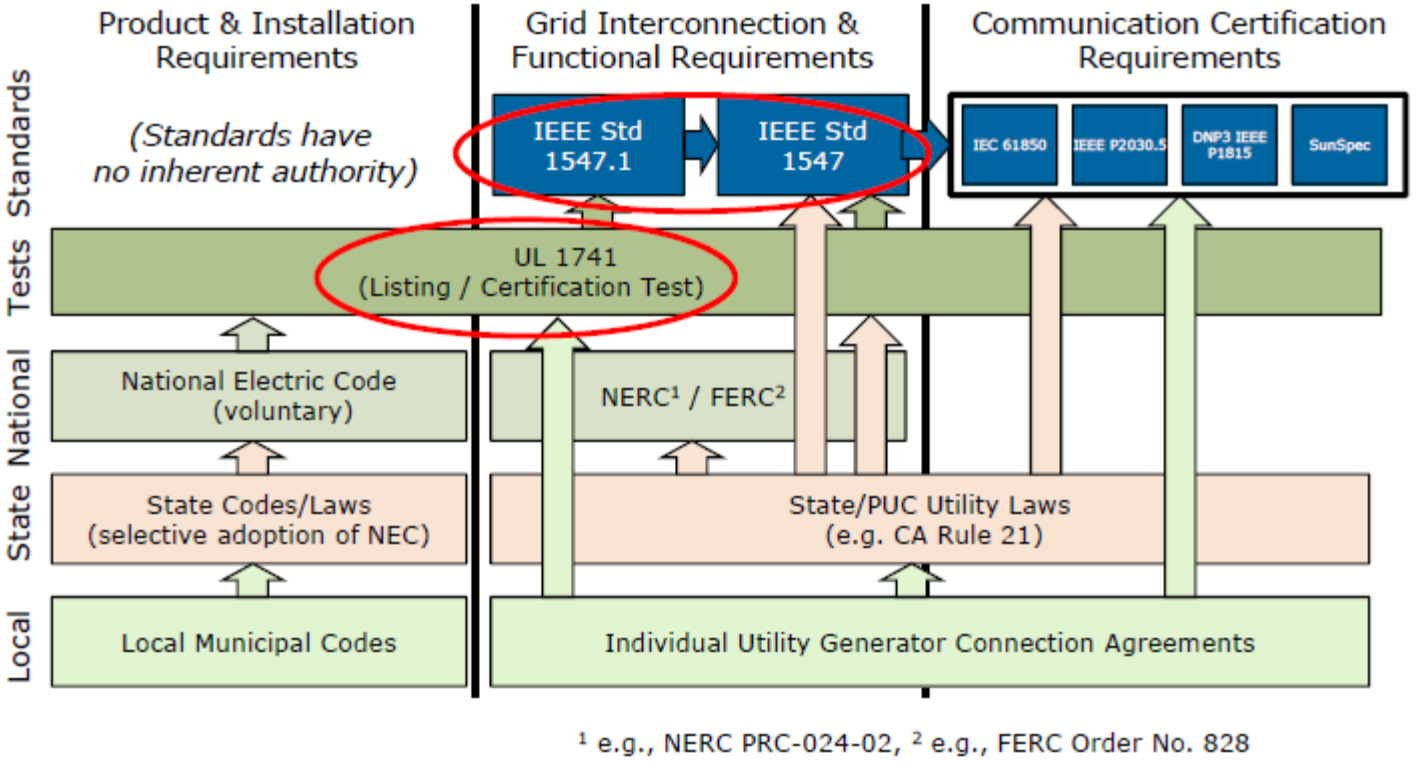
IEEE 1547-2018 REVISION

IEEE Standard 1547™-2018, IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

What is IEEE 1547?

