Illinois Power Agency
Power Hour Webinar 7

Carbon Mitigation Credits and CEJA's Support for At-Risk Nuclear Plants

Agenda

- Introduction and Scope of the IPA Power Hour Webinars
- Background on Zero Emission Standard Development
- Background on Zero Emission Standard Process & Procurement
- Climate and Equitable Jobs Act Negotiation
- CMC vs. ZEC vs REC comparison
- Carbon Mitigation Credit Procurement Process
- Q&A
- Closing

IPA Power Hour Webinars

IPA Power Hour Webinars

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- **Introduction and Scope**
  - **Power Hour is a newly launched series of educational and informative presentations on a wide range of clean energy topics and emerging issues**
  - **Today's Power Hour:**
    - We will provide a brief background on the Zero Emission Standard Plan, including process and procurement under it. During this session, we will also provide a quick comparison of the Carbon Mitigation Credits, Zero Emission Credits, and Renewable Energy Credits. In addition, we will talk about the Climate and Equitable Jobs Act (Public Act 102-0662) negotiations leading to the bill passage on September 15, 2021. Lastly, we will give an overview on CEJA's requirement for the IPA to establish Carbon Mitigation Credit Procurement.
    - Past IPA Power Hour Webinars have covered other topical areas impacted by Public Act 102-0662

- **Introduction and Scope**
  - **We will not cover items from P.A. 102-0662 related to:**
    - Stakeholder feedback processes related to the Adjustable Block Program opening and the Revised Long-Term Plan development
    - Specific program or procurement requirements
    - Issues outside the purview of the IPA such as:
      - Changes to ratemaking
      - Electric vehicle and transportation incentives
      - Programs administered by other state agencies

IPA Power Hour Webinars

- **Completed Webinars**
  - **IPA Power Hour Webinar 1: Expansion of the Illinois RPS Under CEJA**
  - **IPA Power Hour Webinar 2: CEJA's Impact on Adjustable Block Program**
  - **IPA Power Hour Webinar 3: CEJA's Impact on Illinois Solar for All**
  - **IPA Power Hour Webinar 4: CEJA's Impact on Utility-Scale Solar and Wind and Brownfield sites**
  - **IPA Power Hour Webinar 5: Creating a Diverse and Equitable Energy Workforce**
  - **IPA Power Hour Webinar 6: Decarbonization, from Coal to Solar**
- **Future Power Hour Webinars will be held in 2022. Details to be determined. Stay tuned!**
- **Recordings of Power Hours and registration links available at:**
  - **https://www2.illinois.gov/sites/ipa/Pages/Events.aspx**

