Claudio Lima, Ph.D.
Chair IEEE Blockchain Transactive Energy Initiative

The leading global event for power system expertise
cigre PARIS SESSION 2022

Transactive Energy

with Blockchain DLT

BEC BLOCKCHAIN ENGINEERING COUNCIL

IEEE BLOCKCHAIN™

IEEE FUTURE DIRECTIONS

cigre | SC C5: Electricity markets and regulation

August 31st, 2022

Blockchain Distributed Ledger Technology (DLT)

Data Properties & Benefits

source: BEC

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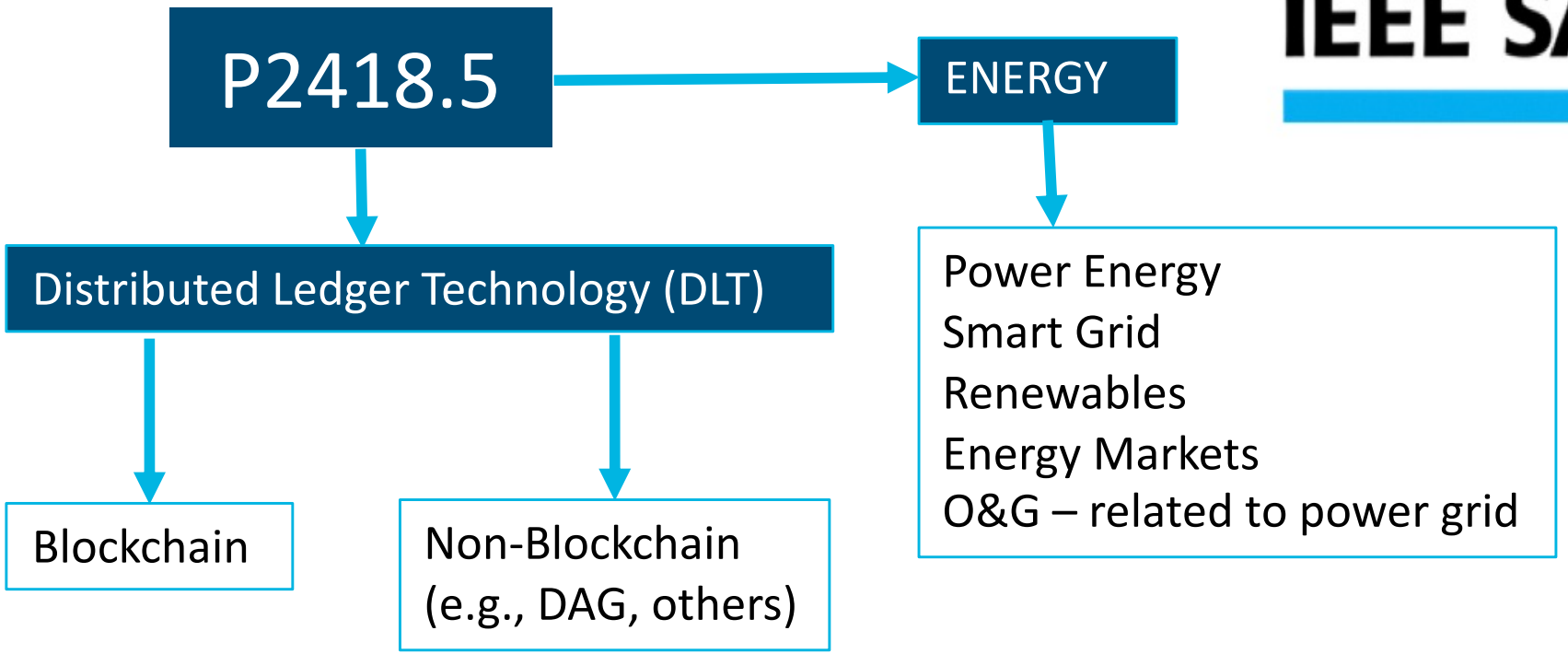
IEEE Blockchain in Energy Standards, P2418.5

- ✓ **P2418.5 is primarily a DLT standard**. Blockchain is used because is the most popular use of DLT, but other DLTs shall be considered.
- ✓ **P2418.5 is an Energy standard** and shall cover all related power and energy grid definitions.



