TITLE 170 INDIANA UTILITY REGULATORY COMMISSION

Regulatory Analysis

LSA Document #25-368

I. Description of Rule

This proposed rule revises Indiana's interconnection rule found at 170 IAC 4-4.3. There are three main changes, as explained below.

Interconnection is generally the process by which a customer may connect the customer's owned equipment, often solar panels at the customer's residence or business, to the electric utility so the equipment runs in parallel with the utility's system and the customer can both receive electricity from the utility and provide excess electricity to the utility.

First, the proposed rule expands the definition of "customer-generator facility", thereby allowing interconnection of additional types of customer facilities with the electric utility, such as the interconnection of systems that include or that are entirely batteries.

Second, the proposed rule updates the performance standards for "customer-facilities", by incorporating IEEE 1547-2018, Standard for Interconnection and Interoperability of Distributed Energy Resources and Associated Electric Power Systems Interfaces and Underwriters Laboratories 1741: Standards for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources. While earlier editions of these standards are currently incorporated into Indiana's interconnection rules, these updates and additional proposed changes are being made in response to, and are necessitated by, the Federal Energy Regulatory Commission's Order No. 2222, which endeavors to better enable distributed energy resources ("DERs") to participate in the electricity markets run by regional electric transmission grid operators, and in response to the resulting Indiana legislative directive in Indiana Code §8-1-40.1-4, directing that the Indiana Utility Regulatory Commission ("IURC") adopt rules necessary to implement FERC's Order.

Third, the proposed rule increases the Level 1 interconnection threshold from 10 kW to 25 kW, thereby allowing customers to interconnect a larger customer owned facility without a fee. This change better aligns with neighboring states, consumer preferences, and advances in technologies.[1]

a. History and Background of the Rule

Background

This rulemaking is the first rulemaking in response to the Indiana General Assembly's directive to implement Federal Energy Regulatory Commission's ("FERC's") Order 2222 in Indiana. See IC 8-1-40.1, et. seq. The existing interconnection rule dates from 2006 and it has not been amended since that time.

In 2017, Indiana Code chapter 8-1-40 regarding Distributed Generation was enacted. This statute began the grandfathering of existing customers on net metering (one-for-one retail credit) and the switch to an excess distributed generation rate (average annual wholesale plus 25%) for new distributed generation customers. Indiana Code section 8-1-40-21 limited the IURC's authority to amend its interconnection rule, only allowing it to: "(1) update fees or charges; (2) adopt revisions necessitated by new technologies; or (3) reflect changes in safety, performance, or reliability standards."

On September 17, 2020, the Federal Energy Regulatory Commission (FERC) issued Order No. 2222, regarding the participation of distributed energy resources (DERs), through aggregators/aggregations of DERs, in the wholesale markets. This rule is meant to enable DERs to participate alongside traditional resources in the regional organized wholesale electricity markets through aggregations. The rule allows several sources of distributed electricity to aggregate in order to satisfy minimum size and performance requirements that each individual DER might not be able to meet individually.

The Indiana General Assembly thereafter tasked the IURC with implementing FERC Order 2222 by enacting Indiana Code chapter 8-1-40.1. It explicitly provided the IURC with rulemaking authority:

> "The commission shall adopt rules that the commission determines to be necessary to implement Federal Energy Regulatory Commission Order No. 2222 concerning distributed energy resources and distributed energy resource aggregators."[2]

In response to Indiana Code section 8-1-40.1-4, the IURC staff began a stakeholder process regarding the implementation of FERC Order 2222 in Indiana.[3]

Stakeholder Outreach

On December 1, 2022, the IURC held an educational meeting to kick-off its stakeholder process. The meeting featured background and educational presentations from FERC staff, MISO, and PJM. Following the educational meeting, stakeholders were invited to comment on topics or issues to be considered as part of this stakeholder process going forward, and on how those issues should be discussed and vetted (for example, additional meetings, rulemaking(s), IURC formal investigation, etc.).