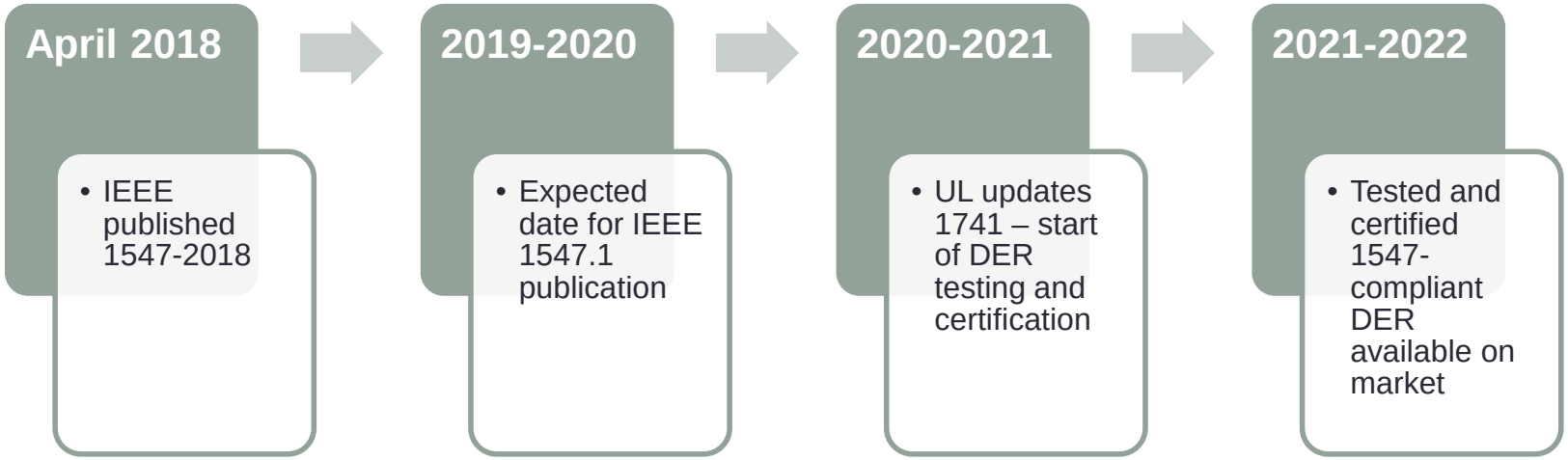
- A voluntary industry standard
- Referenced in 4 CSR 240-20.065 Net Metering



From IEEE presentation title “IEEE Std. 1547-2018 Bulk System Opportunities from New Distributed Energy Resource Interconnection and Interoperability Standards”

What is the timeline for full rollout?

- IEEE 1547-2018 was formally published in April 2018
  - *Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces*
- Revisions to the accompanying standard IEEE 1547.1 is underway
  - *Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems*



Has the scope changed?

IEEE 1547-2003

- Focused on distribution system aspects
- Specifications for the interconnection system
- Mainly used for equipment listing
- Limited to electrical requirements

IEEE 1547-2018

- And bulk system
- Encompasses the whole DER
- Plant-level verification
- Interoperability/ communications requirements

