

NYS

SmartGrid
Consortium

National Summit on Smart Grid and Climate Change: NY's Reforming the Energy Vision (REV)

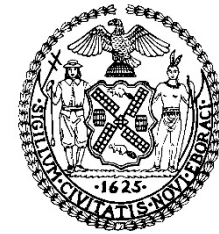
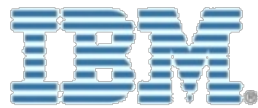
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Consortium Overview





Consortium Mission

Ongoing advocacy of Smart Grid / grid modernization

- ✱ Maintain vision of future grid
- ✱ Advocate benefits for producers, suppliers, and consumers of power
- ✱ Support initiatives that demonstrate capabilities of the smart grid
- ✱ Educate public, regulators, and policy makers
- ✱ Priorities for 2014/2015
 - Real world projects - - Multiple microgrid demonstrations
 - Utility of the Future (REV)
 - Strengthen research and international collaboration

Drivers of Change in NY

- ✿ Aging utility infrastructure, massive investment requirements
- ✿ Increasingly devastating storms and less tolerance of outages
- ✿ Changing consumer expectations and demands, especially for innovative third party services and understanding their energy use and bills
- ✿ Movement towards less centralized power system
 - Integration of distributed resources on distribution networks
 - Greater visibility into and automatic control of distribution networks
 - Physical and Cyber Security

Drivers of Change (cont'd)

- ✿ Consumer technologies increasingly grid connected
- ✿ Rapidly increasing interest in Microgrids
- ✿ Recognition that regulated utility business models need added flexibility to encourage new technologies and innovative services
- ✿ Change in State Leadership on Energy Issues
- ✿ Growing impatience for change



NY's Reforming the Energy Vision (REV)

Proceeding Considering

- ✿ Fundamental changes in ways utilities provide distribution service
- ✿ Aligning electric utility practices and regulation with technological advances in information management, pricing, power generation and distribution
- ✿ Improving system efficiency, empowering customer choice, and encouraging greater penetration of clean generation and energy efficient technologies and practices



The Distribution System Platform

An intelligent network platform that will provide safe, reliable and efficient electric services by integrating diverse resources to meet customers' and society's evolving needs.

Key Functions of the DSP

- Designs and operates distribution system that integrates DERs as primary means of meeting system needs
- Plan for and accommodate new distributed generation and demand response
- Balance production and load in real time
- Monetize system & social values
- Coordinate interactions among customers, the distribution system and energy services companies (DSP markets and NYISO)

Source: Rocky Mountain Institute



REV – Process

Two Tracks Proceeding in Parallel

Track 1 – Distribution System Platform (DSP) Model

Consider changes necessary for DSPs to actively manage and coordinate distributed energy resources (DER), and provide vibrant market for third party energy services

- ✿ July 22, 2014 PSC Staff Straw Proposal
- ✿ NYS Smart Grid Consortium proposes to develop collaborative process on DSP business and technical architecture
- ✿ Jan: Track 1 Order Expected

REV – Process (cont'd)

Track 2: Regulatory and Ratemaking Reforms

To accommodate DSP business model that promote energy efficiency, renewable energy, least cost energy supply, fuel diversity, system adequacy and reliability, demand elasticity, and customer empowerment

- ✱ Jan 31: Track 2 Straw Proposal to be Released
- ✱ Early 2015: On-going market rules and technology platform design processes established and launched
- ✱ April/May: Track 2 Order Expected



Highlights on the REV Straw Proposal

- Coordination of DER via markets operated through a DSP is achievable and will benefit consumers
- Customers and vendors should have access to system information, to make transparent and readily available the economic value of time and location-variable usage
- Technology to support the DSP function is already available
- DSP function should initially be served by existing utilities, subject to performance reviews
- Stakeholder process needed for market design, Business and Technical architecture and standards and protocols



DPS Business & Technical Architecture – Consortium Proposed Process

Market Design & Business Architecture

Functions and capabilities required to establish competitive distribution markets, and carry out DSP role, including:

- ✱ Interactions with Dist. Energy Resource Providers
- ✱ Transaction management and settlement functions
- ✱ Financial management and billing
- ✱ Market information and participant interfaces
- ✱ Market rules and procedures
- ✱ Meter data management



DSP Business & Technical Architecture – (cont'd)

Functional and Technical Architecture

Functional Architecture. Identify interactions among market participants:

- Flow of information, energy and dollars
- Identify interfaces needing Standards & Protocols

Technical/Application Architecture. Technologies and applications to support business capabilities.

- Adopt appropriate communications systems to ensure interoperability
- Complete assessment of technology availability and mapping policy to technology



New York Grid Transformation

PSC staff identified “near-term, no regrets” actions to be immediately implemented” by utilities.

What portion of NYS’s \$30 billion in planned transmission and distribution system upgrades over next decade might be deferred?

e.g.

- Con Ed seeking to invest in customer load management and grid upgrades to defer \$1 billion in substation investment.
- Central Hudson Gas & Electric filed a \$46 million plan with the PSC that includes community solar, demand response and a “Microgrid as a Service” program.