The IURC received comments from the following entities:[4]

- The Indiana Electric Cooperatives
- Indiana Michigan Power
- MISO Indiana Utilities (Duke Energy Indiana, AES Indiana, NIPSCO, CenterPoint Energy Indiana South)

- The Public Interest Organizations (Solar United Neighbors, Citizens Action Coalition, IndianaDG, Solarize Indiana, Indiana Beyond Coal)

On March 2, 2023, the IURC held a second educational meeting featuring presentations from Voltus, Solar United Neighbors, Indiana Michigan Power, Citizens Action Coalition, and the MISO Indiana Utilities.

Following the March 2nd meeting, the IURC again invited stakeholders to submit comments.

The IURC received comments from the following entities:

- Armada Power
- CPower Energy Management
- Indiana Investor-owned Utilities (Duke Energy Indiana, LLC, Indiana Michigan Power Company, AES Indiana, Northern Indiana Public Service Company, and CenterPoint Energy Indiana South)
- The Public Interest Organizations (Solar United Neighbors, Citizens Action Coalition, IndianaDG, Solarize Indiana, and Indiana Beyond Coal).

Roundtable Meetings

In an effort to focus stakeholder discussions on specific topics, the IURC convened a series of roundtable meetings, which were held monthly from June through November of 2023. Below are the meeting dates and the general topics that were discussed. Notes and other materials are available on the IURC website.[5]

• June 8, 2023 - Reviewed existing state interconnection rule, 170 IAC 4-4.3.

• July 13, 2023 - Discussed a state-level registration process and the public utility status of DER aggregators and market participants in Indiana.

• August 16, 2023 - Discussed the considerations and concerns regarding the operation of DER aggregations on and across retail distribution systems.

• September 14, 2023 - Presentations were made by DER aggregators (Voltus, CPower, and Octopus Energy) regarding the IURC's stakeholder/implementation process generally. Collaborative Utility Solutions also gave a presentation regarding its non-profit DER data registry.

• October 12, 2023 – Topics for this meeting included utility cost recovery, consumer and participant cost allocations and distribution system wheeling charges.

• November 9, 2023 – Discussed possible next steps in this stakeholder process.

Additional Stakeholder Outreach

On April 23, 2024, the IURC issued a draft proposed rule for review by stakeholders and then on June 11, 2024, IURC staff held a stakeholder meeting for a first read and discussion of the strawman rule. Following the meeting, stakeholders were invited to submit written comments by July 12, 2024.

On June 13, 2024, IURC staff emailed the Indiana State Bar Association's Utility Law Section, via its Online Community on Inbar Connect, in addition to the 2222 Indiana stakeholders group list serv, soliciting written comments on these proposed rule revisions and requesting input regarding the potential costs and benefits of these changes and the identities of impacted parties.

Written comments on the proposed rule revisions were received from Citizens Action Coalition, Solar United Neighbors, Indiana Michigan Power Company, and Voltus, Inc. *See* https://www.in.gov/iurc/rulemakings/rulemakings-pending-and-effective/rm-24-01-regarding-170-iac-4-4.3/iurc-rm-24-01-comments/

Additional revisions were made to the proposed rule revisions in response to comments received and the revised draft was again submitted to stakeholders for further comment. On December 9, 2024, therefore, IURC staff emailed the Indiana State Bar Association's Utility Law Section, via its Online Community on Inbar Connect, the 2222 Indiana stakeholders group list serv, and the Indiana Energy Association, soliciting written comments on these additional proposed rule revisions and requesting input regarding whether 11kw - 25kw customer-facilities can be sufficiently reviewed under Level 1 interconnection reviews (*see* 170 IAC 4-4.3-6) or whether they require Level 2 interconnection reviews (*see* 170 IAC 4-4.3-7). In addition, IURC staff requested input regarding the potential costs and benefits of these changes and the identities of impacted parties.

