Transactive Energy

June 16, 2014

Presentation for the

DOE Electricity Advisory Committee

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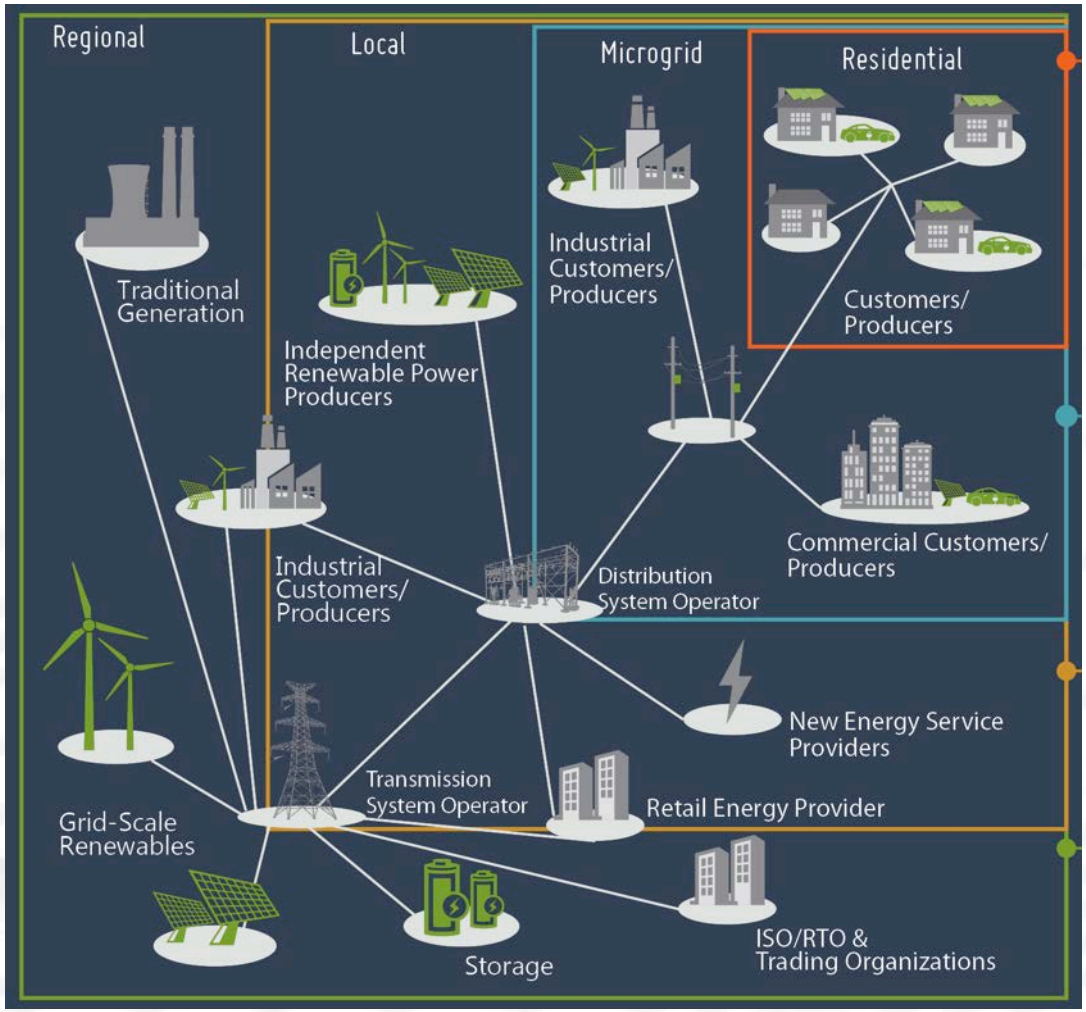
PNNL-SA-103372

Motivation for Transactive Energy

The changing nature of the electric power system:

- Increased penetration of distributed energy resources
- Increased variability
- Intelligent devices – internet of things becoming our reality



TE responds to the need to manage such a system

Transactive Energy

Transparent energy prices enable customers of all sizes to join traditional providers in producing, buying, and selling electricity – using automated control – to drive a reliable and cost-efficient electricity system

Why it's important:

