

**NYS**

SmartGrid  
Consortium

# **TE Challenge Interim Meeting**

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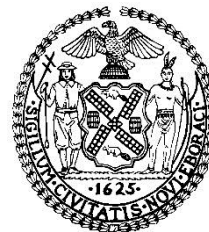
**New York State Smart Grid Consortium**

**December 3, 2015**





# Consortium Overview



ADVANCED ENERGY  
RESEARCH AND TECHNOLOGY CENTER



Stony Brook University



# Consortium Mission

## Forum for Advancing Grid Modernization in NY State

- ✱ Maintain vision of future grid
- ✱ Advocate benefits for producers, suppliers, and consumers
- ✱ Support initiatives that demonstrate capabilities of advanced grid technologies
- ✱ Provide technical resources for industry and policy makers
- ✱ Priorities for 2015
  - Facilitate real world projects - microgrid demonstrations
  - Strengthen research and international collaboration
  - Utility of the Future (REV)

# Reforming the Energy Vision (REV)

## Proceeding Considering

- ✱ Fundamental changes in distribution service
- ✱ Aligning utility practices and regulation with technological advances in information management, pricing, power generation and distribution
- ✱ Improve system efficiency, empower customer choice, and encourage greater penetration of clean generation and energy efficient technologies and practices. Must be customer centric!
- ✱ New business models (reduce risk, new capital)

# Distribution System Platform

## Key Functions of the DSP

- ✱ Design and operate distribution system that integrates DERs as major means of meeting system and customer needs
- ✱ Optimize operations by balancing production and load in real time – at the local level
- ✱ Monetize system & social values
- ✱ Use market based means where appropriate, leverage outside capital
- ✱ Coordinate interactions among customers, the distribution system and energy service companies (DSP markets and NYISO)



# REV Market Design & Platform Technology Groups (MDPT)

## Purpose

Provide guidance for utility 5 year Distributed System Implementation Plans (DSIPs) on near- and mid-term market design and platform technology issues

## Process

- Two working groups: Market Design and Platform Technology
- Final Report issued August 17, 2015
- Expert Advisory Group
- Co-led by NYS Smart Grid Consortium, NYPSC and RMI

# MDPT Participating Organizations

AES
Alstom Grid
Association for Energy Affordability Inc.
Brattle
Brookhaven National Lab
Buffalo Niagara Medical Campus
CAISO
Central Hudson
City of New York
Con Ed
Direct Energy
DOE
Energy Spectrum
EPRI
Georgia Tech
Google
Green Charge Networks
Iberdrola
IBM
Innovation and Technology Inc.
IPPNY
Landis & Gyr
LBNL

National Grid
Newport Group
NRDC
NREL
NRG
NY BEST
NYISO
NYP&A
NYSEG / RGE
NYSERDA
Pace University
Pacific Northwest National Laboratory
PSEG LI
RAP
Related Co.
RESA (Con Ed Solutions)
Siemens
Silver Spring
Smarter Grid Solutions
Solar City
Spirae
Stoel Rives LLC
SunPower





# DSP Market Design: Essential Characteristics

- ✱ Establish DSP Structure within utilities that optimizes distribution system operations, improves reliability, and enhances affordability through improved integration of DER
- ✱ Utilize competitive distribution markets to procure and compensate DER for value of services provided
- ✱ Initial DSP markets focused on DER to offset or defer distribution infrastructure investments and to address reliability and operational needs (initially RFPs/auctions)
- ✱ Complement and not replicate existing NYISO wholesale markets



# DSP Market Design: Essential Characteristics (cont'd)

- ✱ Forecast granular locational benefits and costs of DER within a long term planning context- Create a locational and temporal based distribution system “adder.”
- ✱ Basic market design and interactions uniform across DSPs, but value of products based on specific location and time
- ✱ Evolve the markets over time based on sophistication of participant capabilities and infrastructure capabilities.
- ✱ Customer experience enhanced through new technological approaches and innovative competitive offerings (e.g. digital marketplace, automated demand response).