Written comments on the proposed rule revisions were received from Indiana Michigan Power Company, Advanced Energy United, and Collaborative Utility Solutions. See https://www.in.gov/iurc/rulemakings/rulemakings-pending-and-effective/rm-24-01-regarding-170-iac-4-4.3/iurc-rm-24-01-comments/

Clarifications on certain comments were sought, and additional non-substantive revisions were made to the proposed rule in preparation for commencing the formal rulemaking process.

b. Scope of the Rule

This rulemaking: (1) revises and expands the definition of "customer-generator facility", thereby incorporating energy storage systems and technologies; (2) updates customer-facility performance standards through the incorporation of IEEE 1547-2018 and UL 1741; and (3) increases the Level 1 interconnection threshold from 10 kW to 25 kW.

c. Statement of Need

The rule is intended to address, in part, needs resulting from FERC's Order 2222 and Indiana Code chapter 8-1-40.1. The Commission must adopt rules necessary to implement FERC's Order 2222 concerning distributed energy resources and distributed energy resource aggregators. Interconnection of these resources is the first step a customer must take in order to participate in DER aggregations as contemplated by FERC's Order 2222, and thus the revision to the interconnection rule is the first step in implementing that order. This is both a statutory directive, as well as being a necessary and prudent action to ensure that resources interconnecting to and injecting energy across Indiana's retail distribution systems are doing so safely and reliably.

d. Statutory Authority for the Proposed Rule

Specific Authority: IC ch. 8-1-40.1. General Authority: IC 8-1-1-3(g).

e. Fees, Fines, and Civil Penalties

This proposed rule does not add or increase any fees, fines, or civil penalties and no fees, fines, or penalties will be imposed or assessed by the IURC.

II. Fiscal Impact Analysis

a. Anticipated Effective Date of the Rule -

- The Commission anticipates receiving approval from the Office of Management and Budget and State Budget Agency within forty-five (45) days.
- Assume fourteen (14) days for the Commission to approve the proposed rule.
- Assume fourteen (14) days for the Legislative Services Agency (LSA) to publish the Notice of First Public Comment Period and Notice of Public Hearing in the Indiana Register.
- Assume thirty (30) days for the first public comment period and public hearing.
- Assume fourteen (14) days for staff to review the comments from the first public comment period.
- If needed, assume fourteen (14) days for the Legislative Services Agency (LSA) to publish the Notice of Second Public Comment Period and Notice of Public Hearing in the Indiana Register.
- If needed, assume thirty (30) days for the second public comment period and second public hearing.
- If needed, assume fourteen (14) days for staff to review the comments from the second public comment period.
- Assume fourteen (14) days for staff to assemble the rule packet.
- Assume fourteen (14) days for the Commission to approve the final rule.
- The Attorney General has forty-five (45) days to review the packet.
- The Governor's office has up to thirty (30) days to review the packet.
- The rule is effective thirty (30) days from the date the Legislative Services Agency accepts the rule for filing.

Therefore, with added time for uncertainty, based on the facts and timeline above, the Commission anticipates the rule could be fully promulgated and effective by January 31, 2026.

b. Estimated Fiscal Impact on State and Local Government

The IURC estimates there will be no fiscal impact of the proposed rule on the state and local government. The interconnection process is operationally controlled by regulated electric utilities. The IURC sets the parameters for interconnection but does not administer the interconnection process itself. The IURC estimates that any questions or complaints from utilities and their customers regarding the interconnection process can be addressed by the current IURC staff under existing budgets without change.

c. Sources of Expenditures or Revenues Affected by the Rule

This rulemaking does not impact expenditures and revenues of state agencies or local government.

III. Impacted Parties

The first impacted parties are the electric utilities regulated by the IURC and subject to its rules. Those five investor-owned electric utilities are Duke Energy Indiana, LLC; Indiana Michigan Power Company; Indianapolis Power and Light Company (d/b/a AES Indiana); Northern Indiana Public Service Company, LLC; and Southern Indiana Gas and Electric Company (d/b/a CenterPoint Energy Indiana South). Those electric utilities will be bound by the proposed rule, meaning the interconnection process specified in the proposed rule with the incorporated standards, definitions, and size standards will be administered by these regulated electric utilities. Secondarily, customers of the above regulated electric utilities will be impacted by the proposed rule if the customer chooses to interconnect a customer owned facility. Based on this proposed rule, customers that intend to interconnect what were previously non-conventional energy resources such as battery storage systems to an electric distribution system in Indiana for participation in the wholesale energy markets will be impacted by the proposed rule changes and allowed to interconnect to the utility system following the proposed rule's process. The total number of customers of the regulated electric utilities is approximately 2,525,000, though only a fraction of those customers are anticipated to purchase customer facilities and seek interconnection with the electric utility.