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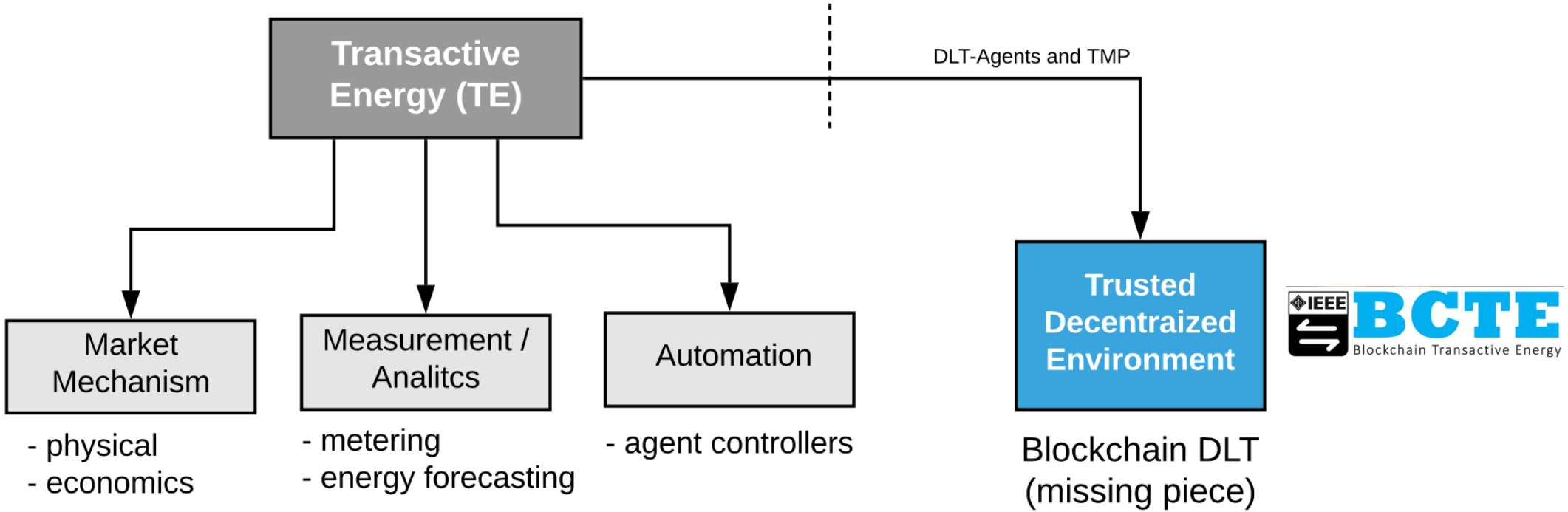
Blockchain in Transactive Energy

The Missing Component



DLT-TES is built upon existing TE system, adding another layer of trustability, traceability and transparency

The Blockchain Transactive Energy (BCTE) is a new layer that adds trustability, traceability, and transparency to the existing TE layer . **This layer was missing**!

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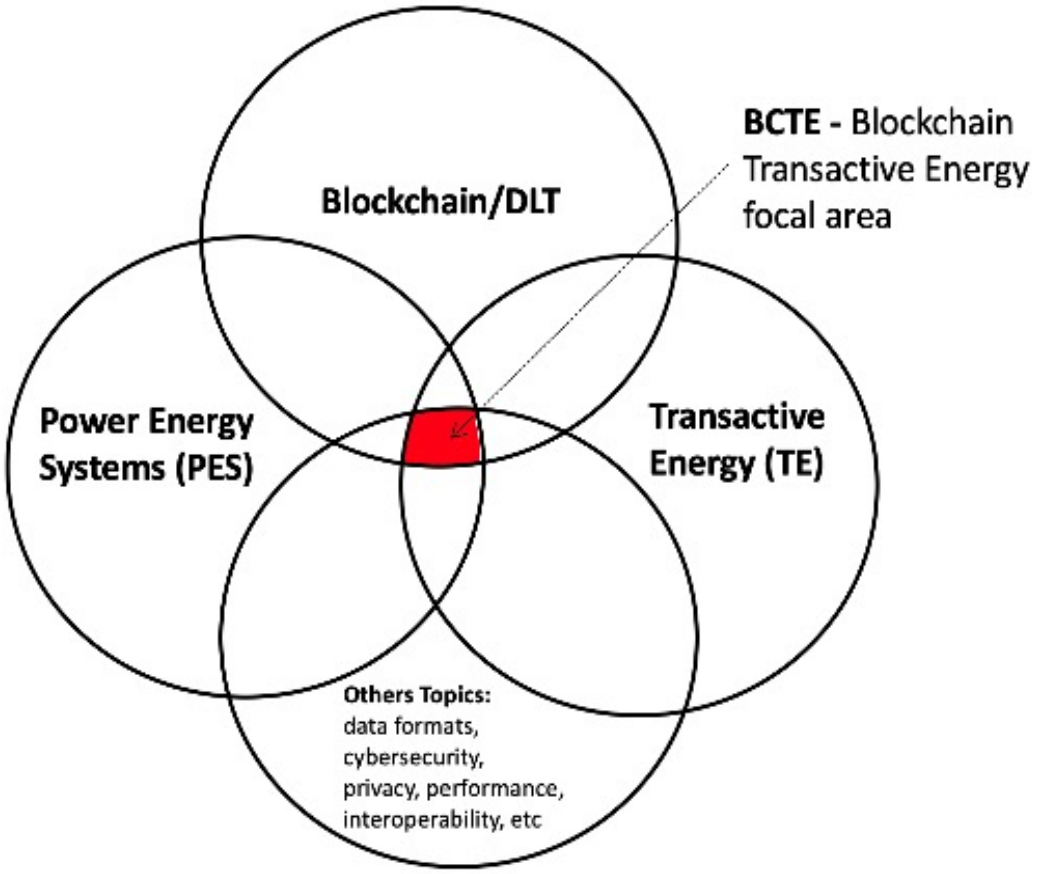
Blockchain Transactive Energy Definition

BCTE is an IEEE framework used for the design, and implementation of **Distributed Ledger Technology (DLT)/Blockchain in Transactive Energy systems**.

It is composed of a modular architecture that interfaces with existing distribution energy systems and intersects with other existing technologies components.



IEEE BCTE Blockchain Transactive Energy

Areas of standardization

- Data formats
- Consensus algorithms
- Governance models
- Cybersecurity
- Smart contracts framework
- Interoperability

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IEEE Blockchain Transactive Energy (BCTE) Initiative

IEEE BCTE
Blockchain Transactive Energy

IEEE-CIGRE 2020, 2021, 2022
IEEE PES 2019, 2020,2021
IEEE ISGT 2019, 2020, 2022
IEEE-Ethereum Hackathon
IEEE Blockchain Energy Workshop, 2022

2020

IEEE BCTE Position Paper

2021-2022

BCTE Architecture Framework

2022

BCTE Events, Standards, etc.