Illinois Power Agency

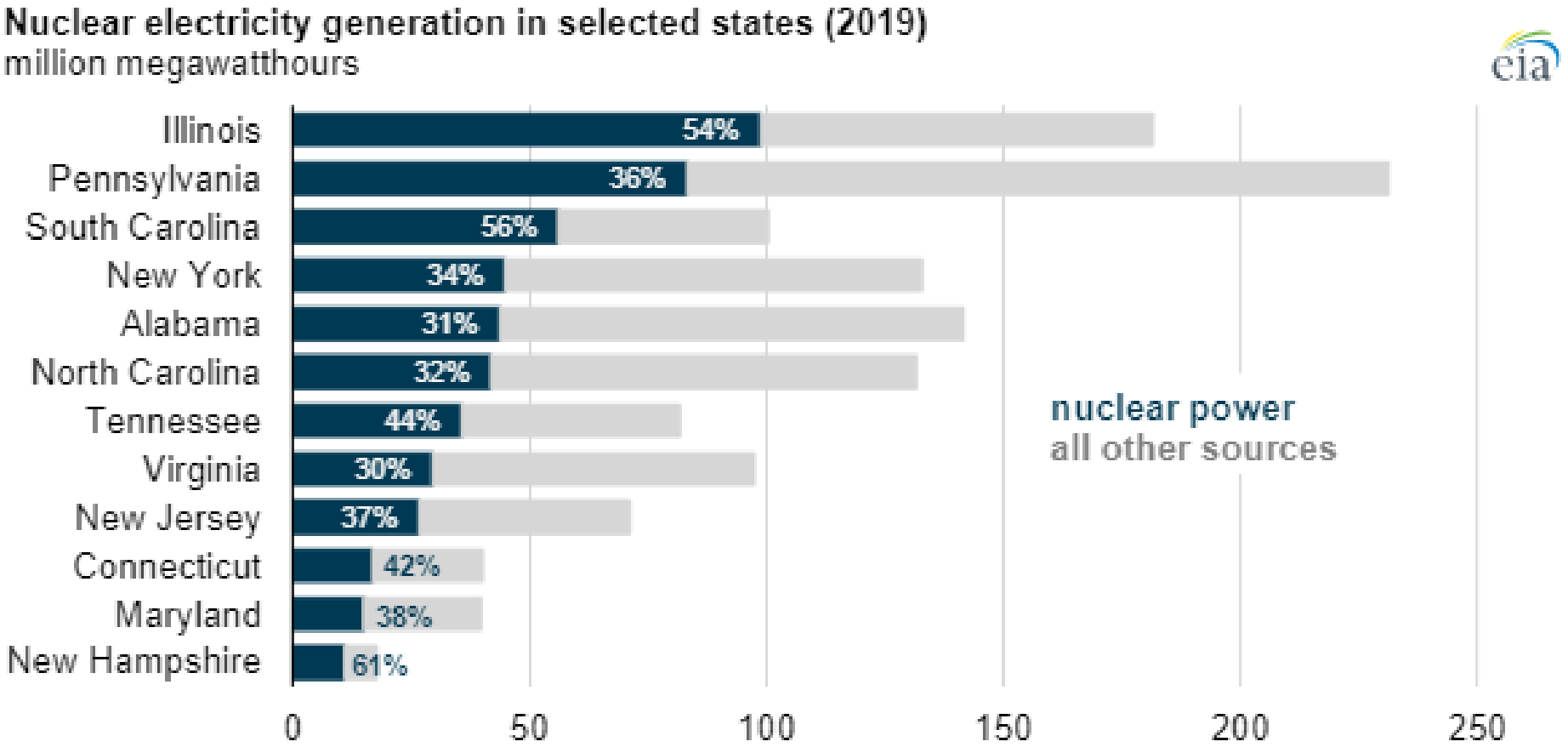
- **Independent State Agency created in 2007**
- **Agency duties include**
  - **Development and implementation of energy procurement plans for electricity supply for default service customers**
  - **Development and implementation of other procurement plans such as those to support at-risk nuclear plants (e.g., for Zero Emissions Credits and Carbon Mitigation Credits)**
  - **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

Zero Emission Standard Development (2014-2016)

Background on Nuclear Power in Illinois

- Illinois is most nuclear heavy state in country
  - Six plants, 11 reactors
  - 5 plants located in PJM
  - Mostly owned by Exelon
- Significant portion of IL generating mix
  - Over 90 millions MWh of generation
  - Carbon emission-free generation
  - Over 5000 jobs associated with plants
  - Local tax revenue, etc.
- IL is restructured state
  - Generating facilities cannot handle revenue shortfalls through a rate case before public utilities commission
  - Energy revenue declines across 2010s

