

Overview of DOE Energy Storage Funding Under Infrastructure Act



U.S. DEPARTMENT OF
ENERGY



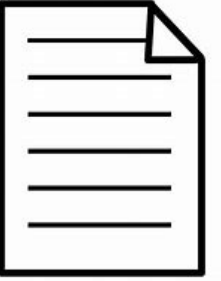
Sandia National Laboratories

FEMA Webinar Series:
*Energy Storage and Microgrids for
Energy Resilience and Reliability*

Russ Weed
CleanTech Strategies 

April 12, 2023

Presentation Outline



- **CleanTech Strategies Background**
- **Looking Backward: Infrastructure Investment and Jobs Act (IIJA)**
- **Overview of Energy Storage Funding Under IIJA**
- **Specifics of IIJA Programs That Are Funding Storage**
- **Looking Forward: \$3.4B (est.) of Energy Storage Funding Under IIJA**



CleanTech Strategies Background



**Russ
Weed,
principal**

Energy storage expert with 12 years industry experience, including development, revenue, legal management, and advisory

Founding management of flow battery company in 2012

Established consulting firm CleanTech Strategies LLC in 2018

J.D.; executive at General Electric, mid-market companies, start-ups



**Bob
Kirchmeier,
consultant**

Electrical engineer with over 40 years experience in power industry

Program manager of Washington State Clean Energy Fund Grid Modernization program since 2013

Joined Washington State University Energy Program in 2021; contracting with CleanTech Strategies

P.E.; upper management at utilities



**Chris
Murray,
consultant**

Washington, DC veteran with almost 20 years experience in "the Beltway"

Served a U.S. Senator, the White House, Federal Energy Regulatory Commission, US Navy

Established sole proprietorship Poterre in 2019; contracting with CleanTech Strategies

J.D.; manager at Washington, D.C. utility



**Curt
Kirkeby,
consultant**

Electrical engineer with 41 years utility experience

Innovation and technology grid-edge strategist for 20 years

Advanced grid automation control development for 15 years; contracting with CleanTech Strategies

P.E.; technology patent holder for multiple grid edge technologies



Looking Backward: IIJA (a.k.a. BIL)

Nov. 15, 2021

[H.R. 3684]

An Act

To authorize funds for Federal-aid highways, highway safety programs, and transit programs, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the “Infrastructure Investment and Jobs Act”.

GUIDEBOOK MAY 2022

A GUIDEBOOK TO THE BIPARTISAN INFRASTRUCTURE LAW FOR STATE, LOCAL, TRIBAL, AND TERRITORIAL GOVERNMENTS, AND OTHER PARTNERS

<https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf>

After IIJA’s enactment at 2021 end, 2022 was its first year of implementation, focused on planning and program roll-out by the various Agencies including DOE. 2023 is the second year of IIJA’s implementation, in DOE’s case focused on preparing and releasing funding opportunities, then proposal evaluations and award selections, and subsequent information exchange, negotiations, and contracting between DOE and awardees.



IIJA Funds Long Duration Energy Storage Budgeted by 2020 Energy Act and Prioritized by DOE

SEC. 41001. ENERGY STORAGE DEMONSTRATION PROJECTS.

(a) ENERGY STORAGE DEMONSTRATION PROJECTS; PILOT GRANT PROGRAM.—There is authorized to be appropriated to the Secretary to carry out activities under section 3201(c) of the Energy Act of 2020 (42 U.S.C. 17232(c)) \$355,000,000 for the period of fiscal years 2022 through 2025.

(b) LONG-DURATION DEMONSTRATION INITIATIVE AND JOINT PROGRAM.—There is authorized to be appropriated to the Secretary to carry out activities under section 3201(d) of the Energy Act of 2020 (42 U.S.C. 17232(d)) \$150,000,000 for the period of fiscal years 2022 through 2025.

IIJA sections 41001(a) and (b) provide \$505M in funds for demonstration-scale storage projects that were budgeted under the Energy Act of 2020 (Senate Energy Cmte., led by Sens. Cantwell and Murkowski), but not previously appropriated.

DOE is applying a long duration (10+ hours discharge) requirement to all projects under these IIJA sections.



