



ThinkMicrogrid

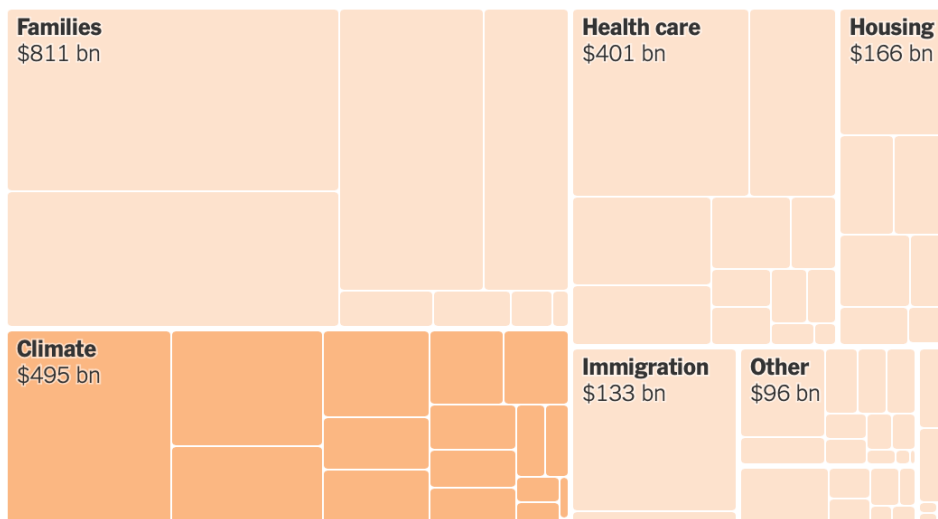
Infrastructure Investment and Jobs Act Think Microgrid Overview

December 2021

Overview

The recently passed Infrastructure Investment and Jobs Act of 2021 (Infrastructure Bill) will provide spending of more than \$1.2 trillion, which includes \$550 billion in new federal spending for the next 5 years. Several major areas of the economy that will be touched by new funding, including transportation, energy, utilities, climate and the environment. The most common method for appropriating funds is to allow spending by federal departments (such as the through the Department of Energy), who are then authorized to distribute funds in the form of grants and research studies.

Spending and tax cuts

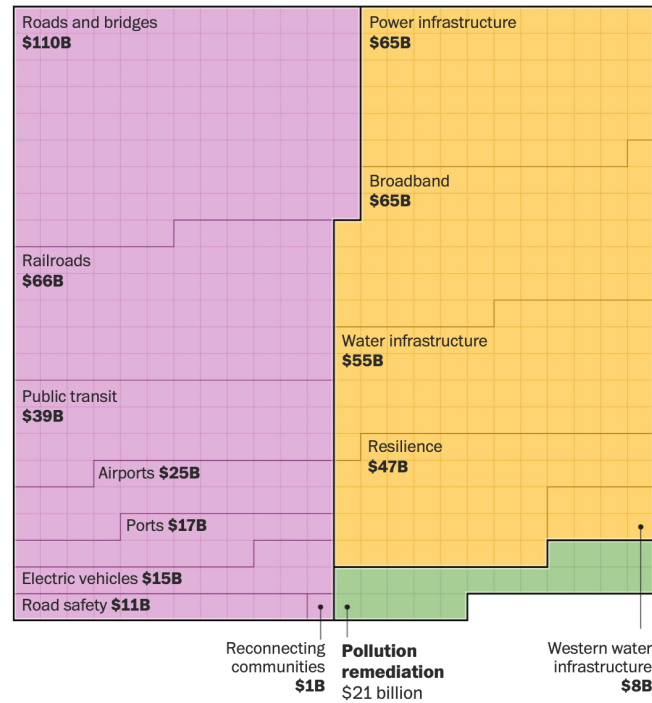


Source: New York Times

■ = 1 billion

Transportation
\$284 billion

Utilities
\$240 billion



Source: Washington Post

Review of Sections Relevant to Microgrids

Based on section-by-section review of the legislation, roughly \$41.49 billion of available funding is appropriated to the creation of grant programs, research studies, and working groups that are relevant to the microgrid market in varying degrees. Provisions of interest are defined as sections that broadly cover the following areas:

- Resilience
- Grid modernization and flexibility, smart grid
- Capital upgrades
- Transportation electrification
- Emergency response and mitigation
- Cybersecurity and security

\$41.49B of Microgrid-relevant funding and programs

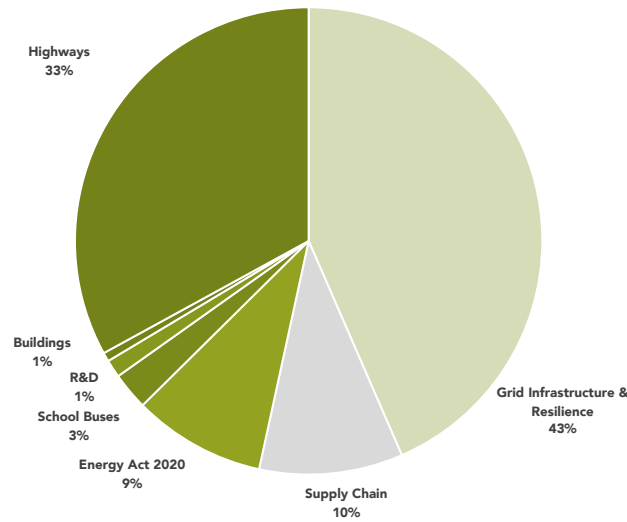


Figure: Breakdown of funding relevant to the microgrid market by subdivision title

The term “microgrid” was mentioned a total of 5 times in the entirety of the bill, appearing in three separate sections. These sections encompass \$13.5 billion of the \$41.49 billion determined to be broadly related to the microgrid market. Details on funding available as well as a description of said programs are listed below.

Section	Title	Funding	Description
40101	Preventing outages and enhancing the resilience of the grid	5,000,000,000	Grant program for states and Indian tribes for hardening efforts, reducing risk of power lines causing wildfires, or reduce likelihood and consequences of disruptive events
40103	Electric grid reliability and resilience research, development, and demonstration	6,000,000,000	Establishes program for demonstration of innovative approaches to transmission, storage, microgrids and distribution infrastructure for resilience
40106	Transmission facilitation program	2,500,000,000	Establishes a \$2.5 billion revolving Transmission Facilitation loan fund for transmission facilities, including microgrids

Table 1: Priority provisions directly relevant to microgrid stakeholders

Sections 40101 and 40106 are grant and loan programs that are funded by appropriations to the Department of Energy. Stakeholders can access these funds through an application process with the DOE that is specified in the sections' paragraphs in the text of the bill. Section 40103 is a research, development and demonstration program, the funding for which is also appropriated to DOE but is designated for states, tribal territories, local governments, and public utility commissions. To access funding in this section, market stakeholders will likely need to engage with state and local governments and PUCs. Section 4101 and 40103 list an array of entities that are eligible to receive funding, while 40106 instead lists the requirements for eligible projects.

Section	Section Title	Entities/Projects Eligible for Funds
40101	Preventing outages and enhancing the resilience of the grid	<ul style="list-style-type: none"> ● Electric grid operators ● Electricity storage operators ● Electricity generators ● Transmission owner or operator ● Distribution provider ● Fuel supplier ● Any other relevant entity, as determined by the Secretary.
40103	Electric grid reliability and resilience research, development, and demonstration	<ul style="list-style-type: none"> ● States ● Combinations of 2 or more states ● Indian tribes ● Units of local governments ● Public utility commission
40106	Transmission facilitation program	Projects involving: <ul style="list-style-type: none"> ● Constructing new or replacing an existing transmission line ● Increasing the capacity of an existing transmission line ● Connecting an isolated microgrid to an existing transmission or telecommunications infrastructure corridor

Table 2: Eligible entities and projects for funding

Aside from new funding programs, the IJJA includes the creation of new working groups and studies that offer opportunities for engagement at the federal level.

Section 25006 (pg. 417) establishes an EV working group led by the secretary of energy. Non-federal stakeholders should include a representative of "a public utility regulator or association of public utility regulators," as well as a representative of "an organization representing state departments of energy or state energy planners."

