

The Role of Energy Storage for Accelerating the Transition to a Decarbonized, Clean Energy Future in Illinois

October 28, 2022

Agenda



- 1. Housekeeping and introductions
- 2. Overview on energy storage
- 3. Survey of state energy storage policies
- 4. Best practices and lessons learned
- 5. Federal support around energy storage
- 6. Energy storage in Illinois
- 7. Energy storage program, report, and webinar series
- 8. Q&A

IPA Power Hour Webinars



Introduction and Scope

- Power Hour is a series of educational and informative presentations on a wide range of clean energy topics and emerging issues
- Today's Power Hour:
 - During this webinar, the speakers will provide an overview on the role of energy storage in decarbonization, highlight barriers and state-by-state activities and federal support for energy storage. The webinar will also examine what energy storage currently looks like in Illinois, including the ICC's role in it.
 - This presentation is intended for educational purpose only and does not represent a legal interpretation or statement of policy by the IPA or its staff.
 - Future IPA Power Hour Webinars will cover other topics related to the clean energy economy in Illinois



Upcoming Webinars

IPA Power Hour 10: IPA Power Hour 10: Net Zero Buildings and the Role of On-Site Solar

Date: November 18, 2022

Time: 12-1pm CST

REGISTER HERE

IPA Power Hour 11: Navigating the Energy Transition-Growing Pains and Path Forward

Date: December 16, 2022 Time: 12-1pm CST <u>REGISTER HERE</u>

The Illinois Power Agency



- Independent State Agency created in 2007
- Agency duties include
 - Development and implementation of procurement plans for electricity supply for utility customers
 - Development and implementation of other renewable energy programs
 - Implementation of the Renewable Portfolio Standard
 - Development of Long-Term Renewable Resources Procurement Plan
 - Conduct competitive procurements for utility-scale projects
 - Manage programs for community solar and solar for homes and businesses



Background on Energy Storage



Energy Storage: State Policy Best Practices

Todd Olinsky-Paul Senior Project Director Clean Energy Group Clean Energy States Alliance

About CEG and CESA

Clean Energy Group (CEG) is a national nonprofit working at the forefront of clean energy innovation to enable a just energy transition. The Clean Energy States Alliance (CESA) is a national, member-supported nonprofit for state energy organizations working together to advance the rapid expansion of clean energy technologies.



We are good at storing everything... except electricity!





1 Terawatt = 1 million Megawatts

Without storage, the electric grid is the world's biggest just-in-time delivery system!



• Vulnerable to outages

Global operational energy storage (MW) 2020



Energy storage performance ranges



Energy storage performance ranges



Energy storage can provide many benefits from both sides of the meter:

- Decarbonization (enables electrification and increased renewable generation, can replace fossil peaking generation)
- Integration of renewables (makes variable generators dispatchable, adds value, shifts variable generation in time)
- Grid modernization (enables two-way power flows, improves resilience, decentralizes the grid, ancillary services)
- Cost savings (reduces reliance on high-cost peak power generators, enables demand charge management, T&D investment deferral, non-wires alternatives)
- Equity (democratizes the electrical system, delivers cost savings and resilience to underserved communities, helps reduce pollution in overburdened communities)

Battery storage applications and value stacking



State policy tools

- 1. Studies and planning
- 2. Grants (demonstration projects and pilots)
- 3. Longer-term policy and programs
 - a. Utility mandates/procurement targets
 - i. Storage procurement targets
 - ii. Storage in renewable/clean energy portfolio standards
 - iii. Clean peak standards
 - b. Rebates
 - c. Storage adders in renewables incentive programs
 - d. Storage incentives in energy efficiency programs
 - e. Tax incentives
 - f. Financing/clean energy financial institutions



- g. Market and regulatory reform
- h. Removal of barriers/reduction of soft costs
- i. Technical assistance and resources



State energy storage policy for decarbonization

Sandia National Laboratories has identified 11 policy types that states typically use to support energy storage deployment and market development:

- 1. Procurement mandates, targets, or goals for energy storage procurement by regulated utilities;
- 2. Utility ownership of energy storage assets;
- 3. Inclusion of energy storage in utility IRPs;
- 4. Incentive, tax credits, or other subsidies for energy storage;
- 5. Multiple use applications (MUAs) for energy storage technologies;
- 6. State-sanctioned benefit-cost analysis (BCAs) of energy storage;
- 7. Distribution system modeling for location-specific siting of energy storage technologies;
- 8. Changes to existing net metering programs to accommodate BTM energy storage;
- 9. Changes to legacy interconnection standards to enable deployment of BTM energy storage;
- 10. Changes to existing renewable portfolio standard (RPS) programs to include or specifically carve out energy storage requirements; and
- 11. Replacement of bundled, volumetric electric rates with time-variant rates to spur the development of BTM storage technologies.