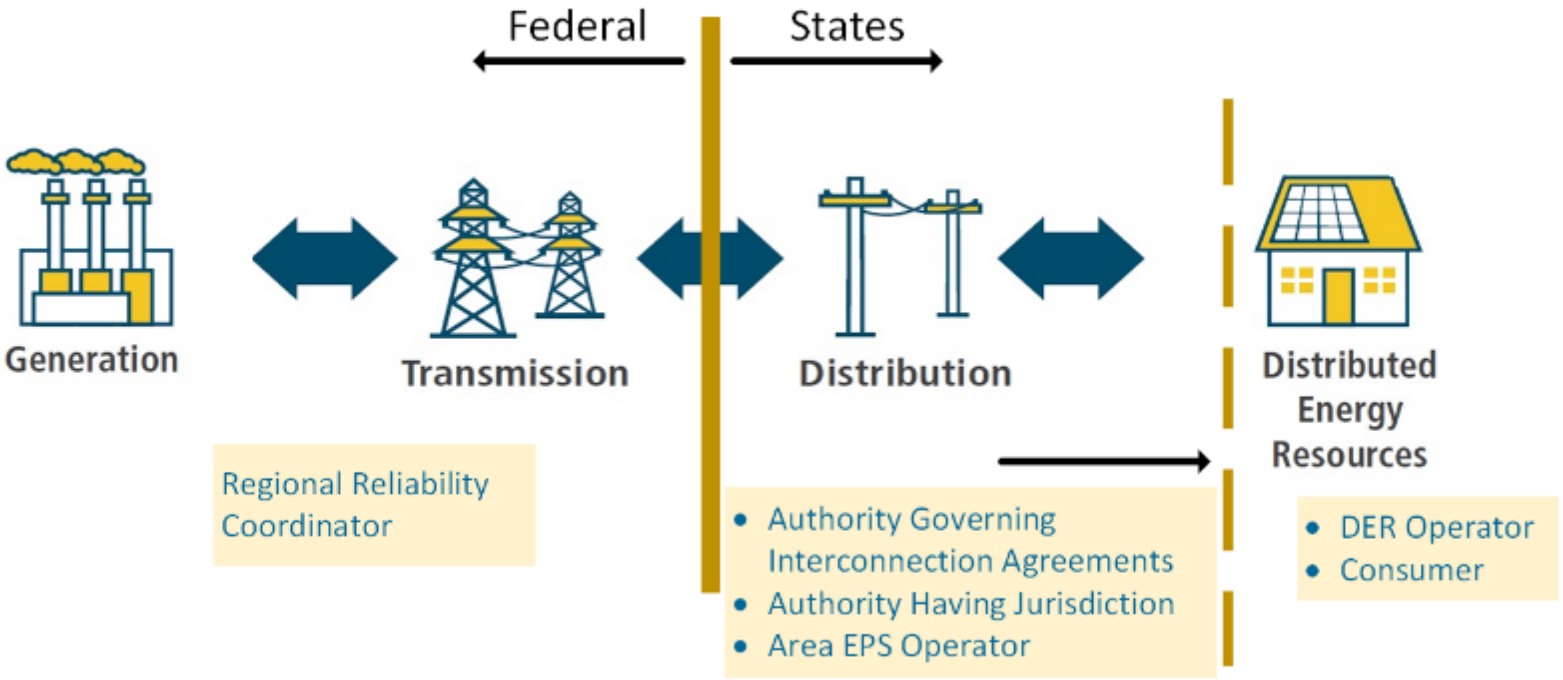
What are the impacts of the revised standard?

- Provides grid supportive functionalities:
  - Voltage and frequency ride-through,
  - Voltage and frequency regulation, and
  - Communications and control functionality.
- Utilization of frequency regulation will be required
- Voltage-regulating functions are not required to be turned on by default

How is the revised standard different than previous standards?

- More flexibility and options
- Performance categories
  - Normal operating performance category
    - Specifies how the DER should perform during normal grid operations (Category A and Category B)
  - Abnormal operating performance category
    - Specifies DER performance during a grid disturbance (Category I, II, & III)
- Performance categories are technology-neutral

Key Terms



From NREL presentation titled "Preview of the Revised IEEE 1547 Standard for Interconnecting Distributed Energy Resources with Electric Power Systems"