IEEE P2418.5 standards

BCTE Field Demonstration

utilities, ISOs, service-providers, start-ups, etc.

participating partners

18x U$10K Global Awards for BCTE project demonstration in 2021-2022

IEEE FUTURE DIRECTIONS

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IEEE Blockchain in Energy Standards, P2418.5

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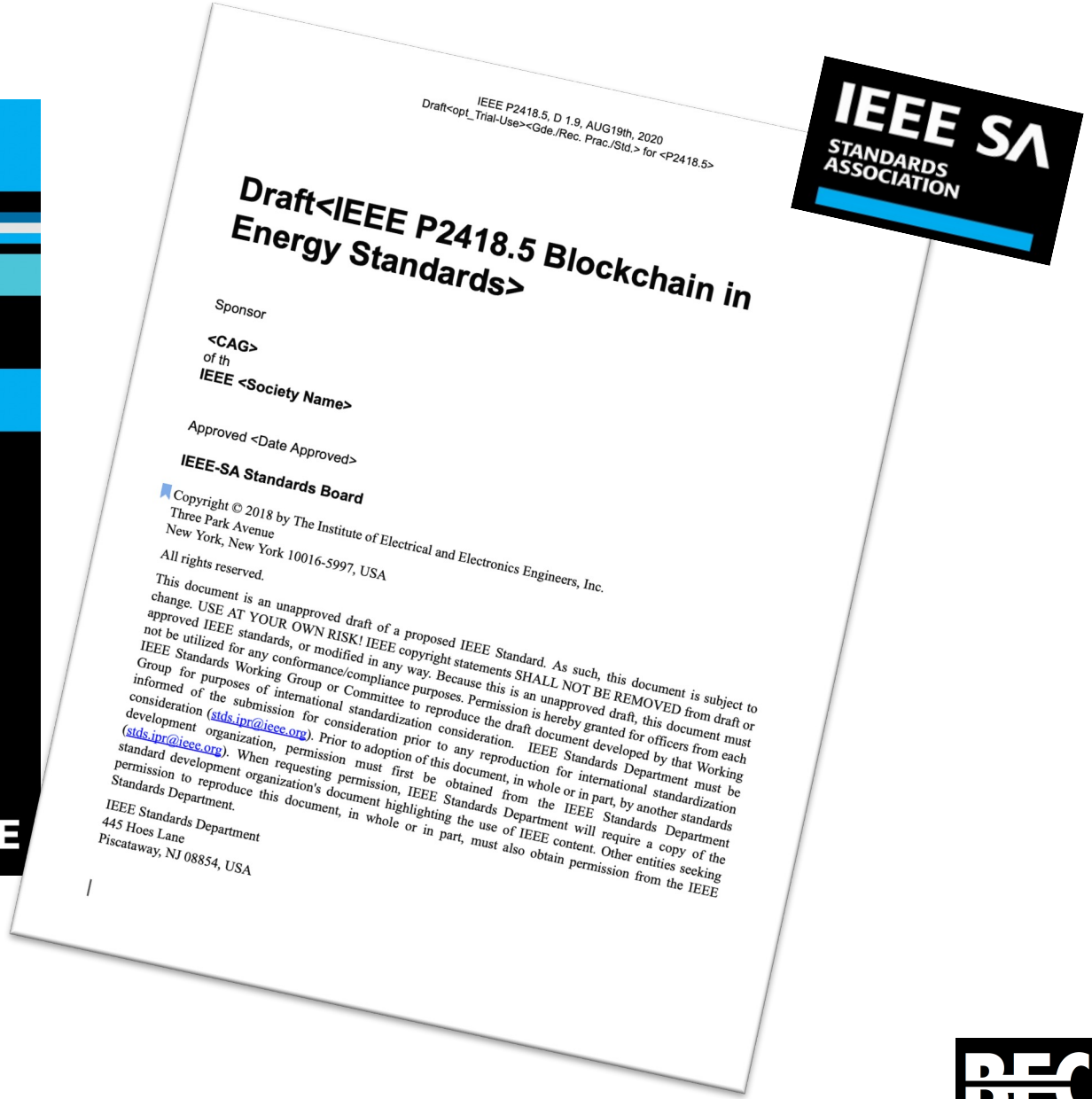
IEEE BLOCKCHAIN IN ENERGY WG STANDARDS P2418.5

Claudio Lima, Ph.D.

