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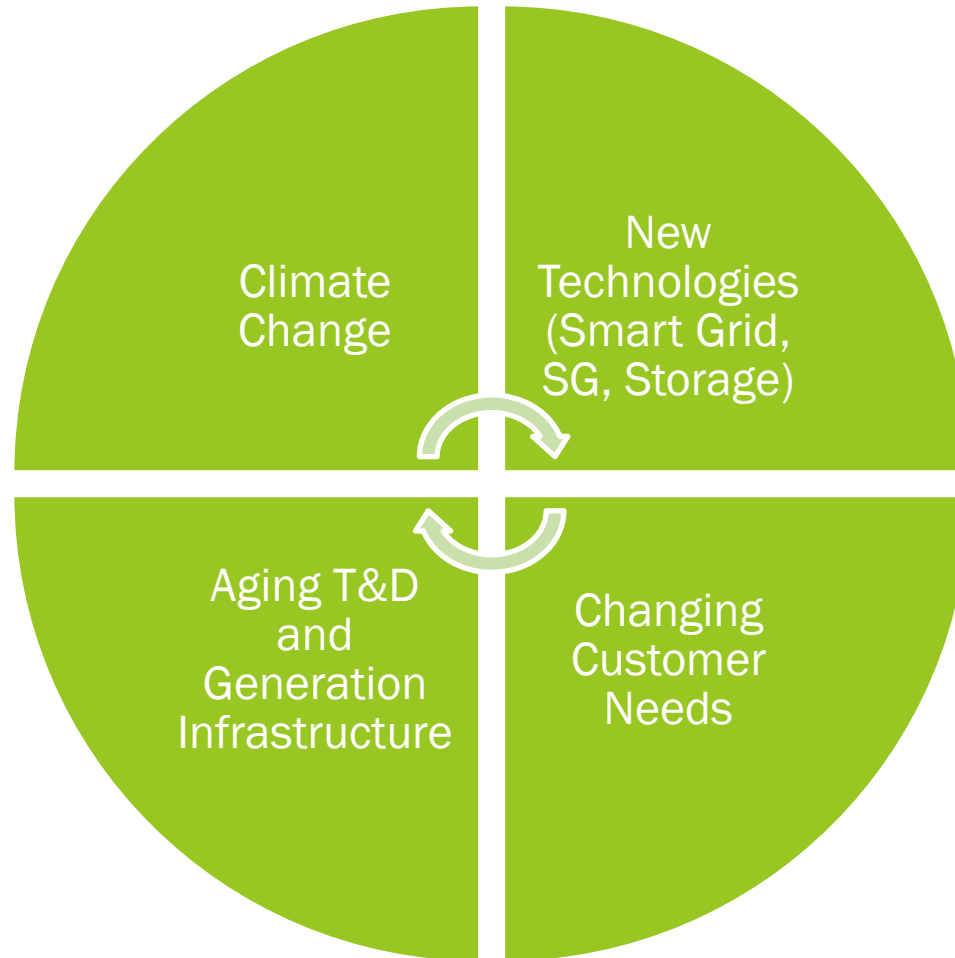
DER Integration Opportunities: NY as a Case Study

1/27/17

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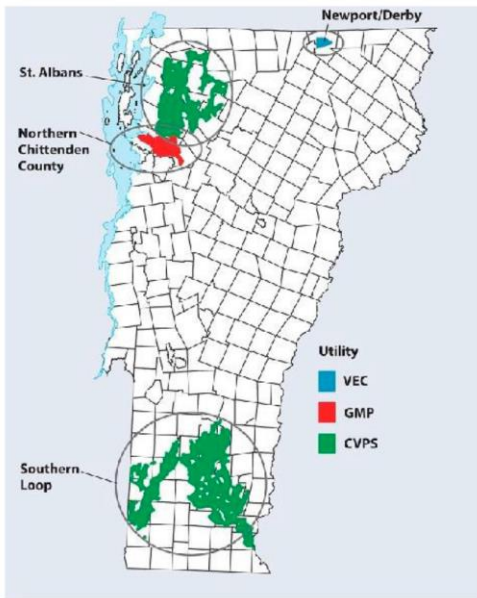
Changing Energy Landscape

