

## **Opus One Solutions**





# Distribution-Level Energy Markets

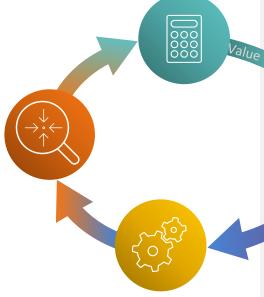
### **Evolving Utility-Customer Relationship**

#### Grid/DER Valuation

DER locational and temporal valuation and price generation (if required), based on emerging economic/regulator models

Visibility, Control, Optimization

Power flow results on every node across the distribution network, dynamic hosting capacity, optimal power flow controls



#### **Grid Investments & Operations**

Utilities modernize grid investment planning and operations given the added value from DERs

## TRANSACTIVE ENERGY

"A system of
economic and control
mechanisms that
allows the dynamic
balance of supply and
demand
across the entire
electrical
infrastructure
using value as a key
operational
parameter."

GridWise Architecture
Council

#### Customer Value-Add to Grid

Engaged customers are incented to align operations to the benefit of the greater grid



#### **Customer Engagement**

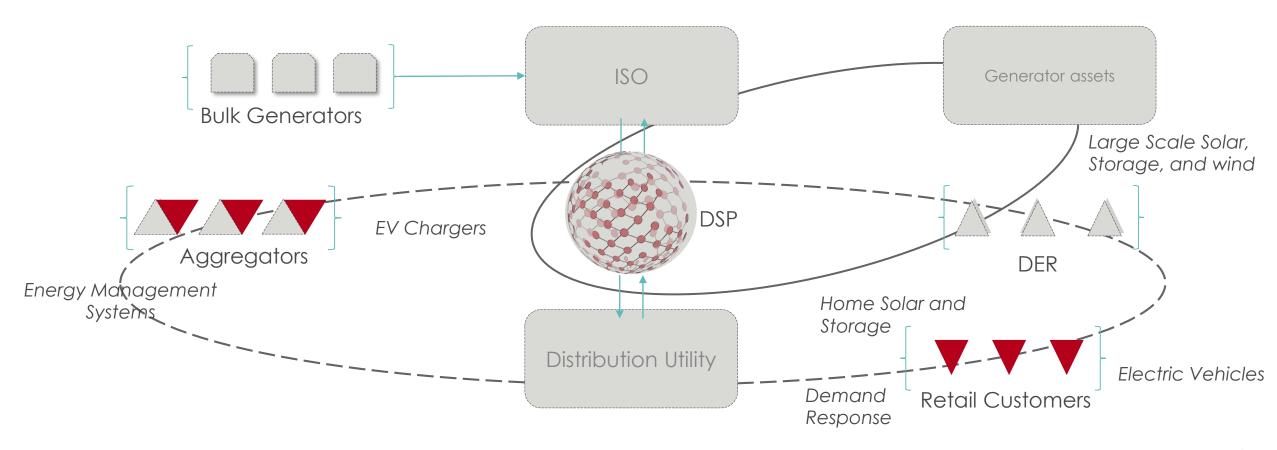
Empowered customers can transact value with each other, enabled by the utility with the grid as a platform

#### **New Platform Business Models**

DER/energy efficiency values enable *integrated*energy/service markets and win-win business models
between utilities and empowered customers

## Tying it together: The Distributed System Platform

A Distributed System Platform (**DSP**) may emerge as the entity to manage the energy services the various DER in the utility's service territories may provide and communicates schedules and prices between DER, Distribution System Utility, and Transmission System Operator (ISO).



## Transforming Energy Retail

#### **Status Quo**

 Energy retailers serve load by purchasing through bulk systems and contracting with some DER

#### Market Change

- DER have increased in prevalence, but current markets do not adequately consider their ability to provide services
- Result:
  - Higher rates than necessary
  - Lower DER penetration than possible

- DER installations 'right-sized' to native loads
- Rate structures differing by asset rather than service
- Demand Response tied to total system rather than local constraints
- Assets utilized based on grid-safety heuristics

#### Status Quo

#### **Technological Solution**

- GridOS-Transactive Energy Management Systems (GridOS-TEMS) creates a single price and schedule per service per interval at the distribution level
  - Non-discriminatory participation by each DER based on the services it provides to the network
  - One system-generated price per service, per location, per interval, rather than a complex web of programs operated separately
    - DER 'right-sized' to distribution system specific needs
    - Time- and location- specific rates tied to service rather than asset
    - DER providing services based on as-operated market needs
    - Assets utilized based on real-time calculations of system and asset capabilities

**New Market Possibilities**