Broadly speaking, all persons and entities residing in Indiana, and the members of regional electric transmission organizations that are operating in Indiana, that rely on the reliability of Indiana's electric distribution systems for their health and security and economic prosperity, are also indirectly impacted and should benefit from increased reliability and safety after this rulemaking.

IV. Changes in Proposed Rule

The following substantive changes are made in the Proposed Rule:

• The definition of "customer facility" is modified to explicitly include energy storage systems or technologies, such as batteries, in the definition, thereby subjecting batteries and other energy storage systems to the same interconnection process as solar panels and other customer owned generation. The term "customer facility" replaces "customer generation facility" throughout the rule.

• In proposed 170 IAC 4-4.3-5, the incorporated standards for IEEE 1547 and UL 1741 are updated to more recent version of those standards, to the 2018 version of IEEE 1547 and the 2021 version of UL 1741, thereby incorporating updated reliability and safety standards that will apply to new technologies of customer facilities.

• In 170 IAC 4-4.3-6, the threshold size for customer facilities for level 1 interconnections with no charge is increased from 10 kilowatts to 25 kilowatts, thereby allowing larger customer facilities to interconnect with no charge and a simplified interconnection process.

V. Benefit Analysis

The benefits of the Proposed Rule primarily are related to the implementation of FERC's directive in Order 2222 to remove barriers to participation in wholesale energy markets for customer owned resources, and in relation to the General Assembly's statutory directive to adopt rules needed to implement that Order 2222. Updates to IEEE and UL operating standards are generally needed to ensure that energy resources interconnecting in Indiana are both safe and reliable, as more fully explained below.

a. Estimate of Primary and Direct Benefits of the Rule

The FERC, through Order 2222, has directed that injectable distributed energy resources, previously unable to participate in wholesale energy markets, must be accommodated. A result of this directive is that electric utilities in Indiana must allow aggregations of customer owned energy resources to interconnect and inject energy (and other services) onto distribution systems *en route* to the wholesale energy markets.

Direct benefits of this accommodation can include increased energy system reliability because the customer-owned facilities can provide additional energy and other ancillary services that in certain situations can provide needed market products to the electric grid. Electric distribution system reliability has enormous health, social and economic implications, and a loss in reliability (*e.g.* a "blackout") could cost lives, impact public health and safety, or disrupt economic security and prosperity. We rely on electricity every day and in nearly every facet of our lives.

As to the updated incorporated safety and reliability standards, the direct benefit is again increased grid reliability and public safety. Stakeholders have expressed general support for the adoption of the updated standards in IEEE 1547-2018. In commenting on the IURC's proposed rule revisions, and in regard to the adoption of IEEE 1547-2018 in Indiana, Indiana Michigan Power Company explained that "While implementation of IEEE 1547-2018 may be somewhat more onerous on DER implementation it has become the industry standard and accommodates NERC rules. IEEE 1547-2018 *promotes the integrity and reliability of the electric grid*, and it is appropriate to update 170 IAC 4-4.3 to reference this standard." (emphasis added). *See* https://www.in.gov/iurc/rulemakings/rulemakings-pending-and-effective/rm-24-01-regarding-170-iac-4-4.3/iurc-rm-24-01-comments/

Benefits to the general public through the adoption of updated customer-facility performance standards include maintaining or increasing overall electric distribution system reliability, which subsequently results in an increase in public health and safety, as well as continued or enhanced economic security and prosperity. Increasing performance standards through the adoption of IEEE 1547-2018 and UL 1741 will help to ensure that inverter-based electric resources interconnecting in Indiana are performing to current industry standards, which in turn will help ensure that these resources do not create reliability contingencies on electric distribution systems here in Indiana or on interstate electric transmission facilities on the eastern interconnection. These standards specify certain performance criteria such as the ability of the inverters to withstand specified voltage fluctuations while remaining safe and operational. Safe and reliable operations of distributed energy resources mean fewer system contingencies and their ensuing consequences.

