Business and Regulatory Models for Transactive Energy

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Transactive Energy (TE) has four big ideas.

Forward transactions are used to coordinate investments and manage risk.

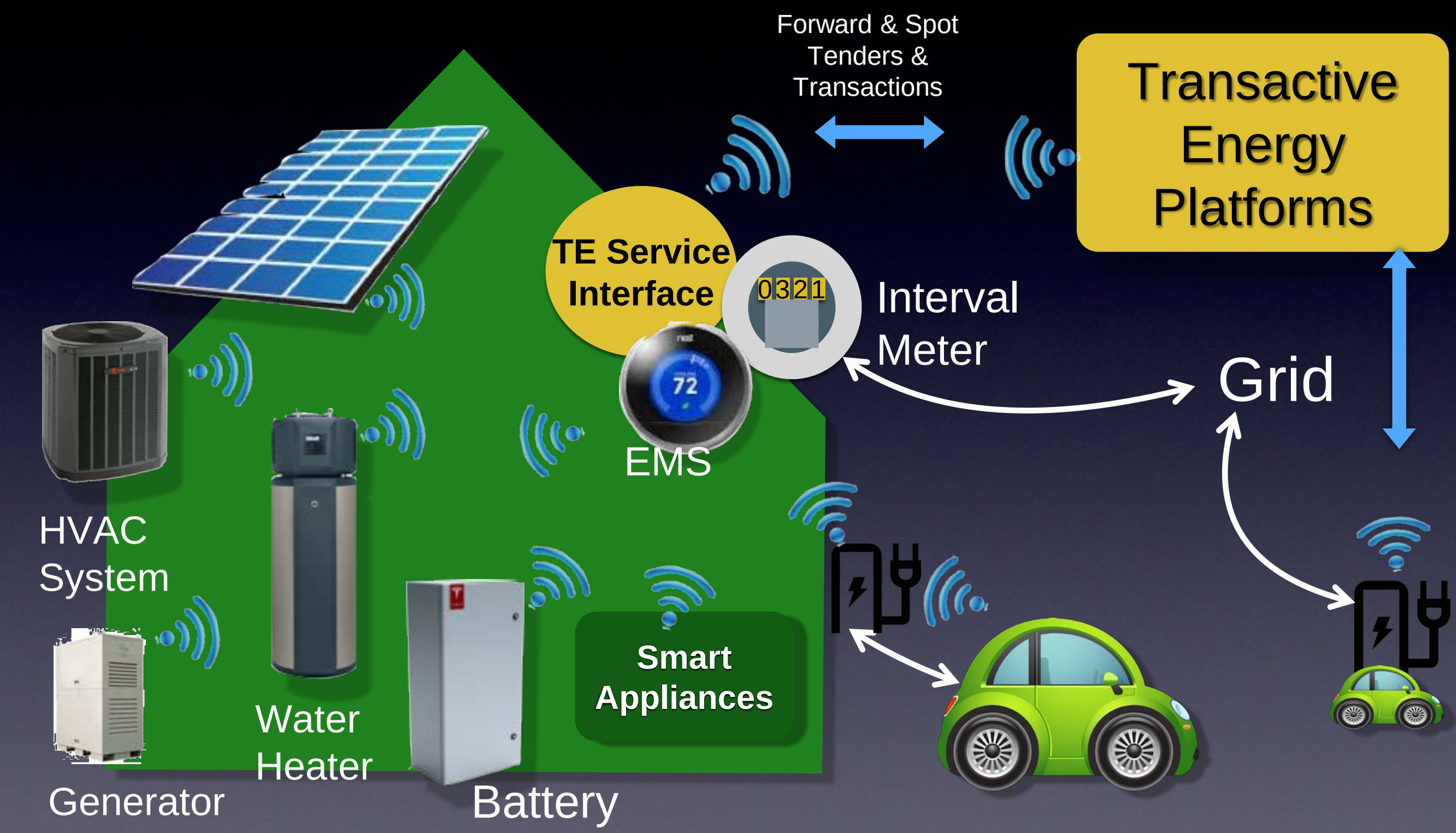
Spot transactions are used to coordinate operating decisions.

