



# Illinois Climate and Equitable Jobs Act: PJM Reliability Guidance

**PJM**

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## PJM Interconnection

PJM Interconnection (PJM) is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. An important function of the RTO, and a core component of PJM's mission, is to maintain reliable operation of the bulk electric system.

## Illinois Climate and Equitable Jobs Act

[Public Act 102-0662](#), which includes the Energy Transition Act and related legislation (the "Act"), was enacted by the Illinois General Assembly with an effective date of September 15, 2021. The Act directs a number of state agencies to implement new programs, initiatives and directives intended to further the state's goals of transitioning the state to 100% clean energy.

The Act includes a number of provisions that seek to phase out carbon emissions and other pollutants from fossil fuel-based electricity generation. The Act also establishes a ceiling for a broad range of pollutants emitted from privately owned, natural gas-fueled electricity generation. The emissions ceiling, with its initial application beginning October 2021 on a rolling 12-month basis, is set at the average emissions of those generating units calculated over the three-year period 2018 through 2020. The Illinois Environmental Protection Agency (IEPA) has regulatory oversight of generator emissions, including the restrictions implemented by the Act.

Additionally, the Act includes provisions by which individual generators can be granted limited and temporary exceptions to the emissions ceiling if they are deemed necessary to maintain the reliability of the bulk electric system. The Act preserves PJM's ability, as the RTO serving northern Illinois, to call upon emission-limited generators within its footprint to produce electricity necessary to maintain the reliability and stability of the grid. PJM was made aware that, in the absence of a formal IEPA rulemaking process, additional clarity and guidance would be helpful to: 1) ensure that PJM has the tools necessary to manage the grid in light of the provisions of the Act regarding PJM's role in determining when a GHG-emitting unit is needed to continue operations to address issues directly affecting grid reliability, and 2) address generators' concerns about potential enforcement and litigation risk. Therefore, PJM, in coordination with the IEPA and the Illinois Governor's Office, prepared this "guidance document" to give both PJM and generators clarity on how to manage reliability under the auspices of the Act.

### ***Definitions<sup>1</sup>***

**"Electric generating unit" or "EGU"** means a fossil fuel-fired stationary boiler, combustion turbine or combined cycle system that serves a generator that has a nameplate capacity greater than 25 MWe and produces electricity for sale.

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<sup>1</sup> <https://www.ilga.gov/legislation/publicacts/102/PDF/102-0662.pdf>

**“Large greenhouse gas-emitting unit” or “large GHG-emitting unit”** means a unit that is an electric generating unit or other fossil fuel-fired unit that itself has a nameplate capacity or serves a generator that has a nameplate capacity greater than 25 MWe and that produces electricity, including, but not limited to, coal-fired, coal-derived, oil-fired, natural gas-fired and cogeneration units.

**“Existing emissions”** means (for CO<sub>2e</sub>) the total average tons per year of CO<sub>2e</sub> emitted by the EGU or large GHG-emitting unit either in the years 2018 through 2020 or, if the unit was not yet in operation by January 1, 2018, in the first three full years of that unit’s operation.

**“Public greenhouse gas-emitting units” or “public GHG-emitting unit”** means large greenhouse gas-emitting units, including EGUs, that are wholly owned, directly or indirectly, by one or more municipalities, municipal corporations, joint municipal electric power agencies, electric cooperatives, or other governmental or nonprofit entities, whether organized and created under the laws of Illinois or another state.

## ***Relevant Statutory Provisions Regarding Emissions Ceilings for Private Natural Gas Generation<sup>2</sup>***

### **Establishing an Emissions Ceiling for Non-Public Natural Gas Generators**

#### **415 ILCS 5/9.15: Subsection k-5**

No EGU or large GHG-emitting unit that uses gas as a fuel, and is not a public GHG-emitting unit, may emit, in any 12 month period, CO<sub>2e</sub> or co-pollutants in excess of that unit’s existing emissions for those pollutants.

### **Emissions Exceptions for Reliability**

#### **415 ILCS 5/9.15: Subsection I**

Notwithstanding subsections (g) through (k-5), large GHG-emitting units, including EGUs, may temporarily continue emitting GHGs after any applicable deadline specified in any of subsections (g) through (k-5) if it has been determined, as described in paragraphs one and two of this subsection, that ongoing operation of the EGU is necessary to maintain power grid supply and reliability, or ongoing operation of a large GHG-emitting unit that is not an EGU is necessary to serve as an emergency backup to operations.