Further, broadening the definition of "customer-generator facility" to incorporate energy storage systems and their technologies has the potential to increase the type and quantity of electricity resources entering the wholesale energy markets, which could in turn have the effect of increasing overall energy resource adequacy and system reliability.

A direct benefit of increasing the Level 1 interconnection threshold from 10 kW to 25 kW is homes and small businesses will be enabled to employ larger storage or generation systems through the simplified interconnection process in the Level 1 review, instead of proceeding through a more expensive and complicated system review under a Level 2 review. This saves the customer time and expense, and by the same token, saves the electric utility from performing the more involved and costly review. This increased threshold also allows a customer to more simply install larger customer owned facilities to promote energy independence without incurring higher interconnection fees to do so.[6]

All of these direct benefits are difficult to quantify, but in the aggregate are estimated to be significant over time.

b. Estimate of Secondary or Indirect Benefits of the Rule

As an indirect benefit of this Proposed rule, by accommodating the safe and reliable participation of distributed energy resources in the wholesale energy markets, those markets may be made more competitive. This could further result in cost savings for entities benefiting from lower market costs. By allowing smaller DERs to aggregate and participate in the market, and to do so safely through

the adoption of industry standards, it creates more competition among energy providers, potentially leading to lower electricity prices for consumers.

In addition, participation in the wholesale market by customers allows those participating customers to receive an economic benefit from selling power and services to a market in which the customers heretofore could not participate. The economics of participation will be particular to each customer as well as the market prices for electricity and the location and cost of the customer facility. Yet access to the market in and of itself is a benefit to those customers.

A final indirect benefit of expanding the definition of customer-facility is a potential increase in resources interconnecting and thereby an increase in resource adequacy. More resources equate to more megawatts. Expanding the definition of customer-facility allows a broader range of energy resources to interconnect and to serve as energy providers.

c. Estimate of Any Cost Savings to Regulated Industries

Estimates of cost savings are also difficult to quantify. The safety and reliability increases should result in significant cost savings over time compared to the status quo where customers do not have access to the wholesale market and cannot aggregate their resources with other customers for participation in wholesale markets. Avoiding a single moderately-sized outage or one public safety incident could realistically result in hundreds of thousands of dollars of cost savings. The increase in size for the Level 1 interconnection review reduces the cost of interconnection to customers for a system greater than 10 kilowatts but lower than 25 kilowatts. The increase in this threshold also is a cost savings to the electric utility as it does not need to conduct a more intensive and expensive engineering review for the system for customer facilities that fall below the new, higher threshold.

VI. Cost Analysis

Change	Citation	Costs
The definition of "customer facility" is modified to explicitly include energy storage systems or technologies, such as batteries, in the definition, thereby subjecting batteries and other energy storage systems to the same interconnection process as solar panels and other customer owned generation. The term "customer facility" replaces "customer generation facility" throughout the rule.	Proposed 4-4.3-1 and throughout	Minimal to no costs are imposed on regulated entities based on the change to allow new and additional customer facilities to interconnect. The regulated utilities may see limited additional applications for interconnection for the new types of customer facilities, but electric utilities already have methods in place to process interconnection applications.
The incorporated standards for IEEE 1547 and UL 1741 are updated to more recent version of those standards, to the 2018 version of IEEE 1547 and the 2021 version of UL 1741, thereby incorporating updated reliability and safety standards that will apply to new customer facilities.	Proposed 170 IAC 4-4.3-5	The updated performance and safety standards mean that Customers will only be able to interconnect compliant electronics and facilities. In some cases, non-compliant electronics, such as inverters, battery controllers, etc. may be less expensive, but safety and reliability considerations outweigh any increase in cost for the licensed and compliant electronics. IURC staff expects that most if not all systems and electronics for purchase by customers in the United States will be compliant with the updated standards as more states implement these standards in their own rules.[7] However, at this time there remain non-compliant electronics and facilities in commerce, which is why it is imperative to establish these standards in Indiana. Pricing for non-compliant inverters is comparable to pricing for compliant inverters. Customers with existing facilities that are already interconnected are not affected by this rule.[8]
The threshold for customer facilities for Level 1 interconnections with no charge is increased from 10 kilowatts to 25 kilowatts, thereby allowing larger customer facilities to interconnect with no charge and with a simplified interconnection process.	Proposed 170 IAC 4-4.3-6	This change is a cost savings to customers, as a customer may apply through the essentially free Level 1 application process instead of the more costly Level 2 process for customer facilities below the threshold. The Level 2 application and interconnection review fee is capped in 170 IAC 4-4.3-4(e)(2) at fifty dollars plus one dollar for each additional kilowatt. There may be relatively minimal costs to electric utilities who will not be able to collect the Level 2 interconnection