All parties act autonomously.

There are two products: energy and transport..

The TE business process is straightforward.

A building (or charge station) with DER looks like this in a Transactive Energy (TE) model.



Here's an example of how TE works for a consumer.

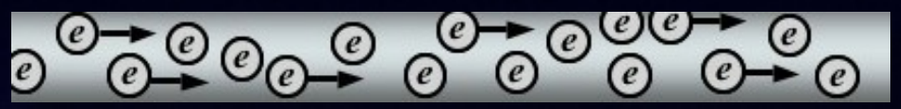
(Interoperable Transactive Retail Tariff / Rate)

- Based on my typical usage, I automatically transact with one or more suppliers for delivery of a fixed quantity of energy in each hour of the year(s) for a fixed monthly payment (subscription.)
  - If I use less than I subscribed for in each hour then I am paid for the difference at an hourly spot price.
  - If I use more than I subscribed for then I pay for the difference at an hourly spot price.
- At any time I can automatically buy or sell a quantity of energy at current tendered prices.

My energy management system (EMS) automates this process

The two-way Transport product delivers the Energy product.

Bidirectional forward and spot transactions
(tariffs) for transport

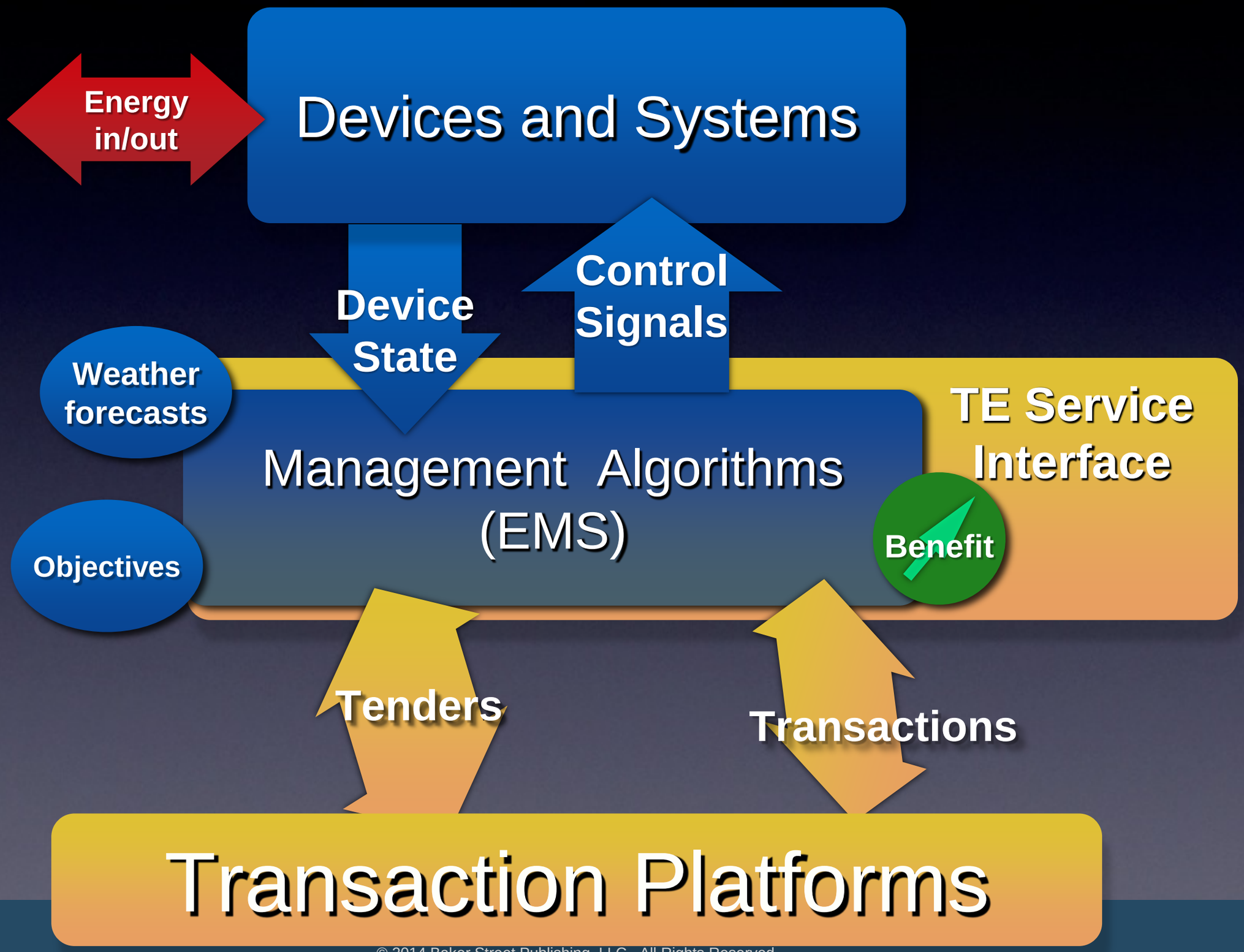


Electric energy (at a place and time)
Example: Transmission Connected Substation

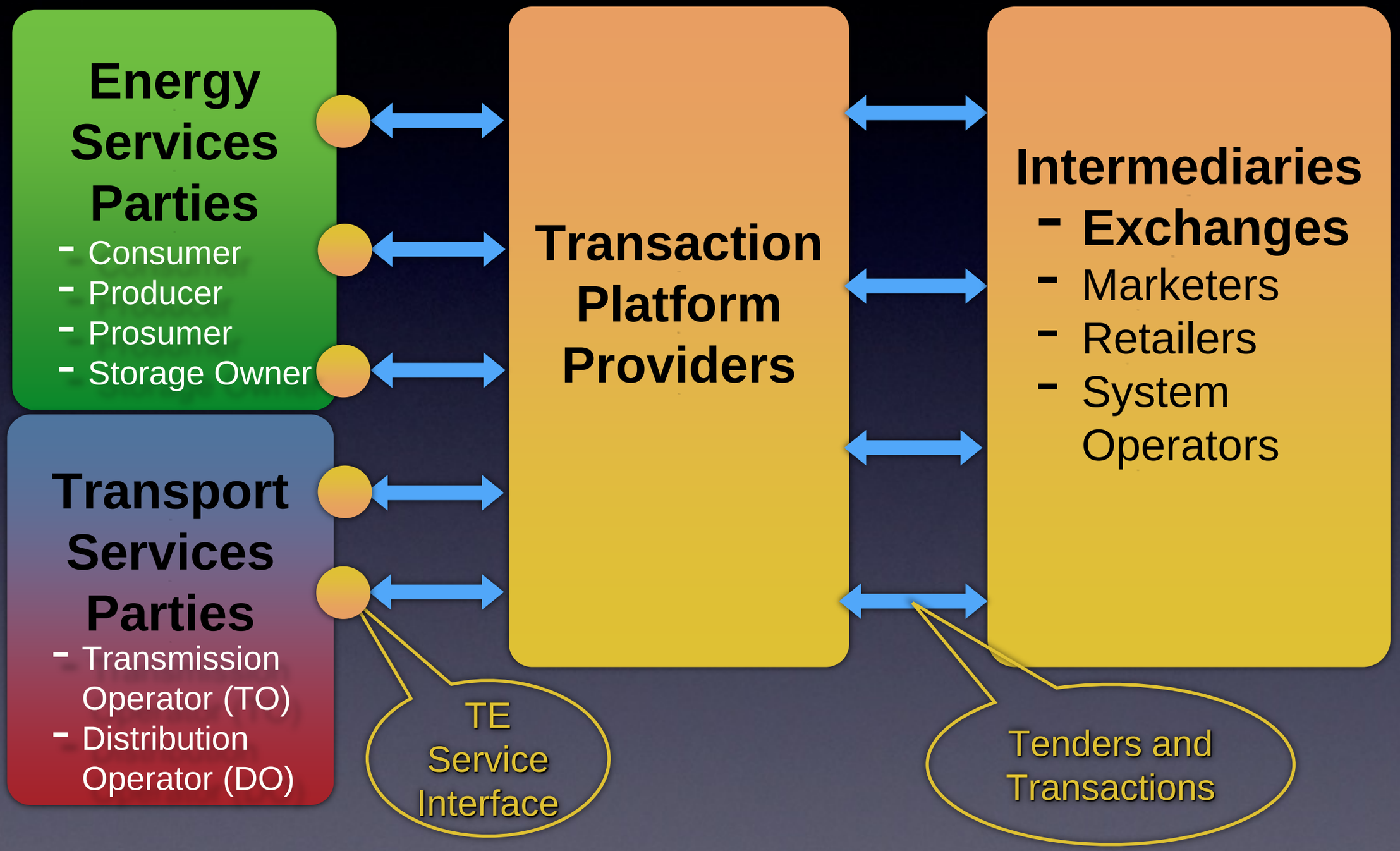
Transport
Example: Two-way Feeder

Electric energy (at a different place and same time)
Example: Building

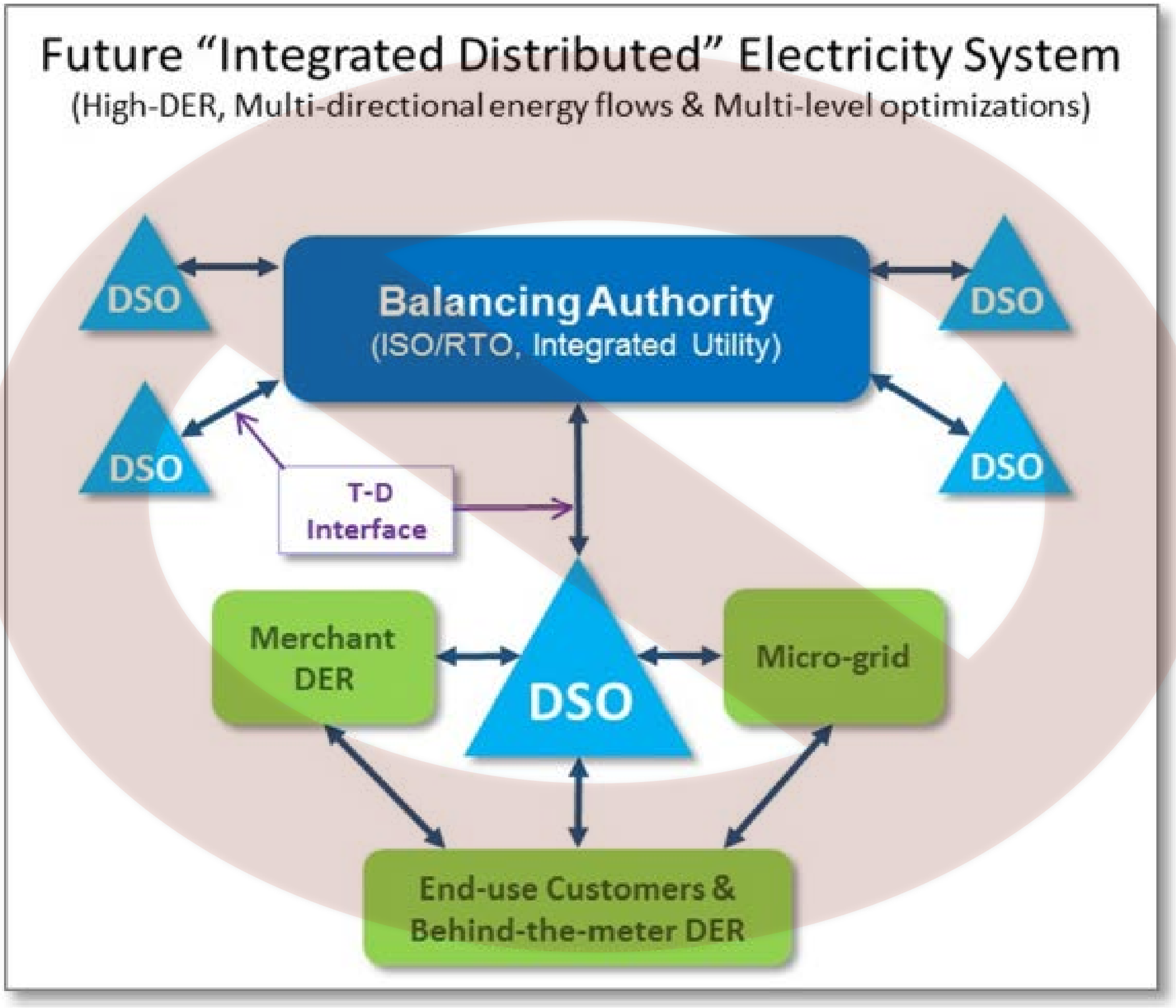
Parties use a TE Service Interface to control devices/systems and manage tenders and transactions.