#### **415 ILCS 5/9.15: Subsection I (2)**

If any EGU or large GHG-emitting unit that is a participant in an RTO receives notice that the RTO has determined that continued operation of the unit is required, the unit may continue operating until the issue identified by the RTO is resolved. The owner or operator of the unit must cooperate with the RTO in resolving the issue and must reduce its emissions to zero, consistent with the requirements under subsections (g), (h), (i), (j), (k) or (k-5), as applicable, as soon as practicable when the issue identified by the RTO is resolved.

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<sup>2</sup> <https://www.ilga.gov/legislation/publicacts/102/PDF/102-0662.pdf>

## PJM Reliability Management

### *PJM Use Cases for Exception Events*

As the RTO responsible for bulk electric system reliability in northern Illinois and across the rest of its service territory, PJM may determine that continued operation of generators is necessary to maintain power grid supply and reliability consistent with the statutory provisions that enable generators to run for reliability after emissions ceilings have been reached. PJM would only direct emission-restricted generators to run in a limited number of defined scenarios and only for the duration necessary to resolve the issues directly affecting grid reliability. The defined scenarios would presumably allow the units to run under the provisions of the Act in the event that the rolling emissions limits needed to be exceeded to maintain grid reliability and stability. Each unit will be responsible for accounting for their own emissions and Exception Event information and data. PJM will maintain run-hour reliability categories and run hours for independent validation.

PJM's operational procedures and criteria that may lead to a determination that continued operation of generators is necessary to maintain system reliability are as follows:

### System Restoration

Following the complete or partial shutdown of the system, PJM works with its members to restore the integrity of the interconnection as quickly as possible. The process may include using black start units that are capable of starting without any external supply to form electrical islands, building cranking paths to other generating units, nuclear stations and critical gas facilities, restoring load, synchronizing and interconnecting islands to form larger islands and then ultimately interconnecting to outside areas and returning the system to normal operation. For additional information about how PJM would restore the system from a complete or partial shutdown, see the [PJM Open Access Transmission Tariff](#), Operating Agreement and [Manual 36: System Restoration](#) on the PJM website.

### Capacity Emergencies

If PJM determines that the resources scheduled for an operating day are not sufficient to maintain the appropriate reserve levels for the RTO, then PJM would begin to implement capacity-related emergency procedures. These procedures include a series of alerts, warnings and actions to be taken by our members to preserve the reliability of the PJM RTO. Actions may include implementing load management procedures, using all available generation and requesting generation to operate above its maximum economic capability. By definition, Deploy All Resources Actions meets the criteria of an Exception Event and should be responded to without delay.<sup>3</sup> For additional information about PJM's capacity emergencies, see the [PJM Open Access Transmission Tariff](#), [Operating Agreement](#) and [Manual 13: Emergency Operation](#) on the PJM website.

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<sup>3</sup> See PJM Manual 13, Emergency Operations, section 2, Capacity Emergencies, step 7 (Real-time) "Deploy All Resources Actions," <https://pjm.com/-/media/documents/manuals/m13.ashx>.

## Thermal Operating Criteria

The PJM RTO is operated so that the electrical loading on all PJM facilities<sup>4</sup> is within their normal continuous ratings, and so that immediately following any single facility malfunction or failure, the loading on all remaining facilities can be expected to be within emergency ratings. One of the ways PJM controls the loading on facilities is by adjusting generation energy (megawatts) output via redispatch. This redispatch process generally involves reducing generation output in one part of the system while turning on or increasing generation in another part of the system. The generation resources that are selected are determined by the Security Constrained Economic Dispatch (SCED) package, which selects units that have the desired reliability effect at the lowest cost.

For additional information on PJM's thermal limit operating criteria, see the [PJM Open Access Transmission Tariff, Operating Agreement](#) and section 2 of PJM [Manual 03: Transmission Operations](#) on the PJM website.

## Voltage Operating Criteria

PJM operates all facilities under PJM's operational control such that no PJM-monitored facility will violate normal limits on a continuous basis and that no monitored facility will violate emergency voltage limits following any simulated facility malfunction or failure. PJM controls the voltages on facilities in several ways including by adjusting generator reactive power (MVAR) output and by adjusting generation output via the redispatch process described above.