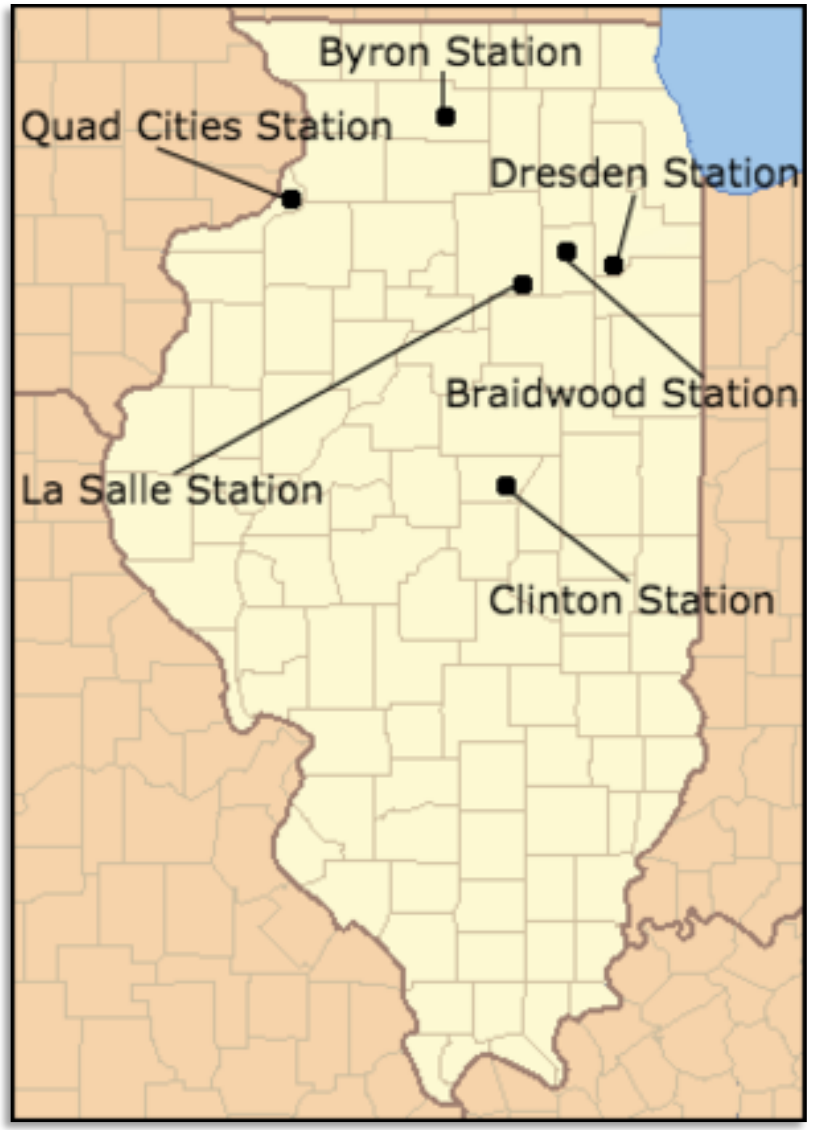
IL vs. the Nation: Nuclear Power



Nuclear Plants in Illinois

Name	Location	Nameplate capacity (MW)	Generating units	2016 net generation (MWh)	Reactor type	Owner	License Start	License Expiration
Braidwood Nuclear Generating Station	Braidwood, Will County	2,389	2	19,849,269	Pressurized water	Exelon	1987 1988	2046 (Unit 1) 2047 (Unit 2)
Byron Nuclear Generating Station	Ogle County	2,347	2	19,600,248	Pressurized water	Exelon	1985 1987	2044 (Unit 1) 2046 (Unit 2)
Clinton Nuclear Generating Station	Clinton, De Witt County	1,069	1	8,914,453	Boiling water	Exelon	1987	2026 (Unit 1)
Dresden Generating Station	Morris, Grundy County	1,845	2	15,443,893	Boiling water	Exelon	1969 1971	2029 (Unit 2) 2031 (Unit 3)
LaSalle County Nuclear Generating Station	LaSalle County	2,320	2	19,144,080	Boiling water	Exelon	1982 1983	2042 (Unit 1) 2043 (Unit 2)
Quad Cities Nuclear Generating Station	Cordova	1,871	2	15,655,095	Boiling water	Exelon 75%; MidAmerican 25%	1972 1972	2032 (Unit 1) 2032 (Unit 2)

Map of Illinois Nuclear Plants



Source: Nuclear Energy in the Midwest, Stanford University

Background on FEJA Development

- House Resolution 1146 and associated reports
  - May 29, 2014 passage
  - Direct state agencies to determine: what would happen if at-risk nuclear plants closed?
  - IPA assessed "reliability and capacity for the Midwest region"
  - DCEO, IEPA, and ICC also provided assessments
- HR 1146 Report: Jan 5, 2015
  - Three at-risk plants discussed in report (Quad Cities, Clinton, & Byron) LINK: https://www.icc.illinois.gov/downloads/public/HR1146%20Report.pdf
- Iterations of legislative proposals across 2015-16
  - How to recognize the environmental contributions of nuclear power?
- Culminates in Future Energy Jobs Act
  - Consolidation of state's RPS
  - Expansion of Energy Efficiency requirements
  - Funding to Support Additional Renewable Energy Development
  - Support for At-Risk Nuclear Plants (Zero Emission Standard)

Zero Emission Standard Process and Procurement

ZEC Process and Procurement

Under Zero Emission Standard, how is state-administered support provided to nuclear plants at risk of closure?

- Requirement to procure ZECs from at-risk nuclear plants
  - Providing revenue back to plants
  - Providing environmental benefits to state
- Requirements found in Section 1-75(d-5) of Illinois Power Agency Act (20 ILCS 3855)
  - Definitions of Zero Emission Facility, ZECs found in Section 1-10
- Overview of ZECs
  - What are they?
  - How are they different than RECs?
  - How are they traded/retired?

Zero Emission Standard Requirements

- Statutory Zero Emission Standard Requirements
  - Procurement quantity
    - 16% of contracting utility's load
    - Overall total of ~20 million ZECs
  - Project qualification
    - Nuclear plant in PJM or MISO
    - Not necessarily plants discussed in negotiations
      - Application of public interest criteria
      - Determination of closure risk
  - Contract length
    - 10 years (from June 1, 2017 to May 31, 2027)
  - Contract counterparties
    - ComEd, Ameren Illinois, MidAmerican Energy Company

Zero Emission Standard Requirements (cont.)