Section 40111 directs the Department of Energy to conduct a study to identify barriers, codes that need revision in order to facilitate the adoption of energy storage systems across sectors. This study should involve the use of emerging storage technologies, use cases such as V2G integration and more. The DOE will receive formal input from stakeholders, the details of which are specified further on page 518 of the bill's text.

Expansion of Smart Grid Investment Matching Grant Program

An additional \$600 million is allocated to the Smart Grid Investment Matching Grant Program per year from 2022 through 2026, for a total of \$3 billion. Qualifying investments include specialized electric-using equipment, devices, transmission and distribution equipment fitted with monitoring and communications devices, metering devices, sensors, and software that allows smart grid functions, as well as devices that allow for EVs to engage in smart grid functions.¹

¹ Energy Independence and Security Act of 2007, pg. 299 - <https://www.congress.gov/110/plaws/publ140/PLAW-110publ140.pdf>

All relevant sections

IJA Full Text - <https://www.congress.gov/117/bills/hr3684/BILLS-117hr3684enr.pdf>

Note: The “Engagement” column lists entities that will ultimately be allocating funding or receiving appropriations, and therefore are the entities that stakeholder should engage with in order to receive funds.

Page	Section	Funding	Description	Notes	Engagement*
33	11109 - Surface transportation block grant program		Funding for expanding eligibility to include installation of EV charging infrastructure, installation and deployment of current and emerging intelligent transport technologies, including ability of vehicles to communicate with infrastructure, buildings, and other road users.	Use of funds - Amounts under this clause may be expended directly by the state, through contracts with state agencies, private entities or nonprofit entities. Appropriations for this program are not directly specified but are a lumped together as a part of the \$273.15 billion allocated to Federal-Aid Highways.	States
52	11115 - Congestion mitigation and air quality improvement program	13,200,000,000	Funding to reduce congestion and improve air quality, including EV infrastructure, priority to minority and low-income communities and port-related emissions	Includes micro mobility, car sharing, replacements or retrofits, verified technologies as defined in section 791 of energy policy act of 2005	States
118	11401 - Grants for Charging and Fueling Infrastructure		Establishes a grant program to deploy publicly accessible EV charging and alternative fuel infrastructure, to achieve reduction in GHG and improve mobility with an emphasis on equitable access	Includes V2G. Individual grants shall not exceed \$15,000,000. Eligible entities: state or political subdivisions, metropolitan planning org, local government, special purpose district or public authority, or groups of the above	States, local gov
125	11402 - Reduction of truck emissions at port facilities	150,000,000	Includes port electrification projects	The secretary shall coordinate and provide funding to test, evaluate, and deploy projects that reduce port-related emissions from idling trucks, including through the advancement of port electrification and improvements in efficiency, focusing on port operations, including heavy-duty commercial vehicles, and other related projects.	Secretary of Transportation

127	11403 - Carbon Reduction Program	Funds allocated equal 2.56% of what is left over after allocating to national highway freight program, congestion mitigation and air quality improvement program, and metropolitan state planning program	Incentives including for V2I communication, port electrification, projects or strategies designed to support congestion pricing, shifting transportation demand to non-peak hours. Includes the acquisition, installation, or operation of publicly accessible EV or alternative fuel infrastructure	Refer to page 127 for details on eligible projects, page 28 for details on appropriations for this section.	States
133	11405 - Promoting resilient operations for transformative, efficient, and cost-saving transportation (PROTECT)	Funds allocated equal 2.9% of whats left over after allocating to national highway freight program, congestion mitigation and air quality improvement program, and metropolitan state planning	Competitive planning grants for community resilience, surface transportation critical load, focus on extreme weather and climate related events.	Refer to page 28 for details on appropriations for this section.	States
408	25002 - Smart community research center		Research center to promote intelligent transportation system or smart community transportation programs	Focuses more on community transportation, still may be relevant	
412	25005 - Strengthening mobility and revolutionizing transportation grant program	500,000,000	Establishes a program that provides grants for entities to conduct demonstration projects focused on advanced smart city or community technologies and systems in a variety of communities	Projects must include one of the following: (iii) intelligent sensor-based infrastructure (vii) Smart grid. Funding from the secretary	Secretary of Transportation
417	25006 - Electric vehicle working group		Establishes an EV working group led by secretary of energy	Non-federal stakeholders should include a representative of "a public utility regulator or association of public utility regulators," as well as a representative of "an organization representing state departments of energy or state energy planners."	Secretary of Energy
489	30018 - Grants for buses and bus facilities		Funding for bus procurement and upgrades to bus facilities, fleets.		