Overview of Energy Storage Funding Under IIJA

IIJA Programs	IIJA Funding
Resilience – Utilities section 40101	\$5B
Resilience – States & Tribes section 40103(b)	\$5B
Resilience – Remote Areas section 40103(c)	\$1B
Grid Modernization section 40107	\$3B
Advanced Manufacturing section 40209	\$750M
Clean Energy Projects on Mine Lands section 40342	\$500M
Storage Demonstrations section 41001(a)	\$355M
Long-Duration Storage Demonstrations section 41001(b)	\$150M
TOTAL	\$15.755B



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Grid Modernization section 40107	\$3B
Advanced Manufacturing section 40209	\$750M
Clean Energy Projects on Mine Lands section 40342	\$500M
Storage Demonstrations section 41001(a)	\$355M
Long-Duration Storage Demonstrations section 41001(b)	\$150M
TOTAL	\$15.755B



Specifics of IIJA Programs Funding Storage: Long Duration Energy Storage (LDES)

- The next 4 slides go through the two IIJA sections funding LDES.
- The information includes the specific objectives of each section, the types of projects they will fund, and their status.
- DOE has grouped both LDES sections under one Funding Opportunity Announcement (FOA).
- The deadlines for submitting letters of intent (LOI's) or concept papers (CP's), and full applications have passed. But there are still many opportunities to participate in the future.



DOE FOA: “Long Duration Energy Storage Demonstrations”

DOE has grouped IIJA sections 40101(a) and 40101(b) under one FOA directed to “Long Duration Energy Storage Demonstrations.”

DOE has issued a LDES FOA for \$349M. Also a LDES lab call for \$30M (only DOE US National Labs are eligible).

IIJA Programs	IIJA Funding
Resilience – Utilities section 40101	\$5B
Resilience – States & Tribes section 40103(b)	\$5B
Resilience – Remote Areas section 40103(c)	\$1B
Grid Modernization section 40107	\$3B
Advanced Manufacturing section 40209	\$750M
Clean Energy Projects on Mine Lands section 40342	\$500M
Storage Demonstrations section 41001(a)	\$355M
Long-Duration Storage Demonstrations section 41001(b)	\$150M
TOTAL	\$15.755B



IIJA Sec. 41001(a)

“Energy Storage Demonstration Projects; Pilot Grant Program”

This program dedicated to LDES demonstrations is “in the thick of it,” with full applications submitted in March 2023. The FOA states the expected date for selection notifications is Summer 2023, with award negotiations in Fall 2023.

- **\$355M of grants**
- Managed by DOE Office of Clean Energy Demonstrations (OCED), supported by Office of Electricity (OE) and Energy Efficiency & Renewable Energy (EERE)
- Eligible entities include higher education institutions, for-profit and non-profit entities, State and local governmental entities, and Tribal Nations
- FOA issued for \$349M on November 14, 2022
- LOI's for each Topic, including behind-the-meter Storage (Topic 2A), front-of-meter (transmission-connected) Storage (Topic 2B), and multi-day Storage (Topic 2C), were due December 22, 2022.
- Full applications were due March 3, 2023.

[Long-Duration Energy Storage Demonstrations | Department of Energy](#)



IIJA Sec. 41001(a)

“Energy Storage Demonstration Projects; Pilot Grant Program”



FOA Mod 000003, pg. 15



IIJA Sec. 41001(b)

“Long-Duration Demonstration Initiative and Joint Program”

This program also dedicated to LDES demonstrations is “in progress.” The DOE National Labs have competed under the \$30M lab call, including LOI’s, DOE feasibility study funding, full applications by the Labs, and in-person Lab presentations in Chicago in April 2023.

\$150M of total grants

- Also managed by OCED, supported by OE and EERE

\$30M of grants to US National Labs now in process

- Lab presentations in Chicago in April 2023

[Financial Opportunities: Funding Opportunity Exchange \(energy.gov\)](https://energy.gov/financial-opportunities/funding-opportunity-exchange)

\$120M of further grants still to come

- \$75M for “Demonstration Initiative” projects with mid-maturity (Technology Readiness Level, or “TRL,” 4-6) Storage technologies
- \$45M for “Joint Program” projects on DOD premises including Storage

[Long-Duration Energy Storage Demonstration Initiative and Joint Program | Department of Energy](https://www.energy.gov/long-duration-energy-storage-demonstration-initiative-and-joint-program)



Specifics of IIJA Programs Funding Storage: Grid Resilience

- The next 4 slides go through three of the IIJA sections directed to grid resilience, which include funding for energy storage.
- The information includes the specific objectives of each section, the types of projects they will fund, and their status.
- DOE has grouped these three IIJA sections under one FOA.
- In some cases, funding awards have already been announced, or the deadlines for submitting LOI's, CP's, and/or full applications have passed. But again, there are still many opportunities to participate in the future, including for subsequent FY.