IEEE P2418.5 Blockchain Energy WG Standards, Chair

Blockchain Engineering Council, BEC, Co-Founder

IEEE



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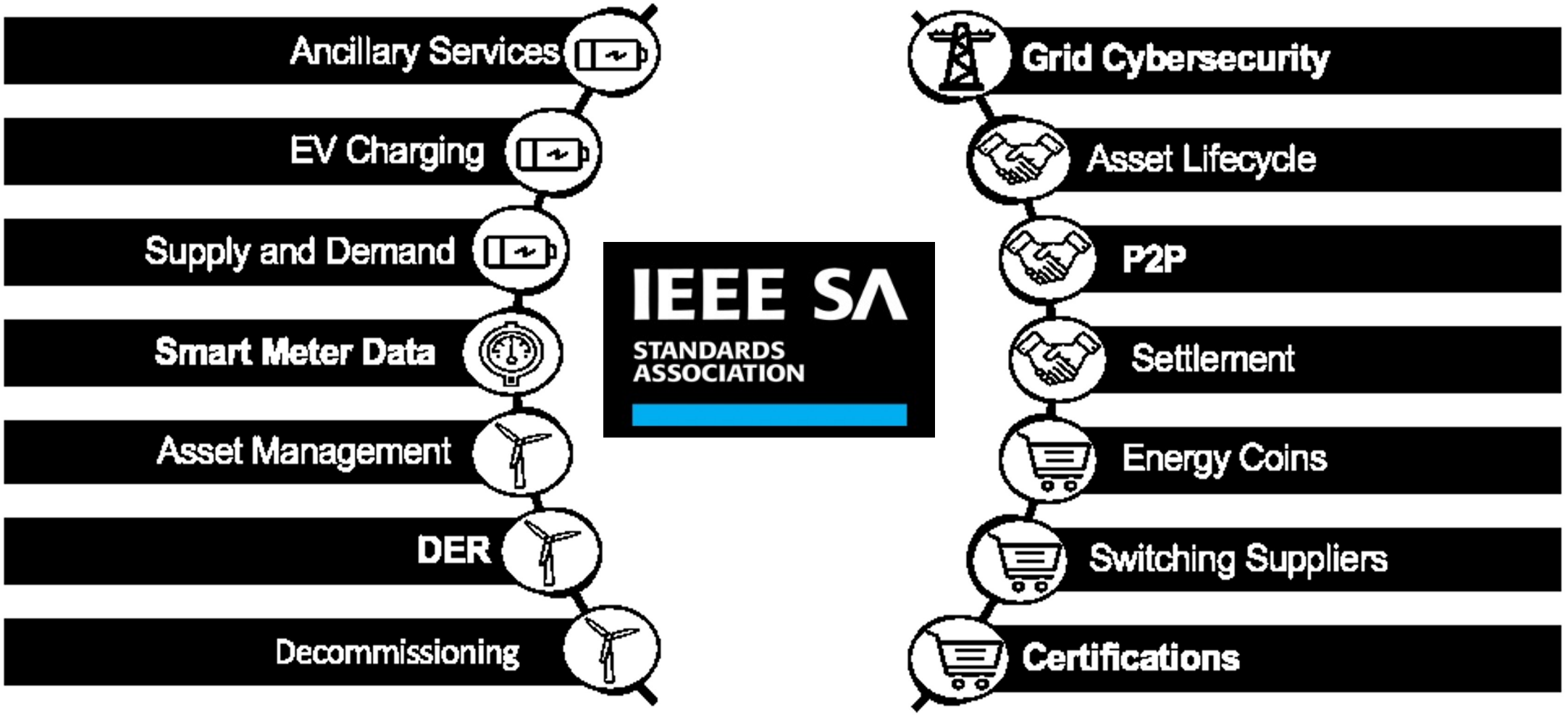
IEEE P2418.5 DLT for Energy Use Cases



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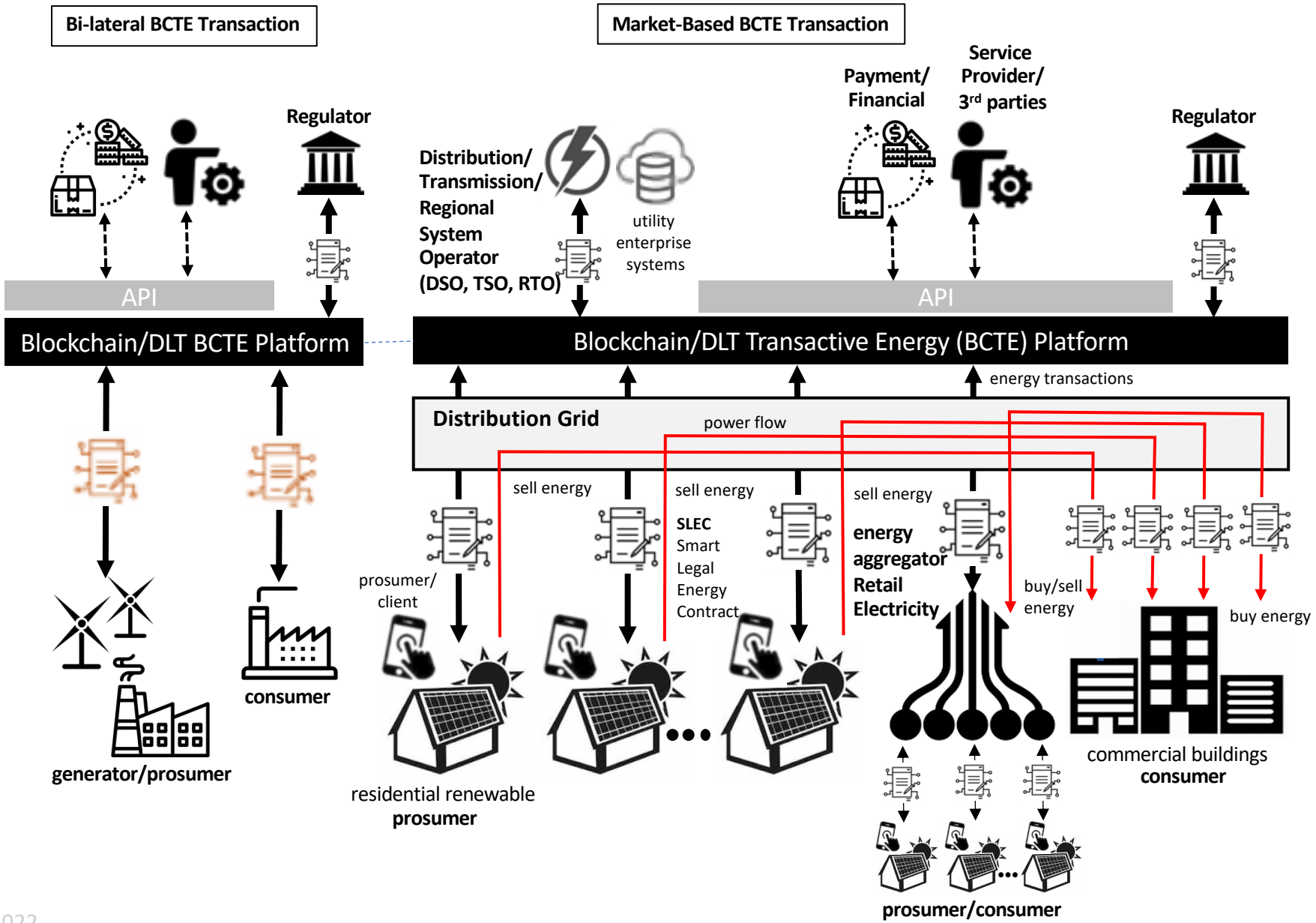
High Level Blockchain Transactive Energy Framework



