



**NY Power
Authority**

Workforce at NYPA Digital Utility

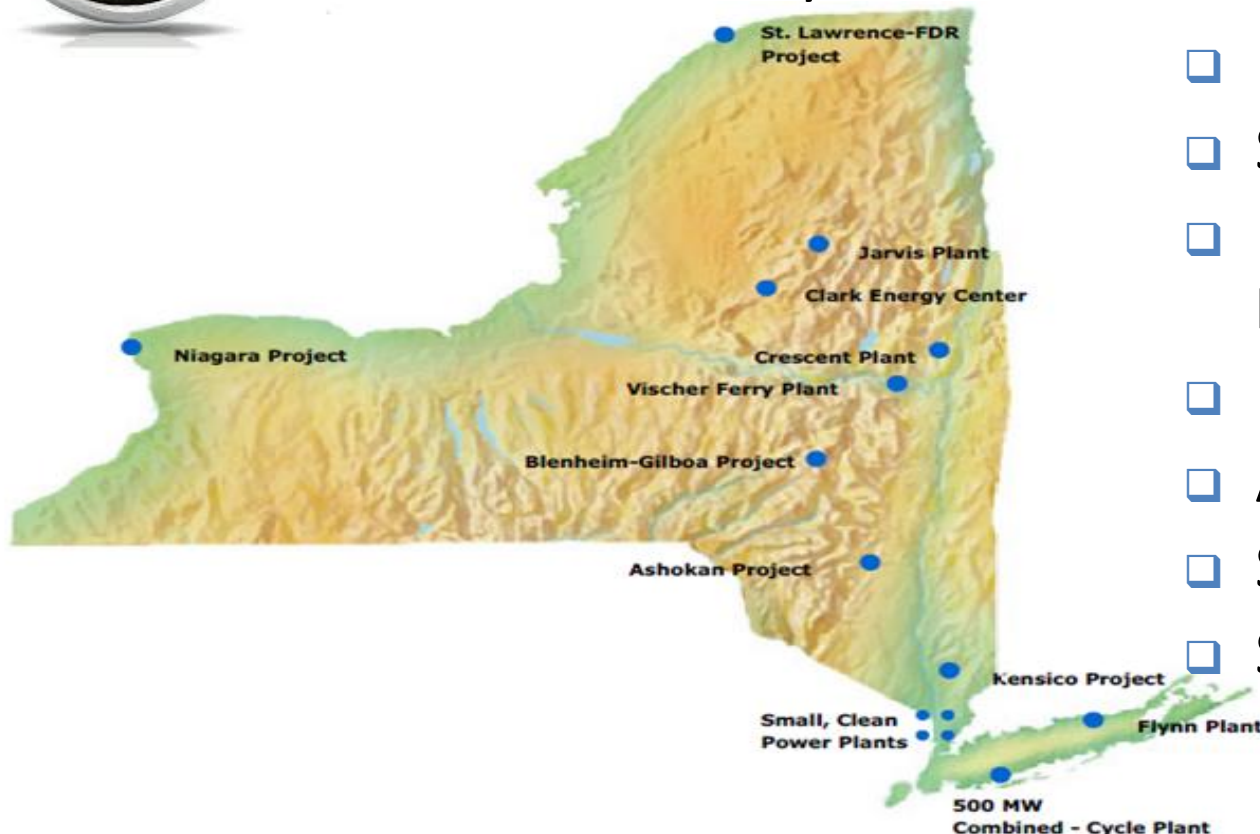
March 23, 2019

Fernando Saavedra PE, NYPA Technology & Innovation
Future of Electrical Grid Symposium
October 12, 2018, Alfred University
Alfred, NY

About NYPA – Generation Assets



- Wholesale power supplier throughout New York State and neighboring states
- Provides, with generation and power purchases, about 25% of New York State's electricity with a mix of 70% hydro and 30% gas/oil