Survey of leading decarbonization states

SNL and CESA surveyed the members of CESA's 100% Clean Energy Collaborative. Survey results indicated that the following five policy issues have been embraced more frequently than others by the leading decarbonization states:

- 1. Procurement mandates, targets or goals
- 2. Utility ownership
- 3. Incentive/tax credits
- 4. Benefit-cost analysis
- 5. Distribution system modeling



EXAMPLES (not a comprehensive list):

- CA: 1,825 MW by 2020 (CEC added 500 MW to the original 1,325)
- MA: 1,000 MWh by 2025
- NJ: 2,000 MW by 2030 (600 MW by 2021)
- NY: 3,000 MW by 2030 (1,500 MW by 2025)
- OR: 5 MWh by 2020 (capped at 1% of utility's peak load)

California procurement targets (2013)

Proposed Energy Storage Procurement Targets (in MW)²²

Storage Grid Domain	3 19			57	
Point of Interconnection	2014	2016	2018	2020	Total
Southern California Edison	2740-41-1		510-012		Parent S
Transmission	50	65	85	110	310
Distribution	30	40	50	65	185
Customer	10	15	25	35	85
Subtotal SCE	90	120	160	210	580
Pacific Gas and Electric			-		a
Transmission	50	65	85	110	310
Distribution	30	40	50	65	185
Customer	10	15	25	35	85
Subtotal PG&E	90	120	160	210	580
San Diego Gas & Electric					
Transmission	10	15	22	33	80
Distribution	7	10	15	23	55
Customer	3	5	8	14	30
Subtotal SDG&E	20	30	45	70	165
Total - all 3 utilities	200	270	365	490	1,325

- Utilities may own up to 50% of required storage capacity
- CPUC prioritizes "public sector and low-income customers"

Examples:

CA – Self Generation
Incentive Program (SGIP)
(re-funded in 2018 at
\$830 million through
2025)

NY – Market Acceleration Bridge Incentive Program (\$350 million)

California SGIP

Summary: Ratepayer funded. Originally conceived in 2001 as a peak load reduction program supporting mainly solar PV; modified in 2011 to focus on greenhouse gas emissions reductions; modified again in 2016 to focus 79% of the program budget on energy storage. Incentives later modified to support state emissions reduction targets.

Program design: Up-front rebate in a declining block structure, with a 25% equity carve-out, defined geographically by environmentally disadvantaged and low-income communities, and affordable housing. 15% of SGIP budget reserved for residential customers. Equity and resilience budgets target wildfire areas.

Program statistics: Since 2016, SGIP has:

- Disbursed more than \$158 million in incentive payments
- Supported more than 828 behind-the-meter battery projects (residential and nonresidential) representing almost 67 MW (defined as average discharge power across two hours). Another \$31 million is reserved or pending.

Rebates – pros and cons

Pros:

- Gives customers needed assistance in defraying up-front capital and installation costs
- Helps to build markets by providing long-term, financeable structure for developers
- Works for both residential and commercial customers, regardless of tax status or system size
- Gives the state complete control over incentive rates and overall program budget
- Can support low-income communities through adders, carve-outs, and low-cost financing (carve-outs alone are usually not effective)
- Can include requirements to support state goals
- Program statistics are easy to track
- Works well in tandem with utility procurement mandates

Cons:

- Doesn't provide market-based price signals
- May not provide sufficient utility control over system operations
- Market-building is limited by rebate program budget
- May not support state policy goals unless specifically designed with storage dispatch requirements

Examples: Massachusetts, New York, Nevada

Solar Massachusetts Renewable Target (SMART)

Summary: SMART replaced the previous SREC program in 2018. SMART is a declining block tariff program that provides fixed base compensation over a 10- or 20-year term. Offers solar rebates with stackable adders including a storage adder for new batteries connected with new solar PV behind customer meters.

