Zero Emission Standard

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ZERO EMISSION STANDARD

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PROCUREMENT PLAN

DRAFT

DRAFT PLAN FOR PUBLIC COMMENT

July 11, 2017

Prepared in accordance with the
Illinois Power Agency Act (20 ILCS 3855) and Public Act 99-0906

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1 Introduction

Public Act 99-0906 which took effect on June 1, 2017, created a new subsection of the Illinois Power Agency Act, 1-75(d-5), the Zero Emission Standard. This Standard requires the Illinois Power Agency ("IPA" or "Agency") to create this Zero Emission Standard Procurement Plan. This Plan sets out the provisions for the procurement of Zero Emission Credits from Zero Emission Facilities. These credits recognize the environmental benefits of certain electric generation resources that do not emit carbon dioxide or other key pollutants.

One of Public Act 99-0906's legislative findings was a declaration that "[r]educing emissions of carbon dioxide and other air pollutants, such as sulfur oxides, nitrogen oxides, and particulate matter, is critical to improving air quality in Illinois for Illinois residents," and that, as a result, "… Illinois must expand its commitment to zero emission generation and value the environmental attributes of zero emission generation that currently falls outside the scope of the existing renewable portfolio standard, including, but not limited to, nuclear power." With regard to existing zero emission facilities, the legislature found that "[p]reserving existing zero emission energy generation and promoting new zero emission energy generation is vital to placing the State on a glide path to achieving its environmental goals and ensuring that air quality in Illinois continues to improve."

To best achieve these goals, the General Assembly found that "it is necessary to establish and implement a zero emission standard, which will increase the State's reliance on zero emission energy through the procurement of zero emission credits from zero emission facilities, in order to achieve the State's environmental objectives and reduce the adverse impact of emitted air pollutants on the health and welfare of the State's citizens." To this end, Public Act 99-0906 established a new subsection 1-75(d-5) of the IPA Act, creating a Zero Emission Standard and requiring the IPA to develop this Zero Emission Standard Plan setting forth its approach for ensuring compliance with that standard.

1.1 Plan Organization

The Plan contains the following Chapters:

Chapter 1 is this Introduction. It contains a brief summary of the Chapters of this Plan as well as an Action Plan for specific items that the Illinois Power Agency requests that the Illinois Commerce Commission approve as part of the approval of this Plan.

Chapter 2 provides an overview of legislative background for the newly enacted Section 1-75(d-5) of the Illinois Power Agency Act.

Chapter 3 describes the Plan development and procurement requirements. This chapter outlines the approach for how ZECs are priced and the timeline for plan development and approval.

Chapter 4 contains a detailed discussion of the Social Price of Carbon, Baseline Market Price Index, Market Price Index, ZEC Price, ZEC contractual volumes, ZEC cost cap, and ZEC volume cap.

Chapter 5 covers Bid Evaluation and Selection. It describes how the public interest criteria are applied, the weighting of scores, and the methodology applicable to CO_2, NO_x, SO_2, and Particulate Matter.

Chapter 6 describes the Procurement Process itself. This includes a discussion of the practicability of the application of the provisions of Section 16-111.5 of the Public Utilities Act to the procurement process, bidder qualification, the procurement process itself, ZEC contract development, and ZEC tracking.

Appendices to this Plan provide more detailed data and calculations, as well as a draft template for the Bidder Eligibility Application Form.

1.2 Action Plan

In approving this Plan, the Agency requests the following Action Items be explicitly approved by the Commission.

1. A finding that this Plan will result in the procurement of cost-effective zero emission credits.
2. Approval of the calculations contained in Chapter 4.
3. Approval of the Bid Evaluation and Selection methodology contained in Chapter 5.
4. Approval of the Procurement Process, timeline, and provisions as described in Chapter 6, including the summary of the applicability of Section 16-111.5 provisions to the procurement process as contained in Appendix G.
5. Approval of the use of Emission Free Energy Certificates as tracked in the PJM Generation Attribute Tracking System as the means for tracking the generation, transfer, and retirement of Zero Emission Credits.
6. Approval of the Bid Eligibility form contained in Appendix E.

The Illinois Power Agency respectfully publishes this Zero Emission Standard Procurement Plan, and invites interested parties to submit comments on the Plan to the Agency by July 21, 2017.

2 Legislative Overview

This Chapter of the 2017 Zero Emission Standard Procurement Plan ("Plan"), as well as the Chapter that follows, describe the legislative background and requirements applicable to the Illinois Power Agency that are applicable to the development of the Illinois Power Agency's Plan to procure zero emission credits ("ZECs"). Chapter 2 (Legislative Overview) provides background on the Agency and its process for developing procurement plans and conducting procurement events more generally, while Chapter 3 (Zero Emission Standard Plan Development and Procurement Requirements) focuses on issues specific to the state's new Zero Emission Standard (20 ILCS 3855/1-75(d-5)).

2.1 Illinois Power Agency Authority

The Illinois Power Agency ("IPA" or "Agency") was established in 2007 through omnibus energy legislation ultimately enacted as Public Act 95-0481. Not unlike the recently enacted Public Act 99-0906, Public Act 95-0481 touched on many aspects of energy sector's legal and regulatory structure and instituted major energy reforms into Illinois law, including a new electricity procurement process to serve eligible retail customers, the establishment of state's initial Renewable Portfolio Standard to support renewable energy generation (20 ILCS 3855/1-75(c)), the Clean Coal Portfolio Standard (20 ILCS 3855/1-75(d)), and the Energy Efficiency Portfolio Standard (220 ILCS 5/8-103), and, more broadly, the establishment of the Illinois Power Agency Act ("IPA Act"), 20 ILCS 3855.

As evident in the IPA Act itself, in creating the Agency, the General Assembly found that Illinois citizens should be provided "adequate, reliable, affordable, efficient, and environmentally-sustainable electric service at the lowest total cost over time, taking into account benefits of price stability."[1] Thus, one primary purpose of the IPA Act, and in turn the creation of the Agency, was to ensure that ratepayers, specifically customers in service classes that had not been declared competitive and who take service under a utility's bundled rate ("eligible retail customers"),[2] benefit from retail and wholesale competition. A primary objective for creating the Agency was therefore to improve the process to procure electricity and other standard wholesale products for those customers.[3]

As initially conceived, the Agency's primary responsibility concerned developing procurement plans and conducting competitive procurement events to help the state's large investor-owned electric utilities meet the supply requirements of those entities' "eligible retail customers," i.e.,

[1] 20 ILCS 3855/1-5(1).

[2] 220 ILCS 5/16-111.5(a).

[3] 20 ILCS 3855/1-5(2)-(4).

those customers who continued to receive supply service from their utility even as the competitive supply market developed in Illinois.[4] As set forth in Section 16-111.5 of the Public Utilities Act ("PUA"), the Agency's process for meeting those requirements begins with the receipt of load forecasts from the utilities themselves each year by July 15, with the IPA and its procurement planning consultant then having 30 days to draft and publish an annual "procurement plan" setting forth its proposed strategy for conducting procurements to bring necessary "standard wholesale products" (i.e., block energy, capacity, ancillary services, etc.) under utility contract. After comments are received on the draft procurement plan, that plan is revised and filed with the Illinois Commerce Commission ("ICC" or "Commission") for approval through a formal docketed notice and comment proceeding.[5]

After Commission approval of an IPA Procurement Plan, the Agency then works with its Procurement Administrator[6] to prepare for and conduct the procurement events proposed in the Plan and authorized through the Commission's Order approving the Plan. The results of those procurement events likewise require Commission approval, with the Commission receiving confidential reports from both its Procurement Monitor[7] and the IPA's Procurement Administrator to inform its approval of the Procurement Administrator's selection of winning bids. Shortly after the Commission's approval of procurement results, standard form supply contracts are executed between winning suppliers and the utilities whose supply requirements were met through the procurement event.

2.2 Renewable Energy Resource Procurement

In establishing the IPA, the General Assembly also acknowledged the importance of including cost-effective renewable resources as part of a "diverse electricity supply portfolio" that provided

[4] Public Act 95-0541 also required the development of an IPA Resource Development Bureau for potentially constructing and operating electric generating facilities to meet the load requirements of municipal electric systems, governmental aggregators, or rural electric cooperatives in Illinois. As this function has proven unnecessary or unwise to undertake, the Agency has never established a Resource Development Bureau, and in 2016 the Illinois General Assembly amended the IPA Act to ensure that the establishment of that Bureau was a permissive ("may establish") and not prescriptive ("shall establish") requirement.

[5] Since 2009, the IPA has each year developed an annual procurement plan and (except for in 2013) conducted competitive procurements to meet the needs of the eligible retail customers of Ameren and ComEd. Beginning in 2016, MidAmerican Energy elected to participate in the IPA's planning and procurement process to serve a portion of its load requirements for its eligible customers in Illinois.

[6] The Procurement Administrator is a third-party consultant mandated pursuant to Section 1-75(a)(2) of the IPA Act to be retained by the IPA in order to conduct the Agency's competitive procurement processes. The Agency's current Procurement Administrator is NERA Economic Consulting.

[7] The Procurement Monitor is a consultant retained by the Commission pursuant to Section 16-111.5(c)(2) of the PUA to monitor and review all aspects of the Agency's procurement processes. The Commission's current Procurement Monitor is Bates White, LLC.

"environmentally sustainable electric service," with an aim of "decreasing environmental impacts" and "avoiding or delaying the need for new generation, transmission, and distribution infrastructure."[8] This informed enactment of the state's Renewable Portfolio Standard, or "RPS." The state's original RPS required that the above-referenced process be used to bring under contract environmental attributes of generation (known as "renewable energy resources," which may be met through renewable energy credits, or "RECs").[9]

Not unlike the Zero Emission Standard (discussed in more detail in the Chapters to follow, as well as Section 2.3 below), the RPS established percentage-based procurement targets for ensuring that utilities' eligible retail customer load was met through an annually-increasing percentage of renewable energy credits. Consistent with the requirements of Section 1-75(c) of the IPA Act and Section 16-111.5 of the PUA, procurement events to procure those RECs were proposed as part of the Agency's annual procurement plan. The results of approved procurement events were likewise subject to Commission approval, with winning suppliers of RECs and the utilities' whose RPS requirements were met through the REC procurement required to execute standard form supply contracts shortly after the approval of procurement results.

As with the Zero Emission Standard, RPS spending was (and continues to be) subject to the limitations of a rate impact cap. Amounts that could be recovered from eligible retail customers to fund RPS procurements were limited to "no more than the greater of 2.015% of the amount paid per kilowatthour by [eligible retail] customers during the year ending May 31, 2007 or the incremental amount per kilowatthour paid for these resources in 2011," resulting in the establishment of a budget cap as this value was multiplied against previously-supplied utility load. Purchases that would cause that cap to be exceeded would not be authorized, even if such purchases were necessary to meet the percentage targets found in the RPS.[10]

As referenced above, Public Act 99-0906 also brought about significant reforms to the Illinois RPS. Perhaps the most important reform concerns transitioning from different RPS requirements based on supply source – while the IPA developed plans and conducted procurement events to meet *eligible retail customer* RPS requirements, alternative retail electric suppliers were subject

[8] 20 ILCS 3855/1-5(5), (6).

[9] Under revisions to the RPS brought about by Public Act 99-0906, meeting the state's RPS requirements now requires the development of a separate "long-term renewable resources plan," with only the "initial forward procurements" and "competitive procurement events" subject to the specific procurement process requirements of Section 16-111.5(e) of the PUA (instead, for projects such as solar photovoltaic distributed generation and "community solar," a more rolling and open-ended project proposal and selection process known as an "adjustable block program" applies).

[10] Long-term renewable resources contracts approved as part of the 2010 procurement cycle also included curtailment provision to ensure that the rate impact cap was not exceeded. Those provisions were invoked for ComEd's contracts in 2013 and 2014.

to very different requirements[11] -- to a model through which the RPS budget is established through a delivery service charge applied to all retail customers, regardless of supply source, with procurement targets applicable to retail customer (and not merely *eligible* retail customer, i.e., utility supply) load. In this respect, the RPS is being brought into alignment with the newly-enacted ZES, which likewise features targets based on retail customer load funded through a charge applicable to all retail customers (and which likewise is subject to the development of a separate procurement plan).

This overview of the Agency's historical renewable resources procurement process and obligations demonstrates that the Agency's role in developing procurement plans and conducting procurement events to meet statutory targets for the environmental attributes of electric generation is not a new one, nor is the Commission's role in adjudicating the review of those plans and approving the results of environmental attribute procurement events.[12] Likewise, requirements that the Agency develop plans and conduct procurements of environmental attributes consistent with its "standard wholesale product" procurement requirements found in Section 16-111.5 of the PUA are not new either. The Agency perhaps has more latitude and different structures to apply to renewable energy resource procurements *after* the passage of Public Act 99-0906 than before, but the vast majority of its renewable resource procurements to date have followed the strictures of Section 16-111.5 of the PUA—as the procurement of zero emission credits will in large part as well, further explained in Chapter 3 below and Appendix G. Thus, where possible, the Agency has drawn upon its prior lessons learned from planning and conducting *renewable energy credit* procurements in developing this Zero Emission Standard Plan for the procurement of *zero emission credits*. Procedural specifics regarding the procurement process for zero emission credits can be found in Chapter 3 below, with key elements of that process explained in further detail in Chapters that follow.

2.3 House Resolution 1146, Public Act 99-0906, and the Zero Emission Standard

As referenced above, Public Act 99-0906 introduced a series of reforms to the Illinois energy statutory and regulatory landscape. Among them included the expansion of targets found in the state's energy efficiency portfolio standard,[13] many changes to the state's renewable energy portfolio standard (some of which are referenced above) including the establishment of the Illinois

[11] See 220 ILCS 5/16-115D.

[12] Indeed, through the Agency's Supplemental Photovoltaic ("SPV") procurement process (authorized by 20 ILCS 3855/1-56(i), enacted through Public Act 98-0672), the Agency even has experience developing a standalone plan for the procurement of environmental attributes only from a specific type of underlying generation—in that case, renewable energy credits from "new" solar photovoltaic distributed generation systems. (See generally Docket No. 14-0651 approving the IPA's SPV Plan).

[13] See generally 220 ILCS 5/8-103B.

Solar for All low-income solar program,[14] new bill crediting/offset provisions for community solar project subscriptions,[15] the institution of a new $250-per-kilowatt distributed generation rebate for new photovoltaic systems featuring a smart inverter,[16] and the establishment of a zero emission standard intended to support the environmental attributes of nuclear power generation.[17]

While providing nuclear generating units with some compensation for the value of their emission-free environmental attributes has long been a part of energy policy discussions (including any discussions around the institution of a carbon tax or the implementation of a "cap and trade" system for emissions credits), concrete discussions around how such a mechanism could be best implemented through Illinois law began in earnest in 2014. At that time, in response to concerns that certain nuclear power plants were at risk of closure due to market conditions that adversely affected the ongoing commercial viability of these plants, the Illinois House of Representatives adopted House Resolution 1146 of the 98th General Assembly ("HR 1146"). That resolution—specifically referenced in Section 1.5(5)-(8) of the Legislative Findings to Public Act 99-0906, and also mentioned in reference to the public interest bid selection criteria found in Section 1-75(d-5)(1)(C) of the Zero Emission Standard—contained a series of statements regarding the value of nuclear power generation and urged several state agencies, including the IPA, to prepare reports concerning the impacts of premature closure of these plants, with each report topic (taken broadly: cost, reliability, environmental impacts, and economic benefits) assigned to the agency with presumed expertise. HR 1146 concluded with a request that the findings in those reports "include potential market-based solutions that will ensure that the premature closure of these nuclear power plants does not occur and that the dire consequences to the economy, jobs, and the environment are averted."

Those reports prepared by the ICC, the IPA, the Illinois Environmental Protection Agency, and the Illinois Department of Commerce and Economic Opportunity in response to HR 1146 were published on January 5, 2015.[18] Overall, those reports focused on identifying the potential impacts that could result from the premature closure of three specific Illinois-based nuclear generating facilities that were identified across the agencies as being "at risk."[19] The reports concluded with

[14] See generally 20 ICLS 3855/1-56, 1-75(c).

[15] See generally 220 ILCS 5/16-107.5.

[16] See generally 220 ILCS 5/16-107.6.

[17] See generally 20 ILCS 3855/1-75(d-5).

[18] A copy of the HR 1146 reports, as well as a brief summary, may be found on the website of the Illinois Commerce Commission at: www.icc.illinois.gov/electricity/workshops/hr1146.aspx.

[19] Perhaps of particular significance given the focus on environmental benefits in the legislative findings accompanying Public Act 99-0906 was the projected loss of environmental attributes associated with these zero emission facilities. As discussed in the Illinois EPA's contribution to the HR 1146 report, a substantial portion of the generation necessary to replace the output from the zero emission facilities could very well be sourced from fossil fuel

a section identifying and discussing various “market-based solutions” that could be adopted by the state.