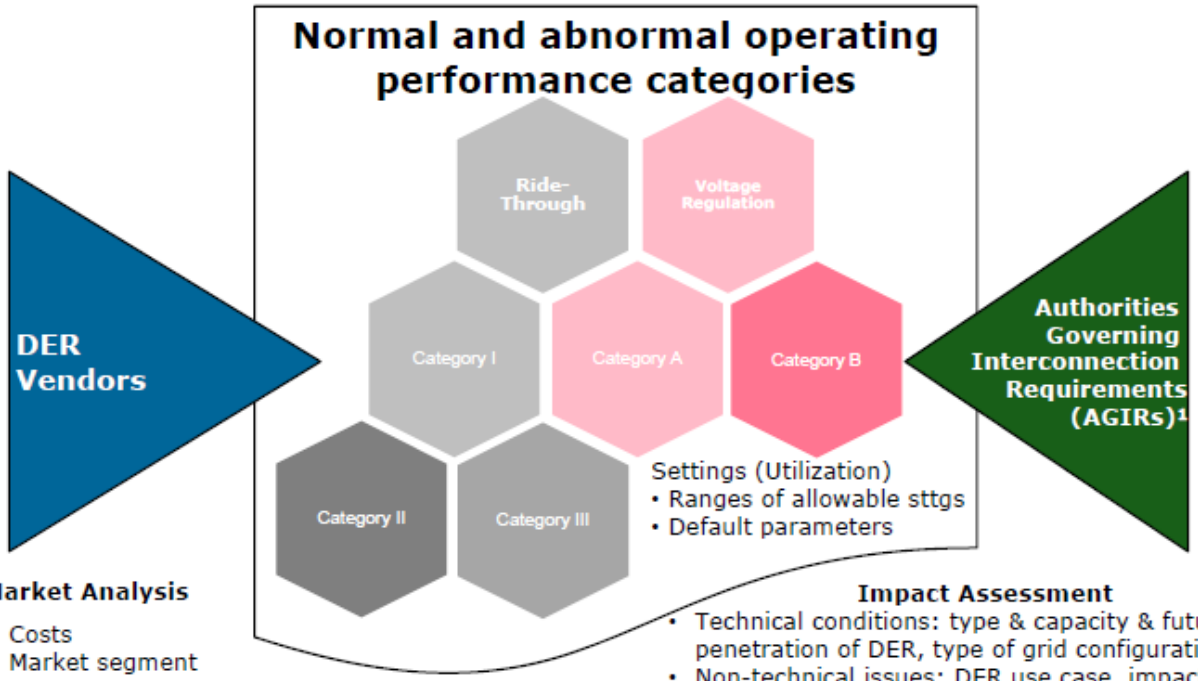
Key Terms

- Area Electric Power System (Area EPS) an EPS that serves Local ESPs.
- Note: Typically, an Area EPS has primary access to public right-of-way, priority crossing of property boundaries, etc. and is subject to regulatory oversight.
- Authority Having Jurisdiction is the authority having rights to inspection and approval of the design and construction of Local Electric Power System (Local EPS) premise electrical systems.

Authority Governing Interconnection Requirements (AGIR)

- "A cognizant and responsible entity that defines, codifies, communicates, administers, and enforces the policies and procedures for allowing electrical interconnection of DER to the Area EPS. This may be a regulatory agency, public utility commission, municipality, cooperative board of directors, etc. The degree of AGIR involvement will vary in scope of application and level of enforcement across jurisdictional boundaries. This authority may be delegated by the cognizant and responsible entity to the Area EPS operator or bulk power system operator.
- NOTE—Decisions made by an authority governing interconnection requirements should consider various stakeholder interests, including but not limited to Load Customers, Area EPS Operators, DER Operators, and bulk power system Operator." (*emphasis added*)

Performance Categories



Market Analysis

- Costs
- Market segment
- Etc.

Impact Assessment

- Technical conditions: type & capacity & future penetration of DER, type of grid configuration, etc.
- Non-technical issues: DER use case, impacts on environment, emissions, and sustainability, etc.

Stakeholder Engagement

- Distribution utilities.
- Bulk system operators & planners
- Regional reliability coordinator.
- DER developers.
- Others.

[1] State Regulator, Area EPS or bulk system operator, etc.

Additional Considerations

- Pros and cons of statewide rollout
  - Impacts to DER customers
- Balancing the practicality of early implementation with the benefits
  - Sooner rather than later may avoid high volumes of legacy systems
  - DERs certified to a lower performance category may not be able to shift to higher performance categories
  - Minnesota – early action
- Cost implications
  - Utility and/or DER operator
- Enablement of optional features