- ❑ Niagara Power Project **2,675 MW**
- ❑ St. Lawrence Power Project **800 MW**
- ❑ Blenheim-Gilboa Pumped Storage **1,160 MW**
- ❑ Flynn Power Plant **167 MW**
- ❑ Astoria CC Plant **500 MW**
- ❑ Small Hydro Plants **83 MW**
- ❑ Small Clean Power Plants **461 MW**

About NYPA – Transmission Assets

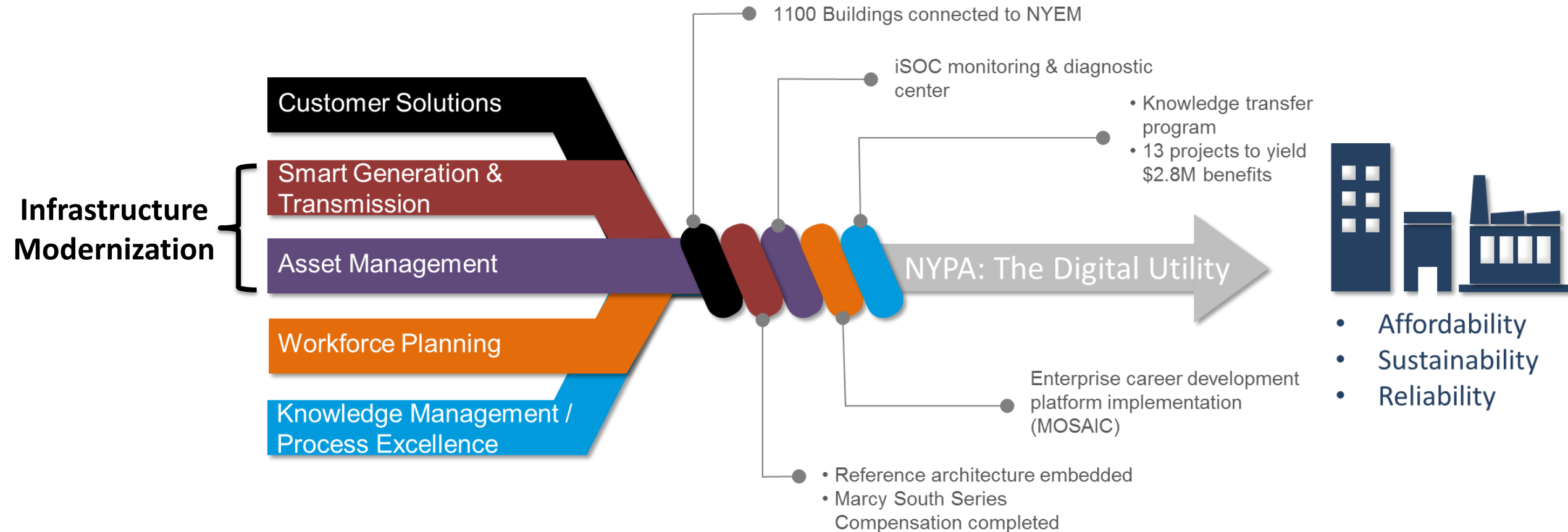


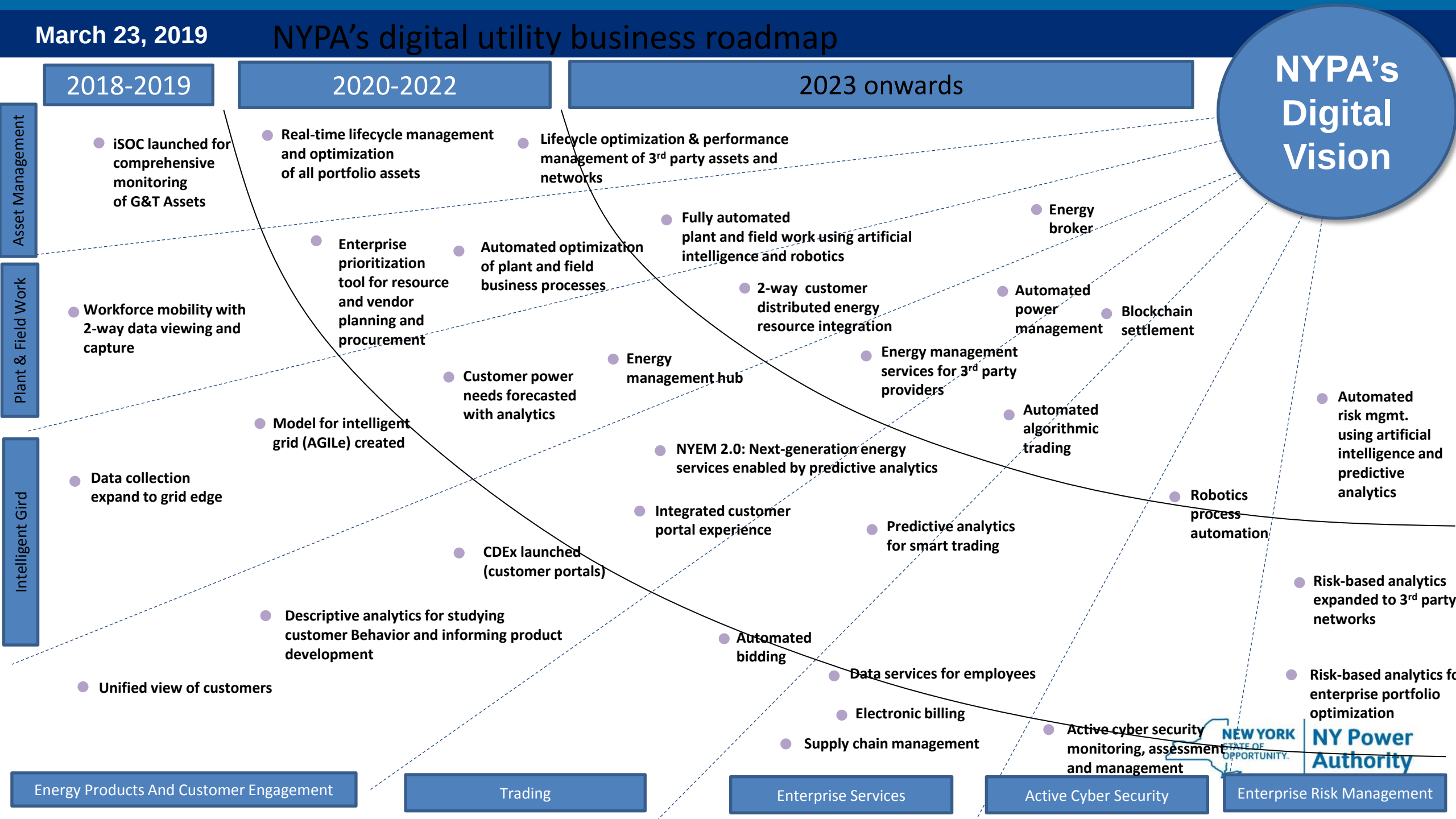
More than 1,400 circuit miles of backbone transmission throughout New York state



- ❑ 765 kV Transmission **155 circuit miles**
- ❑ 345 kV Transmission **928 circuit miles**
- ❑ 230 kV Transmission **338 circuit miles**
- ❑ 115 kV Transmission **35 circuit miles**
- ❑ Total Transmission **1,456 circuit miles**
- ❑ Bulk Transmission Substations **21 substations**
- ❑ Portion of Bulk NYS Grid
 - ~13% (>115kV)
 - ~34% (>230kV)

NYPA Digital Utility Strategic Vision





NYPA Smart G&T Projects

- Communication backbone (fiber/microwave)
- Sensor Deployment
- Synchrophasor Deployment
- Continuous Protection Monitoring System (CPSM)
- Integrated Smart Operations Center (iSOC)
- New York Energy Manager (NYEM –Albany)
- Advanced Grid Innovation Lab for Energy (AGILE)