The time between the publishing of the HR 1146 reports to the passage of what became amendments to SB 2814 in the Illinois General Assembly (and then Public Act 99-0906 once signed into law by the Governor) was roughly 23 months, and the long list of legislative proposals offered during that time span, as well as the many committee hearings exploring the subjects eventually addressed through that bill, need not be recounted here. The process was comprehensive and exhaustive, and the Agency presumes that whatever specific factors motivated lawmakers to enact this particular market-based solution through the form represented by Public Act 99-0906 is, to the extent relevant, properly captured through the plain language of the Act’s text, the Act’s legislative findings, and other legislative history accompanying its enactment.

In that vein, among Public Act 99-0906’s legislative findings was a declaration that “[r]educing emissions of carbon dioxide and other air pollutants, such as sulfur oxides, nitrogen oxides, and particulate matter, is critical to improving air quality in Illinois for Illinois residents,” and that, as a result, “… Illinois must expand its commitment to zero emission generation and value the environmental attributes of zero emission generation that currently falls outside the scope of the existing renewable portfolio standard, including, but not limited to, nuclear power.” With regard to existing zero emission facilities, the legislature found that “[p]reserving existing zero emission energy generation and promoting new zero emission energy generation is vital to placing the State on a glide path to achieving its environmental goals and ensuring that air quality in Illinois continues to improve.”

To best achieve these goals, the General Assembly found that “it is necessary to establish and implement a zero emission standard, which will increase the State’s reliance on zero emission energy through the procurement of zero emission credits from zero emission facilities, in order to achieve the State’s environmental objectives and reduce the adverse impact of emitted air pollutants on the health and welfare of the State’s citizens.” To this end, Public Act 99-0906 established a new subsection 1-75(d-5) of the IPA Act, creating a Zero Emission Standard and requiring the IPA to develop a Zero Emission Standard Plan setting forth its plan for ensuring compliance with that standard .

2.4 ZEC Procurement Plan Development Timeline

Although Section 1-75(d-5)(1)(C-5) of the IPA Act envisions that the entire ZEC procurement process – including the execution of ZEC delivery contracts – “shall be completed no later than May 10, 2017,” the effective date of Public Act 99-0906 was June 1, 2017, leaving the implementing agencies (the IPA and ICC) without authority to meet the requirements of the statute

generating units, which would not preserve the beneficial environmental attributes associated with the at-risk zero emission nuclear facilities.

until after that date had passed. Subparagraph (C-5) also provides, however, that the IPA and ICC "may, as appropriate, modify the various dates and timelines" outlined in the Act "[b]ased on the effective date" of the Act. With an effective date of June 1, 2017, the IPA thus understands that any statutory deadlines will extend from the timelines tracking against the actual effective date of Public Act 99-0906 as set forth in Section 1-75(d-5)(1)(C) of the IPA Act, with other due dates and timelines subject to modification as well. This Section describes that revised timeline.[20]

Under that approach, the IPA is required to publish a draft Zero Emission Standard Procurement Plan within 45 days of June 1, 2017, the effective date of the Act.[21] Copies of the draft plan were published and posted on the IPA's website on July 11, 2017, slightly ahead of its statutory deadline.[22] Interested parties are allowed 10 days from the date of that publishing to provide comments on the draft Plan.[23] Those public comments will be posted on the IPA's website, and to the extent possible, the IPA requests that such comments "be specific, supported by data or other detailed analyses, and, if objecting to all or a portion of the procurement plan, accompanied by specific alternative wording or proposals" consistent with Section 16-111.5(d)(2) of the PUA.

After the end of the draft Plan comment period on July 21, 2017, and consistent with the statutory 60 day deadline from the effective date of the Act, the IPA will review the comments submitted and may, to the extent justified by the comments received, revise the Plan. The revised draft Plan will be filed with the ICC no later than July 31, 2017.[24]

The Act provides the Commission with 45 days to review the filed Plan and determine if the Plan would result in the cost-effective procurement of ZECs.[25] After that notice and comment proceeding, should the Commission determine that the Plan would result in the cost effective[26]

[20] The Act also states that "[n]otwithstanding whether a procurement event is conducted under Section 16-111.5 of the Public Utilities Act, the Agency shall immediately initiate a procurement process on the effective date of this amendatory Act of the 99th General Assembly." (20 ILCS 3855/1-75(d-5)(1)(C-5). The Agency believes that by having begun the development of its Zero Emission Standard Plan on the effective date of Public Act 99-0906, it has satisfied this criteria.

[21] See 20 ILCS 3855/1-75(d-5)(1)(C).

[22]After application of the statute on statutes (See 5 ILCS 70/1.11), the 45-day deadline for publishing the draft Plan is technically July 17, 2017, taking into account that the 45th day falls on a weekend (Saturday July 15).

[23] See 20 ILCS 3855/1-75(d-5)(1)(C). Parties have until July 21, 2017 to provide comments on the draft ZES Plan.

[24] July 30, 2017, the 60-day deadline established by the statute, falls on a Sunday.

[25] 20 ILCS 3855/1-75(d-5)(1)(C).

[26] For the purposes of this Plan, the Act defines "cost effective" as meaning that "the projected costs of procuring zero emission credits from zero emission facilities do not cause the limit stated in paragraph (2) of this subsection to be exceeded." That limitation is discussed further in Section 4.6 below, but generally means that the ZEC procurement cost does not exceed 1.65% of the per kilowatt hour rate paid by eligible retail customers during the year ending May 31, 2009 multiplied against retail customer load.

procurement of ZECs, "then the Commission shall . . . approve the plan or approve with modification."

Should the Agency file its Zero Emission Standard Plan with the Commission on July 31, 2017 (as it currently plans to do), this would leave the Commission with an approval deadline of September 15, 2017. At present, the Commission has a Special Open Meeting scheduled for September, 11, 2017.

Once the Plan is approved by the Commission, the Agency, through its Procurement Administrator, will proceed with conducting the process described in Chapter 6 to procure 10-year contracts for ZECs.

In addition, after this Plan is approved (or approved with modification) by the Commission, the IPA will request that bidders interested in participating who own facilities meeting the definition of a zero emission facility under the Act submit the prescribed eligibility information. Interested bidders will have 14 days to submit the required eligibility information and become qualified bidders.[27] Additional information regarding the eligibility information to be provided to the IPA by potential bidders is described in Chapter 6.

[27] A draft template for this information is contained in Appendix F.

3 Plan Development and Procurement Requirements

As discussed in Chapter 2, IPA procurements begin with the publishing of a procurement plan over which comment is taken, progress to a notice and comment hearing for that plan before the Illinois Commerce Commission, and culminate in a procurement event used to bring procured resources under contract. Section 1-75(d-5) of the IPA Act directs the IPA to develop and publish its plan for when and how to procure ZECs from qualifying zero emission facilities.[28]

This Chapter discusses both key required elements of the Zero Emission Standard Plan itself as well as necessarily elements of the Zero Emission Credit procurement process and procurement event required to bring those ZECs under contract.

3.1 Zero Emission Facilities and Zero Emission Credits

Nuclear power plants generate electricity without the air pollutant emissions that result from the combustion of fuels to generate electricity. In most states—including under Illinois law—these nuclear power generating facilities are not considered to be "renewable" resources and therefore are not eligible to produce RECs. As a consequence, they cannot be used to meet state renewable energy resource procurement targets, such as the Illinois RPS, leaving them without a mechanism to receive value for the zero emission attributes associated with their generation. To recognize the zero emission value of nuclear generation, ZECs represent the environmental attributes from these zero emission facilities that would not otherwise be recognized in the marketplace or under Illinois law.[29]

This Zero Emission Standard Plan exists to explain and define the process through which the IPA will conduct a procurement event to procure zero emission credits from zero emission facilities, and only "zero emission facilities" are capable of producing the "zero emission credits" to be

[28] See generally 20 ILCS 3855/1-75(d-5)(1)(C). While the Zero Emission Standard is less express than other parts of the IPA Act about the staging of a procurement event separate from the underlying plan's development and approval, the need for a subsequent procurement event stemming from the plan may be inferred from the various requirements of the plan itself, which describe how a separate "selection of winning bids" is to be conducted with a report from the Illinois Commerce Commission accompanying its "review and acceptance or rejection of the procurement results," rather than through its Order approving the plan. This two-stage "plan-then-procurement" process, which is consistent with other procurement plans that have been developed by the Agency, is further supported by a statement in subparagraph (C-5) that the "procurement and plan approval processes . . . shall be conducted in conjunction with the procurement and plan approval processes required by subsection (c) of [Section 1-75] and Section 16-111.5 of the Public Utilities Act, to the extent practicable." Under the Section 16-111.5 process, supply contracts can only be developed after administrative approval of the plan setting forth key elements associated with those contracts, necessitating that a procurement event be conducted only after the underlying plan is finalized and approved.

[29] See for example, State of New York Public Service Commission, Order Adopting A Clean Energy Standard, CASE 15-E-0302, Case 16-E-0270, August 1, 2017, pp. 19-20.

delivered under the contracts entered into through this procurement process. What constitutes a zero emission facility is defined in the IPA Act as a generating facility "fueled by nuclear power" interconnected to PJM or MISO.[30] Likewise, a ZEC is defined as "a tradable credit that represents the environmental attributes of one megawatt hour ("MWh") of energy produced from a zero emission facility."[31]

Throughout Section 1-75(d-5) (including in requirements related to submitting facility eligibility information),[32] the statute uses the term "facility" rather than "generating unit," "power plant," "nuclear plant," or some alternative terminology. As some nuclear power plants feature multiple reactors, this raises the question of whether the entire plant is itself a "facility," or whether each individual reactor constitutes a "facility" instead. The IPA believes this is addressed by the definition of "facility" found in Section 1-10 of the IPA Act, which determines that a facility is "an electric generating unit or a co-generating unit that produces electricity along with related equipment necessary to connect the facility to an electric transmission or distribution system."[33] While the term "generating unit" is not itself defined, because each reactor can function to generate electricity as an independent unit from another, and given that each may have its own unique in-service date and cost structure, a "generating unit"—and thus a "facility" for purposes of the Zero Emission Standard—should be defined at the reactor level, and not at the plant level.

3.2 Requirements of the Plan

The Act requires the Plan to provide details for how the IPA will design and implement a zero emission credit procurement process to meet the requirements of Section 1-75(d-5) of the Act. To achieve the zero emission standard goals stated in the Act, the plan developed by the IPA seeks to do at least the following:

- Ensure that all ZECs purchased under the plan will be cost effective as defined in the Act,[34]
    - Section 1-75(d-5)(1)(C) provides that this "cost effective" requirement is met if "the projected costs of procuring zero emission credits from zero emission facilities do not cause [the rate impact cap] to be exceeded." Further discussion of the rate impact cap, and the budget established through application of that cap, can be found in Chapter 4.

[30] 20 ILCS 3855/1-10. A list of the facilities that meet this definition is in Appendix D.

[31] Ibid. Compare to a "renewable energy credit," the definition of which is "a tradable credit that represents the environmental attributes of one megawatt hour of energy produced from a renewable energy resource."

[32] See 20 ILCS 3855/1-75(d-5)(1)(A).

[33] 20 ILCS 3855/1-10.

[34] See 20 ILCS 3855/1-75(d-5)(1)(C).

- Describe and communicate the bidder eligibility requirements specified in the Act,[35]
  - Additional information regarding the eligibility information to be provided to the IPA by potential bidders is described in Chapter 6. The IPA has also included a draft bid submission form containing the submittal requirements of Section 1-75(d-5)(1)(A)(i)-(iv) to this draft Plan, and seeks feedback on that form through the draft Plan comment process.
- Communicate the requirements for interested parties to become eligible bidders,[36]
  - As noted above, additional information regarding the eligibility information to be provided to the IPA by potential bidders is described in Chapter 6. The IPA has also included a draft bid submission form containing the submittal requirements of Section 1-75(d-5)(1)(A)(i)-(iv) to this draft Plan, and seeks feedback on that form through the draft Plan comment process.
- Provide details regarding the bid evaluation and selection process that describe how the public interest criteria specified in the Act are formulated and applied toward selecting the winning bids,[37]
  - Chapter 5 discusses how the public interest criteria specified in the Act will be applied to the selection of winning bids.
- Determine and post the initial price for the ZECs to be procured,[38]
  - The initial price for ZECs to be procured, as well as the accompanying calculations of that price, can be found in Chapter 4 below.
- Explain how the ZEC bid evaluation and selection process takes into consideration the maintenance of incremental benefits associated with existing zero emission generators,[39]
  - Chapter 5 explains how the evaluation and selection process takes into account the maintenance of incremental benefits, specifically through impacting scoring by two

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[35] See 20 ILCS 3855/1-75(d-5)(1)(A).

[36] See id., 220 ILCS 5/16-111.5(e)(1).

[37] See 20 ILCS 3855/1-75(d-5)(1)(C). The Act provides that "…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 the State." The Act further states "The plan shall also describe in detail how each public interest factor shall be considered and weighted in the bid selection process to ensure that the public interest criteria are applied to the procurement and given full effect."

[38] See 20 ILCS 3855/1-75(d-5)(1)(B).

[39] See 20 ILCS 3855/1-75(d-5)(1)(C).

key factors: a) whether the facility's costs are recovered through rates, and b) the economic stress that may be faced by the facility.

- Provide information regarding the contract forms and requirements for completing the procurement of cost effective ZECs.[40]

In addition to these requirements, the IPA has also identified additional discrete requirements applicable to the Plan stemming from the governing law; those requirements, as well as the Section of the Zero Emission Standard in which the requirement is addressed, may be found in the Legislative Compliance Index included as Appendix H.

3.3 ZEC Procurement Contracts

The calculation for determining the number of ZECs to be annually procured through this process, as well as the counterparties to ZEC contracts, is defined through the IPA Act. Specifically, beginning with the delivery year commencing on June 1, 2017, the IPA shall, for electric utilities that serve at least 100,000 retail customers in Illinois (ComEd and Ameren Illinois), procure ZECs in an amount approximately[41] equal to 16% of the actual amount of electricity delivered by each electric utility to retail customers in the State during calendar year 2014. For an electric utility serving fewer than 100,000 retail customers in Illinois that requested the Agency to procure power and energy for all or a portion of the utility's Illinois load for the delivery year commencing June 1, 2016 (MidAmerican), the Agency shall procure ZECs in an amount approximately equal to 16% of the portion of power and energy to be procured by the Agency for the utility.[42] More information on the quantity of ZECs that will be required to be delivered under ZEC procurement contracts can be found in Section 4.5.

Here again, the Zero Emission Standard appears to mirror the approach taken to the procurement of RECs: the 16% of electricity delivered target "is the average of the percentage targets in subparagraph (B) of paragraph (1) of subsection (c) of Section 1-75 of this Act for the 5 delivery years beginning June 1, 2017" (i.e., the average of the state's RPS targets for 2017-2023).[43] As with the procurement of RECs under Section 1-75(c) of the IPA Act, ZEC contracts procured under Section 1-75(d-5) of the IPA Act feature electric utilities as the counterparty for ZEC deliveries,

[40] More details regarding the ZEC contracts are provided in Chapter 6 of this plan.

[41] The IPA's interpretation of the word "approximately" is that the IPA need not procure ZECs in an amount exactly equal to 16% of the actual amount of electricity delivered by each electric utility to retail customers in the State during calendar year 2014, but instead may procure ZECs in an amount somewhat more or somewhat less than the 16% target, depending upon the capacity of the facilities selected to participate. For example, the IPA has discretion to procure 14-15% rather than exactly 16%, or 17-18% rather than exactly 16%.

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[42] See 20 ILCS 3855/1-75(d-5)(1).

[43] 20 ILCS 3855/1-75(d-5)(1).

with the electric utilities required to "retire all zero emission credits used to comply with the requirements of" the Zero Emission Standard.[44]

While many REC contracts under Section 1-75(c) of the IPA Act are for 15 years in length, ZEC contracts "shall be for a term of 10 years ending May 31, 2027,"[45] with contracts including deliveries for the current (2017-2018) delivery year.[46] Indeed, by law, the entire Zero Emission Standard "shall become inoperative on January 1, 2028."[47]

3.4 ZEC Pricing

The formula for determining the price per ZEC is set forth in the Zero Emission Standard as well. Section 1-75(d-5)(1)(B) of the IPA Act specifies that the price for each ZEC procured for a given delivery year shall be in an amount that equals the Social Cost of Carbon, expressed on a price per MWh basis starting at $16.50 per MWh,[48] with the potential for being reduced to "ensure that the procurement of zero emission credits remains affordable for retail customers even if energy and capacity prices are projected to rise above 2016 levels reflected in the baseline market price index."[49]

The Act specifies that the "social cost of carbon" cost of $16.50 per megawatt hour is based on the U.S. Interagency Working Group on Social Cost of Greenhouse Gases, which updated its estimate of the social cost of carbon dioxide in terms of dollars per metric ton in August 2016, using a 3 percent discount factor which is then converted to a dollar per MWh representation.[50] In accordance with the Act, the Social Cost of Carbon price is also increased by $1 per MWh starting in 2023.[51]

[44] 20 ILCS 3855/1-75(d-5)(5).

