



Integrating Public Policy Resources Into Wholesale Markets

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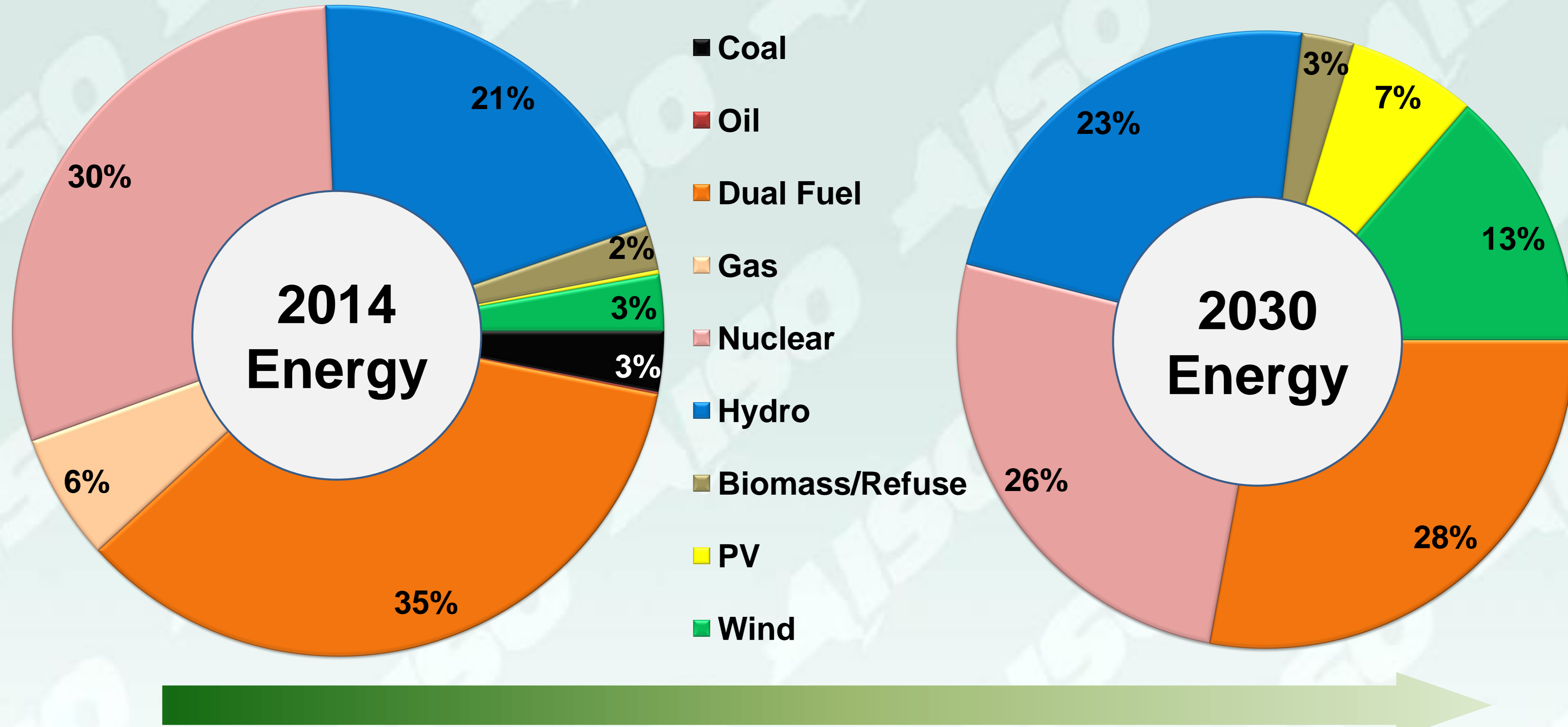
Energy Policy Roundtable

Philadelphia, PA

December 1, 2016

Policy Influence on Resource Mix

[a scenario]



NOTE: Assumes 80% of imported GWH produced by renewable resources & 0.4% load growth before 30,000 GWH EE

Emerging Trends

	CURRENT		FUTURE
PARADIGM	Centralized	➔	<i>Decentralized</i>
GENERATION	Dispatchable	➔	<i>Intermittent</i>
RENEWABLES	Expensive	➔	<i>Grid Parity</i>
GRID POWER FLOWS	One-way	➔	<i>Bi-directional</i>
CUSTOMERS	“Consumers”	➔	<i>“Prosumers”</i>
DEMAND	Inflexible	➔	<i>Price-responsive</i>

SOURCE: ECCO INTERNATIONAL, INC.