HQ – Headquarters
ST – St. Lawrence Transmission (Moses – Adirondack; Moses – Plattsburgh)
NT – Niagara Transmission (Niagara to CEC)
BT – BG Transmission (GNS, Gilboa – Fraser Annex, CCRT, RT-WPO dark fiber)
SY – SENY Transmission (SENY microwave)
MC – Marcy Transmission (CEC-Adirondack; CEC-Fraser Annex)



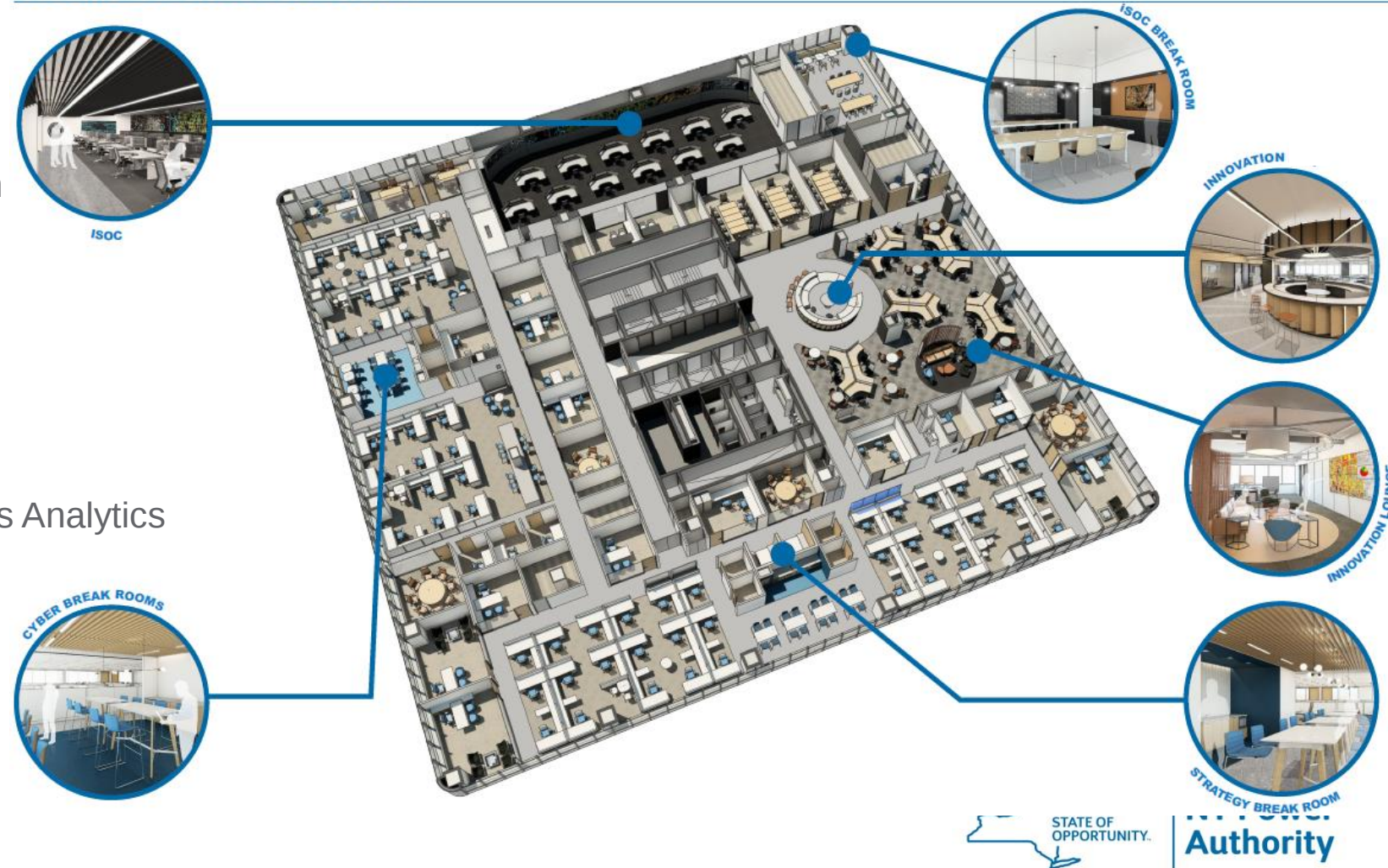
Integrated Smart Operations Center (iSOC)