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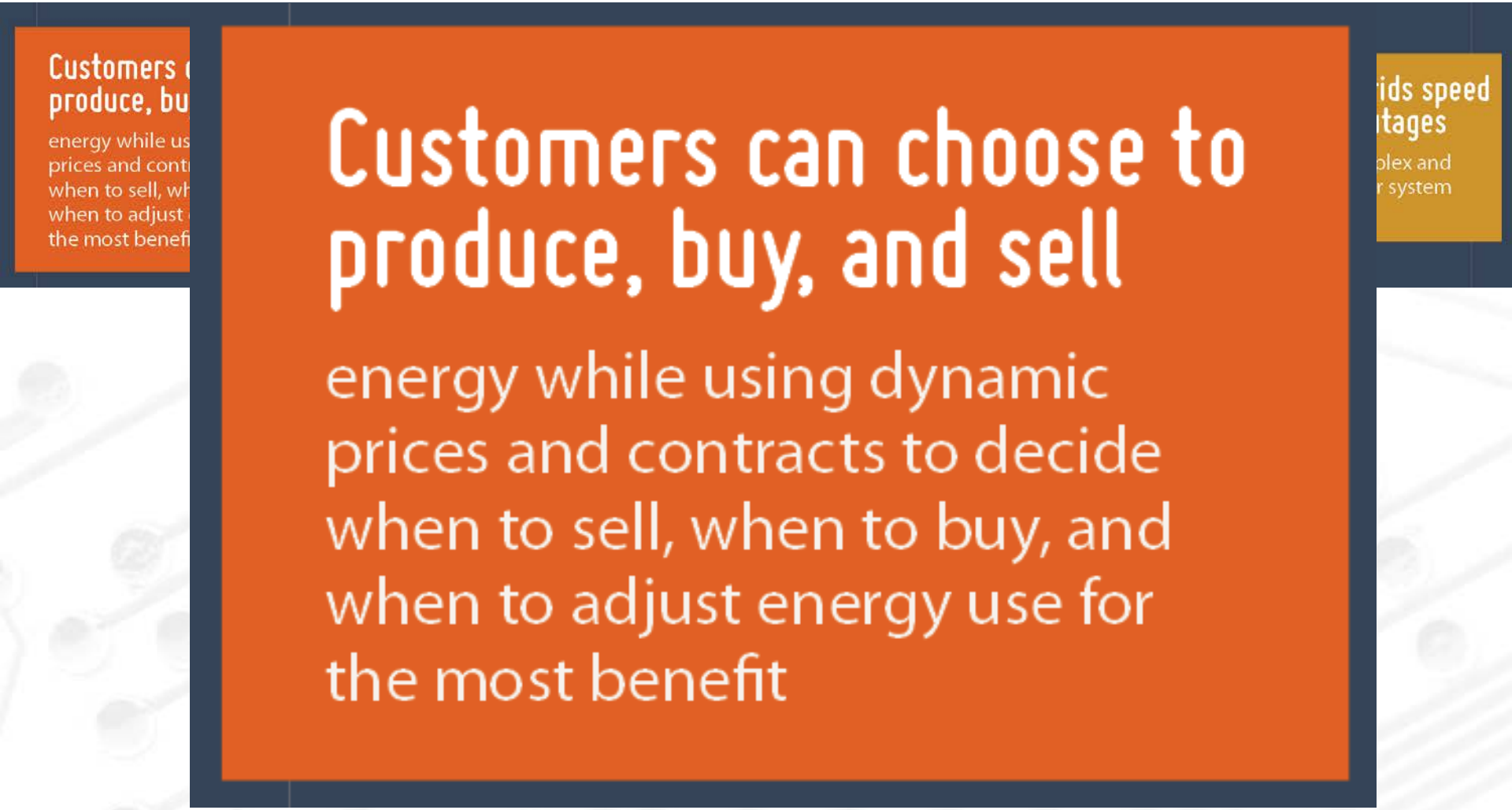

