SHOT TARGET



Reduce storage costs by
90% from a 2020
Li-ion baseline...



...in storage systems that
deliver **10+**
hours of duration



...in **1** decade

Affordable grid storage for clean power – any time, anywhere

New Signature Facility for Storage Advancement




- Expected Completion: Early 2024
- 90,000 sq. ft facility
- Provide systematic and independent validation of new grid storage technologies from basic materials and components, through prototyping under grid operating conditions (<100kW)

\$75M
TOTAL
ESTIMATED
FACILITY COST

100 WORKSTATIONS
30+ LAB MODULES

\$35M
NON-FEDERAL
INVESTMENTS

\$15M 
\$8M 

\$7M 
\$5M 