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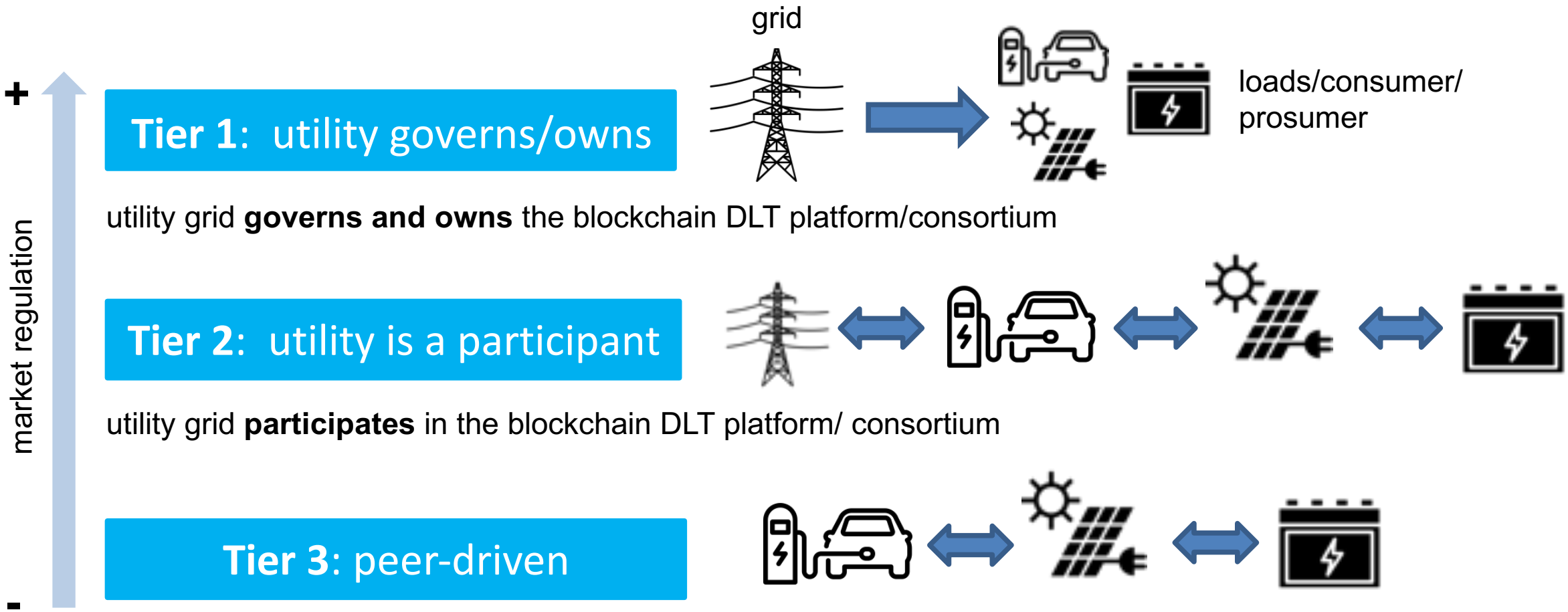
Tiers of Transactive Energy Blockchain/DLT Governance