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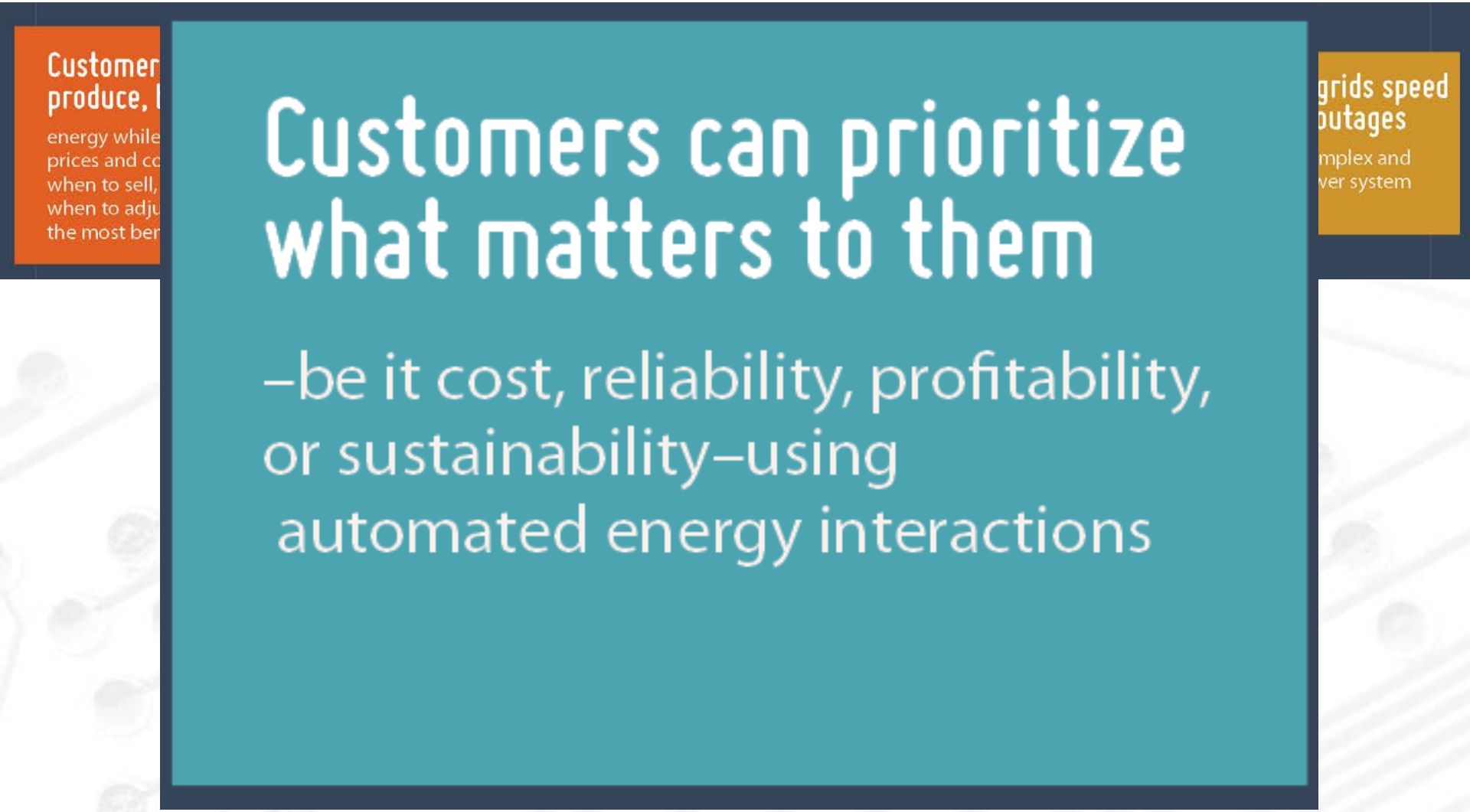