[45] 20 ILCS 3855/1-75(d-5)(1).

[46] Section 1-75(d-5)(1) makes clear that such contracts are to "begin[] with the delivery year commencing June 1, 2017." While the procurement of ZEC contracts will not occur until well into that delivery year, the IPA is unaware of any barrier that would prevent ZEC procurement volumes for the entire 2017-2018 delivery year from being met through ZEC delivery contracts even if those contracts are executed after the commencement of that delivery year. Further, the IPA understands that electric utility counterparties to such contracts are collecting funds for ZEC payments made for a full year of 2017-2018 ZEC deliveries.

[47] 20 ILCS 3855/1-75(d-5)(7)

[48] See 20 ILCS 3855/1-75(d-5)(1)(B).

[49] P.A. 99-0906, Zero Emission Standard Legislative Findings (Section 1.5)

[50] See 20 ILCS 3855/1-75(d-5)(1)(B)(i).

[51] See Id.

That price is then subject to a "market price adjustment," which provides that the ZEC price be limited such that if the average price of a set of price indices of electric energy and capacity increases, the ZEC price in the applicable delivery year shall be reduced *below* that Social Cost of Carbon. The amount of this reduction (the "Price Adjustment") is determined by the amount which the Market Price Index for the applicable delivery year exceeds the Baseline Market Price Index for the consecutive 12-month period ending May 31, 2016 of $31.40 per MWh.[52] If the Price Adjustment is greater than or equal to the Social Price of Carbon, such as in a scenario in which market energy and capacity prices recover to the extent that zero emission facilities should be receiving other revenues at levels sufficient to alleviate any economic stress, then the resulting price of a ZEC would be zero. Notably, the Price Adjustment (and resulting ZEC price) does not reflect the *actual* prices that any given zero emission facility bidding into the ZEC procurement receives in wholesale energy and capacity markets, or through bilateral sales; it instead provides a rough *proxy* for market conditions. If such conditions are very favorable for a facility with a ZEC delivery contract, then ZEC prices may be adjusted downward from the Social Cost of Carbon.

Further discussion about the ZEC price adjustment can be found in Chapter 4 below.

3.5 ZEC Procurement Cost Cap

In addition to providing a delivery-based percentage target for the number of ZECs to be procured and establishing a mechanism for calculating ZEC prices, the Zero Emission Standard also sets an annual cost cap on the amount that can be paid through customer surcharges for the purchase of ZECs.[53] This cost cap limits the cost of ZECs to retail customers to no more than 1.65% of the amount paid per kWh by eligible retail customers during the year ending May 31, 2009.[54]

This cost cap provides the basis for creating a ZEC procurement budget through applying the "resulting per kilowatthour amount" to "the actual amount of kilowatthours of electricity delivered by the electric utility in the delivery year immediately prior to the procurement, to all retail customers in its service territory,"[55] producing the overall total amount that may be spent on ZEC purchases for a given delivery year (i.e., the ZEC procurement budget).

This creates a slight disconnect within the Act: the *price* for ZECs is calculated by a formula fixed in the law; the overall ZEC procurement *budget* defined through the rate impact cap limits how much can be paid for ZECs; and the procurement *quantities* are defined separately as 16% of

[52] See 20 ILCS 3855/1-75(d-5)(1)(B).

[53] See 20 ILCS 3855/1-75(d-5)(2).

[54] See Id.

[55] See Id.

electricity delivered.[56] Under certain circumstances, meeting statutory procurement quantities—let alone "all of the zero emission credits" produced by a facility—at that defined ZEC price would cause the ZEC procurement budget to be exceeded. And because both the price and quantity for the first year of ZEC deliveries (2017-2018) are currently known, the Agency can state confidently that procuring all of the ZECs at the price envisioned in Section 1-75(d-5)(2) would cause the cost cap for the year to be surpassed for the 2017-2018 delivery year.[57]

This potential disconnect appears to have been anticipated by the drafters of the Act, as Section 1-75(d-5)(2) contains a provision referencing "unpaid contractual volume," specifically stating that "[u]npaid contractual volume for any delivery year shall be paid in any subsequent delivery year in which such payments can be made without exceeding" the rate impact cap.[58] Stated differently, the Act appears to envision a regime in which ZECs are delivered at the price arrived at through the Social Cost of Carbon minus the Price Adjustment (the ZEC price) *up until* the rate impact cap for that delivery year is met; from that point forward, ZECs are to still to be delivered under contracts to meet the delivery requirement set forth in Section 1-75(d-5)(1) and the requirement that contracts be for "all of the zero emission credits generated" by the winning facility,[59] but are considered "unpaid contractual volume" potentially eligible for a future year's payment.

As a consequence, should the ZECs produced by the zero emission facilities selected in the IPA procurement exceed the ZEC volumes to be paid for at the ZEC price under the cost cap, the IPA understands that those ZECs statutorily ineligible for payment in the delivery year or generated in excess of that year's target procurement quantities will be delivered to the purchasing utility without charge for that particular delivery year, and will constitute "unpaid contractual volume" eligible for payment in a future delivery year when the rate cap does not limit the total amount paid for ZECs for that year. This would offer the potential for payment to be made for the unpaid contractual volume of ZECs from previous delivery years should that then current delivery year

[56] The statute also states that "[t]he quantity of zero emission credits to be procured under the contracts shall be all of the zero emission credits generated by the zero emission facility in each delivery year." (20 ILCS 3855/1-75(d-5)(1)).

[57] It is unclear whether "all of the zero emission credits generated by the zero emission facility" would likewise cause the cost cap to be exceeded, as a) no facilities will be selected until a procurement event takes place and b) facilities may produce significantly fewer than anticipated zero emission credits in a given delivery year due to an array of factors, including outages, mechanical failures, weather events, labor strife, permitting issues, etc.

[58] 20 ILCS 3855/1-75(d-5)(2).

[59] As stated above, this quantity is subject to the caveat in Section 1-75(d-5)(1) that "if the zero emission facility is owned by more than one entity, then the quantity of zero emission credits to be procured under the contracts shall be the amount of zero emission credits that are generated" only from that "portion of the zero emission facility that is owned by the winning supplier."

feature a ZEC procurement budget greater than the payments required for ZECs delivered in that year at that year's ZEC price.[60]

3.6 ZEC Procurement Process Overview

Certain elements of the Zero Emission Credit procurement process—such as the need to develop an underlying procurement plan, the formula for determining the ZEC price, the ZEC procurement quantities, and the process for registering potential bidders to the procurement—are expressed in the Zero Emission Standard law itself. For other elements of the ZEC procurement process, the IPA takes note of the Zero Emission Standard's requirement that its procurement process "shall be conducted in conjunction with the procurement and plan approval processes required by subsection (c) of this Section and Section 16-111.5 of the Public Utilities Act, to the extent practicable."[61] Because it is clearly not "practicable" for the zero emission credit procurement to coincide with standard wholesale product procurements under Section 16-111.5 from a *timing* standpoint (given that the IPA's annual electricity procurement plan will be filed in late September, approved in December, and result in procurement events in the spring of next year), the Agency understands this provision to require that the zero emission credit procurement process be handled "in conjunction with" the requirements of Section 16-111.5 procurement from a *process* standpoint, to the extent practicable.

Stated differently, where procedural aspects of Section 16-111.5 (especially Section 16-111.5(c)(1) and Section 16-111.5(e)), do not conflict with Section 1-75(d-5), then those processes are adopted. However, where aspects of Section 16-111.5 either a) directly conflict with Section 1-75(d-5) (such as Section 16-111.5(e)(4)'s requirement of "selection of bids on the basis of price" or Section 16-111.5(e)(3)'s requirement to establish a "price benchmark," which directly conflict with Section 1-75(d-5)(1)(C)'s requirement that "winning bids shall be selected based on public interest criteria" with ZEC prices determined pursuant to a formula found in the statute), or b) indirectly conflict as they would be impracticable to adopt given other requirements present in Section 1-75(d-5) (such as Section 16-111.5(f)'s requirement that the Commission "shall accept or reject the recommendations of the procurement administrator within 2 business days after" the receipt of reports, which may be ill-fitting for a ZEC procurement process requiring that the Commission produce a very detailed and intricate "public notice" of its own accompanying its

[60] This raises the question of what price would be paid for "unpaid contractual volume" in a future delivery year: the ZEC price from the original delivery year, or the ZEC price used for the delivery year in which payment is actually made for the ZEC? IPA believes that the statute should be interpreted to pay for "unpaid contractual volume" at the ZEC price from the original delivery year. The statute provides that "[u]npaid contractual volume *for any delivery year shall be paid* in any subsequent delivery year in which *such payments* can be made," Section 1-75(d-5)(2) (emphasis added). Because the statute defines "unpaid contractual volumes" in relation to the delivery year in which those ZECs were produced ("for any delivery year"), the Agency interprets the statute to indicate that "such payments" shall be made at the price that prevailed in the delivery year the ZECs were produced.

[61] 20 ILCS 3855/1-75(d-5)(1)(C-5).

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acceptance or rejection of procurement results).[62] An appendix detailing which specific requirements in Section 16-111.5 which the IPA believes are applicable to the ZEC procurement process can be found in Appendix G.

After this Plan is approved by the Commission and bidder eligibility information is received as described in Section 2.4, the IPA will, consistent with the Commission's Order approving the Plan, work with the Procurement Administrator (and other parties, to the extent envisioned under Section 16-111.5) on the development of bid forms, rules for the resulting bid process, the development of a standard form ZEC delivery contract, and other forms, documents, and guidelines governing the procurement event. As described in more detail in Section 6.2, bidders meeting the Zero Emission Standard's eligibility requirements—i.e., zero emission facilities capable of producing and delivering zero emission credits for 10 delivery years, and satisfying the provisions of Section 1-75(d-5)(1)(A)—will be invited to submit bids for the zero emission credit procurement. Bids submitted shall reflect the actual and projected annual MWh production from the zero emission facility, which will in turn be used to calculate the annual ZEC quantity production from that facility. The IPA, through the zero emission credit procurement, will seek to procure the target number of ZECs being sought under the Plan, but, as noted above, has discretion to procure somewhat more or somewhat less so long as the procurement is "approximately" equal to the target number.

The Procurement Administrator will recommend to the Commission successful bids based on how well these bids meet the public interest criteria specified in the Act. As detailed in Section 1-75(d-5)(1)(C), the public interest criteria used for bid evaluation are focused on the emissions that are avoided through the continued operation of a zero emissions facility;[63] those are described in detail in Chapter 5. The successful bidders, subject to approval by the Commission, will be those bidders that achieve the highest scores as determined through the bid evaluation process, also described in Chapter 5, which is based on the level to which the bid best meets the public interest criteria. Successful bidders will execute ZEC purchase contracts with Ameren, ComEd, and MidAmerican.

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[62] See 20 ILCS 3855/1-75(d-5)(1)(C-5)(i)-(iii).

[63] Specifically, the statute requires that winning bidders "shall provide that 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. In particular, 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. The plan shall also describe in detail how each public interest factor shall be considered and weighted in the bid selection process to ensure that the public interest criteria are applied to the procurement and given full effect." (20 ILCS 3855/1-75(d-5)(1)(C)).

4 ZEC Price, Volumes and Cost Cap Determination

4.1 Social Cost of Carbon

In the legislative findings to Public Act 99-0906, the General Assembly found that "that the Social Cost of Carbon is an appropriate valuation of the environmental benefits provided by zero emission facilities, provided that the valuation is subject to a price adjustment that can reduce the price for zero emission credits below the Social Cost of Carbon."[64] Hence, the pricing mechanism used in the Zero Emission Standard begins with the Social Cost of Carbon as a baseline price for the environmental attributes represented by a Zero Emission Credit.

The Act specifies that the Social Cost of Carbon is $16.50/MWh.[65] As explained in the Act, this Social Cost of Carbon price reflects the social cost of carbon dioxide emissions represented by the U.S. Interagency Working Group on Social Cost of Greenhouse Gases as calculated in the August 2016 Technical Update.[66] The Social Cost of Carbon price specified in the Act was apparently calculated based on converting the cost per metric ton to $/MWh and using a 3% discount rate, and further adjusting for inflation for each delivery year. The cost per metric of carbon dioxide was converted to $16.50/MWh based on state-wide carbon dioxide emissions measured in pounds/MWh for the applicable year. The Social Cost of Carbon price is not fixed, however; the Act further provides that beginning with the delivery year commencing June 1, 2023, the price per MWh shall increase by $1/MWh, and continue to increase by an additional $1/MWh each delivery year thereafter.

4.2 Baseline Market Price Index

As required by the Act, the Social Cost of Carbon is then required to be adjusted based on a Market Price Index; this adjustment is then used to establish a contractual ZEC price. That adjustment calculation begins with the establishment of a baseline price against which market changes can be considered, known as a Baseline Market Price Index.[67] The Act specifies that the Baseline Market Price Index ("BMPI") for the consecutive 12-month period ending May 31, 2016 is $31.40/MWh, which is based on the sum of:

1. The average Day-Ahead energy price across all hours of such 12-month period at the PJM Interconnection LLC Northern Illinois Hub,

[64] Public Act 99-0906, Zero Emission Standard Legislative Findings (Section 1.5).

[65] 20 ILCS 3855/1-75(d-5)(1)(B)(i).

[66] Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, "Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866," August 2016. Note that, the cost in the Technical Update is stated in dollars per metric ton of carbon dioxide which must be converted into a dollars per Megawatt hour basis.

[67] 20 ILCS 3855/1-75(d-5)(1)(B)(ii).

2. 50% multiplied by the Base Residual Auction ("BRA"), or its successor, capacity price for the rest of the RTO zone group determined by PJM Interconnection LLC ("PJM"), divided by 24 hours per day, and
3. 50% multiplied by the Planning Resource Auction ("PRA"), or its successor, capacity price for Zone 4 determined by the Midcontinent Independent System Operator, Inc. ("MISO"), divided by 24 hours per day.

4.3 Market Price Index

The Market Price Index ("MPI") for a delivery year represents a proxy for a specific delivery year's market conditions. As set forth in the Act,[68] the MPI constitutes the sum of Projected Energy Prices and Projected Capacity Prices determined as follows:

1. *Projected Energy Prices*

   The Projected Energy Prices for the applicable delivery year shall be calculated once for the year by the Agency using the forward market price for PJM's Northern Illinois Hub. The forward market price shall be calculated as follows:

   - The energy forward prices for each month of the applicable delivery year will be averaged for each trade date during the calendar year immediately preceding that delivery year to produce a single energy forward price for the delivery year. The forward market price calculation will use data published by the Intercontinental Exchange ("ICE"), or its successor.

2. *Projected Capacity Prices*

   For the delivery years commencing June 1, 2017, June 1, 2018, and June 1, 2019, the projected capacity price will be equal to the sum of:

   i. 50% multiplied by the BRA, or its successor, price for the rest of the RTO as determined by PJM, divided by 24 hours per day and,
   ii. 50% multiplied by the resource auction price determined in the resource auction administered by the MISO, in which the largest percentage of load cleared for Local Resource Zone 4, divided by 24 hours per day, and where such price is determined by MISO.

While generally straightforward, one aspect of this calculation requires further discussion. For the PJM capacity price calculation, the statute specifically references the use of the price in the "BRA, or its successor." For the 2017-2018 delivery year, there are actually *three* products that cleared in the BRA --- Annual,[69] Extended Summer DR, and Limited DR. In establishing a Market Price

[68] 20 ILCS 3855/1-75(d-5)(1)(B)(iii).

[69] The 2017-2018 Annual product is composed of Generation, Demand Resource ("DR"), and Energy Efficiency ("EE") Resources.

Index, the IPA has determined to use the price for the Annual product, because this is the only product which spans the entire delivery year and thus is the one that aligns best with the annual nature of the Market Price Index. However, for delivery years 2018-2019 and 2019-2020, as part of a PJM transition to a single product, the BRA includes two capacity products --- Capacity Performance Resource and Base Capacity Resource.[70] For the 2018-2019 and 2019-2020 delivery years, PJM procured approximately 84% of the BRA as the Capacity Performance Resource, and 16% of the BRA as the Base Capacity Resource. While any specific unit that cleared in the BRA would receive payments from only one of these categories, to ensure that the Market Price Index most accurately reflects the actual overall market price of capacity, the IPA recommends using a weighted average of the clearing prices for the Capacity Performance Resource and the Base Capacity Resource for the capacity price that will be used in the calculation of the MPI for these two delivery years.

For the delivery year commencing June 1, 2020, and each year thereafter, the projected capacity price shall be equal to the sum of:

i. 50% multiplied by the BRA[71], or its successor, price for the ComEd Zone as determined by PJM, divided by 24 hours per day, and
ii. 50% multiplied by the resource auction price determined in the resource auction administered by MISO, in which the largest percentage of load cleared for Local Resource Zone 4, divided by 24 hours per day, and where such price is determined by MISO.