For additional information on PJM's voltage operating criteria, see the [PJM Open Access Transmission Tariff, Operating Agreement](#) and section 3 of PJM [Manual 03: Transmission Operations](#) on the PJM website.

## External RTO Reliability

PJM is a NERC-registered Reliability Coordinator<sup>5</sup> and is required to maintain coordination agreements with neighboring Reliability Coordinators, including the Midcontinent Independent System Operator (MISO). Accordingly, PJM and MISO have a formalized, FERC filed agreement that directs operations between our respective reliability coordinator areas. PJM and MISO have "Market to Market" processes in place where resources in the adjacent area may be utilized to address reliability issues for coordinated flowgates. If needed to support reliability for its area for these reciprocally coordinated flowgates with MISO emission limited generators may be dispatched. Also, emission-limited generators may be dispatched if MISO declares safe operating mode and requests the unit(s) to run. In addition, if MISO experiences a Maximum Emergency Generation event, they may request PJM to schedule generators to supply emergency power. Emission-limited generators would be dispatched once all other available generation has been maximized.

For additional information on market-to-market redispatch, see [PJM Manual 37 Reliability Coordination](#).

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<sup>4</sup> PJM facilities are generally the transmission and transmission-related assets and infrastructure located within the PJM footprint.

<sup>5</sup> The entity that is the highest level of authority who is responsible for the reliable operation of the bulk electric system, has the wide area view of the bulk electric system, and has the operating tools, processes and procedures, including the authority to prevent or mitigate emergency operating situations in both next-day analysis and real-time operations.



## Testing To Ensure Readiness

If generators have exceeded their emission limitations under the Act, they may still be required to test to ensure readiness for one of the above categories. This includes PJM or required regulatory testing. Testing to ensure readiness also includes, but is not limited to, testing of a resource following any unit maintenance or upgrade activities to ensure the unit is in good working order, can meet short-term emissions limits and can be relied upon in an emergency. PJM commits to best efforts to conduct PJM-specific testing for potentially emission-limited generators during periods in which the emissions limitations are not in effect. Generators typically operate for a short period to satisfy these testing requirements, but they are necessary and would constitute a PJM-defined Exception Event when they are testing.

## *PJM Procedures for Excepted Generators*

### Communicating and Scheduling EGU and Large GHG-Emitting Units for Reliability:

- 1 | To help manage run hours, resource owners are encouraged to utilize the IMM Opportunity Cost Calculator as detailed in [PJM Manual 15: Cost Development Guidelines](#), section 12.7 IMM Cost Calculator.
- 2 | If an EGU or large GHG-emitting unit does not have any remaining run hours left as a result of the emissions limits in the Act, the unit will need to bid into the Day-Ahead and Real-Time markets as “Unavailable.” In addition, the unit will need to enter an “Unplanned” outage ticket with a cause code of “Emissions – CEJA” in the PJM eDART system.
  - (a) Units that are entered with this outage type and cause code will not be expected to enter GADs outages and therefore will not have an eFORd impact calculated.
- 3 | If PJM foresees the need to run an EGU or large GHG-emitting unit in the Illinois area for any of the Exception Events listed above, it will communicate this need via phone call to the applicable generation owner in accordance with [PJM Manual 3](#), [Manual 12](#), [Manual 13](#) and [Manual 36](#). Included in this communication will be the time (Eastern) the unit is requested to begin generating, as well as the reason for the commitment (capacity, black start, thermal, voltage or testing), and a clarifying statement: “This dispatch meets the criteria of an Exception Event.”

Generation owners are provided this information through various mechanisms, including a private portal whereby the generator owner can view their commitment details as noted above.

- (a) Both PJM and the generation owner will log this information.
  - (b) The generation owner will run the unit as instructed.
- 4 | In accordance with the PJM manuals, PJM will continue to monitor system conditions and will then communicate to the generation owner via phone call when the unit is no longer needed for reliability and inform them the unit should be taken offline and stop generating.
  - (a) The generation owner will then take the unit offline.
  - (b) Both PJM and the generation owner will log this information.