		fee for those customers. Only one utility commented on the possible loss of Level 2 interconnect fee revenues. One regulated utility provided information showing total application fees it estimates it would lose with this revision. For the period 2020-2024, the lost revenue vs. received revenue for the applications which would now be Level 1 vs. Level 2 was $20,648. IURC staff opined that this cost is offset by equal savings afforded to customers. And IURC staff estimated that the loss of a few thousand dollars per year will in no way impact electric utilities or their profitability.

a. Estimate of Compliance Costs for Regulated Entities

Based on the foregoing, there should be minimal to no costs on regulated entities to comply with the proposed rule. The costs on customers who may need to purchase customer facilities that comply with the updated safety and performance standards following these rule revisions are likely to be unaffected by this rule, as major manufacturers of inverters are moving toward the production of compliant products, For example, among residential solar systems, Enphase is considered the most popular brand, with over 70% of quotes including them according to EnergySage.[9] Regardless of price point, all of their residential inverters are IEEE 1547-2018 and UL 1741 compliant.[10] [11] In addition, while non-compliant inverters are still available in commerce, pricing is comparable to compliant inverters.[12]

b. Estimate of Administrative Expenses Imposed by the Rules

There is likely no additional administrative expense imposed by the rule.

c. The fees, fines, and civil penalties analysis required by IC 4-22-2-19.6 –

Indiana Code Section 4-22-2-19.6 directs that, "[f]or each fee, fine, or civil penalty imposed by an agency that is not set as a specific amount in a state law, a rule must describe the circumstances for which the agency will assess a fee, fine, or civil penalty and set forth the amount of the fee, fine, or civil penalty …" 170 IAC 4-4.3 neither imposes any fees, fines or penalties on anyone, nor assesses any fees, fines or penalties.

Note that 170 IAC 4-4.3-4(e)(2) sets limits on what a regulated electric utility may charge for a Level 2 application and interconnection review fee. While this subsection limits what a regulated electric utility may charge as fees, it does not impose nor assess any fee. It merely allows the utility to charge application and interconnection review fees up to a maximum amount. This proposed rule does not add or increase any fees, fines, or civil penalties charged or imposed by the IURC and no fees, fines, or penalties will be imposed or assessed by the IURC.

VII. Sources of Information

As discussed above, the IURC sought comments on multiple occasions from regulated entities and other interested persons and entity stakeholders, receiving feedback from multiple sources including a comment from a regulated utility on the possibility of losing application fee revenues. The IURC further relied on the knowledge of its expert technical staff for determining and estimating the costs and benefits of the proposed rule.

a. Independent Verifications or Studies

None.

b. Sources Relied Upon in Determining and Calculating Costs and Benefits

The IURC relied on its staff expertise and the stakeholder comments in determining and calculating costs and benefits in this regulatory analysis.

VIII. Regulatory Analysis

In the aggregate, the proposed rule by avoiding even one blackout because of the increased reliability of the system due to the rule changes could have benefits in the hundreds of thousands of dollars. That is contrasted with costs which, if they occur at all, are estimated to be less than $10,000 annually for all utilities. Therefore, the potential benefits exceed the relatively minimal and unlikely costs.

IX. Contact Information of Staff to Answer Substantive Questions

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[1] For comparison, small facilities in Michigan are considered those sized up 20 kW (See Mich. Admin. Code, R 460.901b(e)), while in Illinois and Ohio, the threshold is 25 kW (See 83 Ill. Adm. Code 466.80(a) and Ohio Admin. Code §4901:1-22-06(A)(2), respectively).