495	40101 - Preventing outages and enhancing the resilience of the grid	5,000,000,000	Grant program for states and Indian tribes for hardening efforts, reducing risk of power lines causing wildfires, or reduce likelihood and consequences of disruptive events	50% of funding is for tribes, 50% for eligible entities. Used for weatherization technologies and equipment; fire-resistant technologies and fire prevention systems; monitoring and control technologies; the use or construction of distributed energy resources for enhancing system adaptive capacity during disruptive events, including— (i) microgrids; (i) battery-storage subcomponents; (l) adaptive protection technologies; (J) advanced modeling technologies. Eligible entities: grid operator, storage operator, generator, transmission operator, distribution provider, fuel supplier, any other relevant entity as determined by the secretary	Secretary of Energy
500	40102 - Preventing outages and enhancing the resilience of the grid		Amends Stafford Disaster Relief is amended to include wildfires		
500	40103 - Electric grid reliability and resilience research, development, and demonstration	6,000,000,000	Establishes program for demonstration of innovative approaches to transmission, storage, microgrids and distribution infrastructure for resilience	Eligible entities: a state, a combination of 2 or more states, an Indian tribe, a unit of local government, a public utility commission	States, local gov, PUC
502	40104 - Utility demand response		Amends PURPA 111 to include demand response		
505	40105 - Siting of interstate electric transmission facilities		Amends designation of national interest transmission corridors, federal power act	Includes Indian tribes, includes capacity constraints with congestion, the secretary shall conduct a t study every 3 years, including energy security, addition of "if it would enhance the ability of facilities that generate or transmit firm or intermittent energy to connect to the grid," good faith efforts to engage with landowners for rights of way	

506	40106 - Transmission facilitation program	2,500,000,000	Establishes a \$2.5 billion revolving Transmission Facilitation loan fund for transmission facilities, including microgrids	Eligible projects: constructing new or replacing a transmission line, increasing capacity of a transmission line, connecting an isolated microgrid to an existing transmission, transmission, or telecommunications infrastructure corridor. Eligible entities are anyone with an eligible project	Secretary of Energy
512	40107 - Deployment of technologies to enhance grid flexibility	3,000,000,000	Expands SGIG to Include grid flexibility, DER integration and aggregation, energy storage, smart grid, ability to redirect or shut off power in case of extreme weather, V2G tech	Eligible entities not clear	Secretary of Energy
513	40108 - State energy security plans	None specified	Provides financial assistance to state energy security plans.	Financial assistance and creation of a state energy plan, that propose methods to secure the energy infrastructure of the state against physical and cybersecurity attacks, mitigate supply disruptions, enhance response to and recovery from disruptions, ensure the state has reliable, secure, and resilient energy infrastructure.	States - State governors submit an energy security plan to get funds
516	40109 - State energy program	500,000,000	Funding to support state energy plans, including to reduce carbon emissions in transportation sector and accelerate electrification of all vehicle types	Amendment to Collaborative Transmission Siting section of Energy Policy Act Not subject to matching requirement	States
518	40111 - Study of codes and standards for use of energy storage systems across sectors		DOE to conduct a study to identify barriers, identify codes that need revision; report within 18 months	Use of emerging energy storage tech, use cases such as V2G integration, receive formal input from stakeholders	Secretary of Energy
518	40112 - Demonstration of electric vehicle battery second-life applications for grid services		The secretary shall carry out a project to demonstrate second life applications of EV batteries as aggregated storage installations	To demonstrate power safety and reliability of the applications demonstrated under the program, demonstrate ability to provide ancillary services, reduce peak loads, increase acceptance of use of second life batteries. Prioritize pairing with multifamily affordable housing, senior care, community health center	
521	40121 - Enhancing grid security through public-private partnerships		DOE to conduct a program to develop utility cybersecurity capabilities, and create a report on cybersecurity of distribution systems within a year.	Prioritizes utilities with fewer available resources	