Utilities can benefit from implementing Blockchain/DLT in tiers 1 and 2

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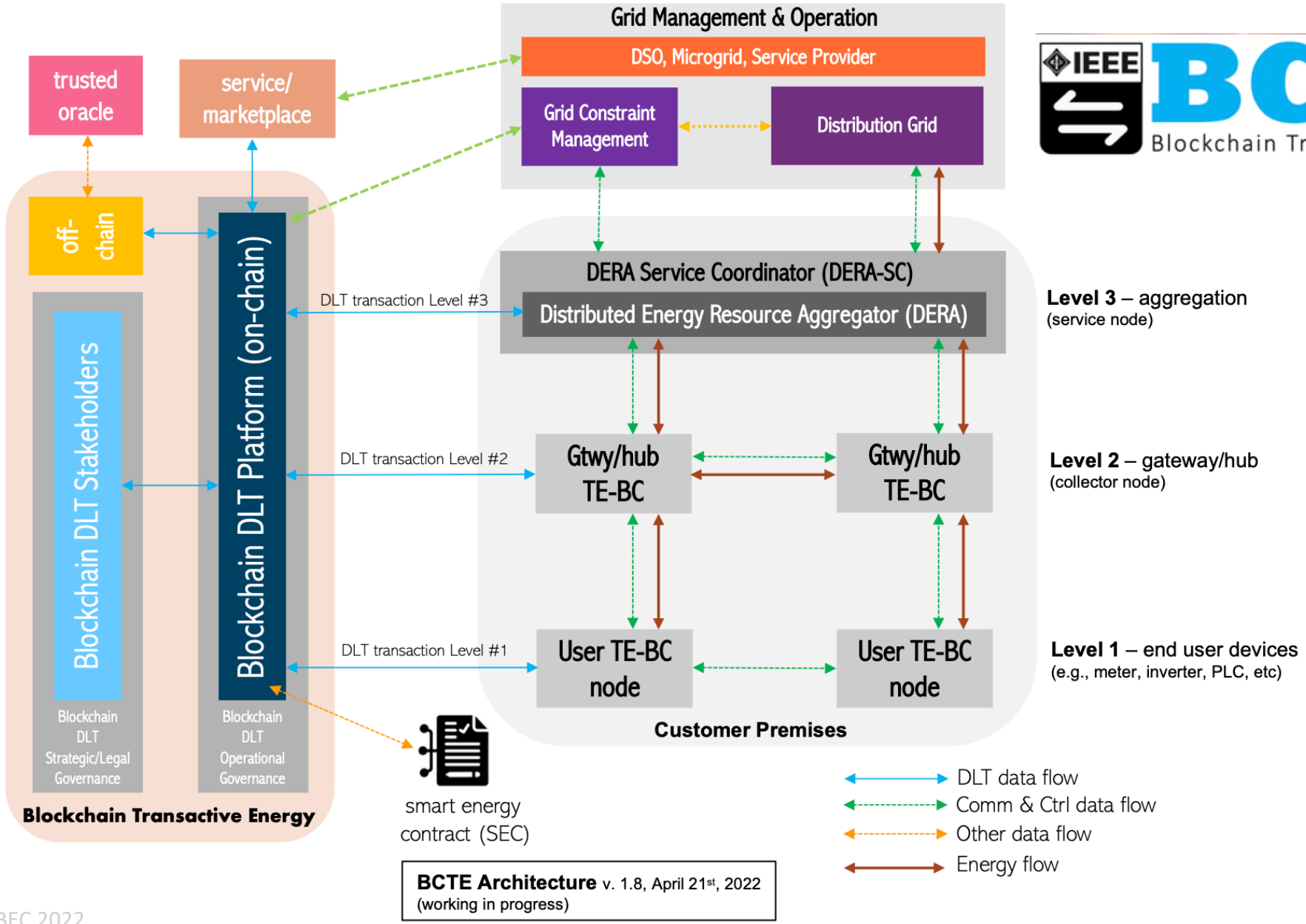
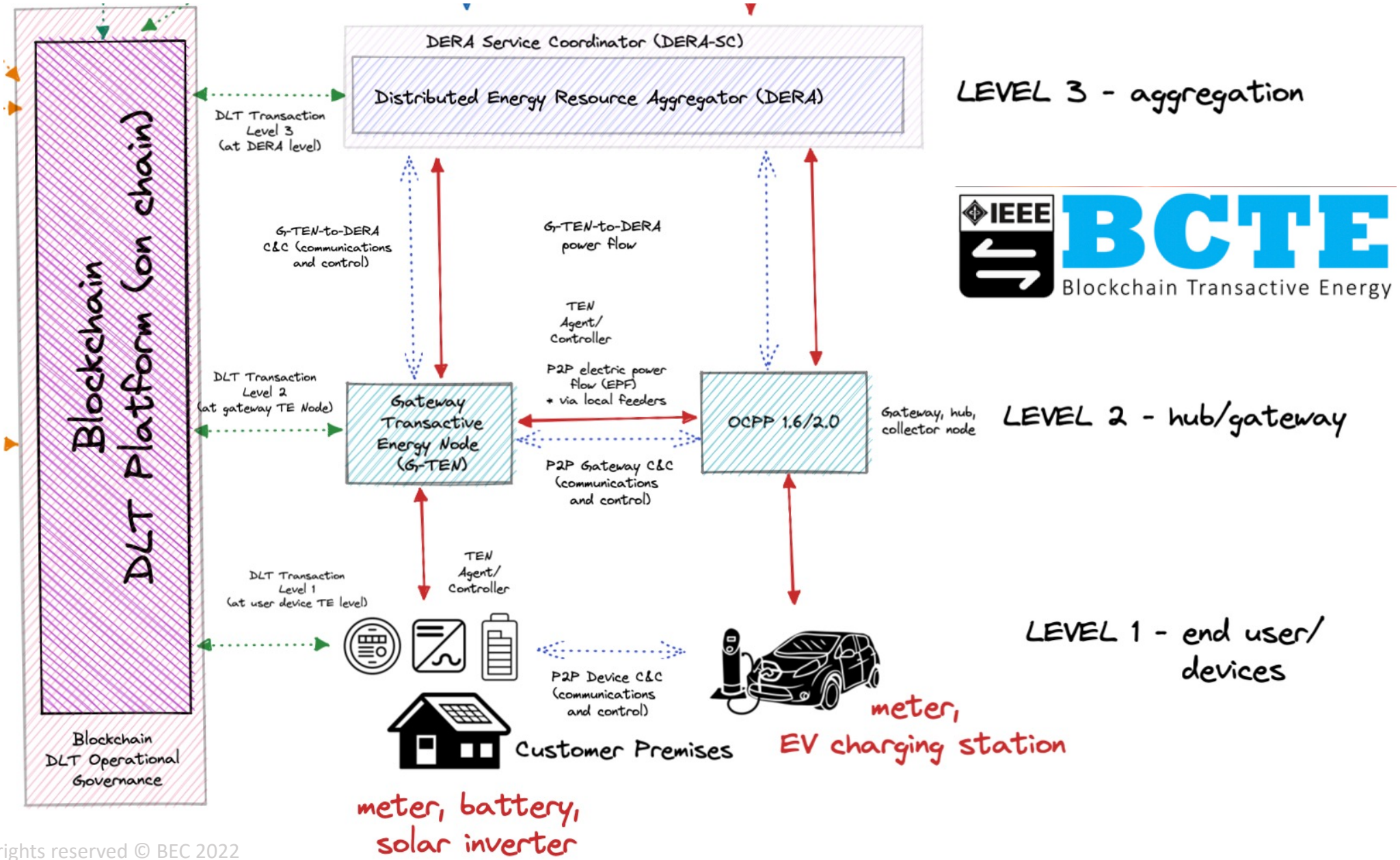
IEEE Blockchain Transactive Energy Framework



