MAKING VIRTUAL POWER PLANTS A REALITY: CULTURE, REGULATION, & ECONOMICS

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VIRTUAL POWER PLANTS
CONCEPT AND EXAMPLES

Concept
Intelligent aggregation and optimization of DER can provide the same essential services as a traditional 24/7 centralized power plant.

Definition
A system that relies upon software and a smart grid to remotely and automatically dispatch retail DER services to a distribution or wholesale market via an aggregation and optimization platform.

VPP Market Segments

- **Demand Response (DR) VPPs**
  - Smart thermostats
  - C&I curtailment
  - Event-based pricing (CPP, PTR)

- **Supply-Side VPPs**
  - Variable renewables
  - Optimized diesel

- **Mixed-Asset VPPs**
  - Combinations of...
    - Generation
    - Load
    - Storage

Source: Navigant Research, *Market Data: Virtual Power Plants, Q2 2019*
MAKING VPPs A REALITY
THE THREE PILLARS

Are utility staff ready to embrace and procure VPPs

Does culture present an impediment to adoption?

Can utilities own customer-sited assets?

Do regulations allow utilities to be compensated for VPP investment and orchestration?

Do market mechanisms compensate customers for the full value of their DERs?

What cost and benefits streams (to whom) do we count?

What metric do we use for determining cost-effectiveness?
MAKING VPPs A REALITY

THE THREE PILLARS

Culture

Are utility staff ready to embrace VPPs, or does culture present an impediment to adoption?

Planning & Operations’ treatment of DERs drives the value of VPPs

Regulation

Can utilities own customer-sited assets?

What cost and benefits streams (to whom) do we count?

Do regulations allow utilities to be compensated for VPP investment and orchestration?

What metric do we use for determining cost-effectiveness?

Do market mechanisms compensate customers for the full value of their DERs?

VPP economics depend on regulatory treatment of DERs

Economics
LOOKING FORWARD TO A FUTURE OF VPPs

VPP Capacity Share by Type (Global)

- Supply-Side: 36%
- Mixed Asset: 24%
- Demand Response: 40%

Total VPP Capacity and Implementation Spending (Global)

Source: Market Data: Virtual Power Plants, Q2 2019
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