New York: In the Forefront of Addressing Climate Change

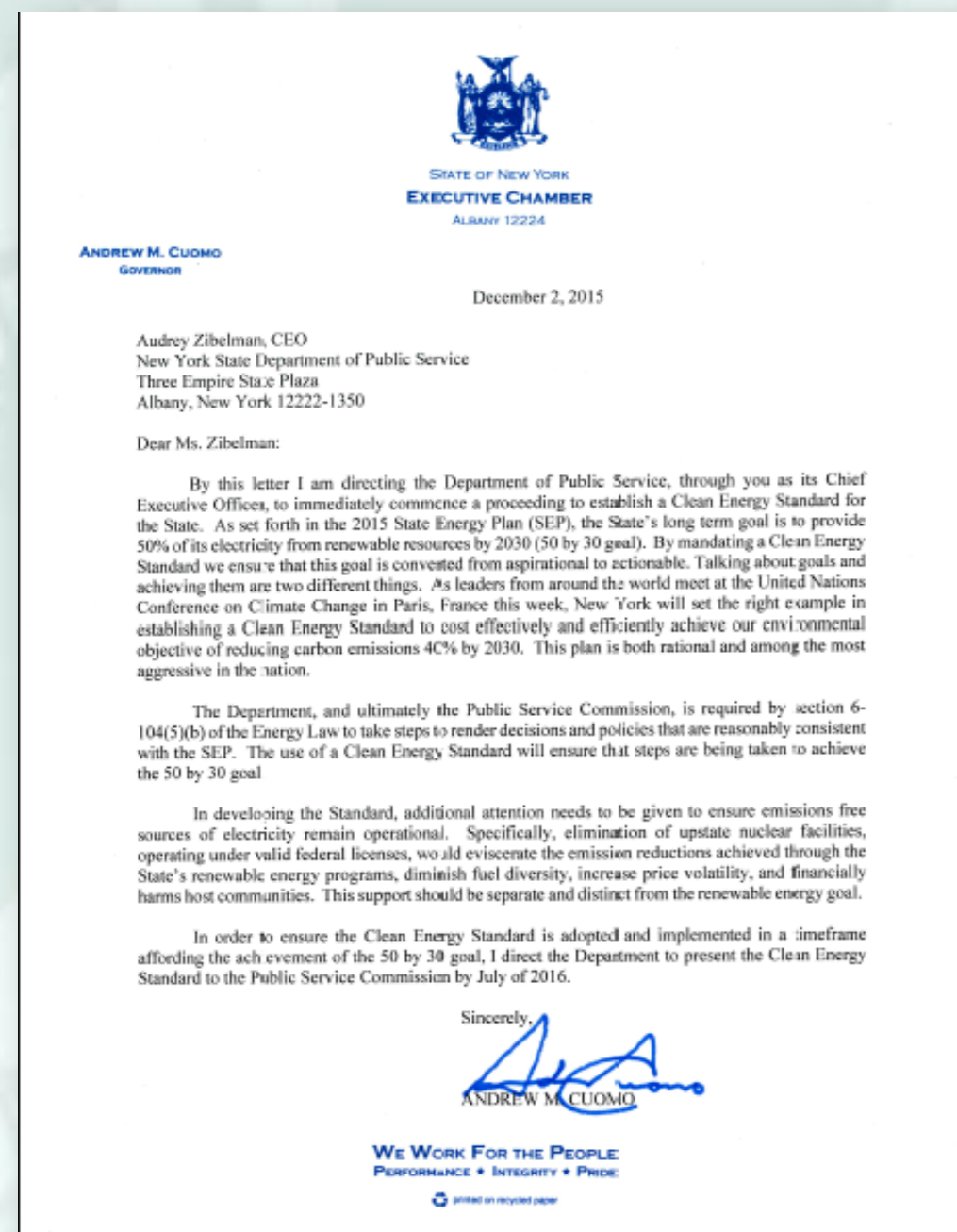
State Energy Plan

- **2015 State Energy Plan clean energy goals:**
 - **40% reduction in greenhouse gas emissions from 1990 levels by 2030**
 - **80% reduction by 2050**
 - **50% of energy generation from renewable energy sources by 2030**
 - **600 trillion BTU increase in statewide energy efficiency**



Governor's Direction on Clean Energy

- **Governor's Directive**
 - *In a Dec. 2, 2015 letter to the PSC Chair, Gov. Cuomo directed the Department of Public Service to start Clean Energy Standard (CES) proceeding*
- **CES Objectives***
 - *Increase renewable generation to achieve the 50 by 30 goal*
 - *Support construction and continued operation of renewable generation in the State*
 - *protect upstate nuclear facilities from premature closure*
 - *promote the market objectives of Reforming the Energy Vision (REV)*



* Staff White Paper on Clean Energy Standard, NYS Department of Public Service, January 25, 2016

NYPSC REV

Reforming the Energy Vision

Six Core Policy Goals

- *Customer knowledge*
- *Market animation*
- *System-wide efficiency*
- *Fuels and resource diversity*
- *System reliability and resiliency*
- *Carbon reduction*



REFORMING THE ENERGY
VISION

NYS DEPARTMENT OF PUBLIC SERVICE
STAFF REPORT AND PROPOSAL

CASE 14-M-0101
4/24/14

“This initiative will lead to regulatory changes that promote more efficient use of energy, deeper penetration of renewable energy resources such as wind and solar, wider deployment of “distributed” energy resources, such as micro grids, on-site power supplies, and storage.”

“It will also promote markets to achieve greater use of advanced energy management products to enhance demand elasticity and efficiencies.”

Integrating Public Policy Within NYISO's Market Structure: Maximizing Benefits

Clean Energy Standard

- **Implications for Transmission**
 - *Additional transmission will be necessary to avoid curtailments and deliver the renewable energy to load*
 - *Sub-transmission system investments necessary to deliver renewable energy to the bulk power system*
- **Implications for Installed Capacity**
 - *Entry of intermittent resources places upward pressure on Installed Reserve Margin (IRM)*
 - *Revenues must be sufficient to attract and retain resources needed for reliability*
- **Implications for Markets**
 - *New market products to incent ramping, quick start, load following, etc. need to be considered*

Integrating Public Policy Initiative

Project Objectives include:

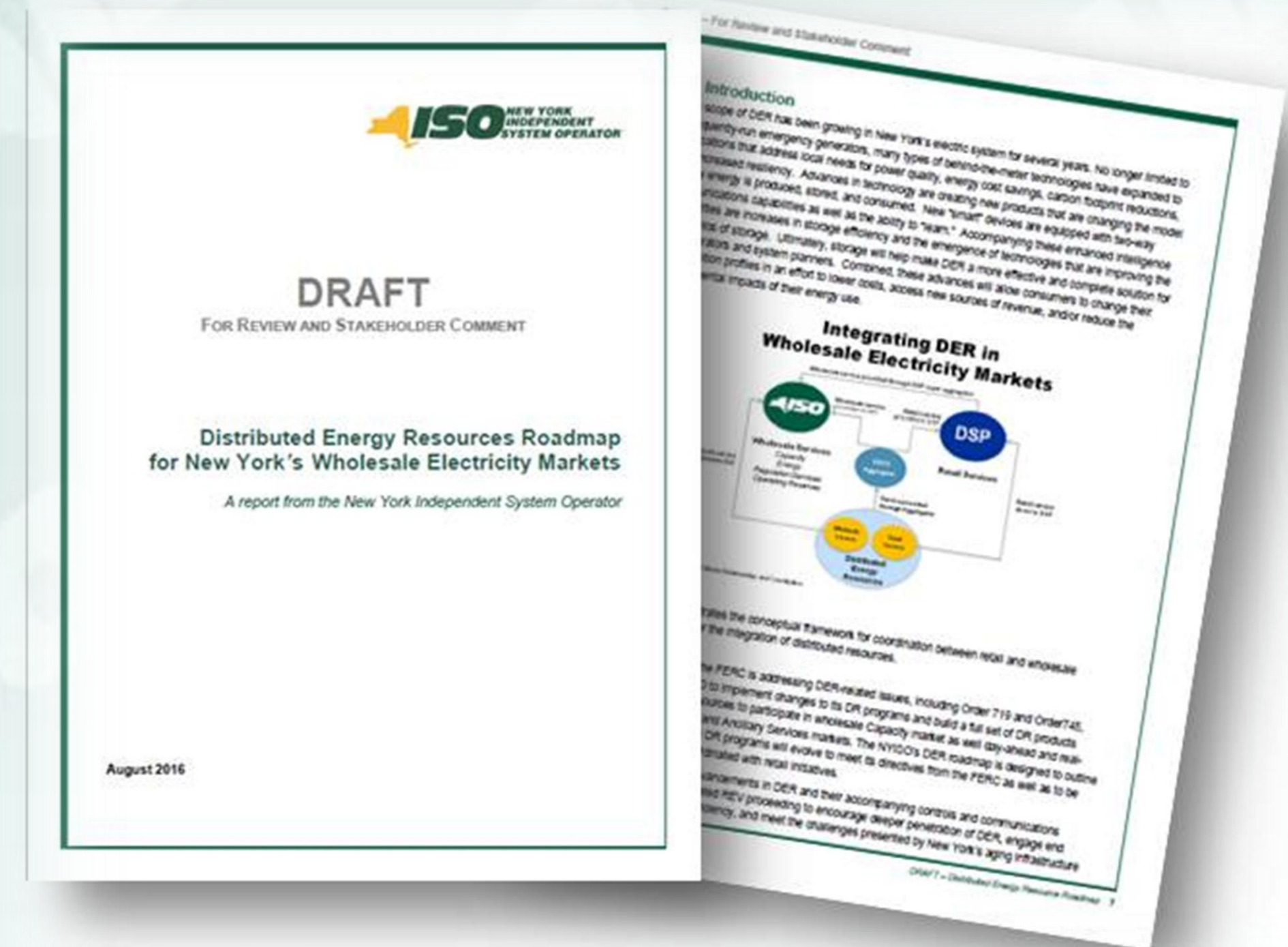
- 1. *Determining the impact of New York's decarbonization goals on the current NYISO energy and capacity markets***
- 2. *Investigating potential market designs that can fully incorporate the cost of carbon into the wholesale markets***
- 3. *Studying whether other market products or changes to the existing market structure will be necessary to meet anticipated reliability needs***

A Framework For Integrating Distributed Energy Resources (DER)

DER Roadmap

Building the Platform for Tomorrow's Grid

- The roadmap establishes the framework for integrating DER into New York's wholesale market
 - *This framework will guide the next three to five years of wholesale market development efforts for DER*