BCTE Architecture v. 1.8, April 21st, 2022
(working in progress)

IEEE BCTE Framework with Electric Vehicle



IEEE BCTE
Blockchain Transactive Energy

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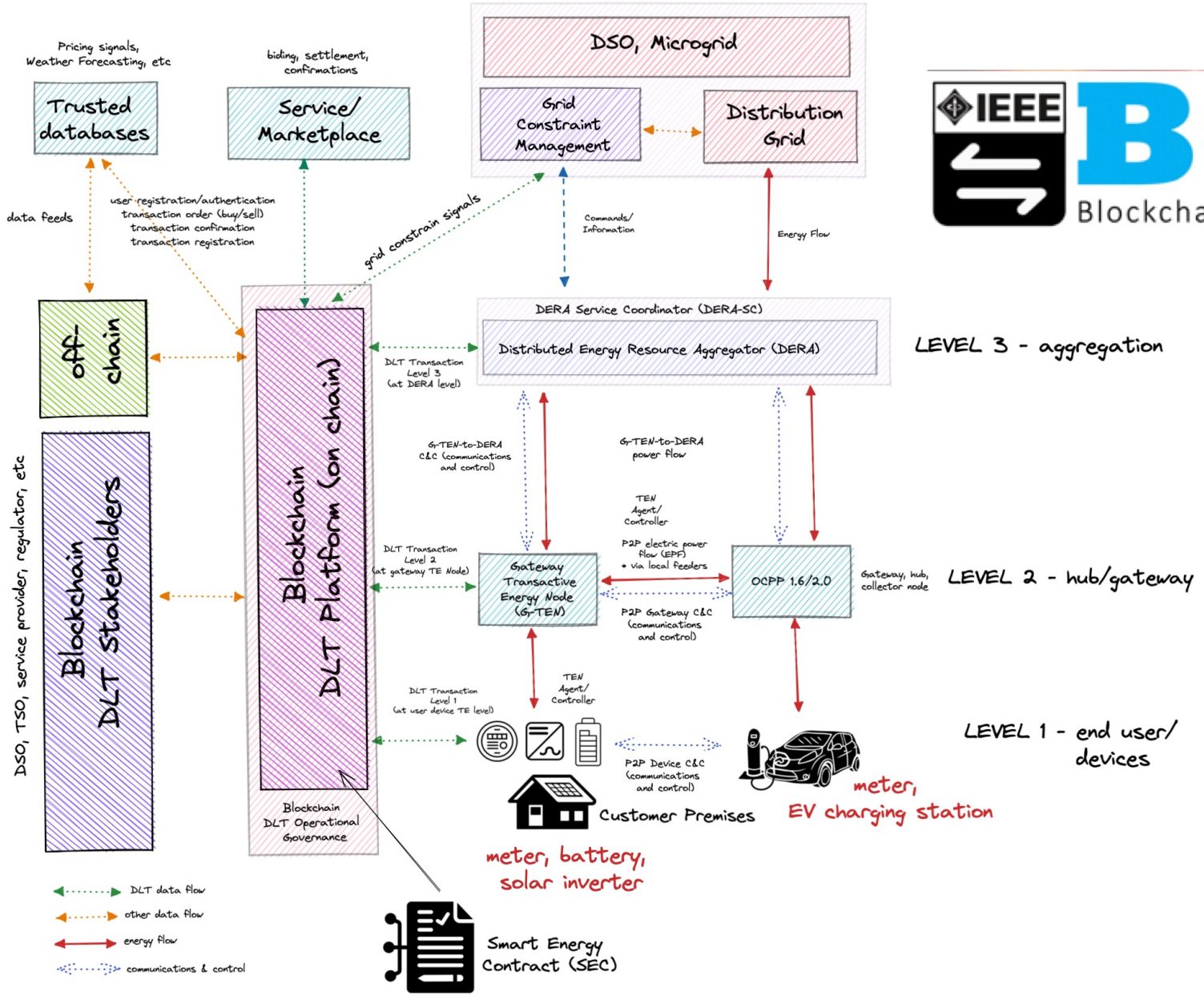
IEEE Blockchain Transactive Energy Framework