4.4 ZEC Price Calculation

To "ensure that the procurement of zero emission credits remains affordable for retail customers even if energy and capacity prices are projected to rise above 2016 levels reflected in the baseline market price index,"[72] the ZEC Price for a given delivery year is determined by reducing the Social Cost of Carbon by the Price Adjustment as explained in Section 3.5. The Price Adjustment to the Social Cost of Carbon is the amount by which the MPI exceeds the BMPI for each delivery year (*i.e.* MPI – BMPI), where the BMPI is equal to $31.40/MWh.

The MPI for a given delivery year is determined as the sum of (i) Projected Energy Prices, (ii) 50% of the PJM BRA price, and (iii) 50% of the MISO PRA price.

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[70] This is part of the transition to 2020-2021, when only one capacity product, the Capacity Performance Resource, will be procured in the BRA.

[71] As noted above, effective delivery year 2020-2021 PJM will procure only one type of capacity product in the BRA --- the Capacity Performance Resource. From delivery year 2020-2021 and going forward, the IPA will use the price for the Capacity Performance Resource for the ComEd Zone in the calculation of the MPI.

[72] Public Act 99-0906, Zero Emission Standard Legislative Findings (Section 1.5).

The following calculations were used to determine the 2017-2018 delivery year Market Price Index. The same methodology will be used to calculate the Market Price Index for each future delivery year.

First, energy prices: in Section 1-75(d-5)(1)(B)(iii)(aa), the Act specifies the use of "the energy forward prices for each month of the applicable delivery year averaged for each trade date during the calendar year immediately preceding that delivery year to produce a single energy forward price for the delivery year," using "data published by the Intercontinental Exchange, or its successor."[73] However, in attempting to obtain this data, the IPA encountered a slight barrier: the Intercontinental Exchange ("ICE") publishes *futures* prices, not *forward* prices. Futures prices and forward prices are technically not identical, as the former is a financial product while the latter is a physically delivered product. That said, because the prices between futures and forward prices are substantially similar, and the use of the *futures* prices from ICE more closely follows the provisions of the Act than any other alternative (as price source still matches the statute, and the use of some alternative source for *forward* prices not only creates a new inconsistency with the plain language of the Act, but could result in the use of less reliable and less adequately vetted prices), the IPA believes that the use of futures prices from ICE is the most justified approach under the law. Additionally, the statute does not specify whether the ICE energy futures prices should be Day-Ahead prices or Real-Time prices. The statute's silence on this point is in contrast to the BMPI, which the statute specifies should be calculated using Day-Ahead prices. The IPA believes the statute's silence with respect to the MPI gives the Agency discretion, and because Real-Time futures prices are more liquid than Day-Ahead futures prices, the Agency believes that Real-Time prices are a superior approach. Thus, in determining the 2017-2018 delivery period Market Price Index, the Average Real-Time PJM Northern Illinois Hub Price was calculated using ICE data observed during calendar year 2016. A summary of that data is available in Appendix A.

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Second, capacity prices: as capacity auctions have already occurred for the current delivery year, in calculating the 2017-2017 Market Price Index, the PJM BRA price was based on the actual clearing price for delivery year 2017-2018. Likewise, the MISO PRA price was based on the actual clearing price for delivery year 2017-2018. Details of these calculations can be found in Appendix A.

As detailed in Appendix A, for the 2017-2018 delivery year, the calculated value of the MPI is $31.21/MWh. This is lower than the BMPI ($31.40/MWh). Since the Price Adjustment may only "reduce[]" the ZEC price "below the Social Cost of Carbon by the amount . . . by which the market price index for the applicable delivery year exceeds the baseline market price index"[74] (i.e., it cannot operate to *increase* the ZEC price above the Social Cost of Carbon), this calculation results

[73] 20 ILCS 3855/1-75(d-5)(1)(B)(iii)(aa).
[74] 20 ILCS 3855/1-75(d-5)(1)(B).

in no adjustment to the Social Cost of Carbon of $16.50/MWh. **Therefore, the ZEC Price for delivery year 2017-2018 is $16.50/ZEC.**

As described in Section 6.4 the ZEC Price for future delivery years will be updated May of each future year. The methodology used for future delivery years will be the same as described in this Section as used for the 2017-2018 delivery year.

4.5 ZEC Contractual Volume

The methodology for determining the amount of ZECs to be procured is specified in the Act.[75] For ComEd and Ameren, this calculation is straightforward: the procurement quantity is determined based on a portion of the delivered electricity to retail customers "for the calendar year 2014" multiplied by 16%, or 0.16.[76]

For MidAmerican, however, a different load multiplier applies; Section 1-75(d-5)(1) requires that the procurement volume be "an amount approximately equal to 16% of the portion of power and energy to be procured by the Agency for the utility" for utilities under 100,000 retail customers participating in an IPA procurement process (i.e., MidAmerican).[77] Unlike for ComEd and Ameren, for which the 16% multiplier is based upon calendar year 2014, the Act does not expressly state what baseline year should be applied to MidAmerican—but does make its participation contingent on it being a utility for which "the Agency procure[s] power and energy for all or a portion of the utility's Illinois load for the delivery year commencing June 1, 2016."[78] While the 16% multiplier could in theory be applied each year to the previous delivery or calendar year's quantity of power procured by the Agency for MidAmerican, thus creating a floating ZEC Contractual Volume for MidAmerican, doing so would introduced unnecessary and seemingly not envisioned complexity and would require an approach fundamentally inconsistent with the set amounts used for ComEd and Ameren. Therefore, the Agency recommends using the 2016-2017 delivery year for determining MidAmerican's ZEC contract volumes as it is the only full year of available data and connects with the delivery year used for participation designated in the statute.

Deleted: The Agency invites interested parties to comment on if a different approach should be considered.

[75] 20 ILCS 3855/1-75(d-5)(1).

[76] See 20 ILCS 3855/1-75(d-5)(1) ("Beginning with the delivery year commencing on June 1, 2017, the Agency shall, for electric utilities that serve at least 100,000 retail customers in this State, procure contracts with zero emission facilities that are reasonably capable of generating cost-effective zero emission credits in an amount approximately equal to 16% of the actual amount of electricity delivered by each electric utility to retail customers in the State during calendar year 2014.")

[77] MidAmerican elected to participate in the IPA's planning and procurement process in 2015 (i.e., for the 2016 Procurement Plan); the first delivery year for which the IPA conducted procurements for MidAmerican was thus the 2016-2017 delivery year.

[78] 20 ILCS 3855/1-75(d-5)(1).

For each utility, the resulting amount of ZECs to be procured under the statute is described hereinafter as the "ZEC Contractual Volume." In summary, the ZEC Contractual Volumes are:

- For Ameren and ComEd, the ZEC Contractual Volume is 16% of their respective energy delivered to retail customers in calendar year 2014 (measured in MWh at the retail meter level).
- For MidAmerican, the ZEC Contractual Volume is 16% of the power and energy procured for MidAmerican by the IPA for the 2016-2017 delivery year (measured in MWh at the retail meter level).

The data for the 2014 calendar year sales for Ameren and ComEd and the data for determining the power and energy procured for MidAmerican[79] was obtained directly from the utilities through data requests issued on June 2nd, 2017. The utilities' responses to those data requests are provided in Appendix B.

Based on the above-referenced formula and the sales data found in Appendix B, the amount of ZECs to be procured is as follows:

Ameren	=	36,897,391 * 16%	=	5,903,583 ZECs
ComEd	=	88,580,643 * 16%	=	14,172,903 ZECs
MidAmerican	=	263,664 * 16%	=	42,186 ZECs
Total (all utilities)[80]			=	20,118,672 ZECs

The total annual cost for procuring this quantity of ZECs based on a ZEC Price of $16.50/ZEC would be $331,958,084 (as shown in Appendix A, which provides the detailed calculation of the Contractual Volumes for the respective utilities). While that annual cost may vary in future years, subject to the Price Adjustment described above in Section 4.4; the Contractual Volume will remain constant for the duration of the zero emission credit program.

4.6 ZEC Cost Cap

As discussed in Chapter 3, the amount to be spent on ZECs for a given delivery year is limited by a cost cap to ensure that the procurement is cost-effective. Specifically, "the contractual volume receiving payments in such year shall be reduced for all retail customers based on the amount necessary to limit the net increase that delivery year to the costs of those credits included in the amounts paid by eligible retail customers in connection with electric service to no more than 1.65%

[79] MidAmerican provided data on (i) the total supply from third-party providers (ARES/RES), (ii) the total supply from MidAmerican owned generation, and (iii) the actual electricity delivered to retail customers. The procured power and energy for MidAmerican was determined as the difference between the total supply (third parties and MidAmerican owned) and the actual electricity delivered to retail customers.

[80] Total may not match the sum of individual utility amounts due to rounding.

of the amount paid per kilowatthour by eligible retail customers during the year ending May 31, 2009."[81] Further, "the result of this computation shall apply to and reduce the procurement for all retail customers, and all those customers shall pay the same single, uniform cents per kilowatthour charge under subsection (k) of Section 16-108 of the Public Utilities Act."[82] Finally, "to arrive at a maximum dollar amount of zero emission credits to be paid for the particular delivery year, the resulting per kilowatthour amount shall be applied to the actual amount of kilowatthours of electricity delivered by the electric utility in the delivery year immediately prior to the procurement, to all retail customers in its service territory." [83]

For delivery year 2017-2018, the calculation is based on the following formula:

*(1.65% * 2008-2009 Rate for Eligible Retail Customers) * 2016-2017 kWh to all retail customers*

On June 2nd, 2017 the IPA issued a data request to the utilities to obtain (i) the revenue and sales data to determine the 2008-2009 Rate for Eligible Retail Customers for Ameren, ComEd and MidAmerican, (ii) the actual amount of electricity delivered in the 2016-2017 delivery year to all Retail Customers of Ameren and ComEd, and (iii) the data for determining the power and energy procured for MidAmerican. The utilities' data responses are provided in Appendix B.

Exactly how the rate impact cap should apply to MidAmerican is less clear from the statutory language of the Zero Emission Standard than with the other utilities. Section 1-75(d-5)(2) of the IPA Act provides that the rate impact cap "shall apply to and reduce the procurement for all retail customers, and all those customers shall pay the same single, uniform cents per kilowatthour charge under subsection (k) of Section 16-108 of the Public Utilities Act," and that the rate impact calculation "shall be applied to the actual amount of kilowatthours of electricity delivered by the electric utility in the delivery year immediately prior to the procurement, to all retail customers in its service territory" in developing a "maximum dollar amount" budget.[84] For MidAmerican, this *could* be interpreted to mean that while its annual procurement *quantities* are determined by only that portion of its load procured by the IPA, its procurement *budget* would be based off all "electricity delivered . . . to all retail customers in its service territory." Such an approach would result in a ZEC procurement budget over seven times greater, proportionately, than MidAmerican's ZEC procurement targets.

[81] 20 ILCS 3855/1-75(d-5)(2).

[82] Id.

[83] Id.

[84] Id.

Against the backdrop of a statute featuring detailed, fixed methodologies for determining ZEC prices and procurement quantities, the IPA believes that such a massive disconnect between quantity and budget cannot be what was intended by the drafters of the statute. Accordingly, MidAmerican's procurement budget—as with its procurement target—must also be adjusted based on only that portion of its Illinois jurisdictional load served by IPA procurements.[85] MidAmerican's procurement quantities used for determining its ZEC procurement budget are adjusted consistent with this approach in the calculations below.

Based on this approach, the applicable amount of electricity delivered by each electric utility to all retail customers for 2016-2017 is:

Ameren	-	35,886,827 MWh delivered by Ameren
ComEd	-	88,075,281 MWh delivered by ComEd, and
MidAmerican	-	263,664 MWh procured by the IPA on behalf of MidAmerican
Total (all utilities)	-	124,225,772 MWh

The 2008-2009 Rates for Eligible Retail Customers for each utility are:[86]

Ameren	-	10.77 ¢/kWh
ComEd	-	11.82 ¢/kWh
MidAmerican	-	6.18 ¢/kWh

Application of the formula stated above results in the following ZEC Cost Caps for each utility:[87]

Ameren	-	$63,748,017
ComEd	-	$171,817,027
MidAmerican	-	$268,705
Total (all utilities)	-	$235,833,749

The total ZEC Cost Cap of $235,833,749 is lower than the $331,958,084 amount based on the ZEC Contractual Volume and the applicable ZEC Price for delivery year 2017-2018. For 2017-

[85] The IPA also makes this determination mindful of the Commission's decision in Docket No. 15-0541 approving the IPA's 2016 Procurement Plan, in which the Commission adopted a methodology for calculating a renewable resources budget based only on MidAmerican's share of load met through IPA procurements. (See Docket No. 15-0541, Final Order dated December 16, 2015 at 133).

[86] The detailed calculations of the rates for Eligible Retail Customers are provided in Appendix A.

[87] The detailed calculations of the ZEC Cost Caps are presented in Appendix A.

2018 the total maximum amount that can be spent to procure ZECs for all the utilities is therefore \$235,833,749.

4.7 ZEC Volume Cap

The ZEC Volume Cap in any delivery year, for each utility, is the maximum amount of ZECs that can be purchased based on the ZEC Cost Cap. The ZEC Volume Cap is derived by dividing the ZEC Cost Cap by the ZEC Price which is the Social Cost of Carbon minus the Price Adjustment as described in Section 3.4.

The ZEC Volume Caps for delivery year 2017-18 for each utility are as follows:

Ameren	-	3,863,516 ZECs to be paid at \$16.50/ZEC
ComEd	-	10,413,153 ZECs to be paid at \$16.50/ZEC
MidAmerican	-	16,285 ZECs to be paid at \$16.50/ZEC

The ZEC Volume Caps result in the following ZEC Unpaid Contractual Volumes for the 2017-18 delivery year:

Ameren	-	2,040,066 ZECs
ComEd	-	3,759,750 ZECs
MidAmerican	-	25,901 ZECs
Total (all utilities)	-	5,825,717 ZECs

As discussed above, unpaid contractual volumes for any delivery year can be paid in a subsequent delivery year in which such payments for unpaid contractual volumes can be made without exceeding the ZEC Cost Cap.[88] The 5,825,717 unpaid ZECs will therefore be eligible for payment in a future delivery year when the rate cap does not limit the total amount paid for ZECs in that year.

[88] 20 ILCS 3855/1-75(d-5)(2).

5 Bid Evaluation and Selection

5.1 Public Interest Criteria

One of the most important components of the Zero Emission Standard Procurement Plan is the process for selecting winning bids based on the public interest criteria described in the Act. Section 1-75(d-5)(1)(C) of the Act specifies that

> *"…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."*

A key focus of the "public interest criteria" concerns environmental benefits maintained through the continued operation of zero emission facilities that would potentially cease to operate without a zero emission credit program that monetizes some or all of the value associated with the environmental attributes of their generation.[89]

Quantifying the benefits associated with these environmental attributes, and how that quantitative calculation may be altered by the ZEC procurement process resulting in the continued operation of a zero emission facility, is necessary to meet the Act's requirements that,

> *"The plan shall also describe in detail how each public interest factor shall be considered and weighted in the bid selection process to ensure that the public interest criteria are applied to the procurement and given full effect."*[90]

This Chapter fulfills that requirement. It includes a consideration of each public interest factor and provides a scoring (weighting) approach. While the Act allows the IPA to consider additional public interest criteria other than those specified in the Act ("…but are not limited to…"), the IPA believes the criteria specifically described in the Act are sufficient for effectuating the purposes of this Plan and the IPA is not proposing additional criteria.[91]

[89] Specifically, the law provides that "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." (20 ILCS 3855/1-75(d-5)(1)(C)).

[90] 20 ILCS 3855/1-75(d-5)(1)(C).

[91] In addition, the IPA notes that while it may have discretion of consider additional public interest factors ("include, but are not limited to…"), the statutory direction offered to the ICC for the public notice accompanying its review and acceptance or rejection of procurement results is more direct and prescriptive, and focused only on the criteria expressly mentioned in the statute. Avoiding a disconnect between the criteria used by the IPA to score bids and the Commission's public statement and accompanying analysis regarding its decision to approve (or reject) bids should result in a more focused, linear, and efficient procurement process.

Quantifying incremental environmental benefits is complex, and involves determining the amount and nature of emissions that would result from the mix of generation sources which would provide the replacement generation for the zero emission facility, had the facility been retired. The Agency's bid selection process takes into account the incremental benefits of the environmental attributes associated with a zero emission facility (in terms of public interest criteria emissions) that would be avoided by the continued operation of the zero emission facility.

The Agency's development of its bid selection process—and the development of its plan generally—endeavored to "consider any reports issued by a State agency, board, or commission under House Resolution 1146 of the 98th General Assembly and paragraph (4) of subsection (d) of Section 1-75 of this Act, as well as publicly available analyses and studies performed by or for regional transmission organizations that serve the State and their independent market monitors."[92] While those sources were indeed given consideration, the Agency's primary focus was on leveraging the best available information to track the evaluation of zero emission facility benefits consistent with the criteria in the statute.