# DSP Platform Technology: Essential Characteristics

- ✱ Improved system/DER/load visibility for real time network monitoring/balancing
- ✱ Pervasive use of system intelligence to enable automate grid operations and dynamic load management
- ✱ Improved integration of utility and NYISO planning and operations
- ✱ Strategic implementation of AMI where determined appropriate
- ✱ Communications and data management infrastructure in place to support overall market and operational requirements
- ✱ Cyber secure

# MDTP Status and Next Steps

**Report filed August 17, 2015 with NYS DPS**

- ✱ Inform guidelines for utility DSIP filings

## **Further work recommended**

- ✱ Planning methods and processes, simulation tools
- ✱ Data availability to customers and DER providers
- ✱ AMI
- ✱ Demo projects/REV Connect



# Distributed System Implementation Plan (DSIP) Guidance

## Overview

- ✱ Filed October 15, 2015
- ✱ Review and comment period ends December 7, 2015
- ✱ Reply comments due December 21, 2015.
- ✱ Two-phased approach to DSIPs:
  - Initial filing of utility 5-year plan – June 2016
  - Subsequent DSIP filing every 2 years – September 2016

## DSIP Guidance (cont'd)

### Initial DSIP filing

- ✱ Self-assessment of utility systems and capabilities
- ✱ Immediate actions to achieve REV policies and goals

### Supplemental DSIP

- ✱ To be filed jointly by utilities – work together
- ✱ Specify tools, process, and protocols:
  - Developed jointly or under shared standards
  - Dynamically manage DER
  - Support retail markets that facilitate DER investment
  - Efficiently manage resources

# White Paper on Ratemaking and Utility Business Models

### ★ Objectives

- Describe limitations in current ratemaking practices
- Describe direction of comprehensive ratemaking and business model reforms
- Make recommendations for near-term reforms

★ Filed July 28, 2015

★ Comments October 26, 2015

★ Reply Comments November 23, 2015



# Distribution System Operator (DSO) Simulation Studio –November, 2015

## Introduction

- ✱ \$3 million award from Advanced Research Projects Agency-Energy (ARPA-E)
- ✱ Develop software tool to simulate DSO physical and market operations
- ✱ Team: Prosumer Grid, the New York State Smart Grid Consortium, Southern California Edison, NRECA, and Georgia Tech Research Corporation



# DSO Simulation Studio

## Simulation Studio Objectives

- ✱ Users: electricity industry analysts, engineers, economists, and policy makers
- ✱ Simulate, demonstrate, and present DSO design propositions
- ✱ Ensure correctness and reduce risks in upcoming regulatory decisions

# DSO Simulation Studio

## Simulation Capabilities

- ✱ Decentralized energy scheduling of DER-rich systems
- ✱ Modeling of DER services transacted in the DSO market
- ✱ Locational and time sensitive pricing of power, ancillary, and security services
- ✱ Analysis and valuation of DER services, DSO rules and utility business models
- ✱ Simulation of DSO interactions with upstream ISO, same level DSOs, and downstream subsystems (e.g. prosumers, microgrids)
- ✱ Web based, with interactive visualization



Source: ProsumerGrid

## Role of Consortium

- ✱ Establish and facilitate working group of New York stakeholders
- ✱ Identify existing distribution grid modeling tools, approaches and capabilities/ DSP objectives under REV
- ✱ Provide NY input regarding needs, features and capabilities for simulator
- ✱ Coordinate beta testing of the simulator using NY case studies

# DSO Simulation Studio

## Desired Impact of Simulation Studio

- ✱ Quantum leap in the industry's ability to simulate and manage the complexity of emerging distribution grids.
- ✱ Support decisions of great criticality and impact, as various states move to the formation of DSO/DSPs in the quest to realize a highly distributed, reliable, optimized, and sustainable electricity industry.



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