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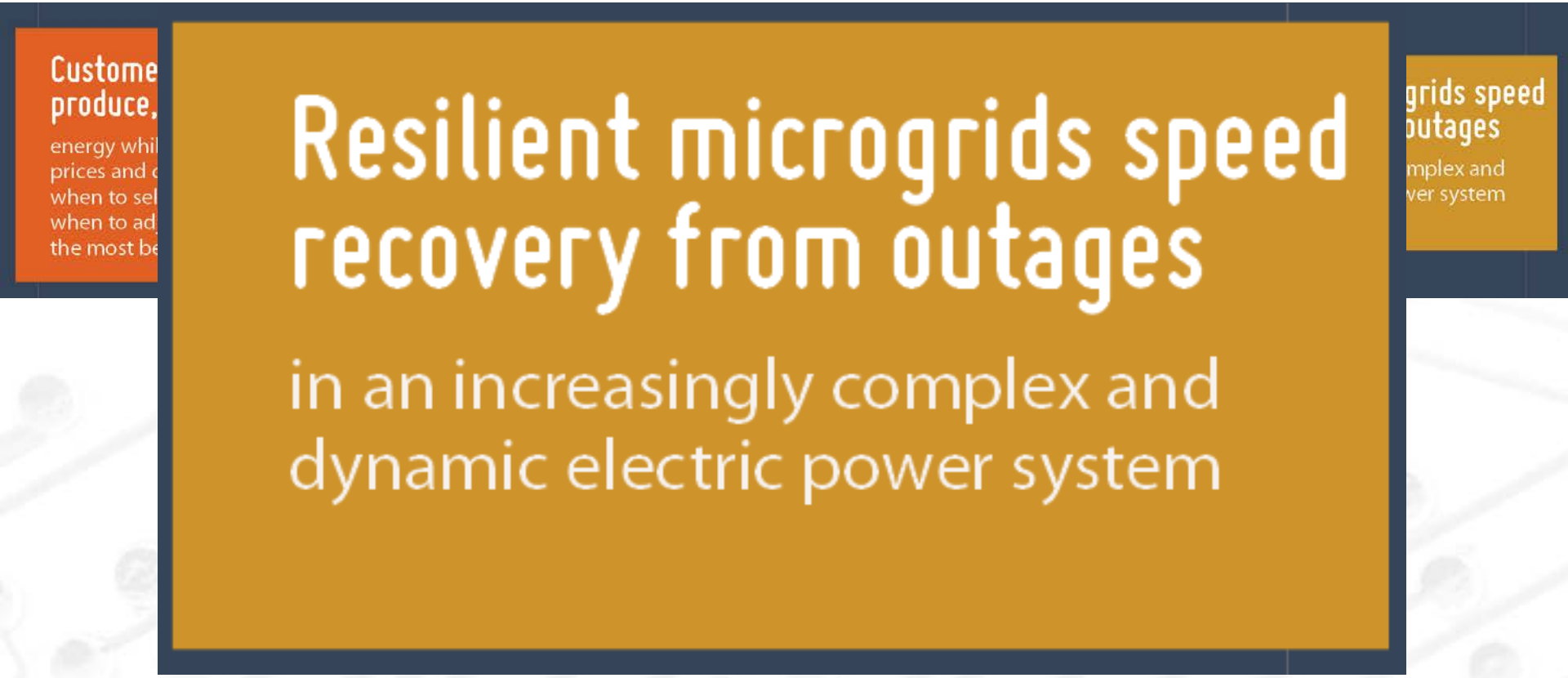