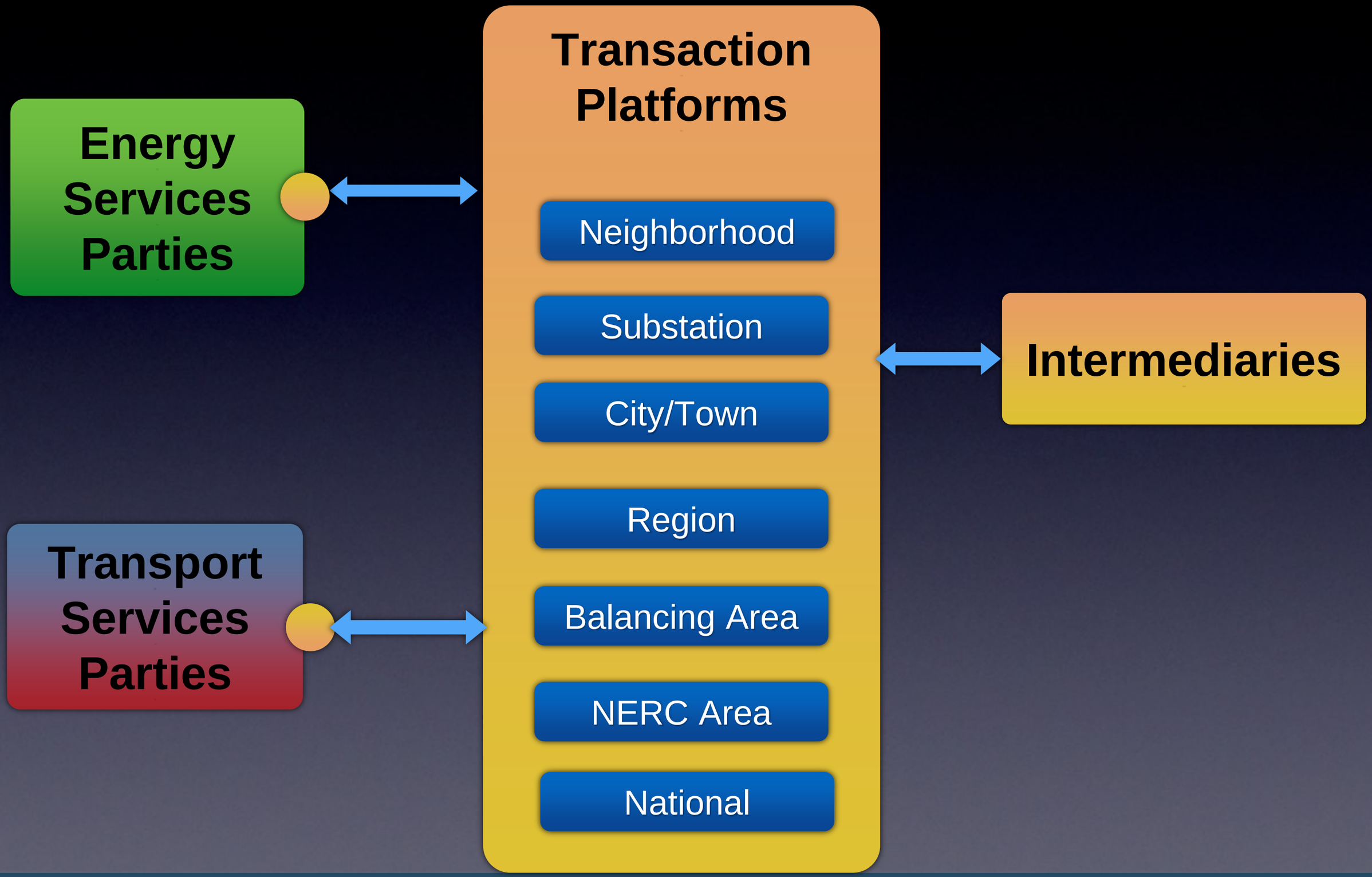
Architecture of the TE Business Model



Distribution System Operator (DSO) Model



Multiple TE Platforms appear as a Virtual Platform to Parties