Stackable adders:

- Building Mounted Solar
- Floating Solar
- Solar on a Brownfield
- Solar on an Eligible Landfill
- Canopy Solar
- Agricultural Solar

- Community Shared Solar
- Low Income Property Solar
- Low Income Community Shared Solar
- Public Entity Solar
- Energy Storage
- Solar Tracking

Examples: Massachusetts, Rhode Island, Connecticut

Massachusetts ConnectedSolutions program:

- Storage incorporated into the state's energy efficiency program as a peak reduction measure
- Customers enter into multi-year contract with utility for BTM storage dispatch at peak demand hours
- Utility compensates customers for storage services
- Lower peak demand saves money for ratepayers
- Developers can finance pipelines of storage projects contracted into ConnectedSolutions, creating virtual power plants

The monetizable value of storage is partly due to the high costs of our oversized grid

The highest value of storage is in providing *capacity* to meet demand peaks... *not* in providing bulk energy.



White space = inefficiency in the system

Energy storage can provide two types of benefits: Monetizable, and non-monetizable

MONETIZABLE BENEFITS	NON-MONETIZABLE BENEFITS
Reduced peak energy demand	More renewables on grid
Energy arbitrage (buy low, sell high)	Increased resilience
Capacity provision	T&D investment deferral
Ancillary services provision (example: frequency regulation)	Reduced GHG and local pollutant emissions

Cost-benefit analysis of energy storage often considers all the costs, but only a fraction of the benefits (example: utility IRPs)

Cost Benefit Analysis



• **Value does not equal price.** What is valuable is not always priced or monetizable in current markets.

• Failing to assign values to the non-energy or non-monetizable benefits of storage has the same effect as assigning them a value of \$0. *Low or estimated value is better than no value at all!*

Cost-Benefit Tests – Examples from Connecticut



PACT = Program Administrator Cost TestPCT = Participant Cost TestSCT = Societal Cost TestTRC = Total Resource Cost TestRIM = Ratepayer Impact Measure

Energy Storage Policy Best Practices from New England: Ten Lessons from Six States

- 1. Identify benefits of energy storage that are not priced or monetizable in existing markets.
- 2. Establish a monetary value for each storage benefit and use those values when calculating cost effectiveness and setting incentive rates. Estimated value is better than no value at all.
- 3. Create incentives to support storage operations that further state policy goals. Incentivize storage use, not just storage deployment.
- 4. Set ambitious clean energy and/or emissions reduction goals and explicitly include energy storage as an eligible technology. Define how storage is expected to be deployed and operated to help meet the goals.
- 5. Incorporate energy storage into existing clean energy and efficiency programs.
- 6. Incorporate equity considerations into energy storage program design from the start, not as an afterthought. This should include significant incentive adders.
- 7. Support a wide variety of storage ownership, application, and business models.
- 8. Anticipate and proactively address needed regulatory changes.
- 9. Replicate and improve on successful programs implemented in other states.
- 10. Fund demonstration projects when needed, but do not rely on grants alone to build a market.





Federal Support Around Energy Storage

Federal Support Around Energy Storage



Bipartisan Infrastructure Law

Infrastructure Investment and Jobs Act (2021)

Appropriates over \$62 billion for US Department of Energy to invest in clean energy, manufacturing, and workforce development.

- \$7 billion in battery supply chain development, including critical mineral production and battery recycling
 - \$505 million long-duration energy storage initiative
- \$8 billion for clean hydrogen hubs
- \$11 billion in grants for local governments to enhance the resilience of electric grid
- \$3 billion expansion of the Smart Grid Investment Matching Grant Program, investing in upgrades that increase the flexibility of the grid, including storage
- \$500 million for the State Energy Program that provides grants to local governments to implement clean energy programs and projects.

Federal Support Around Energy Storage



Inflation Reduction Act

August 2022

The IRA provides direct incentives for installation of battery storage.

- Expands the 30% tax credit for residential clean energy to include battery storage
- Extends current investment tax credit through 2024 and creates a 30% credit for energy storage technology
- Clean vehicle tax credit maintains existing \$7,500 credit for new clean (electric or hydrogen fuel cell) vehicles
 - Starting in 2024, 40% of the critical minerals used in battery components must be from the U.S. or a Free Trade Agreement country or recycled in North America.