5 | Within 30 days of an exception event, the generation owner will submit to the appropriate Illinois government agency and copy PJM\* the following information:

- (a) The unit committed
- (b) The time the unit began operating
- (c) The time the unit stopped operating
- (d) The emissions attributable to this window of time

*\*Due to the confidentiality restrictions in **Section 18.17** of the PJM Operating Agreement, PJM is not permitted to release member confidential information such as unit run times or commitments.*

## **PJM Emergency Procedure Communications**

During periods of actual or anticipated emergency conditions on the PJM transmission system, there are defined PJM operational procedures, as outlined in [PJM Manual 13](#), to address the communication needs of PJM's stakeholders. These stakeholders include, among others, transmission and generation asset owners, demand-side management providers, the general public and state agencies.

The following addresses how PJM will communicate with those state agencies that, due to their role, must understand any emergency conditions present on the PJM system potentially affecting their population.

## **Emergency Procedures in PJM System Operations**

Power system disturbances are most likely to occur as a result of the loss of generating equipment or transmission facilities, or from unexpected load changes that can drop voltage or stress the system. These disturbances may affect the reliable operation of the PJM system. It is PJM's responsibility to communicate when these events are foreseen, when they materialize, the corrective actions to be taken, and when the events subside. Communicating these events to our Illinois state agency constituencies will highlight the situations and scenarios in which PJM is most likely to direct emission-limited generators to run for grid reliability and stability.

## **PJM Emergency Procedures Terms**

Many of the PJM emergency procedures can be broken down into one of the following three categories:

- Alerts may be issued one or more days prior to emergency procedures.
- Warnings occur the morning of the operating day that an emergency event is imminent.
- Actions are issued at the onset of an emergency event.

However, in certain situations, the implementation order of these levels may change. Sometimes PJM must omit a warning or alert and immediately implement an emergency procedure. Certain emergency situations do not have an alert, warning or action level.

## **PJM Emergency Procedure Notification Emails**

When an emergency procedure notice is issued, PJM will designate the affected region, time period and emergency notification pursuant to the PJM manuals. PJM will send the emergency notification to the appropriate state agency emergency contact lists. If an emergency declaration has been issued for a PJM region, the email will be sent to the appropriate regional emergency email list. If an emergency declaration has been issued for a particular PJM zone(s), the email will be sent to the appropriate state(s) emergency email list for which the zone(s) is located. At a minimum, the email should indicate the time for the emergency procedure, the affected PJM zone(s) or region(s), and the message definition.

## Frequently Asked Questions <sup>6</sup>

- 1 |** Is it correct that affected generators must comply with Section 9.15 (k-5) of the Act beginning with the 12-month period from Oct. 1, 2021, through Sept. 30, 2022? If correct, are only emissions from Oct. 1, 2021, through Sept. 30, 2022, subject to limits in the first 12-month rolling period? If not, when does the compliance obligation begin?

Yes, that is correct. The first compliance time frame is from Oct. 1, 2021, through Sept. 30, 2022. And yes, only emissions in that time frame are subject to the limitations as a starting point. Each month thereafter, a new rolling 12-month period will be compared to the limits.

- 2 |** Does the Illinois Environmental Protection Agency (IEPA) and/or the Illinois Pollution Control Board (IPCB) plan to monitor compliance with Section 9.15 (k-5)?

The IEPA will monitor compliance as it does with other regulations. Additionally, sources are already required to notify the IEPA of any noncompliance.

- 3 |** Does the IEPA and/or the IPCB plan to issue regulations addressing the implementation of Section 9.15 (k-5)?

The IEPA does not intend to promulgate regulations itself or propose regulations to the IPCB. The IPCB has not communicated any indication to the IEPA that it intends to do so on its own.

- 4 |** Will the definition of the CO<sub>2e</sub> emissions limit be based on current Continuous Emission Monitoring System (“CEMS”) data for the baseline period, or will it be based on the emissions estimates reported in 2018–2020?

The baseline period emissions are calculated using a combination of CEMS data and emissions factors based on fuel usage. All of this information is already reported to U.S. EPA by sources subject to Section (k-5), per 40 CFR Part 98, and Illinois does not intend for any changes in existing methodologies in that regard.

Specifically, Part 98.2(a)(1) requires Part 98 reporting of sources that are subject to Part 75. CO<sub>2e</sub> emissions are calculated using Equation A-1 from 40 CFR 98.2(b)(4), and emissions data for specific contributing pollutants are taken from a combination of CEMS data and other measurement or estimation methods.