- **Add'l Statutory Zero Emission Standard Requirements**
  - **ZEC Price calculation**
    - Social cost of carbon ($16.50/MWh)
    - Escalator
      - $1 per MWh increase beginning in 2023
    - Price index-based potential adjustment downward
      - If Market Price Index exceeds Baseline Market Price Index ($31.40/MWh), then ZEC price adjusted downward
      - https://www2.illinois.gov/sites/ipa/Documents/IPA%20ZEC%20Final%20Payment%20Calculation%20Notice%20DY%202021-2022.pdf
  - **Annual cost (statutory cost cap)**
    - **1.65% of 2009 rates x prior year's kwh delivered**
    - **~$235 million total annual expenditure cap**
  - **Procurement quantity x price > annual cost?**
    - **Unpaid contractual volume**

Zero Emission Standard Procurement Plan

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- **Zero Emission Standard Procurement Plan**
  - **Timeline for development and approval**
    - 45 days to publish, 10 days for comments, 5 days for filing
    - ICC approval within 45 days
  - **Approved via ICC Docket No. 17-0333**
- **Major issue -- How to select facilities?**
  - "winning bids shall be selected based on **public interest criteria** that include, but are not limited to, minimizing carbon dioxide emissions that result from electricity consumed in Illinois and minimizing sulfur dioxide, nitrogen oxide, and particulate matter emissions that adversely affect the citizens of this State."
  - "the selection of winning bids shall take into account the incremental environmental benefits resulting from the procurement, such as any existing environmental benefits that are **preserved by the procurements** held under this amendatory Act of the 99th General Assembly and **would cease to exist if the procurements were not held**, including the preservation of zero emission facilities."

ZEC Procurement Process

- **Procurement Process**
  - **Plan development: June-July 2017**
  - **Plan approval: September 2017**
  - **Timeline for procurement (Fall/Winter of 2017)**
    - Registration of bidders
    - Submission of information
      - Facility-specific attributes
      - Demonstration of economic stress
    - Evaluation of submissions
    - Commission approval
  - **Selected facilities**
    - Quad Cities I & II
    - Clinton

Legal Challenge to Zero Emission Standard

- ***EPSA v. Star* lawsuit**
  - **Two suits brought in U.S. District Court (ND Ill.)**
  - **Primary constitutional challenges**
    - Dormant commerce clause arguments
    - Preemption arguments (Supremacy clause)
  - **Parallel NY case**
  - **Resolution of Case**
    - Dismissed by District Court
    - Appeal denied by 7th Circuit
    - Cert. denied by U.S. Supreme Court

More info on intersection of state power to promote clean energy as view against federal regulatory authority over wholesale energy markets:

https://statepowerproject.org/

Climate and Equitable Jobs Act Development (2019-2021)

What Issues Needed to Be Negotiated?

- **Broader Negotiations**
  - **Need for utility ethics & ratemaking reform**
  - **Nuclear Plan support**
  - **RPS funding and "solar cliff" issues**
  - **Equity and labor standards**
  - **Multitude of additional issues**
- **Nuclear-specific negotiations**
  - **Continued low energy prices, plant operation at risk**
  - **How to support plants? FRR & MOPR concerns?**
  - **Synapse report from Gov/IEPA**
    - Which plants are at genuine risk of closure?
    - What levels of financial support
  - **Future revenues are unpredictable**
    - How to adjust for assumed higher (or lower) revenues?
    - How to adjust for federal support?
    - What if prohibited from receiving capacity revenues?
  - **Once CMC model – how long to support (contract length)?**

Different Solutions Introduced

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Across 2019-2021, different solutions introduced (non-exhaustive sampling of proposals below):

- HB 804/SB 1718 (the "Clean Energy Jobs Act")
- HB 1734/SB 311 (the "Downstate Energy Affordability Act")
- HB 2640/SB 1601 (the "Path to 100 Act")
- HB 3446/SB 529 (the "Coal to Solar and Energy Storage Act")
- HB 1472/SB 1100 (the "Climate Union Jobs Act")
- HB 4074/SB 2896 (the "Consumers and Climate First Act")
- Additional proposals on RPS self-direct, nuclear support, and more

Process: From Proposals to Public Act

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About a 2.5 year process from the bills, concepts, etc. to the actual conclusion of a bill being signed into law

- Ongoing feedback processes: Workshops, working groups, committee hearings, bill drafts, and comment processes
- Also….a global health pandemic

Late May 2021, began to see drafts of a bill that borrowed ideas from each of these bills

Breaking point in late summer

- RPS issues continued being a concern
- Nuclear plants moving toward closure

Climate and Equitable Jobs Act (Sept 15, 2021)

- **Accomplishes a host of important priorities**
  - **Support for at-risk nuclear plants via procurement of carbon mitigation credits (CMCs)**
  - **Increased support for renewable energy development under Illinois RPS**
  - **Broader decarbonization and fossil-fuel plant retirement provisions**
  - **Utility ratemaking and ethics reforms**
  - **Significantly increased focused on diversity, equity, and inclusion and labor standards**
- **CMC Procurement Plan required to be published within 7 days of effective date of the Act (published Sept. 17, 2021)**

CMC vs. ZEC vs REC comparison

Overview on CMC, ZEC, and REC and How are they Different?