Energy Storage in Illinois

Energy Storage in Illinois



Current State of Energy Storage

- 14 utility-scale battery projects representing 165 MW
 - Online between 2013-2018
 - Many providing frequency regulation services
 - More will be coming through CEJA initiatives
 - IPA Coal to Solar procurements include 6 projects with 13.4 MW of storage
 - DCEO Coal to Solar Energy Storage Grant Program, 5 projects with 255 MW of storage
- Other storage projects include a flywheel and ice storage plants
- Roughly 250 distributed generation projects to date
 - Approximately 2 MW
 - 1% of projects
 - Growing over time



Adjustable Block Program Battery Requirements



- Current Requirements for projects with battery storage designed to ensure that energy is only measured once, and is from the solar project
 - 1. The meter used to report production is electrically located before the battery charger and does not measure any power that is drawn from the battery bank.
 - 2. A net meter is connected to the system that runs in reverse when any non-solar power, including on-site generator power, is used to charge the battery bank.
 - 3. The inverters' software setting is configured to prevent the battery from charging via line power. This software setting may not be changed for the duration of the project's participation in the Adjustable Block Program

Storage and the Illinois RPS



- Illinois RPS based on Renewable Energy Credits (RECs)
 - Each REC represents one MWH of renewable energy generated
 - RECs are generated on a monthly basis, representing cumulative generation across that month
 - M-RETS is testing hourly RECs
 - Storage measured differently
 - Focus on shifting energy between time periods
 - Will require statutory updates to include storage in the RPS



Energy Storage Program, Report, and Webinar Series



Bureau of Public Utilities | Illinois Commerce Commission | www.icc.Illinois.gov





Energy Storage Program Report & Webinar Series

Michael Stieren Policy Division Illinois Commerce Commission <u>Michael.Stieren@Illinois.gov</u>

This slide deck and its contents are intended for informational and discussion purposes only and do not represent a legal interpretation or statement of policy by the ICC or its Staff.



Energy Storage Directives Under CEJA

Through the enactment of the Climate and Equitable Jobs Act (CEJA), the Illinois General Assembly directed the Illinois Commerce Commission (ICC) to initiate proceeding to examine specific programs, mechanisms, and policies that could support the deployment of energy storage systems.

CEJA stated the proceeding must:

- 1. Develop a **framework** to identify and measure the **potential costs and benefits** that deployment of energy storage could produce, and well as **barriers** to realizing such benefits.
- 2. **Analyze and estimate** the impact of storage on the system's ability to integrate renewable resources, the benefits of the addition of storage at specific locations, the impact on grid reliability and power quality, and the effect on rates.
- 3. Evaluate and identify **cost-effective policies** and **programs** to support the deployment of energy storage systems.
- CEJA also directed the ICC to, by May 31, 2022, issue a report and any recommendations for additional legislative, regulatory, or executive actions based on the findings of the proceeding, including a recommendation on energy storage deployment targets for State.



Illinois Energy Storage Webinar Series Summary

In order to examine specific energy storage programs, mechanisms, and policies, the ICC, in collaboration with the U.S. DOE Office of Electricity Energy Storage Program and the Sandia National Laboratories, held a series of <u>six energy storage webinars</u>:

- November 16, 2021: Introduction to Energy Storage
- November 30, 2021: Other States' Approaches
- December 7, 2021: Engineering Details
- December 14, 2021: Energy Storage Benefit Cost Analysis & Valuation
- January 11, 2022: Battery Storage for Generation & T&D Deferral
- January 18, 2022: Decarbonization & Energy Storage

Experts from the national labs, regional agencies, and other organizations and institutions provided energy storage system content that could support the deployment of energy storage systems.

Agendas, presentations, recordings, and meeting materials can be found at:

<u>https://www.icc.illinois.gov/informal-processes/energy-storage-program</u>

Illinois Energy Storage Workshop Series Summary

In order to provide stakeholders a forum for providing comments and input regarding energy storage development in Illinois, the ICC hosted <u>four workshops</u> between December 2021 and February 2022.

Topics included:

- a review of Public Act 102-0662's provisions concerning the Energy Storage Program;
- the framework to identify and measure the potential costs and benefits that deployment of energy storage can produce;
- barriers to realizing the benefits of energy storage systems;
- analyzing and estimating the impacts of deployment of energy storage systems;
- and programs, mechanisms, and policies that could support the deployment of energy storage systems.

The workshop and comment process provided a forum and opportunities for stakeholders to offer comments, information, and opinions regarding programs, mechanisms, and policies that could support the deployment of energy storage systems and their ability to integrate renewable resources.