New Opportunities for Distributed Energy Resources



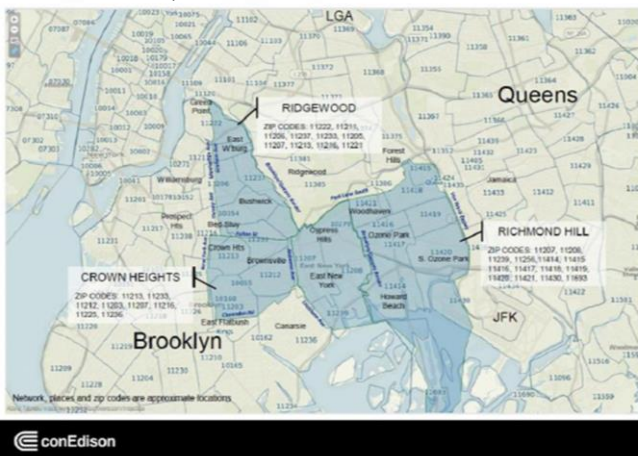
DER as Alternative to Traditional Infrastructure

Green Mountain Power

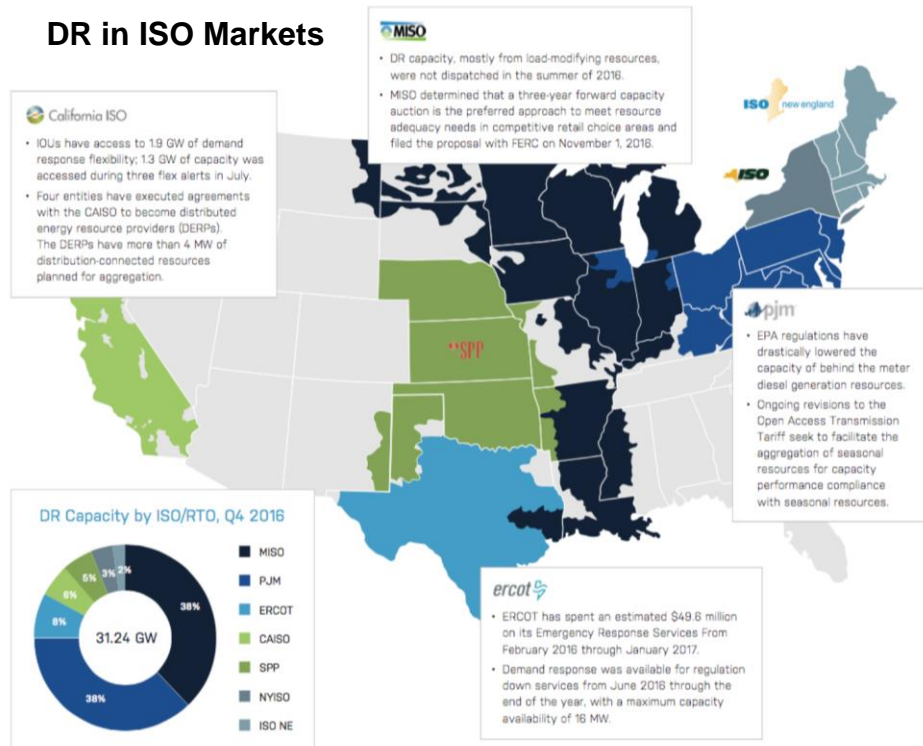


- Broad range of states and markets considering and leveraging DER as alternative for electric grid & generation
- Investments are being deferred or avoided
- Range of approaches including energy efficiency, geotargeted EE and DR, and bundling technologies