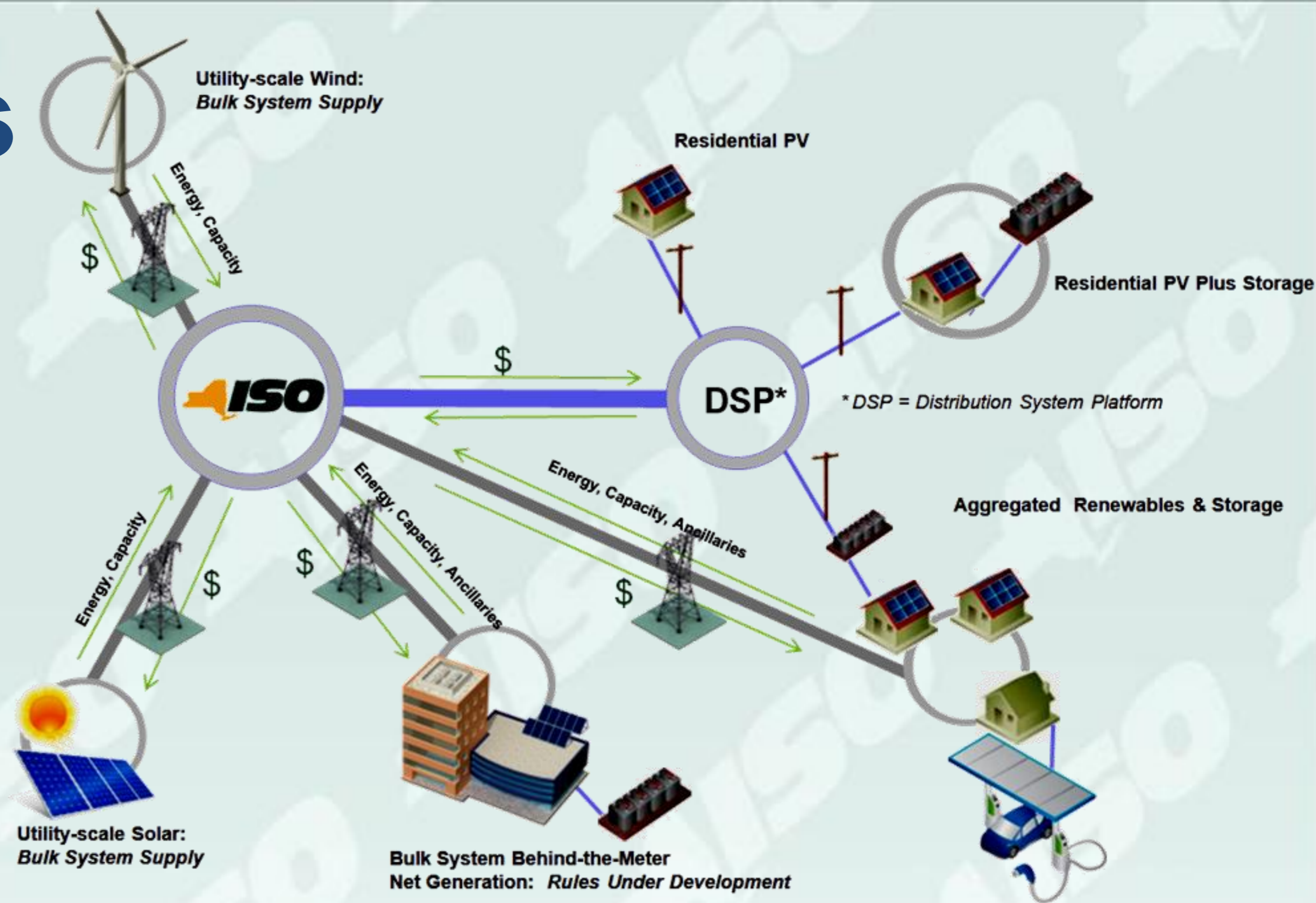


Key Objectives

- Integrate DER into energy, capacity, and ancillary services markets

- *Ability for real-time scheduling*
- *Minimize out-of-market actions*

- Align with goals of NYS REV
- Appropriate measurement and verification
- Align payments with performance
- Focus on wholesale market





The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:

- *Maintaining and enhancing regional reliability*
- *Operating open, fair and competitive wholesale electricity markets*
- *Planning the power system for the future*
- *Providing factual information to policy makers, stakeholders and investors in the power system*

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