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- **What do they represent?**
  - **Environmental Attributes of 1 MWh of electricity for each**
  - **Decoupled from the energy or capacity, which may be traded/sold separately**
  - **Allows purchaser to claim environmental benefits of that generation**
- **Generating facility requirements**
  - **"renewable energy generating facility" defined in Section 1-10 of IPA Act**
    - Applicable technologies outlined
    - Often point of controversy in other jurisdictions
    - NOT nuclear through this listing
  - **ZEC are just nuclear, not renewable**
  - **CMC are just nuclear, not renewable (and located within PJM, per 1-75(d-10) of IPA Act)**

Overview on CMC, ZEC, and REC and How are they Different? (cont.)

- Generation, retirement, and transfer
  - RPS requires retirement by utilities
  - ZES and CMC requires retirement by utilities
  - All traded over GATS/M-RETS
- Traded in liquid markets?
  - RECs are, although not via the Illinois RPS
  - Not aware of same for ZECs and CMCs, not in Illinois
- Facility location requirements?
  - Not definitional for RECs, but Section 1-75(c)(1)(*I*) applies for IL RPS
  - ZEC = located in PJM or MISO
  - CMC = located in PJM

Carbon Mitigation Credit Procurement Process (2021)

CMC Procurement by Law

- **Statutory Requirements**
  - **Procurement quantity**
    - No more than 54,500,000 million CMCs delivered annually
  - **Project qualification**
    - Applicant nuclear plants within PJM
    - Statements expressly excluding LaSalle facility
  - **Contract info**
    - 5 years beginning June 1, 2022
    - Only ComEd as counterparty
  - **CMC price**
    - Floating price (upcoming slide to explain)
    - Price estimates? Can be positive or negative
  - **Annual cost**
    - Unknowable, could operate either way
    - Estimates? ($694 total over 5 years discussed publicly)
    - Not capped, but could also operate as a credit

CMC Procurement Plan

Key Issues

- **How to select facilities?**
  - Borrowed mostly from ZES Plan
    - Public Interest Criteria
    - Economic Stress Multiplier
  - Adjust for no MISO projects possible
- **CMC Price adjustments**
  - Energy prices
  - PJM Minimum Offer Price Rule ("MOPR")
  - Federal subsidies
    - Litigation before ICC
    - Process to be used

CMC Procurement Plan Approval

- **CMC Procurement Plan development**
  - Summer of 2021 to develop most content
  - Published for comment on September 17, 2021
  - Comments received September 24, 2021
- **Approved in ICC Docket No. 21-0718**
  - September 29, 2021 filing
  - Briefs thereafter
  - CMC Delivery Contract Developed in Coordination
  - November 10, 2021 approval

CMC Pricing: How is it Calculated?

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PRICE CALCULATION

- Bid Price – (Available Energy Revenues + Available Capacity Revenues)

Statutory Max Bid Prices (20 ILCS 3855/1-75(d-10)(3)(C)):

- 2022-2023: $30.30 per megawatt-hour;
- 2023-2024: $32.50 per megawatt-hour;
- 2024-2024: $33.43 per megawatt-hour;
- 2025-2026: $33.50 per megawatt-hour;
- 2026-2027: $34.50 per megawatt hour.

- **Monetized Federal Subsidies? Added to Revenues**
- **Minimum Offer Price Rule and Capacity Revenues Unavailable?**

CMC Procurement Process

- **Procurement Process**
  - **Timeline for procurement**
    - November 23, 2021 procurement event
    - Commission Meeting on December 1, 2021
    - Contract Execution by December 3, 2021
  - **Selected facilities**
    - Braidwood, Byron, Dresden
  - **Where are we now?**
    - Procurement completed
    - Contracts executed
  - **What's next?**
    - Delivery of CMCs/Payment for CMCs beginning June 1, 2022
    - Monthly Price Calculations
    - Federal Subsidies? MOPR?

More here: https://www.ipa-energyrfp.com/carbon-mitigation-credits/

Questions & Answers

Closing!