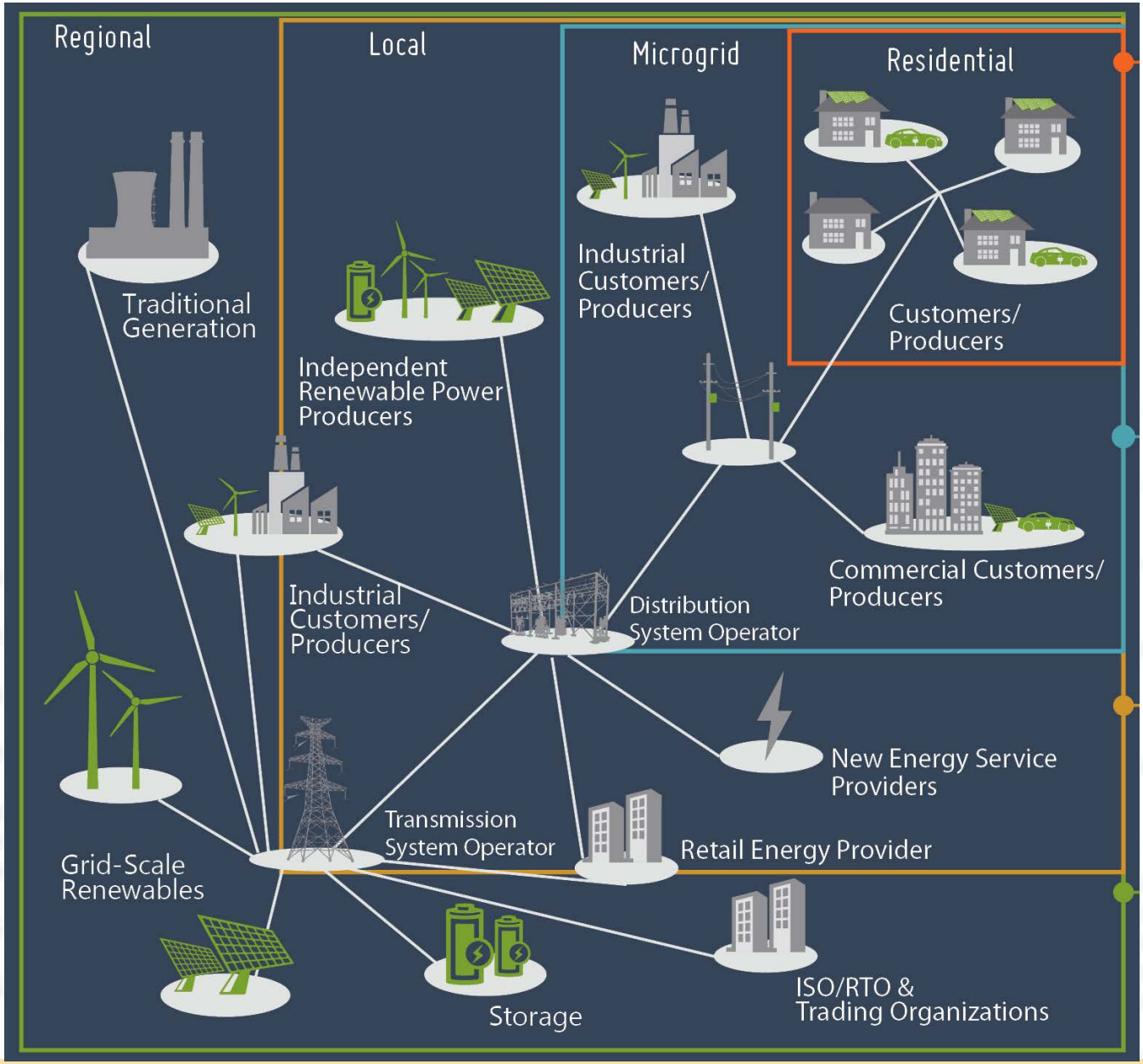
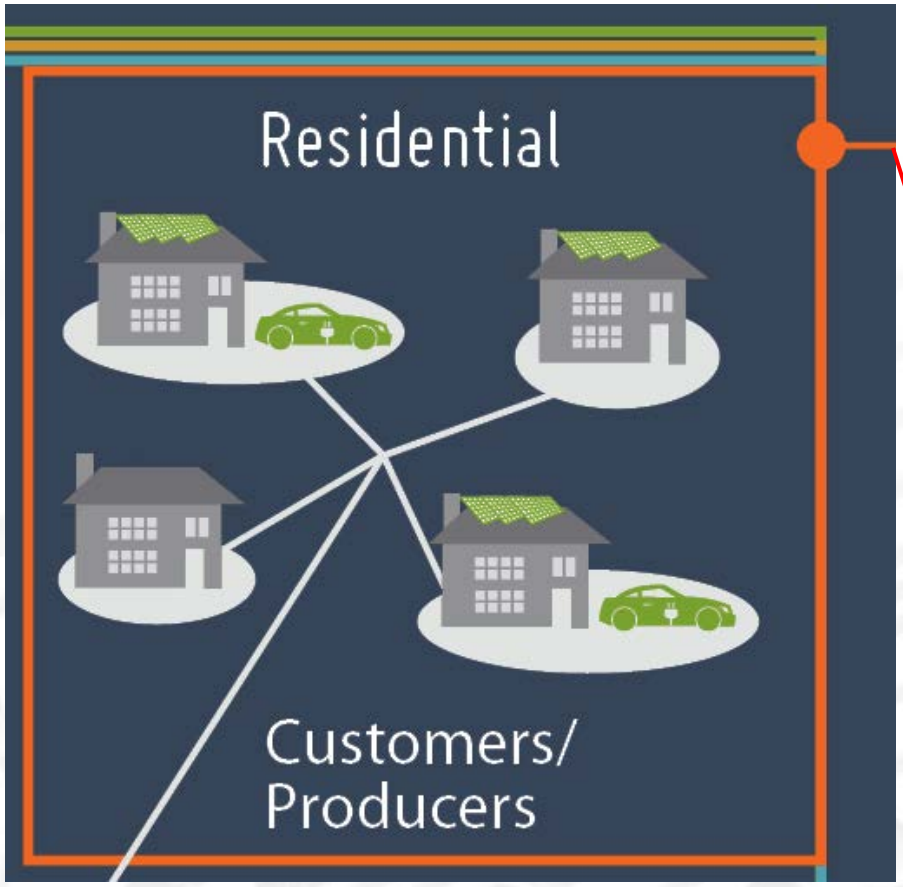