<u>https://www.icc.illinois.gov/informal-processes/energy-storage-program</u>

Energy Storage Program Requirements

Per CEJA, the ICC's energy storage efforts were to identify and analyze the following:

- The impact on the system's ability to *integrate renewable resources*;
- The benefits of addition of storage at *specific locations*, such as at existing peaking units or locations on the grid close to large load centers;
- The impact on *grid reliability* and *power quality*;
- The effect on *retail electric rates* and *supply rates* over the useful life of a given energy storage system;
- Evaluate and identify a *cost-effective framework* to *support* the *deployment* of energy storage systems, including:
 - Incentive programs;
 - Energy storage peak standards;
 - Non-wires alternative solicitation;
 - Peak demand reduction programs for behind-the-meter storage for all customer classes;
 - Value of distributed energy resources programs;
 - Tax incentives;
 - Time-varying rates;
 - Updating of interconnection processes and metering standards; and
 - Procurement by the Illinois Power Agency of energy storage resources.



Energy Storage Polices and Programs

During the ICC webinar series, Sandia National Laboratories identified these key policy issues that states are considering the support of energy storage systems.

- Procurement Mandates
- Utility Ownership
- Incentives/Tax Credits
- Multiple Use Applications

- Cost / benefit analysis
- Distribution system modeling
- Changes to interconnection standards
- Changes to RPS programs



Storage Policies and Programs

Procurement Mandates:

- <u>Pros</u>: Used to stimulate market development, provides cost recovery certainty for utilities, mandatory approach is compatible with most RPS polices.
- <u>Cons</u>: Uncertainties about how to determine appropriate procurement levels & benefits. Mandates allow the government to pick "winners" rather than the marketplace. Current resource planning is sufficient; 100% renewables will drive storage anyway.

• Utility Ownership:

- <u>Pros</u>: Opportunity for long-range, system-wide planning. Opportunity to optimize the distribution system. Enhanced flexibility to use cost-effective resources. Enhanced economies of scale (i.e., prices drop with larger projects)
- <u>Cons</u>: Market power concerns. Utilities would have an advantage over 3rd parties, creating an unlevel playing field. Uncertainties about utility cost recovery and equitable rate treatment among customers.

• Incentives/Tax Credits:

- <u>Pros</u>: Current regulatory structures may include barriers that preclude ES development. Utilities, without a mandate, may not see any incentive to invest in nascent technologies. Customer incentives can be tied to the economic value that is brought to the grid
- <u>Cons</u>: Without equity provisions, subsidies may only benefit affluent customers. Can be very complex--e.g., determining if the battery is charged by renewable energy or grid electricity. Undefined parameters create a gap allowing parties to "double dip."



Storage Polices and Programs

• Multiple Use Applications:

- <u>Pros</u>: Consideration of multiple uses allow energy storage to achieve its full economic potential. Storage uses could include energy, capacity, environmental, and locational/temporal demand response benefits.
- <u>Cons</u>: Currently most energy storage installations are either behind-the- meter or grid-tied, but not both. In addition, some uses may have higher priority than others (e.g. reliability), and this could create conflicts in the marketplace.

• Cost/Benefit Analysis:

- <u>Pros</u>: The advantage of cost/benefit analysis is that it will justify utility cost recovery and it could help identify and prioritize potential customers. The advantage of cost/benefit analysis is that it will justify utility cost recovery and it could help identify and prioritize potential customers.
- <u>Cons</u>: Currently there is no universal approach to defining storage costs and benefits. Assessing storage cost/benefit is difficult in part because it is an emerging technology, and different storage systems are in various stages of development. Currently, there is a wide range of performance variance, which creates large differences in costs and benefits.



Storage Policies and Programs

- Changes to RPS Mandates:
 - <u>Pros</u>: Integrating intermittent renewable energy and matching renewable generation more closely with peak loads. New RPS mandates would allow storage to provide generation and load balancing services, while reducing the need for peaking and backup generators on the grid. Could also reduce customer demand charges.
 - <u>Cons</u>: But changes to RPS mandates would have limits, including the risk that a reopened RPS would allow an opportunity to weaken a state's current renewable energy obligations. It is also unclear whether regulators need to encourage storage specifically, or if encouraging renewables alone is enough to stimulate storage.

• Distribution system modeling:

- <u>Pros</u>: Effective distribution system modeling is optimizing storage sizing, placement, and operation.
 Distribution modeling provides local power quality improvements, mitigation of voltage deviation, frequency regulation, load shifting, and other benefits.
- <u>Cons</u>: Distribution utilities might choose least-cost options over maximum benefit solutions. Misusing or mislocating storage systems on the distribution network can degrade power quality, reduce reliability, and lessen load control.