As specified in the Act, the public interest criteria emissions include: minimizing carbon dioxide (CO_2) emissions that result from electricity consumed in Illinois, as well as minimizing sulfur dioxide (SO_2), nitrogen oxides (NO_x), and particulate matter (PM) emissions that adversely affect residents of the state. The bid selection process is thus focused on quantifying the relative benefits provided by each zero emission facility based on a determination of how each facility meets the public interest criteria. The bid evaluation process is described in more detail in the following sections.

Public interest criteria pollutants are not emitted during the operation of nuclear powered generating facilities; as such, these facilities have been designated by statute to be zero emission facilities. If zero emission facilities ceased operating, the electricity generated by these facilities generally would be replaced by electricity generated from a resource mix that is predominantly fueled by fossil fuels. In PJM and MISO coal and natural gas generation would most likely replace the generation from retiring zero emission facilities.[93] Fossil fuel resources, even if equipped with

[92] 20 ILCS 3855/1-75(d-5)(1)(C).

[93] For example, in the Illinois Environmental Protection Agency's report provided in response to H.R. 1146, the replacement generation mix was assumed to be 80% coal and 12% natural gas-fired. See: p.118 "Potential Nuclear Power Plant Closings in Illinois, Impacts and Market-Based Solutions, Response to the Illinois General Assembly Concerning House Resolution 1146. Prepared by: Illinois Commerce Commission, Illinois Power Agency, Illinois Environmental Protection Agency, and Illinois Department of Commerce and Economic Opportunity, January 5, 2015. Also see: Haratyk, Geoffrey, "Early Nuclear Retirements in Deregulated U.S. Markets: Causes, Implications and Policy Options," MIT Center for Energy and Environmental Policy Research, Working Paper Series, CEEPR WP 2019-009, March 2017; Nuclear Energy Institute, White Paper, "Status and Outlook for Nuclear Energy In the United States," November 2016.

state-of-the-art emission controls, by the nature of the combustion of fuels that contain or form pollutant generating materials, would inevitably emit the public interest criteria pollutants including CO_2, SO_2, NO_x, and PM in generating the replacement electricity.

Electric generating resources are dispatched to minimize the total system-wide cost of producing electricity while safely operating the transmission system. To achieve this objective, resources with the lowest variable cost are dispatched first. Following industry-standard system dispatch logic, zero emission facilities along with renewable energy resources are the first resources dispatched followed by the next-most efficient fossil-fueled resources.[94] In some states, including Illinois, renewable resources, primarily wind and solar resources, represent a growing portion of the generation mix. However, given the likely position of renewable resources in the dispatch queue over the lifetime of the Zero Emission Standard,[95] the bid evaluation process assumes that the replacement generation will be composed of coal and natural gas-fueled generation.[96] This is because, in general terms, generating facilities are dispatched by the independent system operators (PJM and MISO for the purposes of the facilities under consideration in this Plan) in terms of production cost with the least expensive units dispatched first until sufficient generation is dispatched to meet the load; this process is known as economic dispatch. All of the units that are dispatched receive the clearing price, which is the cost of generation for the last quantity of generation needed to meet the load. Some generating units that need to operate whenever the facility is available, such as nuclear or wind resources, participate in the economic dispatch process as price takers. These units bid low enough prices to ensure dispatch and take the clearing price which, in some hours, may be less than their operating costs. These units are almost always dispatched as they are at the bottom, or low price end, of the dispatch queue.[97] In PJM and MISO typically coal and natural gas-fired generating units operate at the margin in the dispatch queue and are thus the last units dispatched to meet load.[98,99] Therefore, the replacement generation mix

[94] FERC Docket No. AD05-13-000, "Report on Security Constrained Economic Dispatch," The Joint Board for the PJM/MISO Region. May 24, 2006.

[95] Section 1-75(d-5) becomes inoperative on January 1, 2028.

[96] Replacement generation would constitute a combination of increased dispatch of existing units as well as potentially new generation yet to be built.

[97] "EPA's Final Clean Power Plan Compliance Pathways Economic and Reliability Analysis," PJM Interconnection, September 1, 2016, p.46.

[98] Page 19 of the 2016 PJM State of the Market report provides the breakdown of marginal resources (i.e. the last unit dispatched): "Marginal Resources. In the PJM Real-Time Energy Market, in 2016, coal units were 44.9 percent of marginal resources and natural gas units were 43.8 percent of marginal resources. In 2015, coal units were 51.7 percent and natural gas units were 35.5 percent of the marginal resources."
http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2016/2016-som-pjm-volume1.pdf

[99] Table 1 of the 2016 MISO State of the Market Report shows that in 2016 generation by coal and natural gas set real-time energy prices 99% of the time (coal 55% and natural gas 44%).

used in the ZEC bid scoring reflects the increased emissions from coal and natural gas generation sources that would result if a zero emissions facility retired.[100]

5.2 Bid Scoring and Selection

The proposed bid evaluation and selection process involves developing a selection score for each ZEC bid using the public interest criteria to develop that score, with the highest scoring facilities emerging as winning bidders. In developing the scoring process, emphasis was placed on using an approach that incorporates the emission factors into the bid selection and which reflects the environmental attribute benefits associated with the emissions-related public interest criteria that would be provided by the continued operation of a zero emission facility.

The state-wide emissions and generation-related data utilized to develop the proposed zero emission facility scoring methodology are sourced from publicly available databases including emissions data from the U.S. EPA National Emissions Inventory ("NEI") and emissions and generation data from the U.S. EIA.[101] To determine the impact of the public interest criteria, the proposed bid selection methodology uses generation weighted emission factors for all emission criteria, with the exception of CO_2, in terms of pounds of relevant pollutant per megawatt hour (pounds/MWh), developed on a statewide basis. The proposed bid selection methodology also utilizes certain facility eligibility information that bidders are required to submit for zero emission facilities seeking to bid ZECs into the IPA's procurement—specifically, facility operating costs.[102]

The scoring of bids will be based on the quantity of SO_2, NO_x, and PM emissions resulting from the expected generation resource mix that would replace the electricity generated by the zero emission facility submitting a bid to the procurement, adjusted to account for the degree to which those emissions can be expected to adversely affect residents of Illinois. PM emissions are divided

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https://www.misoenergy.org/Library/Repository/Report/IMM/2016%20State%20of%20the%20Market%20Report.pdf.

[100] State-wide emission and generation data are utilized in the IPA's bid selection methodology in part because data reported by the U.S. EPA and U.S. EIA is available at the State level on a consistent and comparable basis. Such data is not available in a consistent and comparable way for, say, the location of a facility *within* a state or through viewing the facility as part of a broader region, thus introducing the potential for inconsistent or discretionary treatment in scoring facilities through utilizing a different approach.

[101] The most recent emissions data are taken from the NEI 2016 release, www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei, which includes data for 2014 for emissions of SO_2, NO_x, PM_{10}, and $PM_{2.5}$ from electric generation by fuel source by state. The electric generation data by fuel source is sourced from the U.S. EIA State Electricity Profiles, Electric power industry generation by primary energy sources, 2014, www.eia.gov/electricity.state. The year 2014 is the most recent year for which both EPA and EIA data are available for both state-level emissions for all pollutants and state-level generation.

[102] The eligibility information template is shown in Appendix F.

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into primary fine particulate matter for particulates with a diameter of 2.5 micrometers or less ($PM_{2.5}$) and particulates with a diameter of greater than 2.5 micrometers but not more than 10 micrometers (PM_{10}).[104] Scoring will also be based on the fraction of the bidding zero emission facility's generation that can be expected to be consumed in Illinois, reflecting the CO_2 abatement value provided by that zero emission facility to Illinois consumers.

The statute does not provide express guidance on the weighting attributed to each pollutant in determining an overall facility score. While the actual adverse impacts of these pollutants to citizens of Illinois may not be evenly distributed, the IPA believes that any attempts to prioritize one pollutant above another could introduce problematic discretion into the bid scoring process and may be inconsistent with language in the Act that does not differentiate among the importance of the public interest criteria.[105] Thus, under the proposed bid selection methodology, a baseline of 25 points would be awarded for each of the CO_2, SO_2, NO_x, and PM emission criteria (PM_{10}, and $PM_{2.5}$ each would receive 12.5 points, totaling 25 points overall for PM) for an equal weighting for each criterion in the ZEC bid selection. Notably, equal *treatment* would not necessarily result in each pollutant having equal *influence* in bid scoring, as this approach still captures the intensity of differences offered between competing bids for a given pollutant.

The overall score for each facility will be the sum of the resulting emissions scores for each pollutant, adjusted for facility capacity factor and economic stress.

5.2.1: Non-CO_2 Emissions Scoring Metrics

For non-CO_2 emissions, the statute directs that the Plan's proposed bid selection approach consider "emissions that adversely affect the citizens of this State."[106] Thus, a primary focus of the proposed bid selection methodology involves determining the degree to which emissions from a facility's replacement generation would indeed have adverse impacts on Illinois citizens. For measuring those adverse impacts – and producing resulting facility scores accordingly – the proposed approach focused on three main sources of information: 1) the expected replacement generation mix; 2) the pollutant intensity in the states in which replacement generation is located; and 3) the degree to which wind patterns result in those airborne pollutants being blown into Illinois resulting in adverse impacts to Illinois residents.

The Non-CO_2 Emissions Scoring Metric for each non-CO_2 pollutant will be calculated using the following method:

[104] $PM_{2.5}$ and PM_{10} cover the bulk of the primary particulate matter emitted from fossil fuel fired generating plants.

[105] While the ZEC priced is based in part on the Social Cost of Carbon specifically, the General Assembly found in enacting the Zero Emission Standard that "the Social Cost of Carbon is an appropriate valuation of the **environmental benefits** provided by zero emission facilities," and not only carbon emissions avoided. (P.A. 99-0906, Zero Emission Standard Legislative Findings (Section 1.5) (emphasis added)).

[106] 20 ILCS 3855/1-75(d-5)(1)(C).

Deleted: The IPA would be interested in receiving feedback in the draft Plan comment process on whether this is indeed the optimal weighting approach.

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Emission Factor = pounds/MWh emitted for each emission criterion (State specific amounts for CO_2, NO_x, SO_2, $PM_{2.5}$, and PM $_{10}$)¶

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Table 1. Expected

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1) Estimate where generation to replace a retiring zero emissions facility is likely to occur;
2) Determine the State Emissions Intensity for that pollutant for each state providing replacement generation, based on the state average emissions rate for that pollutant divided by the RTO average emissions rate for that pollutant;
3) Adjust the State Emissions Intensity for that pollutant for each state providing replacement generation based on wind direction and distance factors;
4) Multiply the Adjusted State Emissions Intensity for that pollutant for each state providing replacement generation by the share of replacement generation provided by that state; and
5) Sum the state-specific results from every state providing replacement generation to obtain the overall Emissions Scoring Metric for that pollutant.

Below, the Agency describes each of these steps in greater detail.

5.2.1.1 Determining the Replacement Generation Mix

We first estimate the location of the generation that would replace a retiring zero emission facility. While one approach would be to run a production simulation model, the IPA does not view production simulation modeling as an appropriate approach to estimating the replacement generation mix. In developing any such model, the wide range of assumptions that would need to be made would require the exercise of a tremendous amount of discretion by the modeler. For example, assumptions would have to be made about the future of the Clean Power Plan (or successor carbon regulations), or future trends in natural gas and/or coal prices or regulations, all of which are issues for which there is no consensus.

In connection with the House Resolution 1146 Report, PJM modeled the likely emissions impact in 2019 resulting from the retirement of nuclear facilities in Illinois. PJM concluded in that, in the event that Byron 1 and 2 and Quad Cities 1 and 2 retired, 32.1% of the RTO-wide increases in CO_2, 30.2% of the RTO-wide increases in SO_2, and 36.9% of the RTO-wide increases in NO_x resulting from replacement generation would occur in Illinois.[117] While these findings concern emissions rather than generation, emissions are obviously highly correlated to generation. These findings suggest that, if an Illinois nuclear plant retired, approximately 33% of the replacement generation would be located in Illinois, and the remainder would be elsewhere in the RTO.

Thus, in calculating the Emissions Scoring Metric for each non-CO_2 pollutant, the Agency will first assume that 33% of replacement generation occurs in the state in which the retiring zero

[117] *See* PJM Interconnection, LLC, PJM Response to Illinois Commerce Commission Request to Analyze the Impact of Various Illinois Nuclear Power Plant Retirements 9 (Oct. 21, 2014), Appendix to HR 1146 Report, available at http://www.pjm.com/-/media/committees-groups/committees/teac/20150107/20150107-pjm-response-to-icc-request-to-analyze-the-impact-of-nuclear-retirements.ashx?la=en.

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State	Coal	Natural Gas
AR	78%	22%
IA	96%	4%
IL	94%	6%
LA	26%	74%
MD	88%	12%
MI	81%	19%
MN	88%	12%
MO	95%	5%
MS	25%	75%
NJ	7%	93%
OH	79%	21%
PA	60%	40%
VA	50%	50%
WI	82%	18%

The emission factors are adjusted based on the location of the zero emission facility submitting a ZECs bid relative to Illinois. The emission factor adjustments reflect weighting for the bid selection score taking into consideration whether the facility is located in Illinois, or in a MISO or PJM state other than Illinois. The emission factor adjustments provide scoring weights for each emission factor based on how likely the public interest emission criteria from the generation that would replace the output from a zero emission facility will impact the citizens of Illinois.[108] The impact of each of the emission factors relating to SO_2, NO_x, PM_{10}, and $PM_{2.5}$ depends on the relative location of the facility and the average direction that the wind blows into Illinois from the general location of the replacement generation, which is assumed to be located in the state where the zero emission facility is located. This is discussed further in Section 5.2.2 below. ¶
Through the language of the statute, CO_2 presents a different case: the bid selection process is instead directed to consider "minimizing carbon dioxide emissions that result from electricity consume ... [1]

Deleted: The Act specifies that the CO_2 emission criterion consider the CO_2 emissions "that result from electricity consumed in Illinois."[110] However, not only is Illinois a net exporter of electricity, it exports annual amounts greater than the ZEC procurement target.[111] Since the replacement generation is assumed to com ... [2]

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emissions facility is located, and the remaining 67% of replacement generation will occur in equal shares in each of the other states in the relevant RTO (PJM or MISO).

5.2.1.2 Determining the State Emissions Intensity for Each State Providing Replacement Generation.

Next, for the particular non-CO_2 pollutant being scored, the Agency will determine the emissions intensity for that pollutant for each state in which replacement generation will occur.

To do so, the Agency will first determine, for that pollutant, each state's weighted average emissions rate for coal and gas generation in the state. The Agency focuses only on coal and natural gas generation because, as discussed above, coal and gas plants are likely to be the marginal resources that form the replacement generation mix. Each state's weighted average emissions rate for coal and gas generation in the state can be calculated using the following formula:

Weighted Average Coal & Gas Emission Rate for a pollutant = (State's tons of coal emissions of pollutant + State's tons of gas emissions of pollutant) * (2000 lbs/ton) / (MWh of coal generation + MWh of gas generation)

To determine each state's emission intensity for the pollutant, the Agency will then divide the state's Weighted Average Coal & Gas Emission Rate by the average such figure for all states in the RTO. This is provided by the following formula:

State Emission Intensity for a pollutant = State Weighted Average Coal & Gas Emission Rate / RTO Weighted Average Coal & Gas Emission Rates

5.2.1.3: Wind and Distance Adjustments to State Emission Intensity

The next step is to adjust the State Emission Intensity for the pollutant being scored based on the location of each state providing replacement generation relative to Illinois. For NO_x, SO_2, $PM_{2.5}$, and PM_{10} emissions, the public interest criteria in the Act are focused on the adverse effects of these emissions on the citizens of Illinois. Thus, the impact of each of the emission factors relating to SO_2, NO_x, $PM_{2.5}$, and PM_{10} depends on the relative location of the facility and the average direction that the wind blows into Illinois from the general location of the replacement generation.

As these emissions are airborne pollutants emitted from fossil fuel electric generating facilities, the proposed weighting is determined based on the average amount of time that the wind blows into Illinois from the state where the replacement generation is located, adjusted for the distance that state is from Illinois to account for the increasing dispersion and deposition of pollutants over increasing distances.

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The wind direction weighting methodology was developed for efficient and transparent application in the bid selection methodology and uses publicly available state-wide generation and emissions data to maximize its transparency.

Other alternatives to this approach were considered, but ultimately not adopted. These alternatives included atmospheric dispersion and deposition modeling, and the EPA's Avoided Emissions and Generation Tool ("AVERT").

Dispersion and deposition modeling systems seek to characterize the dynamics of point source emission plumes identifying physical and chemical interactions of the pollutants in the plume. The models are designed to quantify exposures to various pollutants based on pollutant concentration, including total exposure on a percentage basis over distances, cumulative exposures, and provide dispersion maps which depict the patterns of pollutant dispersions and magnitude of concentrations. These models require extensive input data for each point source modeled (including data for each specific replacement generating unit). The results of the dispersion models do not correlate well with the parameters utilized to quantify the specific outputs needed for use in the Agency's bid selection methodology.