522	40122 - Energy cyber sense program		DOE to create an energy cybersecurity product test bed		
523	40123 - Incentives for advanced cybersecurity technology		FERC, DOE, NERC, NARUC to conduct a study on incentive based rate treatments to incentivize investment by utilities in cybersecurity tech and participation in threat sharing programs.	No later than 1 year after completion of the study, said rate treatments should be implemented	
525	40124 - Rural and municipal utility advanced cybersecurity grant and technical assistance program	250,000,000	Grant program to protect against, detect, respond to, and recover from cybersecurity threats.	Eligible entities: rural coops, munis, utility owned by any subdivision of a state, IOU <4000 GWh per year. Prioritize critical infrastructure, limited access to resources	Secretary of Energy
526	40125 - Enhanced grid security	350,000,000	DOE and other stakeholders to conduct a program to develop advanced cybersecurity applications and tech, a program to enhance and periodically test the emergency response capabilities of the department, and a program to secure energy networks		Secretary of Energy
528	40126 - Cybersecurity plan		DOE provisions on cybersecurity for awards and funding		
535	40207 - Battery processing and manufacturing	3,075,000,000	Establishes a battery material processing grant program to support US battery manufacture	Grants are \$50-100 million based on project type, phase III Li-Ion recycling price competition of \$10 million. Eligible entities: universities, national labs, fed research agency, state research agency, nonprofit, industrial entity, manufacturing entity, private battery collection or recycling entity, state or municipal government, battery producer, battery retailer, consortium of 2 or more entities	Secretary of Energy
543	40208 - Electric drive vehicle battery recycling and second-life	200,000,000	DOE to conduct a RD&D program of second life batteries, study of viable market opportunities within 1 year		Secretary of Energy

547	40209 - Advanced energy manufacturing and recycling grant program	750,000,000	Grant program to carry out advanced energy projects	Projects that re-equip an industrial or manufacturing facility with equipment designed to reduce the greenhouse gas emissions of that facility substantially below the greenhouse gas emissions under current best practices, as determined by the Secretary, through the installation of— (I) low- or zero-carbon process heat systems; (II) carbon capture, transport, utilization, and storage systems; (III) technology relating to energy efficiency and reduction in waste from industrial processes; or (IV) any other industrial technology that significantly reduces greenhouse gas emissions, as determined by the Secretary	Secretary of Energy
555	40211 - 21st century workforce advisory board		Establishes a workforce advisory board		
605	40401 - Department of Energy Loan Programs		Expands DOE Loan Programs		
623	40502 - Energy efficiency revolving loan fund capitalization grant program	250,000,000	Building retrofits	Primarily energy efficiency	States
699	41001 - Energy storage demonstration projects	505,000,000	DOE to conduct energy storage demonstration pilot grant program and long duration demonstration initiative and joint program.		Secretary of Energy
699	41002 - Advanced reactor demonstration program	3,211,000,000	Funding for advanced reactor demonstrations		Secretary of Energy
824	70203 - Establishment of commission		Establishes a commission to study wildfire prevention and rehabilitation	Seeking non federal representatives from utility industry, stakeholders with expertise in wildfires	
844	70612 - State and local cybersecurity grant program	1,000,000,000	Grant program for states and Indian tribes for cybersecurity	Eligible entities: state or tribal government	Secretary of Energy
893	71101 - Clean school bus program	1,000,000,000	Grant program for low emission and zero-emission school buses	Eligible recipients: Local state government entities responsible for providing school bus service, eligible contractors, nonprofit school transportation association, Indian	EPA

				tribes	
897	71102 - Electric or low-emitting ferry pilot program	50,000,000	DOT to carry out pilot program for electric or low-emitting ferries		Secretary of Transportation

IIJA Full Text - <https://www.congress.gov/117/bills/hr3684/BILLS-117hr3684enr.pdf>