[2] IC 8-1-40.1-4.

[3] Information about Indiana's stakeholder process can be found on our website at: https://www.in.gov/iurc/home/implementation-re-ferc-order-2222/

[4]All comments submitted throughout this stakeholder process, as well as presentations, notes, and other materials are posted and available for viewing at: https://www.in.gov/iurc/home/implementation-re-ferc-order-2222/

[5] https://www.in.gov/iurc/home/implementation-re-ferc-order-2222/

[6] See Comments of Advanced Energy United, submitted 1/17/25, at https://www.in.gov/iurc/files/2025.01.17-IURC-RM-24-01-United-Strawman-Proposal-Comments-Final.pdf

[7] *See e.g.* https://irecusa.org/resources/ieee-1547-2018-adoption-tracker/
https://sagroups.ieee.org/scc21/standards/1547rev/#:~:text=This%20standard%20establishes%20criteria%20and,the%20IEEE%20Standards%20Reading%20
https://solarbuildermag.com/inverters/smart-pv-inverter-overview-ieee-1547-2018-and-ul-1741-explained/
"Not all states have announced their plans for adopting the IEEE 1547-2018 Standard, but many of the biggest markets for solar PV (e.g., California, Texas, New York) either already have established dates or intend to by the end of 2023. Grid Independent System Operators (ISOs) may also choose to adopt the IEEE 1547-2018 standard. ISOs in the Midwest and Northeast have already introduced guidelines or have plans to do so soon."

[8] See e.g. https://www.amazon.com/Inverter-AC110V-Output-DC26-46V-Suitable/dp/B0CY4VDB8T/ref=sr_1_7_sspa?crid=3M0DBJII3T1W0&dib=eyJ2IjoiMSJ9.n1jr-sGk-hk098PCoH2Wq9OPaL--EfymUqq-BUrgfz1vscYi2SLyeinKC63X6wbD5zIfiw5BBinGgZdWvqXRduc66Wh1nlPHDiTqwMr9BzB3Vu9PQGNVeTmwNMZ88ZtKtS38sGq-IROTdiPLhAVzJKvx395W0lNsjMzlgOoV7eqVYQu7s2oAXAeoLZuB1EGRKkWXGTGKDd5nbUShad2aqlIoeRIAJ78Jrg9HSoI50UQ.YBaOTl8GaMEi_aPLdEQmWXQEYc2RxS7-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9tdGY&th=1

[9] Seehttps://www.energysage.com/solar/best-solar-inverters/

[10] Compare https://enphase.com/store/microinverters/iq7-series/iq7pd-72-microinverter to https://enphase.com/store/microinverters/iq8-series/iq8h-microinverter?sku=IQ8H-240-72-2-US

[11] See also https://enphase.com/installers/resources/ieee-1547-2018#:~:text=Note:%20*%20Three%2Dphase%20implementations%20using%20IQ7%20and,be%20used%20to%20install%201547%2D2018%20compliant%

[12] See e.g. https://www.amazon.com/Inverter-AC110V-Output-DC26-46V-Suitable/dp/B0CY4VDB8T/ref=sr_1_7_sspa?crid=3M0DBJII3T1W0&dib=eyJ2IjoiMSJ9.n1jr-sGk-hk098PCoH2Wq9OPaL--EfymUqq-BUrgfz1vscYi2SLyeinKC63X6wbD5zIfiw5BBinGgZdWvqXRduc66Wh1nlPHDiTqwMr9BzB3Vu9PQGNVeTmwNMZ88ZtKtS38sGq-IROTdiPLhAVzJKvx395W0lNsjMzlgOoV7eqVYQu7s2oAXAeoLZuB1EGRKkWXGTGKDd5nbUShad2aqlIoeRIAJ78Jrg9HSoI50UQ.YBaOTl8GaMEi_aPLdEQmWXQEYc2RxS7-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9tdGY&th=1

Notice of First Public Comment Period: 20250723-IR-170250368FNA

Notice of Determination Received: June 3, 2025

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