Proposal for New Project DC Electricity Metering

Proposing Country: United States

History

- TC12 is Parent Technical Committee.
- Discussions under PG1 – revisions for R46: Electricity Meters
- Initial decision: Exclude from R46 revision

  1st PG meeting, May 2018
- May 2021 meeting: Subgroup formed for DC Metering

  Include as annex

  Revisit as a PG

  No progress from this point until June 2023.
- June 2023 meeting: Decision to form a new project.

  Too difficult to maintain AC & DC in same recommendation

Existing Standards

ANSI C12.32-2021 American National Standard for Electricity Meters for the Measurement of DC Energy

- ANSI also has a subcommittee on developing revenue grade DC transducers.

IEC 62053-41 Electricity metering equipment - Particular requirements - Part 41: Static meters for DC energy (classes 0,5 and 1)

EN 50470-4

Motivation

Existing

OIML G22 provides an option for EVSEs with separately type approved meters where specifications meet or exceed those requirements in the guide.

Challenge:
Market is small.

Emerging*

- Solar arrays
- Batteries
- Power Electronics
- EVs

* Information provided by David Lawrence, Duke Energy, Emerging Technology Office

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Opportunity:
Jump start international harmonization.

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Advantages of DC Usage*

- Lack of conversion losses: In the US, 5-20% of power lost on AC/DC conversion
- Many new loads are DC: 85% of those found in buildings, including many new appliances.
- Improved energy efficiency of DC motors and DC lighting.
- Reduced wiring costs – reduced usage of copper.

* Information provided by David Lawrence, Duke Energy, Emerging Technology Office

Voltage by Use Case*

- 12-48VDC: Cell towers, lighting
- 125VDC: Utility substation battery
- 350VDC: Data center, residential home (DC), commercial building, EV charging
- 750VDC: DC bus neighborhood microgrid
- 1 000VDC: PV farm, DC bus microgrid, fast EV charging
- 1 500VDC: DC bus microgrid

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Scope

- Develop DC metering standard (recommendation)
- Metrological & technical requirements for revenue applications
- Performance criteria
- Requirements for type approval, verification and reverification