AVERT was developed for the U.S. EPA as a tool to estimate hourly emissions and generation benefits of energy efficiency and renewable energy policies and programs.[118] The tool tracks generation, heat input and emissions by individual fossil generating unit to identify changes in regional emissions when units are retired, replaced or retrofitted with pollution controls. AVERT is available to the public along a Statistical Module that includes prepackaged data from the EPA's Air Markets Program Data, which performs statistical analysis on SO_2, NO_x, and CO_2 emissions. The EPA version of AVERT did not analyze PM emissions, although PM emissions capabilities are available from third party analytics firms. One reason that the IPA determined not to use AVERT is that the EPA cautions that AVERT is only intended for analyzing the emission impacts of energy efficiency and renewable energy policies and programs so this would have been outside of the scope of AVERT's intended use; that could introduce inaccuracies and would need additional analysis and calibration to create the factors needed for this procurement.

A 21-year average of wind direction into Illinois is used to determine the adjustments to the State Emission Intensity for the non-CO_2 pollutant being scored. The average wind direction data is shown in Figure 1. The data is reported by the Illinois State Water Survey, Water and Atmospheric Resource Monitoring Program. The stations that had a full 21 years of data, 1996 through 2016, were utilized to develop the average wind direction distribution for the state. The data sources

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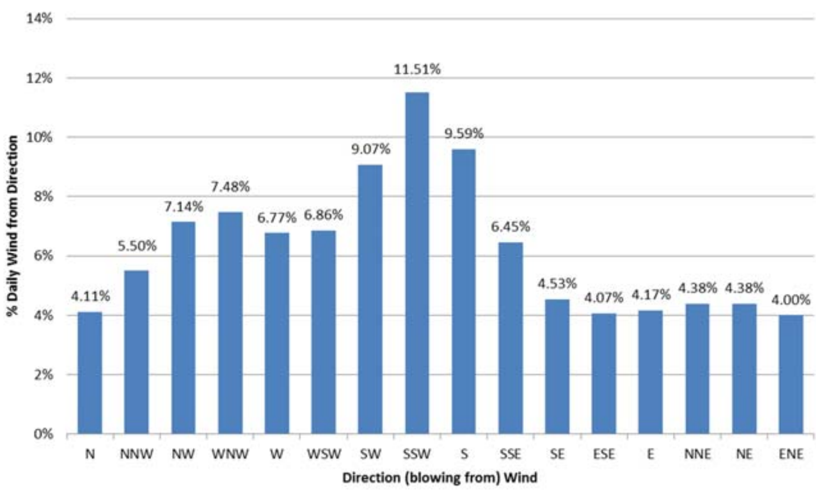
[118] U.S. Environmental Protection Agency, "Fact Sheet for Decision Makers, AVoided Emissions and geneRation Tool (AVERT)," https:// 19january2017snapshot.epa.gov/statelocalclimate/avoided-emissions-and-generation-tool-avert.html

utilized included the following stations which had a complete data set over that time period: Belleville, Bondville, Brownstown, Carbondale, Champaign, DeKalb, Dixon Springs, Fairfield, Freeport, Monmouth, Olney, Peoria, Perry, Rend Lake, Springfield, St Charles, and Stelle.

Figure 1. 21-year Average Illinois Wind Direction



To calculate the Adjusted State Emission Intensity for these pollutants, first, the IPA will calculate a Wind Adjustment. The Wind Adjustment is the sum of the primary direction and the two adjacent directions; for example if the state in question is located to the southwest of Illinois, the three directional components are taken (*i.e*. components WSW, SW, and SSW, in the figure above). By way of example, the sum for Missouri would be 27.4% (or 0.274) since that would be the total amount of time, on a 21 year average, that wind would be blowing into Illinois from the west-southwest to south-southwest direction.

Second, that sum is then multiplied by the Distance Adjustment. The Distance Adjustment accounts for the increasing reduction in the concentration of pollutants over increasing distances, and is the ratio of the approximate distance of the center of each state from the center of Illinois divided by 1,000 miles.[120] To take Missouri as an example again, that ratio is 0.79, leading to an overall wind direction and distance adjustment of 0.22 to Missouri's State Emission Intensity. Calculation of the wind direction and distance weights are provided in Appendix C.

Deleted: To account for the increasing reduction in the concentration of pollutants over increasing distances, the scoring model calculates a relative distance adjustment factor, which is the ratio of the approximate distance of the center of each state from the center of Illinois divided by 1,000 miles.[119]. As the modeling of pollutant dispersion and deposition is very complex, the Agency invites interested parties to comment on this distance adjustment and what alternative approaches could be utilized, if any.¶

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[120] 1,000 miles is an estimate of the outer bounds of PJM and MISO from Illinois and thus the maximum distance a replacement power plant that emits NO_X, SO_2, and PM could be from Illinois.

Finally, the product of the wind and direction adjustments is multiplied by the State Emission Intensity. This is shown in the following formula:

Adjusted State Emission Intensity = State Emission Intensity * (Wind Adjustment * Distance Adjustment)

5.2.1.4 Calculating the Non-CO_2 Emissions Scoring Metric.

Finally, to calculate the Non-CO_2 Emissions Scoring Metric for a pollutant, the Agency multiplies, for each state providing replacement generation, the state's Adjusted State Emission Intensity for that pollutant by the state's share of replacement generation. The result indicates, for each state, the degree to which replacement generation in that state will adversely impact Illinois residents through the emission of the pollutant being scored. The Agency then sums the resulting state-level scores.

For example, suppose there were an RTO with four states. The Non-CO_2 Emissions Scoring Metric for the pollutant being scored would be calculated as follows:

	Column A: Percentage of Replacement Generation	Column B: State Weighted Avg Coal & Gas Emissions Rate	Column C: RTO Avg Coal & Gas Emissions Rate	Column D: State Emission Intensity	Column E: Applying Wind and Location Adjustment	Column F: State Emission Contribution
State 1 (location of retiring zero emission facility)	33%	(State emissions from coal + State emissions from gas) * (2000 lbs/ton) / (State MWh coal gen + State MWh gas gen)	(B1 + B2 + B3 + B4) / 4	B1 / C1	D1 * State 1 Wind and Location Adjustment Factors	A1*E1
State 2	22.3%[121]	"	"	B2 / C2	D2 * State 2 Wind and Location Adjustment Factors	A2*E2
State 3	22.3%	"	"	B3 / C3	D3 * State 3 Wind and Location Adjustment Factors	A3*E3
State 4	22.3%	"	"	B4 / C4	D4 * State 4 Wind and Location Adjustment Factors	A4*E4
Emissions Scoring Metric						F1 + F2 + F3 + F4

[121] This is the pro rata share of the generation that is expected to come from a state other than the state in which the facility is located. Because there are three other states in this hypothetical RTO, the 67% of generation coming from the rest of the RTO is divided equally among the three states, with 22.3% given to each state.

5.2.2 CO_2 Emissions Scoring Metric

Under the language of the statute, CO_2 requires a different approach than non-CO_2 pollutants: the IPA is directed to consider "minimizing carbon dioxide emissions that result from electricity consumed in Illinois."[122]

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In theory, the scoring to reflect the impact of CO_2 emissions for zero emission facilities located both in and outside of Illinois could be developed through several approaches depending on data availability. The challenge is that electrons cannot be tracked, and so it is impossible to precisely measure the carbon intensity of electricity being consumed in Illinois—because one cannot know precisely where that electricity was generated. So the Agency must develop a heuristic to estimate the Illinois carbon dioxide consumption that would be avoided by a zero emission facility's continued operation. Moreover, the replacement electricity consumed in Illinois if a zero emission facility retires is not necessarily the same as the electricity produced by that facility's replacement generation. The replacement generation may be consumed elsewhere.

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The proposed approach recognizes that Illinois is a net exporter of electricity but that power also does indeed flow from other states into Illinois for consumption in Illinois (even if only occasionally). Consistent with the statute's focus on "minimizing carbon dioxide emissions that result from electricity consumed in Illinois," the Agency calculates the carbon Emissions Scoring Metric by reference to the share of a retiring zero emission facility's output that is likely to be consumed in Illinois.

In 2016, the last year for which comprehensive EIA data on generation and consumption are available, Illinois load amounted to approximately 82% of Illinois generation, net of transmission and distribution losses. It is thus reasonable to conclude that 82% of the electricity generated by an Illinois zero emissions facility is consumed in Illinois, and the remaining 18% is exported to other states.

Determining the share of electricity generated by zero emission facilities located in states outside of Illinois, but consumed in Illinois, is more challenging. The approach the Agency proposes likely significantly overstates the amount of electricity generated by a zero emissions facility outside of Illinois that is consumed in Illinois, but the Agency believes it is appropriate to be conservative in crediting the contribution of out-of-state facilities to the abatement of Illinois carbon consumption.

For zero emissions facilities located in states that are net exporters of electricity, the Agency assumes that the share of the zero emissions facility's output consumed in Illinois is equal to the share of that state's generation that is exported. Again, this significantly overstates the contribution made by such a facility to the abatement of Illinois carbon consumption, because

[122] 20 ILCS 3855/1-75(d-5)(1)(C).

electricity is exported to the entire RTO, not only to Illinois. Yet the Agency is assuming that *all* of the zero-emission facility's electricity that is exported finds its way to Illinois and is consumed there. The share of generation that is exported can be calculated by dividing the state's total load by its total generation, and then adjusting that figure for transmission and distribution losses. This adjustment is necessary for accuracy. Because electricity dissipates when traveling any distance, even a state that had no imports or exports of electricity would be expected to have greater generation than load; the difference between the two represents the electricity lost during transmission and distribution between generation and consumption. Accordingly, each state's generation and load figures must be adjusted to account for this reality. In 2016, in the United States as a whole, generation exceeded consumption by approximately 10%, which provides a rough proxy for average national transmission and distribution losses. This figure is used to adjust each state's Emissions Scoring Metric for carbon. Each state's generation total is reduced by the same percentage—approximately 10%—to account for the fact that that amount of generation is lost and not consumed.

For zero emissions facilities located in states that are net importers of electricity, it would be reasonable to conclude that such zero emissions facilities provide no Illinois carbon consumption benefit, because it could be expected that all of their electricity is consumed within the state in which they are located. Nevertheless, in recognition that there may be times during the year that even these states are net exporters—and that during those times, some exported power may be consumed in Illinois—we will assume that no less than 10% of any zero emission facility's output is consumed in Illinois. Again, this is a conservative estimate that likely significantly overstates the contribution of such zero emissions facilities in abating Illinois carbon consumption. Below is a table listing each state's Emissions Scoring Metric for carbon, based on its net export percentage, with a floor of 10%:

State	ISO	2016 Generation (GWh)	2016 Generation Adjusted for Transmission/Distribution	2016 Consumption (GWh)	CO2 Emissions Scoring Metric
AR	MISO	60,417	54,967	45,892	16.5%
DE	PJM	8,765	7,974	11,056	10.0%
IA	MISO	54,793	49,851	47,736	10.0%
IL	PJM	186,939	170,077	139,619	82.1%
IL	MISO	186,939	170,077	139,619	82.1%
IN	MISO	101,824	92,640	98,386	10.0%
KY	PJM	80,345	73,098	73,154	10.0%
LA	MISO	106,688	97,065	88,821	10.0%
MD	PJM	37,282	33,919	61,331	10.0%
MI	PJM	112,719	102,552	103,472	10.0%
MI	MISO	112,719	102,552	103,472	10.0%
MN	MISO	60,148	54,723	64,636	10.0%
MO	MISO	78,905	71,788	77,348	10.0%
MS	MISO	62,906	57,232	49,076	14.3%
ND	MISO	37,582	34,192	17,977	47.4%
NJ	PJM	77,620	70,619	74,769	10.0%
OH	PJM	119,356	108,590	147,637	10.0%
PA	PJM	214,811	195,435	144,582	26.0%
VA	PJM	92,439	84,101	111,910	10.0%
WI	MISO	64,797	58,952	69,466	10.0%
WV	PJM	75,626	68,805	32,070	53.4%

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5.3 Incremental Environmental Benefits Preserved

The Zero Emission Standard expressly addresses four discrete pollutants to be considered, and then also requires that "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."[123] As a result, the IPA understands that the statute directs it to ensure that facility scoring "take into account" the risk that a qualifying zero emission facility may close "but for" receiving revenues for the environmental attributes of its generation—not that such a facility would be unable to bid if it would stay open otherwise (as the Zero Emission Standard merely stated that this factor be taken "into account"), but only that the environmental attributes preserved should be diminished in facility scoring by the degree to which the IPA can discern

[123] 20 ILCS 3855/1-75(d-5)(1)(C).

whether the facility would have continued to operate. As the potential for closure impacts benefits across all four public interest pollutant criteria, the IPA's proposed scoring approach creates multipliers to those pollutant scores to account for the risk of closure faced by a facility.

Nuclear generating unit closures or planned retirements prior to the expiration of the unit's NRC operating license are driven primarily by one or a combination of the following factors: adverse market conditions, state policy decisions such as agreements with political or regulatory authorities, or structural and mechanical problems such as steam generator failures. For example, the Crystal River 3 unit in Florida, and the San Onofre 2 and 3 units in California are examples of plants where structural and mechanical problems led to their closure because of the prohibitive cost that would have been required for repairs. The planned retirements of Indian Point 2 and 3 in New York as well as Diablo Canyon 1 and 2 in California reflect a combination of adverse market conditions and State policy decisions.

There is simply no easy method for determining whether a given facility would in fact close without the benefit of a zero emission credit contract. Public statements by facility owners could be helpful, but may also be made for any number of reasons—including posturing to obtain advantageous policy outcomes—and past statements about a facility's risk of closure may not reflect anticipated future market conditions. Similarly, obtaining statements of intention from facility owners as part of this procurement process may also lend itself to false positives. The IPA has instead sought to rely on objective and obtainable information to determine whether a zero emission facility indeed faces a risk of closure without receiving revenues for its environmental attributes, and thus that the selection of winning bids helps ensure that the facility's "environmental benefits" are "preserved."

5.3.1 Economic Stress Multiplier

The degree to which a zero emission facility may be at risk of closure due to economic and market conditions can be measured through the facility's operating costs measured against a proxy for revenues. If a facility has a particularly high cost structure, it should have a higher level of economic stress, unless it is in a region in which electricity prices are relatively high. Similarly, if a facility is able to produce electricity at a lower cost, then it is presumably facing reduced economic stress and at less risk of closure, unless it is in a region in which electricity prices are relatively low.

To capture this dynamic, the IPA proposes the use of an economic stress multiplier ("ESM"), which works to determine whether a given facility faces economic stress greater or lesser than a baseline market rate, adjusted for regional differences in electricity prices. The ESM reflects the general condition that zero emission facilities with higher operating costs (as defined below)

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Deleted: two factors: first, whether the facility's costs are recovered through rates (in which case it could simply petition its public utilities commission for the collection of additional revenue from ratepayers to address competitive market shortfalls); and second, the economic stress facing the facility. How those factors figure into the scoring offered to qualifying facilities bidding into the zero emission credit procurement is addressed in the sections below.

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relative to imputed revenues, are more likely to face economic stress and potential closure than facilities with lower operating costs relative to imputed revenues.[130]

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The ESM is calculated as follows: to maintain consistency with other information found in the statute, the ESM is calculated through the ratio of the zero emission facility's operating costs, divided by the Base Market Price Index of $31.40/MWh adjusted by the basis between that BMPI and the facility's local nodal energy price. As explained below, there is also a cap on the ESM of 1.53 to reflect the fact that at a certain point, a facility's likelihood of retirement is sufficiently great that its economic stress beyond that point is not relevant.

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The Economic Stress Multiplier is thus the lesser of:

1. 1.53, or
2. (Costs / (31.40 + Basis))

5.3.1.1. Costs and Cap.

The zero emission facility operating costs utilized to determine the ESM are the sum of the fuel expenses, operating & maintenance expenses and the capital expenses necessary to maintain operation of the facility as reported through the final facility eligibility information form, which is provided in draft format as Appendix F.[131] For purposes of making this determination, operating cost data will be taken from the eligibility information that each zero emission facility that bids is required to submit to the IPA (thus maintaining additional consistency with information expressly required to be submitted in the statute).[132] As this information will be certified by the bidder for accuracy and will be subject to additional review and verification by the Agency and the Procurement Administrator, the IPA is confident that this information will be sufficiently accurate for determining a bid score multiplier.

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The IPA recognizes, however, that the Economic Stress Multiplier is being used as a proxy for the risk of facility closure. Once a certain level of economic distress is reached, all facilities beyond that level have a similarly high likelihood of retirement. The degree to which the facility's costs exceed that level do not increase the probability of its retirement on a linear basis. For purposes

[130] Congressional Research Service, "Financial Challenges of Operating Nuclear Power Plants in the United States," December 14, 2016.

[131] The zero emission facility costs as used in the ESM are defined by the Nuclear Energy Institute as shown in the whitepaper "Nuclear Costs in Context" updated April 2017. The ESM is determined based on the fuel costs, O&M costs and sustaining capital costs selected from the eligibility information supplied by the potential bidders to be consistent with industry cost analysis approach presented in the NEI whitepaper. For multiple unit plants, bidders may choose whether to allocate shared costs equally to each of the units or instead to allocate shared costs proportional to the units' capacity.