ConEd BQDM



DR in ISO Markets



Source: Energy Efficiency as a T&D Resource, NEEP, GTM Research

Valuing DER

- Discussions about value and approach occurring at state and national levels

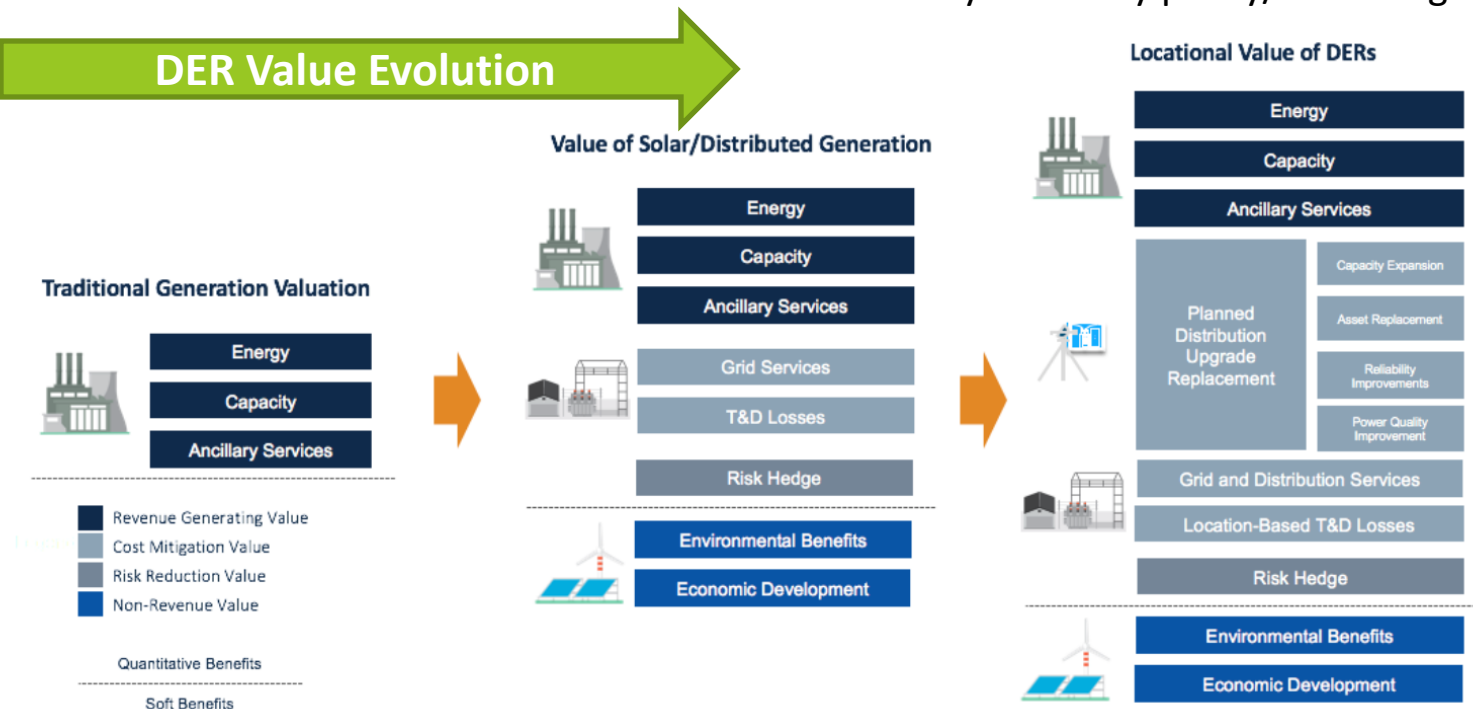
Opportunity:

- Holistic approach across value stack (generation, transmission, distribution)
- Real value in deferred or avoided investments

Considerations:

- Reliability is critical: value must reflect temporal/locational characteristics consistent with load/system need
- Comparative asset life
- Currently driven by policy/rate design

DER Value Evolution



NY Reforming the Energy Vision (REV)

- New York's REV Proceeding seeks to change the role of the regulation and the utility for the changing energy landscape
- **New Utility Model:** serve as a Distribution System Platform (DSP) to support market evolution
 - Increase DER penetration
 - Market animation
 - Support informed and empowered customers
 - Deliver safe, reliable and cost effective energy service
- **New Regulatory Model**
 - minimize regulatory barriers to increase DER penetration
 - support evolving market
 - provide incentives opportunities for utilities to transition to new model
 - ensure consumers are protected and receive safe, reliable, cost effective energy service

REV GOALS



Making energy more affordable for all New Yorkers



Building a more resilient energy system



Empowering New Yorkers to make more informed energy choices



Creating new jobs and business opportunities



Improving our existing initiatives and infrastructure



Supporting cleaner transportation



Cutting greenhouse gas emissions 80% by 2050



Protecting New York's natural resources



Helping clean energy innovation grow



NY REV: Mechanisms to Support Increased DER Integration

- Tools/Models
 - Interconnection portals
 - System heat maps for best interconnection locations
 - DER forecasting tools
 - New distribution system planning models including DER as an option
- Incentives
 - Value of DER/benefit cost analysis
 - Earning Incentive Mechanisms to support carbon reduction and DER penetration
- Standards
 - Update interconnection standards and process
 - Increase interconnects to include 5 MW on the distribution system
- Grid Modernization Investments
 - Increased sensors (monitoring, controls) and system monitoring (DERMs, ADMS)
 - Smart Meters