How it works:


Regional
Local
Microgrid
Residential
Traditional Generation
Independent Renewable Power Producers
Industrial Customers/ Producers
Customers/ Producers
Industrial Customers/ Producers
Distribution System Operator
Commercial Customers/ Producers
New Energy Service Providers
Transmission System Operator
Retail Energy Provider
Grid-Scale Renewables
Storage
ISO/RTO & Trading Organizations

How it works:

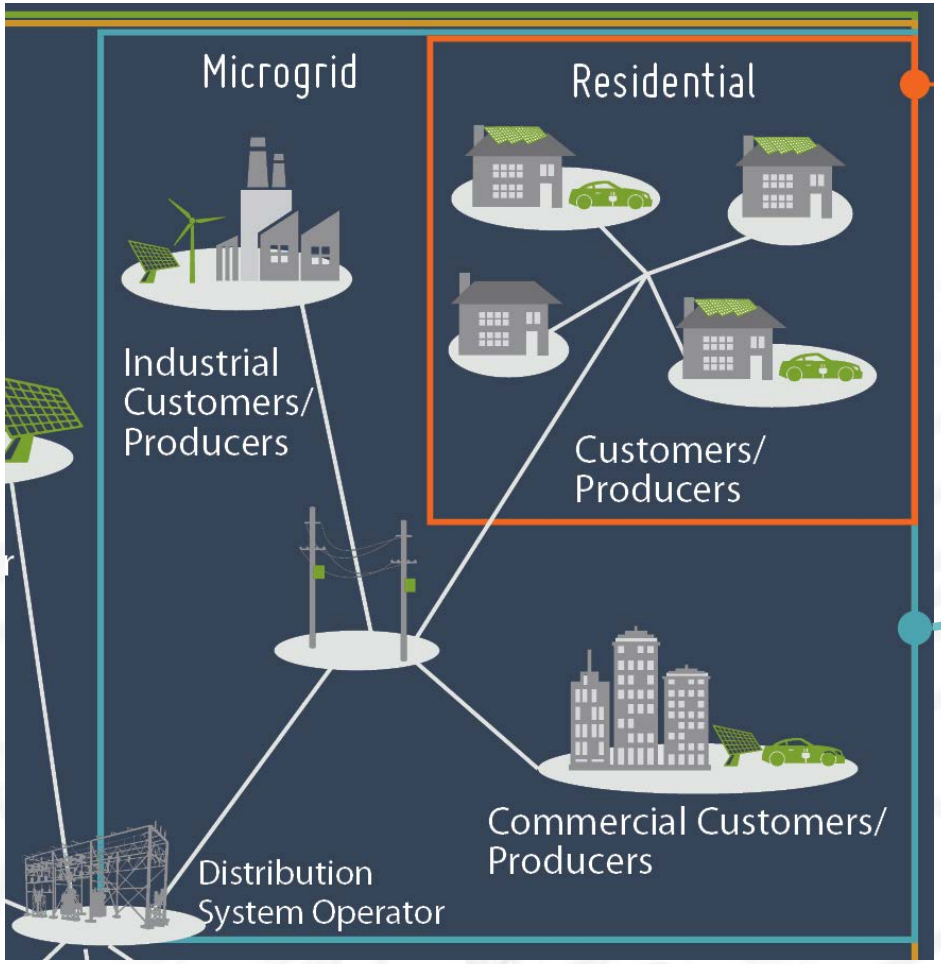


New customer choices

Customers can *choose* to:

- Participate in responsive demand to reduce overall energy costs
- Produce and sell excess energy and services
- Buy energy from multiple sources based on cost and value
- Take advantage of new energy services