[132] See 20 ILCS 3855/1-75(d-5)(1)(A)(iii).

of bid scoring, the statute requires the IPA to take into account only the risk of facility closure (and not the economic losses suffered by a facility owner), so all facilities facing a similar risk of retirement should be treated equally, irrespective of the extent to which each retiring facility's costs outstrip its revenues. In other words, if two facilities are equally likely to retire, it does not matter for selection purposes whether one facility is losing $25/MWh while the other is losing $50/MWh. But absent a cap on the ESM, those two facilities would have very different ESMs. For this reason, the IPA will cap the Economic Stress Multiplier.

Because the statutory maximum ZEC Price is $16.50/MWh, any facility applying for ZECs is committing to operate for no more than an incremental $16.50/MWh. A facility's distress beyond that amount cannot be remedied by the ZES program. The IPA proposes to calculate an ESM Cap based on a generic, hypothetical nuclear facility with assumed revenues of the BMPI—$31.40/MWh. If such a facility had costs more than $16.50/MWh above the generic BMPI, that facility would be under maximum economic stress. Accordingly, that hypothetical facility's costs in excess of that amount ($47.90/MWh, or $31.40/MWh + $16.50/MWh) should not be considered when calculating the Economic Stress Multiplier. Thus, the facility's maximum ESM would be 1.53, equal to $47.90 / $31.40. The IPA will apply this cap of 1.53, derived from the maximum costs of a generic nuclear unit, to the ESM score of any nuclear facility.

5.3.1.2. Basis Adjusted BMPI.

Each facility's costs must be compared against a proxy for the competitive climate facing that facility. As noted above, a facility in a region with higher average electricity prices can survive with higher costs than a facility in a region with lower average electricity prices; accordingly, the most relevant comparison for a unit is between its costs and a proxy for the electricity prices it would receive if it sold its energy. Because *actual* unit revenues are non-public, difficult to calculate, and depend on wholesale market activity that is irrelevant to the IPA's awarding of ZECs, the IPA will rely on publicly reported data on the historical average price differentials between regions in PJM and MISO. One measure for such price differentials is the basis between different locational marginal prices ("LMPs") in an RTO. Average basis is publicly reported. For each facility, the BMPI will be adjusted by the average basis, during the consecutive 12-month period ending May 31, 2016, between PJM's Northern Illinois Hub and the facility's nodal LMP. The 12-month period ending May 31, 2016 is the same period from which the BMPI at the Northern Illinois Hub was derived, so it is used for consistency.

5.3.2. Rate-based Facilities.

Rate-based facilities will be treated somewhat differently. As noted above, a key bid scoring consideration in the Act involves maintaining the environmental attributes of existing zero emission facilities through the procurement of ZECs: "In particular, 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."[133] But facilities that are able to recover their costs through State regulated rates are less exposed to the risks associated with competitive market conditions, and are thus less likely to close. Rate-based facilities do not rely on market prices to cover the costs of operation and provide a regulated return on investment to their owners. These facilities can rely on regulatory processes to adjust rates to ensure that return on investment.

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By contrast, zero emission facilities operating in competitive electricity markets, such as in Illinois, compete on a merchant basis, and the facilities' revenues are subject to commodity price fluctuations and supply/demand dynamics. With greater exposure to fluctuating market conditions, merchant facilities have a greater risk of early retirement brought about by economic stress than facilities with rate-based cost recovery.[134] Since 2013, six nuclear generating units have been retired—three due to structural and mechanical reasons, as described above, and three due to adverse market conditions. Of the units that retired due to adverse market conditions, Kewaunee in Wisconsin and Vermont Yankee in Vermont were operating in competitive markets, while the small single-unit Fort Calhoun in Nebraska was operated by a public power agency.[135] As of the second quarter of 2017, the owners/operators of 19 units have announced plans to close or have indicated that their units are in danger of retiring prematurely because they are losing money.[136] All of these units with the exception of Diablo Canyon 1 and 2 are merchant facilities operating in competitive markets.

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At the same time, although risk of facility closure must be "take[n] into account" under the statute, the Zero Emission Standard does not *prohibit* facilities with costs recovered through rates from participating, as the Renewable Portfolio Standard does in Section 1-75(c)(1)(J). Thus, rate-based facilities will be eligible to bid. However, to reflect the fact that these facilities earn guaranteed returns, rate-based facilities will be assumed to have revenues equal to their cost. That is, rate-based facilities will receive an Economic Stress Multiplier of 1.0.[137]

133 20 ILCS 3855/1-75(d-5)(1)(C).

134 See: Congressional Research Service, "Financial Challenges of Operating Nuclear Power Plants in the United States," R44715, December 14, 2016. Haratyk, Geoffrey, "Early Nuclear Retirements in Deregulated U.S. Markets: Causes, Implications and policy Options," MIT Center for Energy and Environmental Policy Research, Working Paper Series, CEEPR WP 2017-009, March 2017.

135 Nuclear Energy Institute, "Nuclear Costs in Context," April 2017.

136 These units are: Fitzpatrick, Clinton, Quad Cities 1 and 2, Pilgrim, Oyster Creek, Diablo Canyon 1 and 2, Three Mile Island 1, Indian Point 2 and 3, Nine Mile Point 1 and 2, Ginna, Palisades, Perry, Davis Besse, and Beaver Valley 1 and 2.

137 As part of the submission of eligibility information, bidders will be required to certify the status of each zero emission facility as either a) a merchant facility or b) a facility that recovers its costs through regulated rates. In the

5.4 Scoring Calculation

Score for NO_x, SO_2, $PM_{2.5}$, and PM_{10} = **Emission Scoring Metric** for each pollutant * Maximum points for the relevant pollutant.[141]

Score for CO_2 = CO_2 **Emission Scoring Metric** * 25.[142]

The facility's total score, the sum of the five emissions criteria, is then multiplied by the **Facility 10-year average Capacity Factor**[143] and the **Economic Stress Multiplier** to provide the **Final Public Interest Criteria Score**. The **Final Public Interest Criteria Score** will be used to determine which facilities are selected as winning bidders.

Appendix E provides the Excel model with formulas intact used to evaluate zero emission facility bids.

case of a facility owned by more than one entity, to maintain consistency with the statutory directive that "if the zero emission facility is owned by more than one entity, then the quantity of zero emission credits to be procured under the contracts shall be the amount of zero emission credits that are generated from the portion of the zero emission facility that is owned by the winning supplier," this certification shall be based on that individual bidder's "portion of the zero emission facility" owned by it. (20 ILCS 3855/1-75(d-5)(1)).

[141] Maximum points is 25 points for NO_x and SO_2, and 12.5 points each for $PM_{2.5}$ and PM_{10}.

[142] Maximum points is 25 points for CO_2.

[143] The facility 10-year average capacity factor is provided by the bidder in the bidder eligibility form (Appendix F) and is based on the capacity factor for the years 2007-2016..

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The **Facility Size Metric** = (the facility summer-rated capacity in megawatts from the form in Appendix F)/(the average summer-rated capacity for nuclear units in the applicable RTO in megawatts)¶
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The **Emissions Scoring Weight** = For NO_x, SO_2, $PM_{2.5}$, and PM_{10} the percent of time the wind blows from the direction of the replacement generation sources; and for CO_2 the MISO and PJM-specific ratios for Illinois and non-Illinois facilities.¶
Score for each emissions criterion = **Facility 10-year average Capacity Factor** * **Facility Size Metric** * **Emission Scoring Metric** * the **Emissions Scoring Weight**

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6 Procurement Process Administration

The ZEC procurement goals and procedural requirements for the ZEC procurement process are described in subsection (d-5) of the Act. As described in Chapter 3, to the extent not expressly described in the statute, the IPA understands that the procurement process should be conducted consistent with Section 16-111.5 of the Public Utilities Act, as the process is to be conducted "in conjunction with" that Section.[144]. Appendix G contains a summary of the provisions related to the procurement process contained in Section 116-111.5 and their applicability, inapplicability, or need for modification.

One difference between the procurement of ZECs versus the IPA's prior competitive procurement processes for energy or renewable resources is that the selection of winning bids previously involved "… a procedure for sealed, binding commitment bidding with pay-as-bid settlement, and provision for selection of bids on the basis of price."[145] That bid selection process was also guided by the establishment of market-based price benchmark.[146] Alternatively, bidding for zero emission credit contracts involves the evaluation and selection of bids based on applying the public interest criteria which are focused on the amount of emissions that each bidding zero emission facility can avoid if the facility remains in operation. Therefore, unlike the previous IPA procurements, a price benchmark and bid selections based on competitive bid prices are not applicable to this procurement.

6.1 Bidder Qualification

Owners/operators of zero emission facilities interested in becoming bidders must also submit to the IPA an acceptable form of the eligibility information presented in the Act.[147] While nuclear units at a multiple unit site can be operated independently, nuclear utilities usually operate nuclear plants on a site basis rather than as individual units. However, specific units at many multi-unit sites can have different levels of financial performance related to different output levels and different capacity factors.[148] The IPA proposes to request the zero emission facility information on an individual unit basis to evaluate and score the ZEC bids received. For the purposes of this procurement each, generating unit at a multi-reactor site will be considered individually. Registration as a qualified bidder is contingent on submittal and acceptance by the IPA of the eligibility information. A draft template for submitting the required eligibility information is

[144] 20 ILCS 3855/1-75(d-5)(1)(C-5).

[145] 220 ILCS 5/16-111.5(e)(3).

[146] Ibid.

[147] See 20 ILCS 3855/1-75(d-5)(1)(A)(i-iv) for the eligibility information required under the law.

[148] Szilard, R. et. al. "Economic and Market Challenges Facing the U.S. Nuclear Commercial Fleet," Energy Systems Strategic Assessment Institute, Center for Advanced Energy Studies, Gateway for Accelerated Innovation in Nuclear, Idaho National Laboratory, September 2016, INL/EXT-16-39951.

attached as Appendix F to this Plan to help potential bidders prepare for this submittal. The IPA is seeking to obtain the completed eligibility information submissions within 14 days of the Commission's approval of this Plan. Those zero emission facilities that intend to participate in the procurement shall submit to the IPA complete templates that include the following eligibility information for each zero emission facility:

- The in-service date and remaining useful life of the zero emission facility;
- The amount of power generated annually for each of the years 2006 through 2016, and the projected ZECs to be generated over the remaining useful life of the zero emission facility, which shall be used to determine the capability of each facility;
- The annual zero emission facility cost projections, expressed on a per MWh basis, over the next 6 delivery years, which shall include the following:
    - Operation and maintenance expenses;
    - Fully allocated overhead costs, which shall be allocated using the methodology developed by the Institute for Nuclear Power Operations;
    - Fuel expenditures;
    - Non-fuel capital expenditures;
    - Spent fuel expenditures;
    - A return on working capital;
    - The cost of operational and market risks that could be avoided by ceasing operation; and
    - Any other costs necessary for continued operations, provided that "necessary" means, for purposes of this item, that the costs could reasonably be avoided only by ceasing operations of the aero emission facility; and
- A commitment to continue operating, for the duration of the contract or contracts executed under the procurement, the zero emission facility that produces the ZECs to be procured in the procurement.

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These items are all specifically mandated in Section 1-75(d-5)(1)(A). In addition to these specific items, the Agency will require that interested bidders also provide a narrative walkthrough of the assumptions and calculations used to support specific cost projection items.

The Act, in Section 1-75(d-5)(1)(A), provides that cost projection information may be submitted to the IPA on a confidential basis, which the IPA will then treat and maintain as confidential.

> *"The information described in item (iii) of this subparagraph (A) may be submitted on a confidential basis and shall be treated and maintained by the Agency, the procurement*

administrator, and the Commission as confidential and proprietary and exempt from disclosure under subparagraphs (a) and (g) of paragraph (1) of Section 7 of the Freedom of Information Act. The Office of Attorney General shall have access to, and maintain the confidentiality of, such information pursuant to Section 6.5 of the Attorney General Act."

The IPA will review the Eligibility Information received and within 14 days notify applicants of any deficiencies in their submittal and they will have 14 days to provide additional information to cure those deficiencies.

6.2 Procurement Process

Subsequent to this Plan's approval by the Commission, the Agency's Procurement Administrator will release a schedule for the procurement event, and will develop, in conjunction with the Agency, utilities, ICC Staff, and Procurement Monitor, draft contracts and release them for comment (See Section 6.4 below). Assuming that there are no delays created by requests for rehearing, complications in the contract development process, or other items outside of the Agency's direct control, the Agency estimates that the bid date will be in December 2017.

Section 4.5 specifies that the total ZEC target for this procurement is 20,118,672 ZECs to be delivered annually, or 201,186,720 ZECs over the ten-year life of the Zero Emission Standard contracts. Given the "lumpiness" in the output of zero emission facilities, it is unlikely that the total amount of ZECs selected through the selection of winning facilities in the procurement will perfectly match that number. The quantity of ZEC bids is the unit's projected ZECs to be generated over the remaining useful life of the zero emission facility, or the term of the zero emission program, whichever is shorter.

As described in Chapter 5, bids will be evaluated based upon each facility's Final Public Interest Criteria Score (the number of points awarded to each facility), with more points resulting in a more highly rated bid. Selected bids will be the bids up to where the last bid is the marginal bid that approximately meets the overall ZEC procurement quantity. IPA will use its discretion to approximate the 16% procurement target to avoid, to the extent possible, the need to select a marginal bid (*i.e.*, a bid that, if accepted, would result in the total number of ZECs procured no longer approximating the 16% target). To the extent that a marginal bid must be accepted because non-marginal bids (*i.e.*, those where the cumulative volume is less than the ZEC procurement target) result in a procurement of ZECs short of any reasonable approximation of the 16% target, the marginal bidder's contract will provide for payment only for the quantity of ZECs needed to reach the 16% target. The remainder of the marginal bidder's ZECs will also be procured, but will be treated as Unpaid Contractual Volume. To the extent that the quantity of ZECs purchased must be reduced due to the retail price cap, the reduction for the non-marginal bidders and marginal bidder shall be proportional to the volumes for which payment was to be provided.

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Under Section 16-111.5(f), the Agency's procurement process includes the provision that the Procurement Administrator provide to the Commission a confidential report on the recommended winning bids within two business days of the bid date (and concurrently on a confidential basis the Procurement Monitor also provide a separate report on their assessment of the procurement), and the Commission would have two more business days to accept, or reject, those recommendations. However, for the purposes of this procurement, the IPA believes that is may be appropriate to modify that timeline to take into account the additional time that may be needed by the Commission to be able to produce the "public notice" given the non-price selection criteria to be applied to the ZEC bids described in the following section.

Deleted: "The quantity of zero emission credits to be procured under the contracts shall be **all** of the zero emission credits generated by the zero emission facility in each delivery year; however, if the zero emission facility is owned by more than one entity, then the quantity of zero emission credits to be procured under the contracts shall be the amount of zero emission credits that are generated from the portion of the zero emission facility that is owned by the winning supplier."[149] ¶
For the facilities that are selected as winning bidders, once the procurement results are approved by the Commission, and contracts entered into with all three utilities, the facilities will be treated equally for the purposes of ongoing contract administration. Specifically, the actual ZEC payments made each year will be reduced proportionately, if necessary, across all contracts in order to meet any cost cap limitations. The purpose of this provision is to recognize that while the scores each facility received in the bidding process reflect the extent to which the bidding facility maximizes the public interest criteria for selecting facilities, once the procurement process is complete and facilities selected and remain in operation, each individual ZEC has the same impact on the ongoing realization of the goals of the public interest criteria as any other ZEC and therefore each facility that is delivering ZECs should be treated equally. ¶

6.3 Commission Approval of Procurement Results

The Commission's decision approving the procurement results and the release of the public notice of successful bidders will occur at a Commission meeting subsequent to the bid date. Contracts between successful bidders and the utilities will then be executed within three business days of that decision. The Agency, in consultation with the Procurement Administrator, the ICC Staff, and the Procurement Monitor may adjust these dates as needed.

Under the IPA's traditional competitive procurement process, upon the Commission's approval of procurement results in procurement events conducted under Section 16-111.5, " [t]he names of the successful bidders and the load weighted average of the winning bid prices for each contract type and for each contract term" are required to be "made available to the public at the time of Commission approval of a procurement event," with other bidder and supplier information is considered "confidential."[150] Section 1-75(d-5) of the IPA Act requires a different and more (publicly) thorough approach, and envisions the Commission issuing detailed findings explaining its affirmation of the selection of winning bids. Specifically, for the procurement of ZECs, the Commission must release a "public notice" in which it must:[151]

> (i) identify how the winning bids satisfy the public interest bid selection criteria described in the law (i.e., 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);
>
> (ii) specifically address how the selection of winning bids takes into account the incremental environmental benefits resulting from the procurement, including any existing environmental benefits that are preserved by the procurements held under this Act and that would have ceased to exist if the procurements had not been held, including the preservation of zero emission facilities;

[150] 220 ILCS 5/16-111.5(h).
[151] 20 ILCS 3855/1-75(d-5)(1)(C), (C-5).

