58 CIML Meeting, Item 11.2.2

Proposal for a New Project in TC12

DC Electricity Metering

Proposal from: TC12 and the United States

History

- OIML TC12 is Parent Technical Committee.
- Discussions under TC12 PG1 – revision of OIML R46: Electricity Meters
- May 2018 at the 1st meeting of the R46 Project Group
  Initial decision: Exclude DC metering from R46 revision
- May 2021 meeting: Subgroup formed for DC Metering
  Include DC metering as annex
  Revisit as a PG
  No progress in this Subgroup from 2021 until June 2023.
- **June 2023 PG meeting: Decision to form a new project.**
  Too difficult to maintain AC & DC in same recommendation

Scope of this Proposed Project

- Develop a DC metering Recommendation (standard)
- Establish performance criteria, metrological & technical requirements for revenue applications
- Requirements for type approval, initial verification and subsequent verification

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 *(e.g. BS EN 50470-4:2023 Electricity metering equipment Particular requirements. Static meters for DC active energy (class indexes A, B and C))*

Motivation for the project

Existing Motivation Application

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

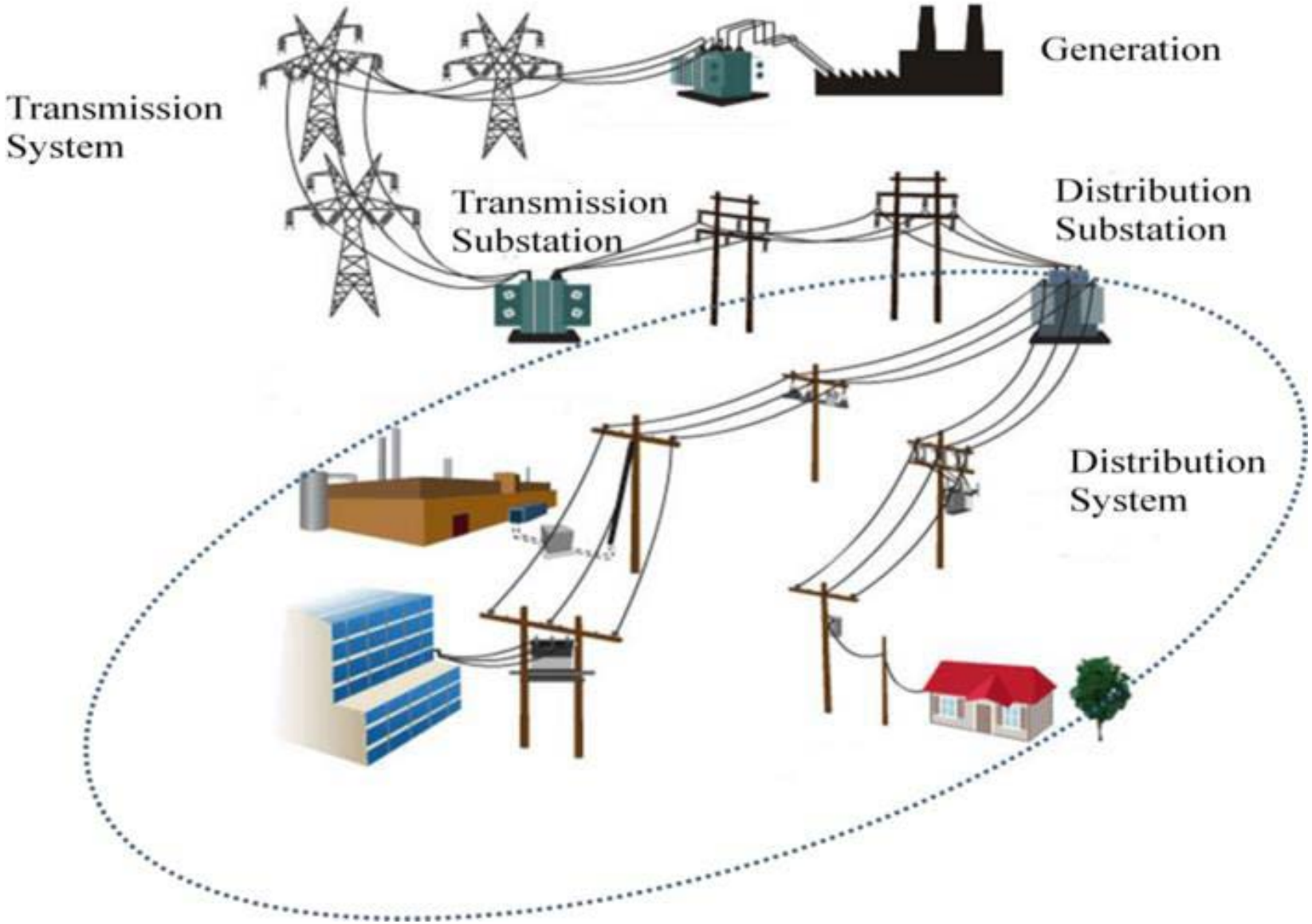
Some Emerging Motivation Applications*

- Solar arrays
- Batteries
- Power Electronics
- EVs

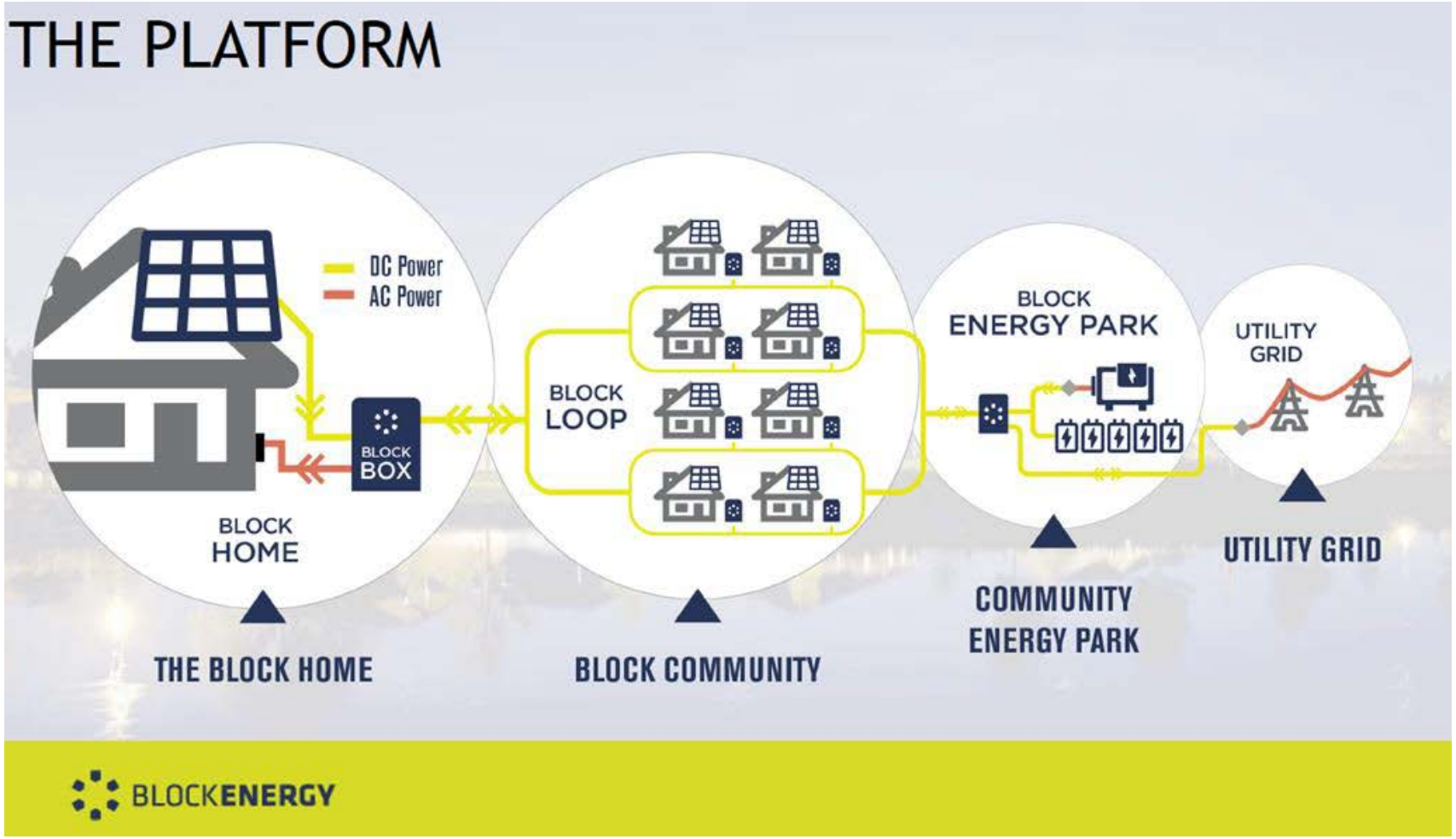
Challenge:
Market is small.

Opportunity:
Jump start international harmonization.

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


Transmission System
Generation
Transmission Substation
Distribution Substation
Distribution System

Future Vision



Some Advantages of DC Usage*

- Lack of conversion losses: In the US, 5-20% of power lost on AC/DC conversion
- Many new loads/application are DC: 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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Thank you!/ Questions

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