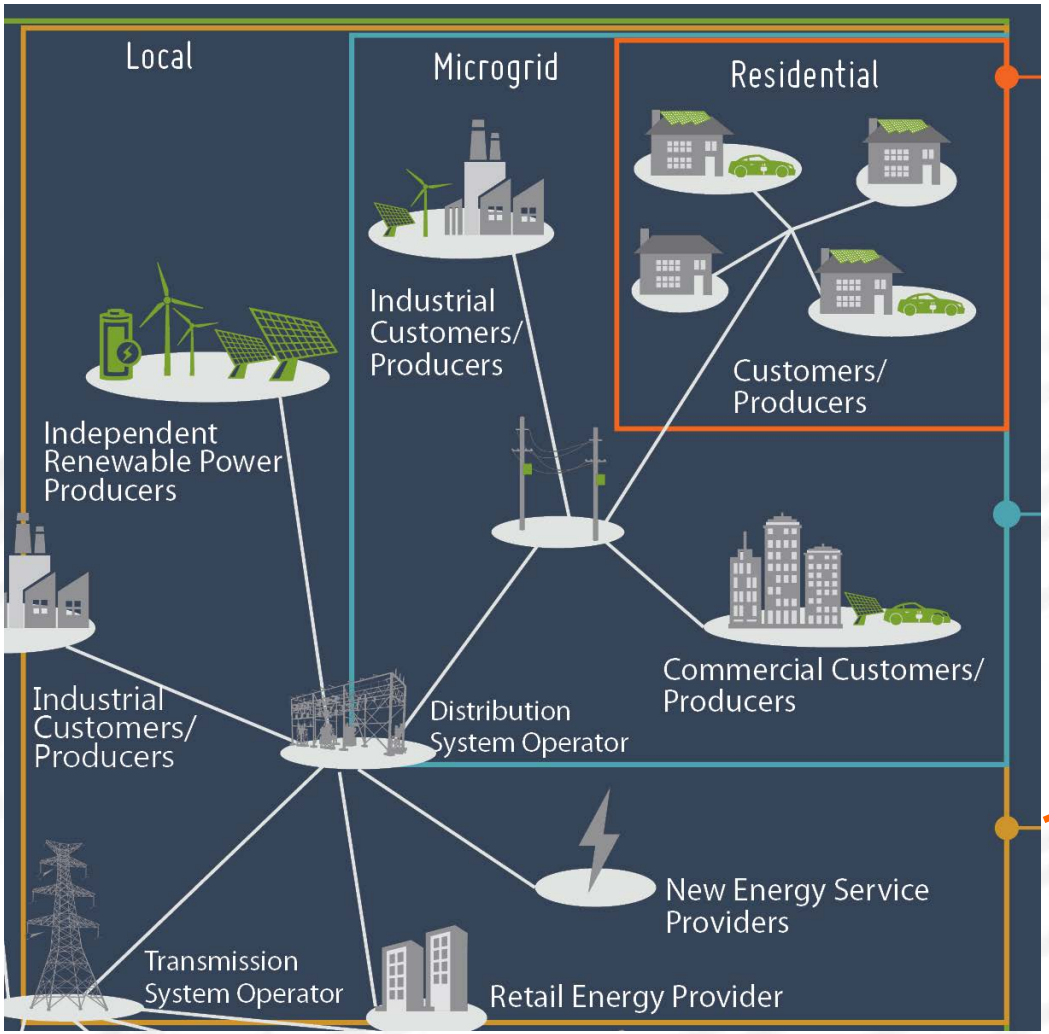
How it works



Resilient electric networks

Advanced automation and control–from substations and wires to homes, buildings, cars, and appliances–allow flexible microgrids that enhance local and regional resilience