Microgrids: Microcosm of Future Utility

Demonstrate

- ✿ New technologies - both demand and supply side
- ✿ New utility business and regulatory models
- ✿ New planning approaches
- ✿ How customers and communities can become engaged
- ✿ Showcase potential end states
- ✿ Expose issues and barriers that need to be addressed

FORTUNE

AMERICA'S BIGGEST REAL ESTATE PROJECT ...EVER

2013 FASTEST-
GROWING
COMPANIES

5 YEARS
AFTER THE
MELTDOWN
What Does Treasury
Secretary Jack Lew Want?
BY TORY NEWMYER

BY SHAWN TULLY



MANHATTAN'S
\$20 BILLION
HUDSON YARDS
PROJECT
NOW UNDER
CONSTRUCTION



50 HY

30 HY

10 HY

15 HY

35 HY

55 HY

RETAIL

CULTURE
SHED

PUBLIC
SQUARE

NO. 7
SUBWAY

HUDSON PARK
& BLVD.

NYS

SmartGrid Consortium

HUDSON
YARDS

TOMORROW'S CITY TODAY

Hudson Yards will be far more than a collection of tall towers and open spaces. It will be a model for the 21st century urban experience, an unprecedented integration of buildings, streets, parks, utilities and public spaces that will combine to form the most connected, clean, reliable, efficient and responsive neighborhood ever.

CONNECTED NEIGHBORHOOD

Communications will be supported by a future-proofed fiber loop, designed to optimize data speed and service continuity for rooftop communications, as well as mobile, cellular and two-way radio communications. This will allow continuous access via wired and wireless broadband performance from any device at any on-site location.

- Rooftop satellite
- Digital antennae service (DAS) for cellular and two-way radio
- Wireless responders

CLEAN NEIGHBORHOOD

The waste-management systems are designed to keep garbage out of sight. A vacuum-tube system that will accommodate three waste streams (organics, recyclables and trash) will send retail and residential waste straight from chutes on each floor to a central terminal—eliminating piles of garbage on sidewalks and considerable trash hauler traffic. Meanwhile, food-service organic waste will be converted to dry fertilizer at 10% of its initial weight and size.

- Three-stream (organic/recyclable/landfill) waste-vacuum system
- Organic-waste disposal system

RELIABLE NEIGHBORHOOD

Whatever the disruption—super storm, brown out—Hudson Yards will have the onsite power-generation capacity to keep basic building services, residences and restaurants running. It doesn't hurt that being built above a rail yard means our first level is well above the flood plain.

- 13.2 megawatts of co-gen
- 15 megawatts of Tier 4 diesel generators
- Accommodation for supplemental, tenant-owned generation

EFFICIENT NEIGHBORHOOD

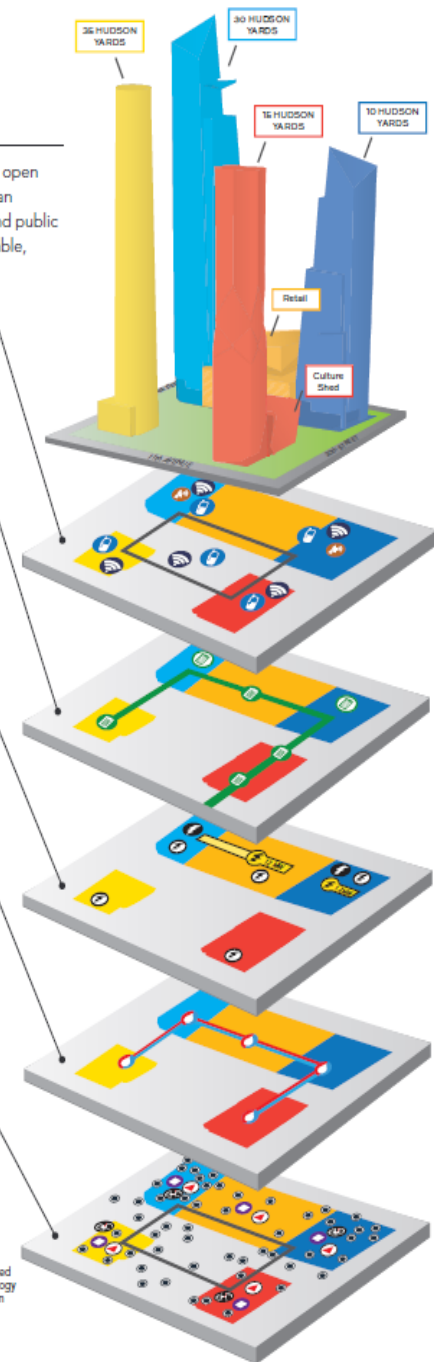
Buildings at Hudson Yards are connected through a micro grid allowing them to be heated and cooled with their own equipment, or that of their neighbor. If on a Sunday, air conditioning is needed for just a few occupants in an office building, it can come from the already-active retail center rather than powering-up the entire commercial tower's cooling plant. And data from an energy management system will be used to generate, buy and conserve power across the neighborhood.

- Hot-chilled water plant
- Micro-grid

RESPONSIVE NEIGHBORHOOD

Hudson Yards will harness big data to innovate, optimize, enhance and personalize the employee, resident and visitor experience. Supported by an advanced technology platform, operations managers will monitor and react to traffic patterns, air quality, power demands, temperature and pedestrian flow to create the most efficiently navigated and environmentally attuned neighborhood in New York.

- Environmental sensors (air, noise, other environmental factors)
- Electrical and thermal sub-metering
- Building data-capture sensors (systems, equipment)
- Advanced technology platform



TOMORROW'S CITY TODAY

The Related Company



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