DOE FOA: “Grid Resilience and Innovation Partnerships”

DOE has grouped IIJA sections 40101, 40103(b), and 40107 under one FOA directed to “Grid Resilience and Innovation Partnerships,” or “GRIP.”

For the first two fiscal years (FY22-23) of GRIP’s total of five years (FY22-26), DOE has issued a GRIP FOA totaling about \$3.8B. DOE has indicated that for FY24, it will issue a next GRIP FOA of about \$2B.

IIJA Programs	IIJA Funding
Resilience – Utilities section 40101	\$5B
Resilience – States & Tribes section 40103(b)	\$5B
Resilience – Remote Areas section 40103(c)	\$1B
Grid Modernization section 40107	\$3B
Advanced Manufacturing section 40209	\$750M
Clean Energy Projects on Mine Lands section 40342	\$500M
Storage Demonstrations section 41001(a)	\$355M
Long-Duration Storage Demonstrations section 41001(b)	\$150M
TOTAL	\$15.755B



IIJA Sec. 40101

“Preventing Outages and Enhancing the Resilience of the Electric Grid”

IIJA sec. 40101 is focused on outage prevention and grid resilience, including Storage.
If 20% of the \$5B of sec. 40101 funding goes to Storage, that's \$1B.

- **Subsection (d)**: \$2.5B total for formula-based grants to States and Tribes, to award to “eligible entities”
- Eligible entities include electric grid operators, electricity storage operators, electricity generators, transmission owners and operators, distribution providers, fuel suppliers, other entities determined by DOE
- DOE grants of \$2.3B announced Nov. 17, 2022

[Biden Administration Announces \\$2.3 Billion for States and Tribes to Strengthen and Modernize America's Power Grid | Department of Energy; Section 40101\(d\) Formula Grants to States & Indian Tribes | netl.doe.gov; Microsoft Word - 40101d Formula Grant Allocations - ALRD Amendment 003.docx \(doe.gov\)\)](#)

- States and Tribes planned their funding distributions to eligible entities and submitted their applications to DOE on Mar. 31, 2023 for the first round of funding, e.g. Washington State:

[Infrastructure Investment and Jobs Act - Washington State Department of Commerce](#)

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- **Subsection (c)**: \$2.5B total for competitive grants to eligible entities; FOA for \$918M issued Nov. 18, 2022

[Biden-Harris Administration Launches \\$10.5 Billion Investment to Strengthen America's Electric Grid | Department of Energy](#)

- Concept papers were due Dec. 16, 2022, with full applications due April 6, 2023. Selection notification is expected in summer 2023, with award negotiations in fall 2023.



IIJA Sec. 40103(b)

“Electric Grid Reliability and Resilience RD&D”

IIJA sec. 40103, subsection (b), is focused on grid research, development, and demonstration, including Storage. If 20% of the \$5B of sec. 40103(b) funding goes to Storage, that's \$1B.

- **\$5B total of “federal financial assistance”** [CFR, Title 2, sec. 200.1]
- “Energy Infrastructure Federal Financial Assistance Program”
- Eligible entities include States, Tribes, Local Government Units, Public Utility Commissions
- FOA for \$1.82B issued Nov. 18, 2022
[Biden-Harris Administration Launches \\$10.5 Billion Investment to Strengthen America’s Electric Grid | Department of Energy](#)
- Concept papers were due Jan. 13, 2023, with full applications due May 19, 2023. Selection notification is expected in fall 2023, with award negotiations in winter 2023.



IIJA Sec. 40107

“Deployment of Technologies to Enhance Grid Flexibility”

IIJA sec. 40107 is focused on grid flexibility, including Storage.
If 20% of the \$3B of sec. 40107 funding goes to Storage, that's \$600M.

- Funding and expansion of eligible activities under the Smart Grid Investment Matching Grant Program established under the Energy Independence and Security Act of 2007, e.g.:
<https://www.pnnl.gov/projects/transactive-systems-program/pacific-northwest-smart-grid-demonstration>
- Eligible entities include higher education institutions, for-profit and non-profit entities, State and local governmental entities, and Tribal Nations
- FOA for \$1.08B issued Nov. 18, 2022
[Biden-Harris Administration Launches \\$10.5 Billion Investment to Strengthen America's Electric Grid | Department of Energy](#)
- Concept papers were due Dec. 16, 2022, with full applications due March 17, 2023. Selection notification is expected in summer 2023, with award negotiations in fall 2023.