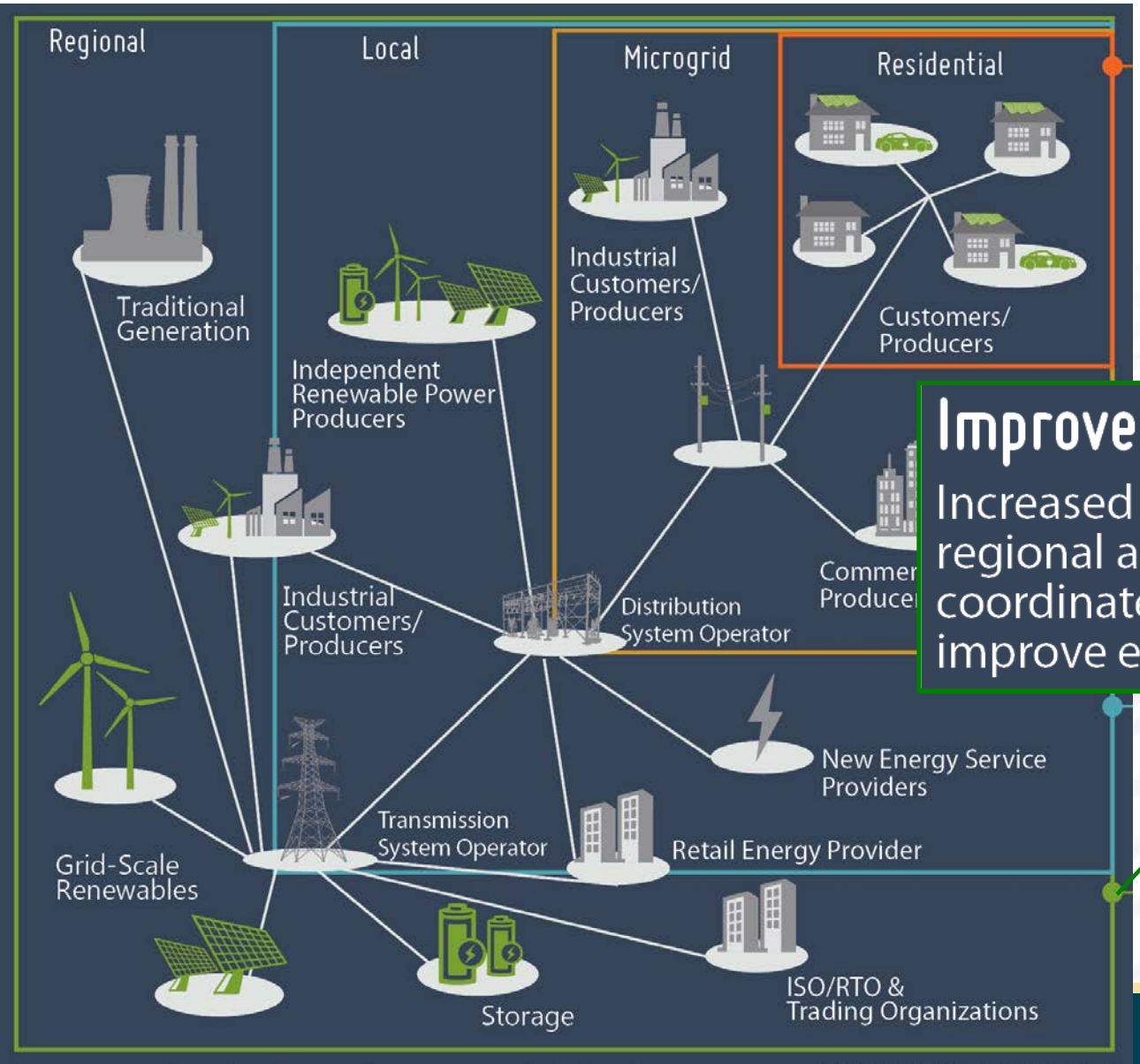
How it works



Expanded services

New and wider data exchange unlocks opportunities for new services to customers

How it works



Improved regional integration

Increased interoperability between regional and local markets coordinates energy resource use to improve efficiency and reliability

The benefit

Reliability

Integrates smart control and automation to manage renewables and balance local energy requirements without disruption

Affordability

Customers can choose to buy and sell energy using price information to best manage cost and priorities

Sustainability

Permits incremental grid modernization with secure, interoperable technologies while integrating renewable resources

Efficiency

Economic signals for conventional and distributed energy encourage the most reliable, energy-efficient production and delivery of electricity

The benefit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Sustainability
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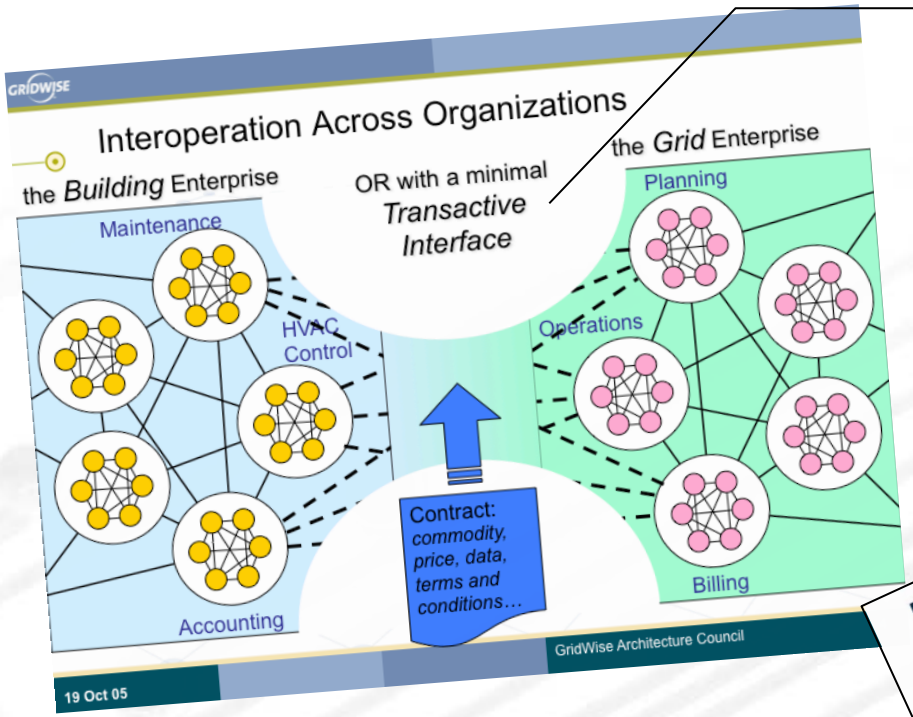
In conclusion



Transactive energy has been a driver for GWAC's efforts from inception

GWAC has been working to build a transactive energy community

Next steps

Update and expand TE Framework

Continued outreach to regulators and policy makers

Continue to build the community