Transactive Energy
Public Policy and Market Design

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What is Transactive Energy?

1. Policy: Transactive Energy engages customers and suppliers in decentralized energy transactions that strive towards economic efficiency, reliability, and environmental enhancement.

2. Market: Transactive Energy is a business process for energy transactions among parties.
Transactive Energy Policy

1. Sustainable energy: efficiency, reliability, renewables, and resilient decentralized generation

2. Coordinated decentralized investment and operation decisions

3. Parties and their automated agents control their own devices, facilities, T&D, etc. and not those of other parties

4. Comprehensive market oversight
Transactive Energy Market Design

1. Simple Products: Subscriptions for Energy and Transport (T&D)

2. Simple Forward Transactions: (Price, Quantity, Start, Duration, Interface, Side)

3. Coordination by mutually beneficial forward tenders and transactions among parties

4. Market Clearing: peer-to-peer, bilateral, retail tariff, or exchange
Transactive Energy Markets

Retail Market
- Residential Load
- C & I Load
- Solar
- Generator
- Distribution

Wholesale Market
- Residential Load
- C & I Load
- Storage
- Generation
- Distribution
- Transmission
- RE

Micro Grid
- Electric Vehicle

Tenders & Transactions for Energy & Transport
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Two Examples

1. Transactive Retail Subscription Tariffs

2. Five-Point Transactive Energy Policy
Transactive Retail Subscription Tariffs

1. Retailer makes forward buy and sell tenders for subscriptions to customers
2. Customer agent accepts or ignores tenders as transactions for subscriptions
3. Repeat 1 & 2 as necessary
4. Delivery imbalance: metered quantity less accumulated subscription quantity for each settlement interval paid or credited at variable ex-post price

(see www.CaFER.org)
Five-Point Transactive Energy Policy

1. Legislature/ PUC: allow retail energy and distribution subscription tariffs

2. FERC/ ISO or RTO:
   - $10,000/MWH wholesale price cap
   - -$2,500/MWH wholesale price floor
   - post forward buy and sell 5-minute and 15-minute tenders

3. Legislature/PUC: locational retail prices
Five-Point Transactive Energy Policy

4. PUC: deploy current surplus, decentralized generation /storage, and flexibility from transactive tariffs before new centralized capacity

5. Legislature/PUC/FERC:
   - accelerate competitive access
   - aggressively monitor markets
Transactive Energy Links

3. Automated Transactive Energy (TeMix) [http://bit.ly/1580gPS]
6. Transactive Energy Association (TEA) [www.tea-web.org]
7. TeMix Inc. [www.temix.com]
TEA Discussion Links

1. **INTRODUCTION TO TRANSACTIVE ENERGY:**
   What is Transactive Energy? [http://lnkd.in/EUqVy3](http://lnkd.in/EUqVy3)
   Transactive Energy Description and Benefits [http://lnkd.in/NGwdsZ](http://lnkd.in/NGwdsZ)

2. **TRANSACTIVE RETAIL TARIFFS:**
   Which Should Come First, Customer Automation or Transactive Energy Tariff? [http://lnkd.in/8adFp5](http://lnkd.in/8adFp5)
   Transactive Energy for ERCOT Retail Markets [http://lnkd.in/7cneEh](http://lnkd.in/7cneEh)
   Transactive Energy for California IOU Tariffs [http://lnkd.in/wZ_pHm](http://lnkd.in/wZ_pHm)

3. **TRANSACTIVE ENERGY FOR THE END-TO-END GRID:**
   How Will Transactive Energy Assist the California Grid? [http://lnkd.in/ycgFPM](http://lnkd.in/ycgFPM)
   Transactive Energy and Ancillary Services [http://lnkd.in/idDTU3](http://lnkd.in/idDTU3)

4. **TRANSACTIVE SUBSCRIPTIONS FOR T&D AND FIXED COSTS:**
   Transactive Energy Recovery of Fixed Costs [http://lnkd.in/-a6RuV](http://lnkd.in/-a6RuV)
   Transactive Energy and Net Energy Metering [http://lnkd.in/WreWmi](http://lnkd.in/WreWmi)
TEA Discussion Links

5. RELIABILITY AND CONTROL:
   Does Transactive Energy Need Capacity Products? [http://lnkd.in/e498JX](http://lnkd.in/e498JX)
   Transactive Energy and Control/Management [http://lnkd.in/62qnUa](http://lnkd.in/62qnUa)
   Transactive Energy and Grid Reliability and Adequacy [http://lnkd.in/uSWzqz](http://lnkd.in/uSWzqz)

6. CUSTOMER BENEFITS:
   Where is the Value for the Customer? [http://lnkd.in/humHrh](http://lnkd.in/humHrh)
   Is It Worth It? [http://lnkd.in/SgGh63](http://lnkd.in/SgGh63)
   Smart Devices and Transactive Energy Spot Prices [http://lnkd.in/fCswB7](http://lnkd.in/fCswB7)

7. RELATED TOPICS:
   Transactive Energy and Peer-to-Peer Home Energy [http://lnkd.in/zfcuAk](http://lnkd.in/zfcuAk)
   How Does TE Deal With Issues Such as Coal Externalities? [http://lnkd.in/XyvgQf](http://lnkd.in/XyvgQf)
   From EISA 2007 to Transactive Energy [http://lnkd.in/m6aVmU](http://lnkd.in/m6aVmU)
   Transactive Energy and the Smart Toaster [http://lnkd.in/nvsHd4](http://lnkd.in/nvsHd4)