Transactive Energy Rate Recovery
an equitable approach to recover cost

by
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AGENDA

1. The Energy Rate Recovery Paradigm
2. The Transactive Energy Paradigm-shift
3. The TE Architectural Representation
4. Discussion on the Benefits
5. Open it up for Q&A
The *Energy* Rate Recovery Paradigm

Industry Norms

- The intent of pricing electricity is to recover *all* costs associated with providing *reliable* service; from a *long-run* vantage point.
The *Energy* Rate Recovery Paradigm

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- Traditionally: only certain Parties are allowed to recover costs.
The *Energy* Rate Recovery Paradigm

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➢ Grid expansion was centric for the most part of the 20th century.
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- Grid expansion was centric for the most part of the 20\textsuperscript{th} century.
- Assumptions:
  - load growth is predictable, and
  - loads can \textit{only} be controlled locally “behind-the-meter”.
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“Cost of Service” Recovery Methodology
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“Cost of Service” Recovery Methodology

- Generation Entities (independent or vertically owned “integrated”)
- Transmission System (decoupled)
- The Generator “Supply”
- Procurement (Wholesale)
- Operators (RTOs/ISOs)
The *Energy* Rate Recovery Paradigm

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“Cost of Service” Recovery Methodology
Cost of Service Worked

Fig. 1. Maps showing high-tension electric transmission lines in continental United States, multiple years. (Source: Report on the Status of Interconnected Power Systems, Edison Electric Institute, 1962.)
Cost of Service Worked; However, Change is Now Needed!

Source: TeMix Inc. Energy Internet of Things
The *Transactive Energy* Paradigm-shift

**TE Norms**

- All Parties who provide grid services can recover costs.
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- Flexible loads **support** secure decoupled management *(via Cloud Computing IT).*
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- Creates a financial mechanism to speed clean electrified asset adoption.
The **Transactive Energy** Paradigm-shift

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- Provides a **means** to exhibit Cost Causation of Service.
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“Cost Causation of Service” Recovery Methodology

- Distribution Systems
- Transmission Systems
- Generation Entities
- Customer
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“Cost Causation of Service” Recovery Methodology

- Forward Tenders
- Forward Transactions
- Grid Conditions
- Grid Upgrades
- Distribution Systems
- Transmission Systems
- Generation Entities

Retail Automated Transactive Energy System (RATES™)

Market Participant
Customer’s Facilities and Devices
Transactive Energy Architecture

Retail customer, prosumer, distributed generation and storage Facilities

Device
TeMix Agent™
Device Interface

Device
TeMix Agent™
Device Interface

Device
TeMix Agent™

Device
TeMix Agent™

Meter

Facility Service Interface

Tenders & Transactions

Retail Automated Transactive Energy System (RATES™)
(“price and settlement machine”)

Device Interface

Device Interface

Device Interface

Device Interface

Distribution Operator (DO)
Service Interface
DO operated by IOU, POU & Microgrid Distribution Provider

Load Serving Entity (LSE)
Service Interface
LSE operated by IOU, POU, CCA & Microgrid Distribution Provider

Independent System Operator (ISO) Service Interface
ISO API
ISO/ RTO in N.A.

Generation Service Interface
Wholesale Parties
Bilateral Forwards & Futures

APIs

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Tenders & Transactions

APIs

Supports Unlimited Platforms

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10/1/2022
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Supports Unlimited Numbers of Facilities and Devices

Supports Unlimited Platforms

Tenders & Transactions

APIs
Transactive Energy Architecture

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Supports Unlimited Numbers of Facilities and Devices

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Peer-to-Peer Supported

Supports Unlimited Platforms
## BENEFITS OF TRANSACTIVE ENERGY

1. Compensates *all* Parties who provide grid services
2. Creates a financial incentive mechanism to speed flexible load and disaggregated *(renewable)* supply adoption
3. Has *no* technology scaling limitations
4. Reduces overall system costs for all stakeholders:
   - Absorbs Stranded Asset costs
   - Maintains low-income discounts
5. Uses short-run grid conditions to determine the recovery price and *a yearly subscription hedges bill volatility*
6. **TE supports:**
   - a phased implementation approach, unique to each service territory, by circuit or by flexible device-type (e.g., EVs, Storage, etc.)
   - unique configurations to meet each State’s energy goals
   - Opt-in or Opt-out design considerations
--Thank you for your attention--

Happy to Answer Any Questions?

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