Energy Storage Programs Authorized Through CEJA

1. Coal-to-Solar Energy Storage Grant Program

• Five projects awarded grants by DCEO. Three 37MW energy storage projects were chosen, alongside two 72MW projects ~ 255MW. CEJA included a price cap of \$28.5 million per year for 10 years to support these programs.

2. Coal to Solar and Energy Storage Procurement Events

• IPA was directed to conduct two procurement events for the delivery of RECs from new utility-scale solar facilities that are to be installed at former coal facilities. The cost for this program can be up to \$375 million.

3. Utility-Scale Pilot Projects authorized in CEJA

• CEJA allows Ameren to construct, own, and operate two utility-scale solar pilot programs. CEJA allows Ameren to also construct, own, and operate storage facilities in connection with the photovoltaic electricity generation pilot projects. CEJA authorized a \$40 million cap for these pilot programs.

It will be valuable to gain information from the deployment of these three energy storage programs in order to assess how the energy storage systems are being used, what services they are providing, what cost-savings or revenue they are securing, and identifying any obstacles or challenges to their deployment



ICC Final Report Recommendations

The Energy Storage Program Report made three recommendations:

- 1. Energy Storage Targets
- 2. Additional Opportunities to Explore Energy Storage Using Existing Authority
- 3. Potential Additional Pilot Programs in Illinois

Recommendation #1: Energy Storage Targets

While the Commission acknowledged the substantial and useful information and feedback provided to the Commission, the Commission stated that "it did not appear that setting specific energy storage deployment targets for Illinois' larger electric utilities is realistic at this time."

Main factors supporting this conclusion included:

- 1. The relative nascence of many storage technologies;
- 2. The lack of direct operational experience with most of the growing energy storage technologies by Illinois public utilities;
- 3. The lack of detailed cost and benefit information resulting from actual Illinois energy storage system deployment and operation experience.

Establishing overall energy storage targets under such uncertain conditions risks:

- 1. Over-deployment of energy storage resources in general;
- 2. Deployment of energy storage resources where they are not cost beneficial;
- 3. Increased costs to rate payers;
- 4. Introducing bias into technology selection;
- 5. Generally providing adverse impacts to Illinois utility consumers and citizens.



Recommendation #1: Energy Storage Targets

- Despite these risks, the webinar and workshop process produced sufficient information to conclude that there
 are measurable net benefits to be realized from prudent deployment and operation of energy storage systems
 in several circumstances. Additionally, it is likely that energy storage systems will be necessary for the integration
 of renewable resources needed to meet the 100% clean energy requirements and decarbonization goals
 established by CEJA.
- The ICC noted that after gaining more actual experience with energy storage system deployment, Illinois may be better positioned to quantify the benefits and costs of energy storage systems and to set deployment targets.
- There are existing and upcoming opportunities within the Commission's authority to design policies, programs, and investments, as appropriate, to reduce barriers to obtaining the benefits of energy storage systems, which may incentivize some energy storage system deployment.
- Leveraging existing authority may better position Illinois to quantify both the benefits and the costs of energy storage systems, and to better identify circumstances in which energy storage systems would be cost-beneficial.
- Several parties recommended that the ICC engage a technical consultant to evaluate the future role of storage in Illinois relative to PJM and MISO. The Commission agreed with this recommendation.



Recommendation #2: Additional Opportunities to Explore Energy Storage Using Existing Authority

CEJA included several other initiatives that should be considered and coordinated closely with an Energy Storage Framework in Illinois:

- ICC Investigation into DER Rebates:
 - CEJA directed the ICC to open an independent, statewide investigation into the value of, and compensation for, distributed energy resources include **energy storage**.
 - In performing this investigation, the Commission is required, among other requirements, to review the full value of the distributed energy resources and the manner in which each component of that value is or is not otherwise compensated; and assessments of how the value of distributed energy resources may evolve based on the present and future technological capabilities of distributed energy resources and based on present and future grid needs. The Commission is required to initiate this investigation no later than June 30, 2023.
 - The result of this investigation will be the development of a rebate and other compensation mechanisms for distributed energy resources, including energy storage, that is paid by utilities to qualifying projects.
- Existing DER Rebates Expanded to Residential & Commercial Storage Systems
 - \$250/kWh of installed capacity for storage paired with distributed generation to customers.
 - P.A. 102-1031 clarified that solar-plus-storage customers who elect to receive a rebate only for their storage system remain eligible for delivery net metering.
- Electric Vehicle Optimized Charging Program
 - Additional DER rebate for solar/storage paired with electric vehicle charging projects.