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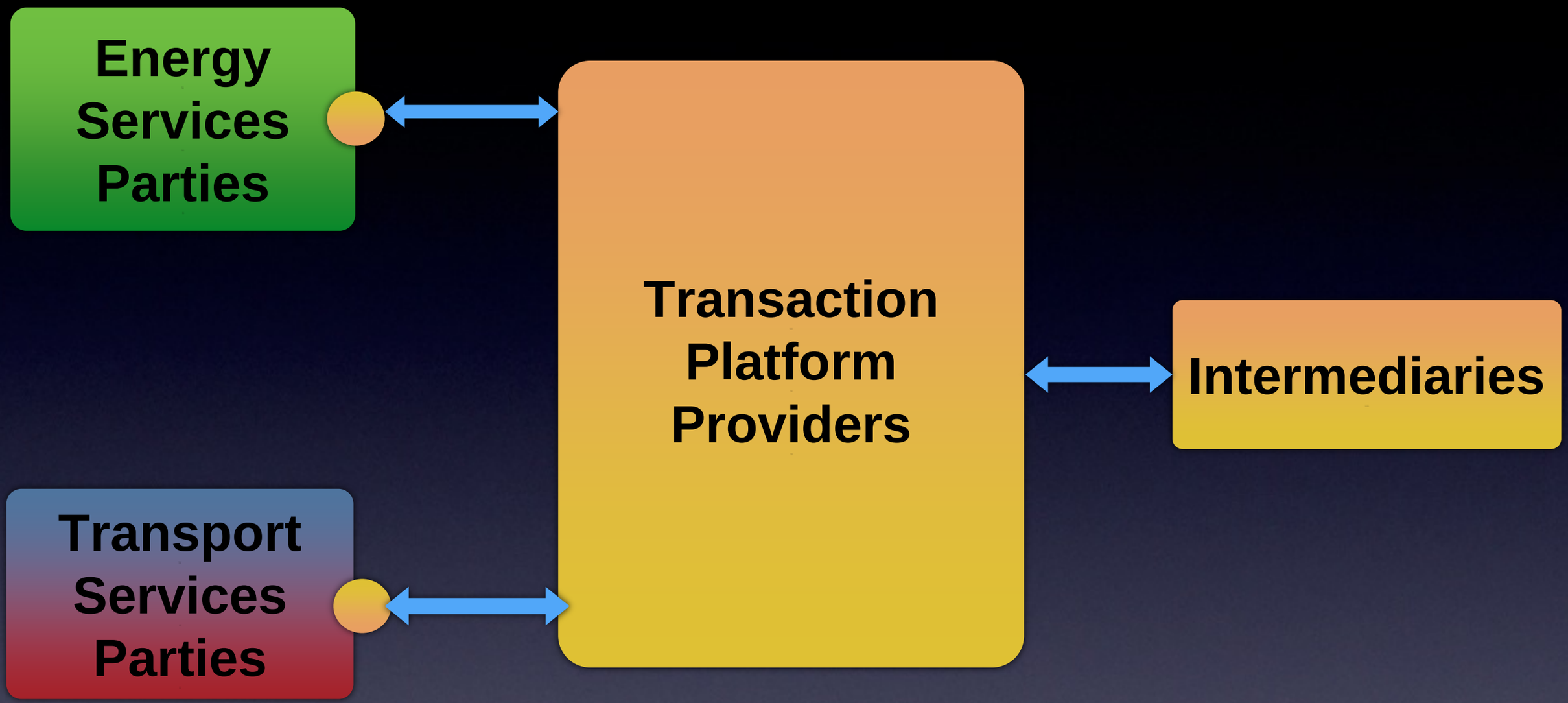
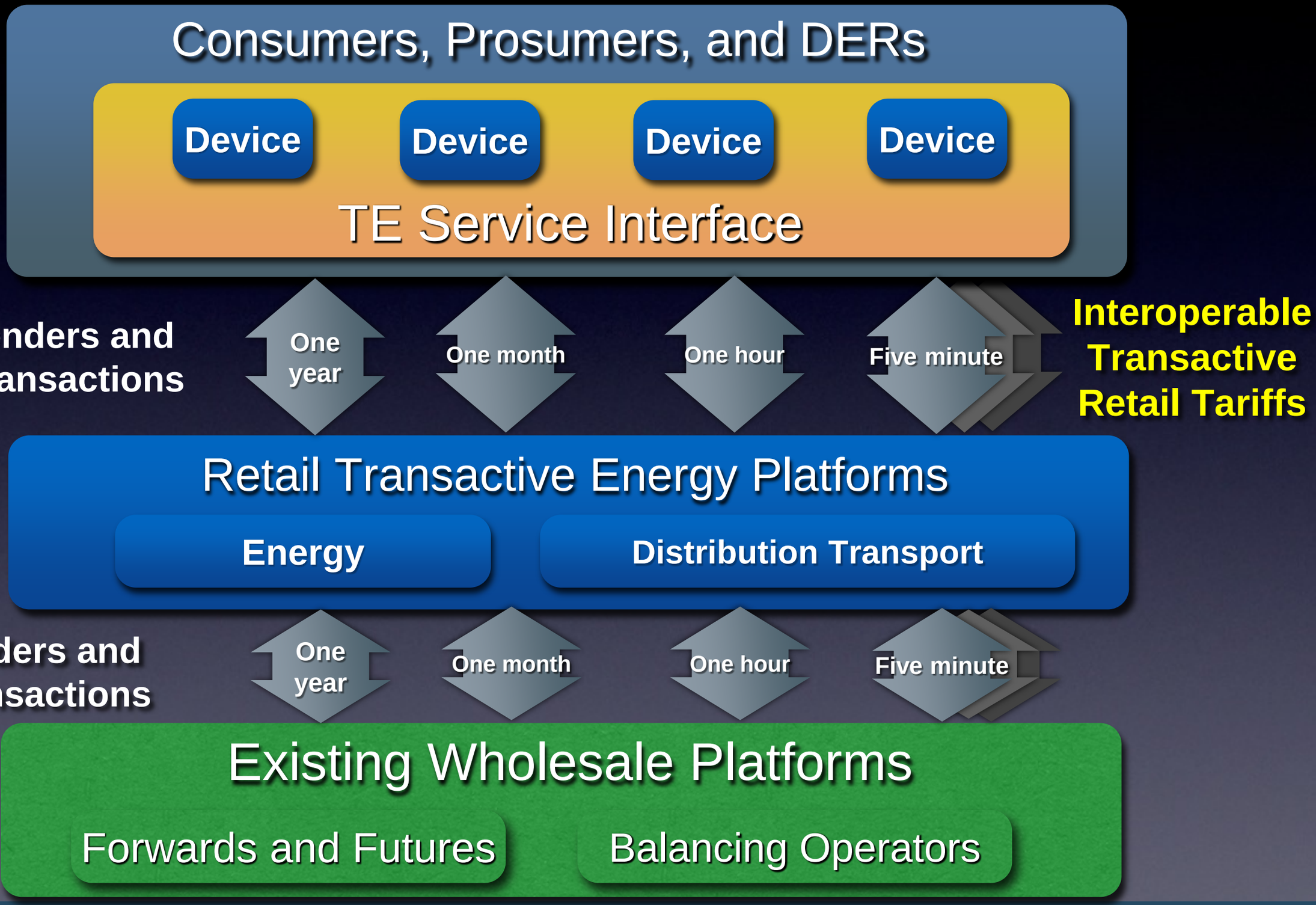


"Frequent small tenders facilitated by automated intermediaries help coordinate investments and operations of all parties."

Transactive Energy can be incrementally deployed to work with current systems and entities.