Specifics of IIJA Programs Funding Storage: More Resilience, Manufacturing, Mine Lands

- The next 4 slides go through the three further IIJA sections which also include funding for energy storage, including resilience for rural or remote areas, advanced manufacturing, and clean energy on mine lands.
- The information includes the specific objectives of each section, the types of projects they will fund, and their status.
- In some cases, the deadlines for submitting LOI's, CP's, and/or full applications have passed. But again, there are still many opportunities to participate in the future.



Specifics of IIJA Programs Funding Storage: More Resilience, Manufacturing, Mine Lands

IIJA Programs	IIJA Funding
Resilience – Utilities section 40101	\$5B
Resilience – States & Tribes section 40103(b)	\$5B
Resilience – Remote Areas section 40103(c)	\$1B
Grid Modernization section 40107	\$3B
Advanced Manufacturing section 40209	\$750M
Clean Energy Projects on Mine Lands section 40342	\$500M
Storage Demonstrations section 41001(a)	\$355M
Long-Duration Storage Demonstrations section 41001(b)	\$150M
TOTAL	\$15.755B



IIJA Sec. 40103(c)

“Electric Grid Reliability and Resilience RD&D”

IIJA sec. 40103(c) will fund grid RD&D, including energy storage, focusing on rural or remote areas.

(Sec. 40103(b) covered above focuses on funding State, Tribes, local government, and public utility commissions in connection with RD&D on energy storage.)

If 20% of the \$1B of sec. 40103(c) funding goes to Storage, that's \$200MM.

- **\$1B total of “federal financial assistance”** [see CFR, Title 2, sec. 200.1]
- Managed by OCED
- Required Activities: DOE to improve resilience, safety, reliability, and availability of energy, and environmental protection from adverse impacts of energy generation, in "rural or remote areas," defined as a city, town or unincorporated area with no more than 10,000 people
- FOA was issued March 1, 2023. Concept papers are due April 14. Full applications are due June 28, 2023.

[Financial Opportunities: Funding Opportunity Exchange \(energy.gov\)](https://energy.gov/foa)



IIJA Sec. 40209

“Advanced Energy Manufacturing and Recycling Grant Program”

IIJA sec. 40209 is directed at advanced energy product manufacturing and recycling in the US, with a focus on supporting communities where coal mines or coal power plants have closed. If 10% of the \$750M of sec. 40209 funding goes to Storage, that's \$75MM.

- **\$750M total of grants**
- Managed by DOE Office of Manufacturing and Energy Supply Chains (MESC)
- Eligible entities include US manufacturing firms with annual sales of <\$100M, <500 employees at firm's plant site, and annual energy bills >\$100K but <\$2.5M
- Build new or retrofit existing manufacturing and industrial facilities in the US, to produce or recycle advanced energy products in communities where coal mines or coal power plants have closed
- Qualified projects must be in, or immediately adjacent to, a census tract (which average 4,000 people; see [Census Tracts](#)) where a US coal mine closed in 2000 or later, or a US coal-fired electricity generating unit was retired in 2010 or later.
- MESC issued a FOA on February 13, 2023. Concept papers were due March 14, with full applications due June 8, 2023.

[Financial Opportunities: Funding Opportunity Exchange \(energy.gov\)](#)



IIJA Sec. 40342

“Clean Energy Demonstration Program on Current and Former Mine Land”

IIJA sec. 40342 is directed at clean energy projects on current and former mine land.
If 10% of the \$500 of sec. 40342 funding goes to Storage, that's \$50MM.

- **\$500M total of funding**
- Managed by OCED
- Act specifies the program shall demonstrate the technical and economic viability of carrying out “clean energy projects” on current and former “mine land,” with DOE selecting not more than 5 projects, to be carried out in geographically diverse regions, at least 2 of which shall be solar projects.
- “clean energy project” means project demonstrating 1 or more of the following technologies: (A) Solar; (B) Micro-grids; (C) Geothermal; (D) Direct air capture; (E) Fossil-fueled electricity generation with carbon capture, utilization, and sequestration; (F) Energy storage, including pumped storage hydropower and compressed air storage; (G) Advanced nuclear technologies.
- “mine land” means (A) land subject to titles IV and V of the Surface Mining Control and Reclamation Act of 1977; and (B) land that has been claimed or patented subject to ‘Mining Law of 1872
- DOE issued a \$450M FOA on April 4, 2023, with concept papers due May 11, 2023, and full applications due August 31, 2023.