Recommendation #2: Additional Opportunities to Explore Energy Storage Using Existing Authority

- Multi-Year Integrated Grid Plans: Flexibility Programs
 - A New Multi Year Integrated Grid Planning process was incorporated into CEJA in order to accelerate and coordinate progress on Illinois clean energy and environmental goals.
 - Ameren Illinois and ComEd will undertake a multi-year integrated grid planning to assess "the impact of utility investments over the next 5 years on hosting capacity" and "provide a narrative discussion of how the hosting capacity analysis advances customer-sited distributed energy resources, including ... *energy storage systems* ... and how the identification of interconnection points on the distribution system will support the continued development of distributed energy resources."
 - Included in those plans are requirements around facilitating the development of distributed energy resources, enabling distributed energy resources to provide grid benefits and support grid services, conducting an evaluation of the short-term and long-run benefits and costs of distributed energy resources, and leveraging customer distributed energy resources to facilitate load flexibility, nonwires alternatives, and other solutions.
 - **Peak reduction and flexibility programs** will be required in the utilities' Multi-Year Integrated Grid Plan, which are intended to meet complementary objectives as those identified in the Energy Storage Program, and can be an effective mechanism to reduce barriers to obtaining the benefits of energy storage systems.



Recommendation #2: Additional Opportunities to Explore Energy Storage Using Existing Authority

- Multi-Year Integrated Grid Plans: Non-wires Alternatives and other Third Party Services
 - Under the Multi-Year Grid Plans, the ICC will evaluate the creation of non-wires alternatives for each utility as part of the utilities' plans and will establish rules determining data or methods for *Solution Sourcing Opportunities*.
 - Such non-wires alternative opportunities would create a process wherein Ameren Illinois and ComEd each identify locations on their networks where the deployment of storage combined with an agreement on how to operate the storage system would prevent otherwise necessary short-term distribution grid investments.
 - RFPs could then be issued for projects meeting the sizing and operational needs of the utilities and the projects could be selected based upon bid prices in combination with the projects' abilities to meet identified needs and other selection criteria.
- Examples:
 - Opportunities to avoid the need for distribution expansion, as well as to provide power quality services.
 - For power quality, utilities could compensate customer-owned energy storage systems on select feeders for services provided to support local power quality, through the provision of reactive power support and enabling greater hosting capacity.

Recommendation #3: Potential Additional Pilot Programs

The ICC Energy Storage Report included several potential pilot programs that would allow Illinois to gain greater experience with deployment and operation of energy storage systems and to experiment and to learn from different energy storage policies and programs.

As highlighted during the webinar series, pilot programs provide numerous benefits:

- Pilot Programs can be a means to "test the market" for energy storage, specifically to examine use cases associated with bulk power system, distribution-level, and customer-side applications, and multiple technologies.
- Provide the ability to review the full value of the energy storage system in a manner in which each component of that value is or is not otherwise compensated.
- Provide an assessment of how the value of distributed energy resources may evolve over time, based on the present and future technological capabilities of distributed energy resources and present and future grid needs.



Potential New Energy Storage Pilot Programs

- Storage Paired with RPS Utility-Scale Renewables Pilot Program A program that provides compensation for energy storage systems that are built and operated in conjunction with existing or new utility-scale renewable energy facilities funded through the Illinois Renewable Portfolio Standard ("RPS").
- Storage Paired with RPS ABP or IL-SFA Renewables Pilot Program A program that provides compensation to energy storage systems that built in conjunction with projects under the Adjustable Block Program or Solar for All Program. The legislature could amend the Illinois Power Agency Act and Illinois Public Utilities Act to provide the IPA and the ICC with the authority to provide developers of renewable resources with payments that are in addition to payments for providing renewable energy credits (RECs) if the developers deploy and operate storage systems paired with RPS supported distributed generation or community solar facilities.
- Storage as Transmission Assets Pilot Program Utilities and RTOs could work collectively to identify sites where the deployment of storage, combined with an agreement on how to operate the storage system, would prevent otherwise needed, and more expensive, transmission system investments. The legislature could provide Illinois electric utilities with the authority to recover from their retail customers the costs of such storage projects, which would be selected through competitive procurements.