Grid Custodians have new tools to oversee TE markets

Grid Custodians:

Congress, DOE, EPA, FERC, NERC, Legislatures, PUCs, Munis, CCAs, PMAs, Coops

Energy Services Parties

Transaction Platform Providers

Tender and Transaction Data Bases

Intermediaries

Transport Services Parties

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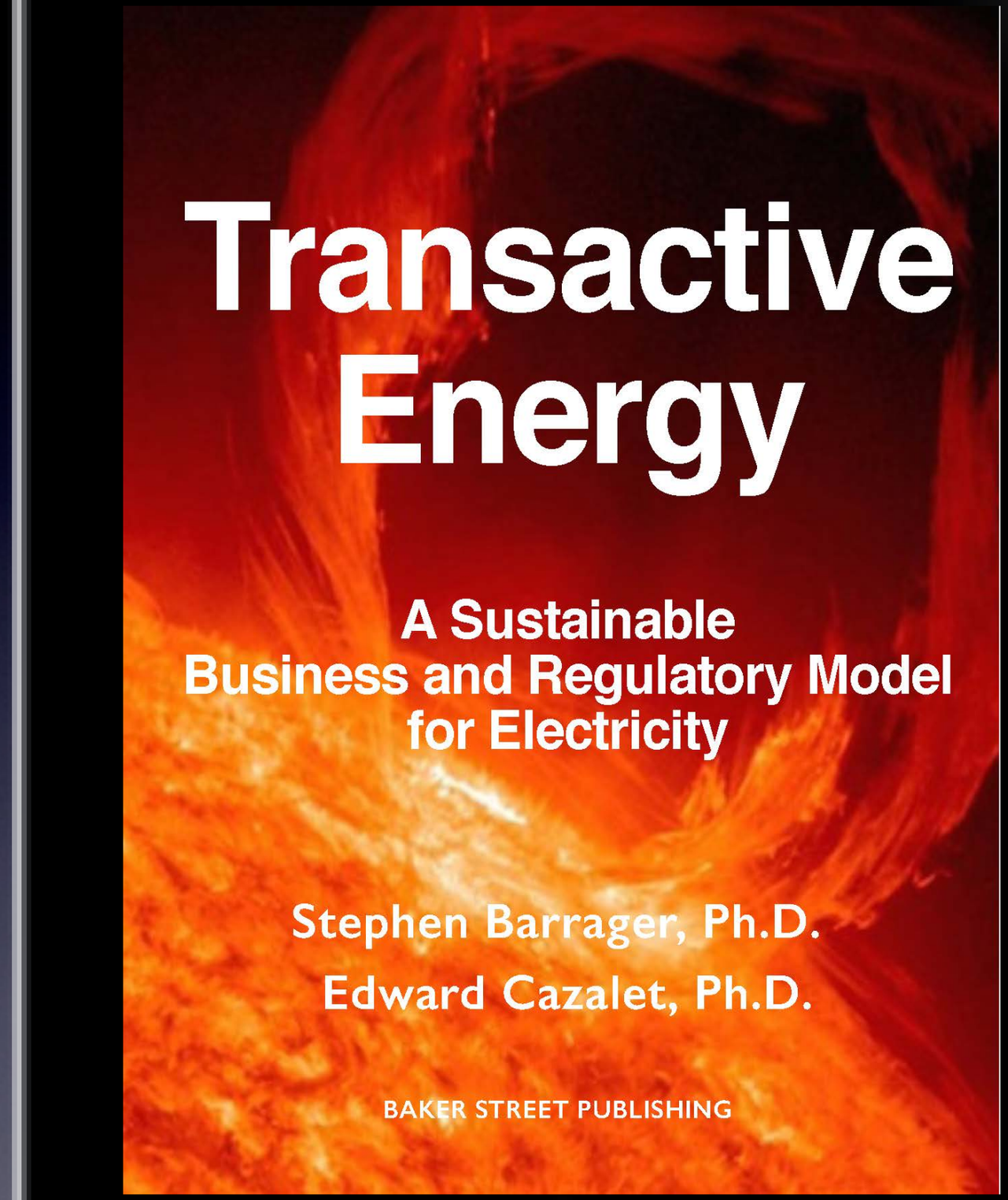

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