NY REV DER Integration

▪ Brooklyn Queens Demand Management (BQDM) Project

- \$1B substation upgrade required due to load growth; limited/\$ real estate
- \$200M in DER
- 52 MW of load reduction by 2018
- Mix of resources – DR, EE, storage and DG
- Defer upgrade from 2019 - 2026

▪ Non-Wires Alternatives (NWAs)

- 13 NWAs have been proposed by the 6 utilities in NY
- Target circuits with load growth and upgrades required within 5 year horizon
- First RFPs issued; leverage learning to inform the process going forward
- Expect a mix of DERs to address system needs
- Expectation: incorporate learnings and approach into distribution system planning going forward



NY REV: Demo New Tools for Increased DER

REV demonstration projects provide opportunity to test new tools and models for DER integration

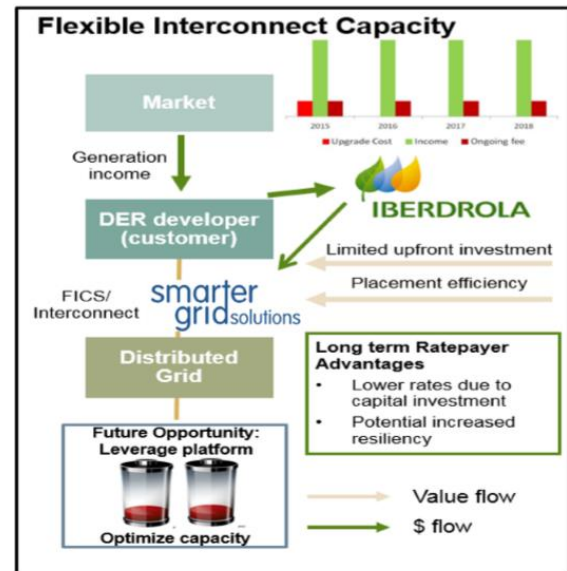
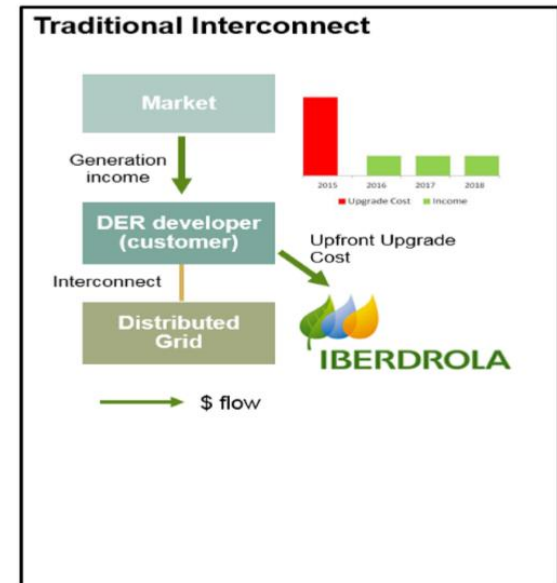
Flexible Interconnect Capacity Demonstration

Problem:

- Significant increase in large scale (2MW) solar PV interconnection requests on rural circuits
- PV exceeded permissible interconnection capacity
- Upgrade requirements made the project cost prohibitive

Solution:

- Reinvent interconnection application process with improved modeling tools
- Provide alternative interconnection agreements and approach for interconnection
- Goal: faster interconnection at 95% of the upgrade costs



Challenges

- Models are immature:
 - distribution system planning models
 - long term DER resource models
 - DER forecasting
- Alignment of value across DER providers and utilities
- Managing reliability: matching DERs with load and system requirements in the right place at the right time
- Smart Grid infrastructure to support monitoring and controls for more complex distribution system management



Opportunities

- Strong momentum and broad interest in DER integration
- Recognition of DER as a distribution system tool
- Focused effort on developing a holistic Value of DER
- Technology to support bundling DER
- Strong foundations of learnings in NY and California
- US Department of Energy funding opportunities to support tools and technology for increased DER integration





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Modern Grid Partners is a consulting firm that provides business and technology expertise to our customer's operations, projects, and future goals.

We focus on increased operational performance and enhanced reliability by employing smart grid solutions. Our team members have supported customers around North America in bringing their visions to reality.

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