IEEE BCTE Blockchain Transactive Energy

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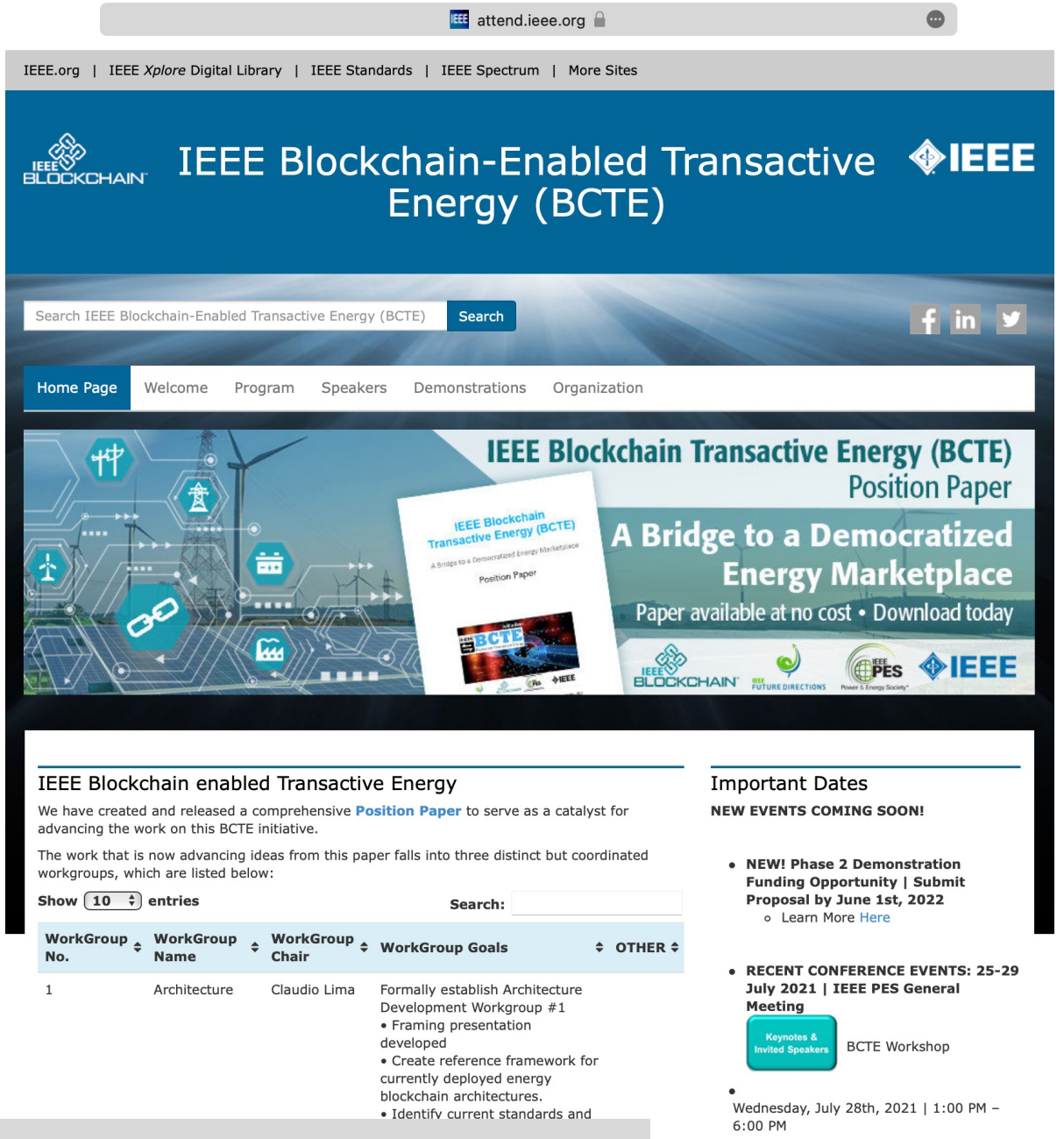
Thank You!

Claudio Lima

clima@blockchain-eng.org

SCAN ME



https://attend.ieee.org/bcte/

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About the Speaker

Claudio Lima, Ph.D.

- *Executive and thought leader in advanced blockchain, IoT, and AI technologies*
- *Expertise in energy (utilities, oil, and gas), smart city, and telecom/IT digital transformation*
- *Distinguished Member of Technical Staff at Sprint Advanced Technology Labs in Silicon Valley, California.*
- *Co-founder of the Blockchain Engineering Council (BEC)*
- *Chair of IEEE Blockchain Transactive Energy (BCTE) Initiative*
- *Chair of the IEEE Blockchain Standards*
  - *Chair IEEE P2418.5 Blockchain Energy WG*
  - *Vice Chair IEEE P2418.1 Blockchain IoT WG*
- *Member ISO DLT for Power Standards*
- *PhD in Electronic Engineering, University of Kent (UK) (1995).*

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