(iii) quantify the environmental benefit of preserving the resources identified in item (ii), including the following:

(aa) the value of avoided greenhouse gas emissions measured as the product of the zero emission facilities' output over the contract term multiplied by the U.S. Environmental Protection Agency eGrid subregion carbon dioxide emission rate and the U.S. Interagency Working Group on Social Cost of Carbon's price in the August 2016 Technical Update using a 3% discount rate, adjusted for inflation for each delivery year; and

(bb) the costs of replacement with other zero carbon dioxide resources, including wind and photovoltaic, based upon the simple average of the following:[152]

(I) the price, or if there is more than one price, the average of the prices, paid for renewable energy credits from new utility-scale wind projects in the procurement events specified in the "initial forward procurements" for new wind generation; and

(II) the price, or if there is more than one price, the average of the prices, paid for renewable energy credits from new utility-scale solar projects and brownfield site photovoltaic projects in the procurement events specified in this Act and, after January 1, 2015, renewable energy credits from photovoltaic distributed generation projects in procurement events held under the "initial forward procurements" for new solar and the IPA's DG procurements proposed in its 2015, 2016, and 2017 annual procurement plans.

Given the significant amount of information required in the Commission's public notice, the Commission may need more than the two business days after the receipt of the reports from the Procurement Administrator and the Procurement Monitor that is envisioned in Section 16-111.5(f), and the Agency recommends that the Commission determine the schedule for what it will require to develop the public notice and approve the procurement results.

Section 1-75(d-5)(1)(D) also provides that, following the ZEC procurement event, the Agency shall "calculate the payments to be made under each contract for the next delivery year based on the market price index for that delivery year" and "publish the payment calculations."[153] The Agency expects that it would publish the 2017-2018 delivery year "payment calculations"

[152] 20 ILCS 3855/1-75(c)(1)(G)(i), (ii).

[153] 20 ILCS 3855/1-75(d-5)(1)(D). This subparagraph also provides that "[t]he Agency shall publish the payment calculations no later than May 25, 2017 and every May 25 thereafter." As the ZEC procurement event did not occur by May 25, 2017, the Agency is adjusting its deadline for the 2017-2018 delivery as discussed further above, but intends to publish ZEC payment calculations by May 25 in subsequent years.

approximately two weeks after the Commission's approval of the procurement results. For subsequent delivery years, the payment calculation will be published by May 25th of each year.[154]

6.4 ZEC Contracts

The Act requires that "each utility shall enter into binding contractual arrangements with the winning suppliers" of ZECs selected in the procurement event.[155] The IPA will not be a party to any contracts executed with the successful bidders selected as the result of the ZEC procurement. The term of the contracts resulting from the IPA's ZEC procurement process will be 10 years and will follow the applicable provisions outlined in this Plan. The contract forms will be developed in accord with Section 16-111.5(e)(2) which states that "The procurement administrator, in consultation with the utilities, the Commission, and other interested parties and subject to Commission oversight, shall develop and provide standard contract forms for the supplier contracts that meet generally accepted industry practices." Interested parties will be given an opportunity to provide comments on draft contracts. In developing the standard contract forms, the procurement administrator may, in consultation with the utilities, rely on the standard credit instruments developed for previous energy and REC procurements. As specified in Section 16-1115(e)(2), if there is no consensus on the contracts, then "the procurement administrator must notify the Commission of any disputed terms and the Commission shall resolve the dispute." Should there be a dispute related to the contract terms that must be resolved by the Commission, then the expectation described in Section 6.2 that the bid date will be in December will likely have to be modified to allow the Commission additional time to resolve the contested issue or issues.

6.4.1 Contract Suspension or Termination

The Act, in Section 1-75(d-5)(1)(E)(i-iv), specifies the conditions under which a zero emission facility can suspend or terminate performance under a contract executed as the result of the IPA's ZEC procurement. Those conditions are generally summarized as follows:

- Standard force majeure conditions that are outside of the control of the zero emission facility as described in Section 1-75(d-5)(1)(D)(ii).
- The zero emission facility can terminate its ZEC contract in the event legislation is enacted by the General Assembly that "…imposes or authorizes a new tax, special assessment, or fee on the generation of electricity, the ownership or leasehold of a generating unit, or the privilege or occupation of such generation, ownership, or leasehold of generation units by a zero emission facility."

[154] 20 ILCS 3855/1-75(d-5)(1)(D).

[155] 20 ILCS 3855/1-75(d-5)(1)(C-5).

- The zero emission facility can terminate its contract if the facility requires capital expenditures of more than $40 million that were unknown or unforeseeable at the time it executed the ZEC contract and which a prudent owner or operator would not undertake.
- The zero emission facility can terminate its ZEC contract if the Nuclear Regulatory Commission terminates the facility's operating license.

The contracts for the procurement will contain terms to recognize these conditions.

6.4.2 Six Year Review of Actual ZEC Payments

Under Section 1-75(d-5)(3), the IPA is directed to determine, six years after the execution of a ZEC contract or at the termination of a contract, whether the actual payments under the contract exceed the Average ZEC payment defined as " …the Average ZEC Payment shall be calculated by multiplying the quantity of zero emission credits delivered under the contract times the average contract price."[156] The Act also states "If the Agency determines that the actual zero emission credit payments received by the supplier over the relevant period exceed the Average ZEC Payment, then the supplier shall credit the difference back to the utility." The contracts described in this section will contain provisions to account for this potential credit.

6.5 Tracking ZECs

ZECs will be created and tracked utilizing the Generation Attribute Tracking System ("GATS") operated by PJM.[157] GATS is one of the tracking systems used to track RECs. It tracks all generating facilities in PJM, and can also track systems located outside of PJM that choose to register in GATS. The specific type of Certificate/Credit to be used is the "Emission Free Energy Certificates" that is already part of the GATS system.

The GATS Operating Rules[158] define an Emission Free Energy Certificate as a "Certificate from a generating unit that produces Emission-Free Energy." The Operating Rules define "Emissions-Free Energy" as "Electric power output from a generating unit that does not directly produce any air emissions (sulfur dioxide, nitrogen oxide, or carbon dioxide) as reported in the GATS system. Eligible fuel types include new and existing: Solar Photovoltaic, Solar Thermal, Wind, Hydro, Nuclear, Tidal Energy and Wave Energy."

Zero Emission Credits as defined in Section 1-10 of the IPA Act must come from a Zero Emission Facility, which is "(1) is fueled by nuclear power; and (2) is interconnected with PJM

[156] The average contract price is determined by subtracting the average of the market price indices as defined in Section 1-75(d-5)(1)(B) during the term of the contract less the baseline market price from the average of the Social Cost of Carbon during the term of the contract.

[157] See: gats.pjm-eis.com

[158] See www.pjm-eis.com/~/media/pjm-eis/documents/gats-operating-rules.ashx

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Interconnection, LLC or the Midcontinent Independent System Operator, Inc., or their successors." Therefore, Zero Emission Credits are a subset of Emission Free Energy Certificates. Emission Free Energy Certificates from facilities that do not meet the definition of a Zero Emission Facility (e.g., facilities that are photovoltaics, wind, or hydro) will not be eligible for this procurement.

Transactions will be governed by the GATS Operating Rules. Successful zero emission facility sellers will deliver and convey to each utility all rights and title to their contractual volume of ZECs for each contract executed with the respective utility. ZECs will be retired by each utility following conveyance to the utility and after acceptance and payment for the ZECs by the utility. In circumstances where there is an unpaid contractual volume, those ZECs will not be retired until such time as they are paid for in a subsequent delivery year. The IPA invites interested parties to comment on if unpaid contractual volume ZECs should be retired in this way, or if they should be retired upon delivery to the utility regardless of if the ZECs are part of an unpaid contractual volume.

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State	Coal	Natural Gas
AR	78%	22%
IA	96%	4%
IL	94%	6%
LA	26%	74%
MD	88%	12%
MI	81%	19%
MN	88%	12%
MO	95%	5%
MS	25%	75%
NJ	7%	93%
OH	79%	21%
PA	60%	40%
VA	50%	50%
WI	82%	18%

The emission factors are adjusted based on the location of the zero emission facility submitting a ZECs bid relative to Illinois. The emission factor adjustments reflect weighting for the bid selection score taking into consideration whether the facility is located in Illinois, or in a MISO or PJM state other than Illinois. The emission factor adjustments provide scoring weights for each emission factor based on how likely the public interest emission criteria from the generation that would replace the output from a zero emission facility will impact the citizens of Illinois.[1] The impact of each of the emission factors relating to SO_2, NO_x, PM_{10}, and $PM_{2.5}$ depends on the relative location of the facility and the average direction that the wind blows into Illinois from the general location of the replacement generation, which is assumed to be located in the state where the zero emission facility is located. This is discussed further in Section 5.2.2 below.

Through the language of the statute, $CO_{2,}$ presents a different case: the bid selection process is instead directed to consider "minimizing carbon dioxide emissions that result from electricity consumed in Illinois,"[2] and thus a different methodology is used that considers the sources of the electricity consumed in Illinois. As discussed further in Section 5.2.1 below, the impact of the CO_2 emission factors is weighted using a proxy for the relative flow of power between the ComEd market area of PJM and the rest of PJM for any zero emission facilities that are located the PJM states outside of Illinois, while a similar proxy is used to weight the CO_2 emission factors for zero emission facilities located in the MISO states outside of Illinois.

CO_2 Scoring

[1] See 20 ILCS 3855/1-75(d-5)(1)(C).

[2] Id.

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The Act specifies that the CO_2 emission criterion consider the CO_2 emissions "that result from electricity consumed in Illinois."[3] However, not only is Illinois a net exporter of electricity, it exports annual amounts greater than the ZEC procurement target.[4] Since the replacement generation is assumed to come from coal and natural gas-fired generation located within the same state as the zero emission facility being replaced, one approach could be to assume that only zero emission facilities located in Illinois would qualify to receive *any* CO_2 emissions scoring credit because any facility located in another state would not impact net CO_2 emissions from electricity consumed in Illinois. This approach would reflect an "all or nothing approach" based on a narrow interpretation of the Act.

A more reasonable approach, and one which better recognizes that power does indeed flow from other states into Illinois for consumption in Illinois (even if only occasionally), would base the CO_2 emissions criteria scoring on power flows between Illinois and the other states in MISO and PJM. Under this approach to CO_2 scoring, zero emission facilities located in states outside of Illinois, but in either MISO or PJM, would be credited for the CO_2 emissions generated based on the portion of the replacement generation that originated from outside of Illinois. While that approach may be attractive in certain respects, the IPA does not view production simulation modeling as an entirely reliable approach to determining the emissions generated by the resources that would replace zero emission facilities.

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Perhaps the optimal way of determining electricity consumed in Illinois from other states' facilities would be simply to base the credit for CO_2 emissions avoided by zero emission facilities located outside of Illinois on the actual power flows into and out of Illinois. Unfortunately, consistent and verifiable data regarding actual interstate power flows between Illinois and the other states in MISO and PJM is not readily available from a public source.[5] But there may be proxies for that information. To the extent that a proxy for power flows relies on actual, documented, verifiable information about imports and exports of energy, the IPA believes that it represents a superior alternative to the open-ended discretion required by modeling.

This proxy exists in the form of capacity imports into Illinois, and given the limitations on available data, the IPA believes that it constitutes the best option for determining "carbon dioxide emissions

[3] Id.

[4] U.S. EIA, Illinois-State Profile and Energy Estimates, Profile Analysis, updated April 20, 2017.

[5] The IPA contacted MISO and PJM to ascertain if interstate power flow data were publicly available. No such data were available from MISO and power flow data for PJM has been designated as critical energy infrastructure information (CEII) and cannot be publicly disseminated.

that result from electricity consumed in Illinois" in scoring qualifying facilities. For zero emission facilities located in MISO, the proxy would involve the ratio of the imports for MISO Zone 4 (which covers the Illinois portion of MISO) to the planning reserve margin requirements for the 2017-2018 Planning Resource Auction results. This ratio of 0.0779, reflecting that 7.79% of Zone 4 requirements are met with imports from elsewhere in MISO, would be applied to the benefits score for the CO_2 emissions avoided for zero emission facilities located in MISO states outside of Illinois. A ratio of 0.9221, reflecting that most of the Zone 4 requirements would be met from resources in the state, would be applied to the CO_2 emissions benefit score for zero emission facilities located in the MISO portion of Illinois. The table below shows the import proxy that would be used as a percentage (7.79%) to adjust the CO_2 emissions benefits for zero emission facilities located in the MISO Zone 4 in Illinois and in the MISO states outside of Illinois.

Table 2. 2017-2018 Delivery Year Import Proxies for MISO Zone 4[6]

	MISO Zone 4
Imports (MW)	771
Planning Reserve Margin Requirement (MW)	9,894
Import Proxy (%)	**7.79%**

Unlike, MISO, PJM does not publish the results of the actual capacity that a locational deliverability area ("LDA")[7] imports from other LDAs in PJM. However, PJM establishes the Capacity Emergency Transfer Objective ("CETO") for each LDA. CETO represents the amount of capacity that a given LDA must be able to import (i.e., the import capability required) in order to meet the PJM reliability criteria. For each LDA PJM also publishes the Reliability Requirement.[8] The relationship between an LDA's CETO and Reliability Requirement can serve as a proxy for the amount of capacity that is imported into the LDA relative to its overall capacity needs. PJM started modeling the Illinois portion of PJM (the ComEd Zone) as an LDA beginning with the 2017-2018 delivery year. The table below shows the import proxy that would be used as a percentage (7.9%) to adjust the CO_2 emissions benefits for zero emission facilities located in the PJM zone in Illinois and in the PJM states outside of Illinois.

Table 3. 2017-2018 Delivery Year Import Proxies for PJM's ComEd LDA[9]

	PJM ComEd LDA
CETO (MW)	2,290

[6] 2017-2018 BRA Planning Parameters, MISO 2017/2018 Planning Resource Auction Results.

[7] An LDA is a geographic area within the PJM region that has limited transmission capability to import capacity to satisfy the area's reliability requirement.

[8] For LDAs the reliability requirement is the sum of the LDA's internal capacity and the CETO.

[9] 2017-2018 BRA Planning Parameters, MISO 2017/2018 Planning Resource Auction Results.

Reliability Requirement (MW)	28,991
Import Proxy (%)	**7.90%**

Therefore, a ratio of 0.079, reflecting that 7.9% of ComEd Zone requirements are to be met with imports from elsewhere in PJM, would be applied to the benefits score for the CO_2 emissions avoided for zero emission facilities located in PJM outside of Illinois. A ratio of 0.921, reflecting that most of the ComEd Zone requirements would be met from resources in the state, would be applied to the CO_2 emissions benefit score for zero emission facilities located in the PJM portion of Illinois.

NO_x, SO_2, $PM_{2.5}$, and PM_{10} Scoring

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Risk-Based Multiplier

Zero emission facilities operating in competitive electricity markets, such as in Illinois, compete on a merchant basis where the facility's revenues are subject to commodity price fluctuations and supply/demand dynamics. Alternatively, facilities that are able to recover their costs through State regulated rates are less exposed to the risks associated with competitive market conditions.

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Since 2013, six nuclear generating units have been retired, three of these units were closed due to structural and mechanical reasons as described above, and three units were closed due to adverse market conditions.

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A key bid scoring consideration in the Act involves maintaining the environmental attributes of existing zero emission facilities through the procurement of ZECs: "In particular, 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."[10]

In order to reflect the lesser risks that zero emission facilities with rate-based cost recovery opportunities are exposed to as compared with zero emission facilities that are operated on a merchant basis, the Agency will incorporate a rate-based risk multiplier into the process for selecting successful bids. To ensure that this reflection of risk is significant without being entirely determinative (as the Zero Emission Standard does not prohibit facilities with costs recovered

[10] 20 ILCS 3855/1-75(d-5)(1)(C).

through rates from participating, as the Renewable Portfolio Standard does in Section 1-75(c)(1)(J)), a multiplier of 0.5 will be applied to the bid scores of facilities with rate-based cost recovery, while a multiplier of 1.0 (i.e., no discount to the environmental benefits at all) will be applied to the bid scores of merchant zero emission facilities.[11] For this draft Plan, the IPA would be interested in receiving comment on whether this multiplier level is appropriate in discounting the risk of closure faced by rate-based facilities, or if there is a sound, well-supported basis for the use of a different multiplier level.

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In addition to whether a facility's costs are recovered through rates, the

[11] As part of the submission of eligibility information, bidders will be required to certify the status of each zero emission facility as either a) a merchant facility or b) a facility that recovers its costs through regulated rates. In the case of a facility owned by more than one entity, to maintain consistency with the statutory directive that "if the zero emission facility is owned by more than one entity, then the quantity of zero emission credits to be procured under the contracts shall be the amount of zero emission credits that are generated from the portion of the zero emission facility that is owned by the winning supplier," this certification shall be based on that individual bidder's "portion of the zero emission facility" owned by it. (20 ILCS 3855/1-75(d-5)(1)).