Potential New Energy Storage Pilot Programs

- Storage as Ancillary Services Assets Pilot Program Utilities and RTOs could work collectively to identify sites where the deployment of storage combined with an agreement on how to operate the storage system would prevent otherwise more costly ancillary services system investments. The legislature could provide Illinois electric utilities with the authority to recover from their retail customers the costs of such storage projects, which would be selected through competitive procurements.
- Storage as Reliability, Stability, and Resiliency Assets Pilot Program Utilities and RTOs could work collectively to identify sites where the deployment of storage combined with an agreement on how to operate the storage system would provide for a more reliable, stable, and resilient grid. The legislature could provide Illinois electric utilities with the authority to recover from their retail customers the costs of such storage projects, which would be selected through competitive procurements.
- Market Accelerator Incentive Program Pilot Program The legislature could provide the utilities with the authority to recover the costs of providing storage incentives through a market accelerator incentive program from their retail customers. The program would provide a one-time incentive on a first-come, first served basis to the first 600 MW of energy storage provider applicants that meet minimum criteria of project viability. The legislature could provide the authority for either the utilities or the IPA to select projects.

Potential New Energy Storage Pilot Programs

- **Community Resilience Pilot Program** Pursuant to CEJA, communities may develop Community Energy, Climate, and Jobs Plans. The legislature could provide funding to these communities to allow them to assess the value of energy storage systems as part of the development of their plans. The legislature could further provide funding to support the deployment of energy storage systems when such systems meet community needs as determined by the plans.
- **Community Solar Paired with Storage Interconnection Study** Community solar paired with storage potentially faces unique barriers when interconnecting to the grid. An independent study that focuses on the entirety of the interconnection process for a community solar project paired with storage could further inform the Commission and stakeholders about the unique challenges and opportunities of this combination. Such an analysis to identify barriers to the deployment of storage paired with existing and new community solar may help incent a diverse set of ESS throughout the state.
- Storage Consultant Several parties recommended that the Commission engage a technical consultant to, among other things, 1) evaluate the future role of storage in Illinois relative to PJM and MISO; 2) run a generation expansion optimization model and a production cost model that will calculate a range of front of the meter utility-scale resource additions that would optimally serve projected load; 3) ensure reliable and resilient service; and 4) meet state decarbonization targets and manage the analysis and collection of stakeholder input in this respect. The expertise of such a consultant will enable the Commission to properly model and evaluate Illinois' storage needs and benefits which will provide a proper foundation for setting specific energy storage deployment targets. The Commission agreed with this recommendation.

Closing

- Driven by various needs and goals, state-level energy storage policy activity has accelerated in recent years.
- Given recent trends in cost declines and the growing body of research and operational experience that are contributing to a more complete understanding of the technology, it is reasonable to expect that states will continue to develop and refine policies in the coming years.
- In identifying and classifying existing policies and their underlying goals, this work provides a framework for future research on this topic as well as a reference for state policymakers who are exploring policy alternatives.



Informational Links

- Sandia National Laboratories Website:
 - www.sandia.gov/ess
- Pacific Northwest National Laboratories Interactive Policy Database:
 - <u>https://energystorage.pnnl.gov/regulatoryactivities.asp</u>
- DOE Energy Storage Program Website
 - <u>https://www.energy.gov/oe/energy-storage</u>
- ICC Climate & Equitable Jobs Act Implementation Page:
 - <u>https://www.icc.illinois.gov/programs/climate-and-equitable-jobs-act-implementation</u>
- ICC Energy Storage Program:
 - <u>https://www.icc.illinois.gov/informal-processes/energy-storage-program</u>
- Multi-Year Integrated Grid Plan Workshops:
 - <u>www.icc.illinois.gov/informal-processes/multi-year-integrated-grid-plan-workshops</u>







Contact Us!



Todd Olinsky-Paul Senior Project Director CESA/Clean Energy Group todd@cleanegroup.org

Anthony Star Senior Advisor, Interim Planning and Procurement Chief Illinois Power Agency <u>anthony.star@illinois.gov</u> Sarah Duffy Deputy Counsel, Illinois Power Agency <u>sarah.duffy@illinois.gov</u>

Michael Stieren Policy Analyst Illinois Commerce Commission <u>michael.stieren@illinois.gov</u>