Part 98.3 requires reporting of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and each fluorinated GHG. This covers all pollutants used to calculate CO<sub>2e</sub> that would be emitted by sources subject to Section (k-5). Part 75.13 requires use of CO<sub>2</sub> CEMS or alternate methods that are acceptable continuous monitoring methods detailed in appendices F and G to Part 75. Part 98 Tables C-1 and C-2 have default values for CH<sub>4</sub>, N<sub>2</sub>O and other GHGs, based on fuel type, that sources should continue to use for requirements pursuant to Section k-5; they are essentially considered to be continuous parameter monitoring based on fuel consumption.

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<sup>6</sup> FAQ 1–6 are taken from correspondence between the IEPA and the PJM Independent Market Monitor. The information provided is not legal advice, and individual companies are encouraged to consult with their attorneys for legal advice on the requirements to comply with the Act.

**5 |** Will the definition of ongoing CO<sub>2</sub>e emissions be based on current CEMS data or will it be based on emissions estimates?

See response to question 4, above. CO<sub>2</sub>e emissions are calculated using Equation A-1 from 40 CFR 98.2(b)(4), and emissions data for specific contributing pollutants are taken from a combination of CEMS data and other measurement or estimation methods. Existing emissions should be calculated using the information sources reported from 2018–2020, and those sources should continue to rely on the same methods for monitoring or estimating those emissions going forward.

One difference between federal requirements and the new Illinois requirements is that federal Part 98 GHG reports are annual, while Illinois requirements are for rolling 12-month periods. However, sources already have the necessary information for tracking these emissions on a monthly (or more frequent) basis. As such, sources should continue to use methodologies in Part 75 and Part 98 as discussed above but must demonstrate compliance on a 12-month rolling basis. This will require that sources review the information on a monthly basis to ensure ongoing compliance.

**6 |** Will the definitions of co-pollutant baselines and ongoing emissions be based on estimated emissions per quantity of fuel (MMBtu) burned?

Similar to question 5 above, a source should continue to use the methods for measuring or calculating emissions that are currently required by its permit. In some cases, this will be based on CEMS monitoring; in other cases, calculations may be based on emissions testing or fuel use for sources subject to (k-5).

"Co-pollutants" refer to the six criteria pollutants that have been identified by the U.S. EPA pursuant to the Clean Air Act (42 U.S.C. §§ 7401, et. seq.): NO<sub>x</sub>, CO, PM, SO<sub>2</sub>, ozone and lead. Many sources subject to Section (k-5) have CEMS for NO<sub>x</sub> and perhaps CO, and may use emissions testing for other emissions. Otherwise, PM, SO<sub>2</sub> and lead emissions should be calculated based on fuel use if the source is not currently required by its permit to record or report emissions of those pollutants. Ozone is not directly emitted by sources subject to Section (k-5).

Emission baselines are established with emissions data previously submitted by sources for 2018 to 2020 in their annual emissions reports, and ongoing emissions for those respective pollutants should be measured or calculated using the same methods that have been employed in those baseline years and required by the source permit.

**7 |** Do the emissions that result from dispatch by PJM for reliability decrement the emissions cap before the cap is reached?

Section 9.15 (k-5) of the Climate and Equitable Jobs Act provides that no unit may emit, in any 12-month period, CO<sub>2</sub>e or co-pollutants in excess of that unit's existing emissions for those pollutants.

Notwithstanding this or any other applicable zero-emissions or emissions-reduction deadline, EGUs and large GHG-emitting units are allowed to temporarily continue emitting greenhouse gases if it has been determined that ongoing operation is necessary to maintain power grid supply and reliability or to serve as an emergency backup to operations. The statutory operation exceptions do not apply until the applicable emissions deadlines or limits are reached. PJM has outlined defined scenarios in which it would utilize these statutory provisions that enable generators to run units in the event that the rolling emissions limits needed to be exceeded to maintain grid reliability and stability. While the statute provides relief for generators to continue to run in exceedance of an emissions deadline or restriction, it does not allow generators to not count the emissions during those PJM-defined run times toward any applicable statutory or permitting emissions limit or restriction.<sup>7</sup>

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<sup>7</sup> Taken from IEPA correspondence to PJM