[OCED eXCHANGE: Funding Opportunity Exchange \(energy.gov\)](https://energy.gov/oced-exchange)



Looking Forward: IIJA Could Provide Approximately \$3.4B in Funding to Energy Storage

The \$3.4B figure is based on adding the \$505M under the LDES-dedicated sections, plus an estimated 20% of the total grid resiliency funding of \$14B, plus an estimated 10% of the \$1.25B funding for advanced manufacturing and clean energy on mine lands.



Foreshadow: \$369B of IRA Funding of Climate and Energy Provisions

The \$369B is a “score” by the Congressional Budget Office, not a funding limit.
If clean energy projects and products are able to receive more incentive tax credits (ITC) and/or production tax credits (PTC) than estimated, the funding could be greater.

Table 1. Conventional Budget Estimates of the Inflation Reduction Act, FY2022-2031

[DOWNLOAD DATA](#)

Billions of Dollars, Change from Current-Law Baseline

Provision	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Budget window
Extension of expanded ACA subsidies	0.0	-16.9	-23.5	-24.3	-4.9	0.0	0.0	0.0	0.0	0.0	-69.5
<i>Under illustrative permanent extension scenario</i>	0.0	-16.9	-23.5	-24.3	-25.0	-26.0	-26.9	-27.7	-28.5	-29.6	-228.4
Climate and energy provisions	0.0	-19.7	-35.7	-45.9	-50.9	-48.0	-40.8	-42.9	-43.7	-41.5	-369.0
Minimum tax on book income of certain corporations	0.0	32.5	28.3	23.0	22.0	23.1	27.0	31.3	34.9	38.1	260.2
Carried interest tax reform	0.0	1.3	1.6	1.5	1.4	1.4	1.4	1.5	1.5	1.5	13.1
Prescription drug pricing reforms	0.0	2.1	2.8	16.5	14.1	41.3	43.2	46.7	48.7	51.0	266.4
IRS funding	0.0	-3.4	-0.8	5.6	11.8	16.6	22.4	26.6	31.3	36.5	146.6
Total	0.0	-4.0	-27.3	-23.6	-6.5	34.4	53.3	63.1	72.7	85.6	247.8
<i>Addendum: Total under illustrative permanent extension scenario</i>	0.0	-4.0	-27.3	-23.6	-26.6	8.4	26.4	35.4	44.2	56.0	88.9

Note IRA funding of climate and energy is 100x of estimated IJA funding of energy storage.



Presentation Notes

- This presentation and commentary are intended to inform (but not advise) on the funding of energy storage under IIJA, as well as to share lessons now being learned in 2023 by stakeholders (system integrators, utilities, independent power producers, states, trade associations, and other industry participants) in multiple efforts to compete for that funding.
- These multiple efforts date from June 2022 to present in connection with DOE's LDES solicitations, including \$349M FOA and \$30M lab call; DOE's GRIP solicitations, including \$3.8B in the current FY22-23 funding cycle; Energy Improvement in Rural or Remote Areas \$1B FOA; and Clean Energy on Mine Lands \$450M FOA. More DOE solicitations totaling over \$7B are to come, including Demonstration Initiatives, DOD Joint Program, and more GRIP funding for FY24-26.



CleanTech Strategies Experience

CleanTech Strategies provides consulting, government relations, grant writing, and engineering services, including in the states and Washington, DC.

Currently consulting to seven (7) companies seeking funding under DOE, DOD, and Treasury programs.

WSU consultant has extensive power industry experience, including serving in executive management of two public utilities with responsibility for large projects such as the Tacoma Narrows electric infrastructure, as program manager for the Washington State Clean Energy Fund Grid Modernization program collaborating with multiple WA electric utilities to develop and complete solar+storage microgrids and other energy storage demonstrations, and as consultant for clean energy projects in the Pacific Northwest including Alaska.

Poterre consultant has long federal experience, including as a Senate and White House staffer and FERC advisor to DOD, and outside consultant for DOD to draft, issue, and review DOD solicitations of third-party financed energy resilience solutions; at utility, successfully down-selected to receive DOD grant for a cutting-edge microgrid for a DOD base.

Utility industry consultant has extensive technology and project experience, including as Fellow Engineer for investor-owned utility Avista, senior engineer seconded to start-up Open Energy Solutions, and now subject matter expert.

Extensive experience with state clean energy funding programs, including Washington State, California, New York, and Massachusetts, as applicants and program managers.

CleanTech Strategies respects and protects client proprietary information rigorously, and is committed to identify and accomplish collaboratively the strategic objectives of each client.



Thank You



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