AERIAL PERSPECTIVE (WPO 8th floor layout)

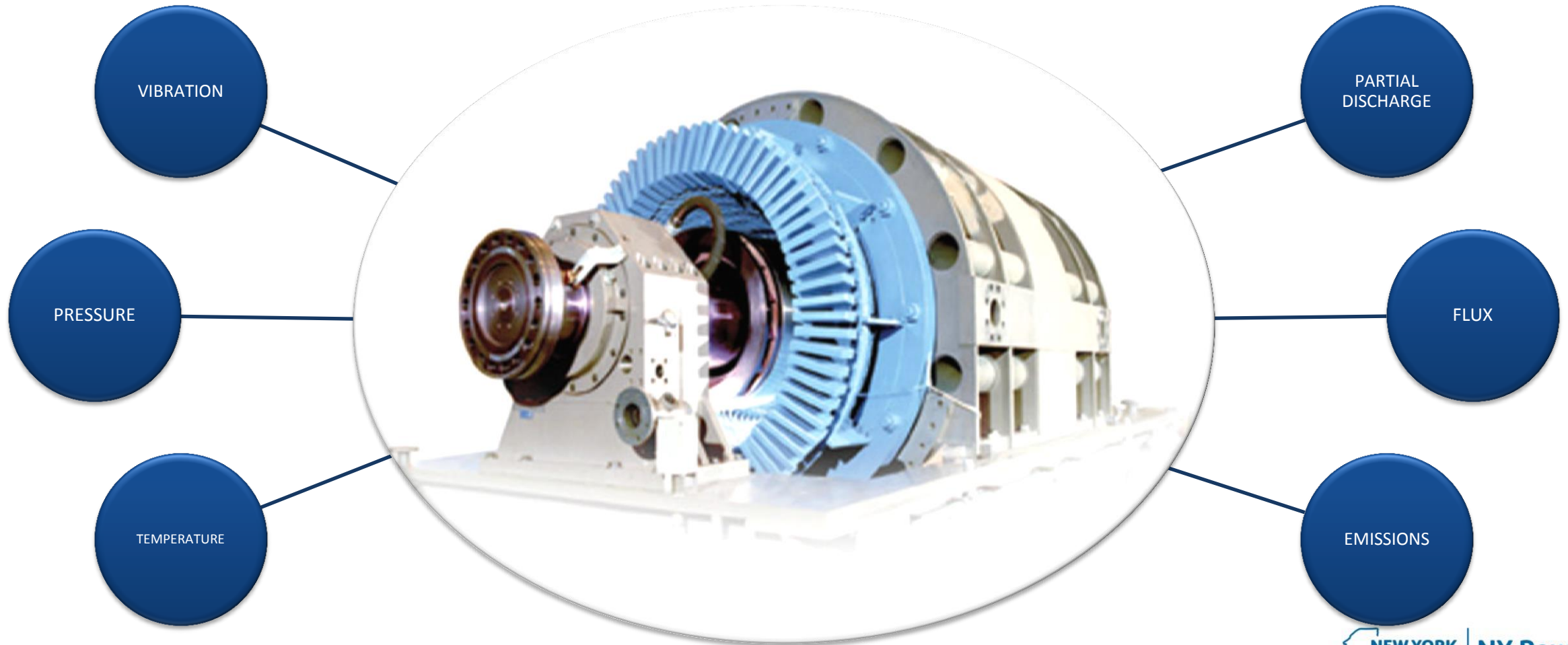
Discussion

Located in the Authority's White Plains Office, the iSOC will provide overarching coordination capabilities that enable single point of contact that spans multiple organizational units allowing:

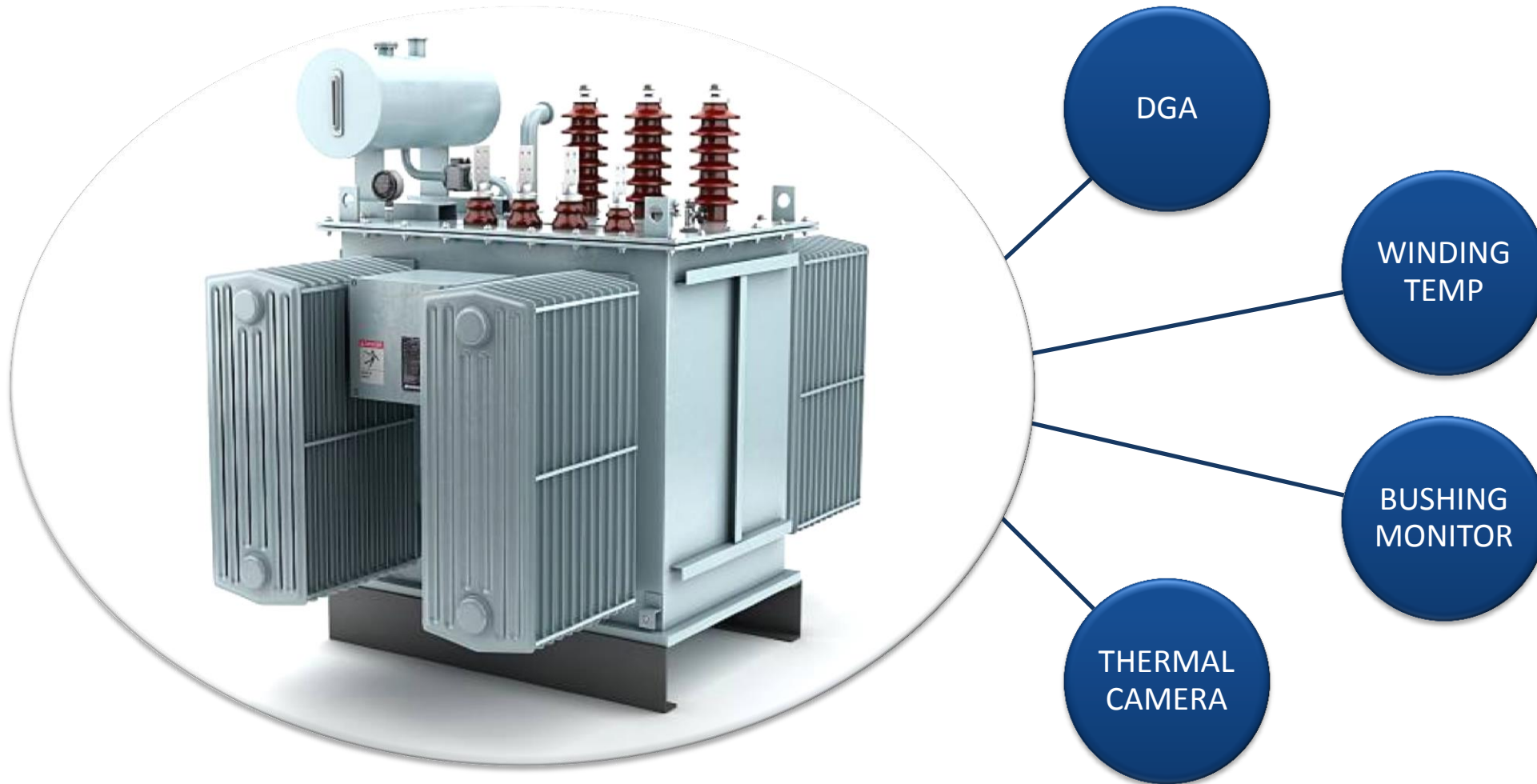
- Communications Network Management
- Physical Security
- Cyber Security
- Asset Health Monitoring and Diagnostics Analytics
- Data Management
- Advanced Data Analytics
- IT Services



Generator & Turbines



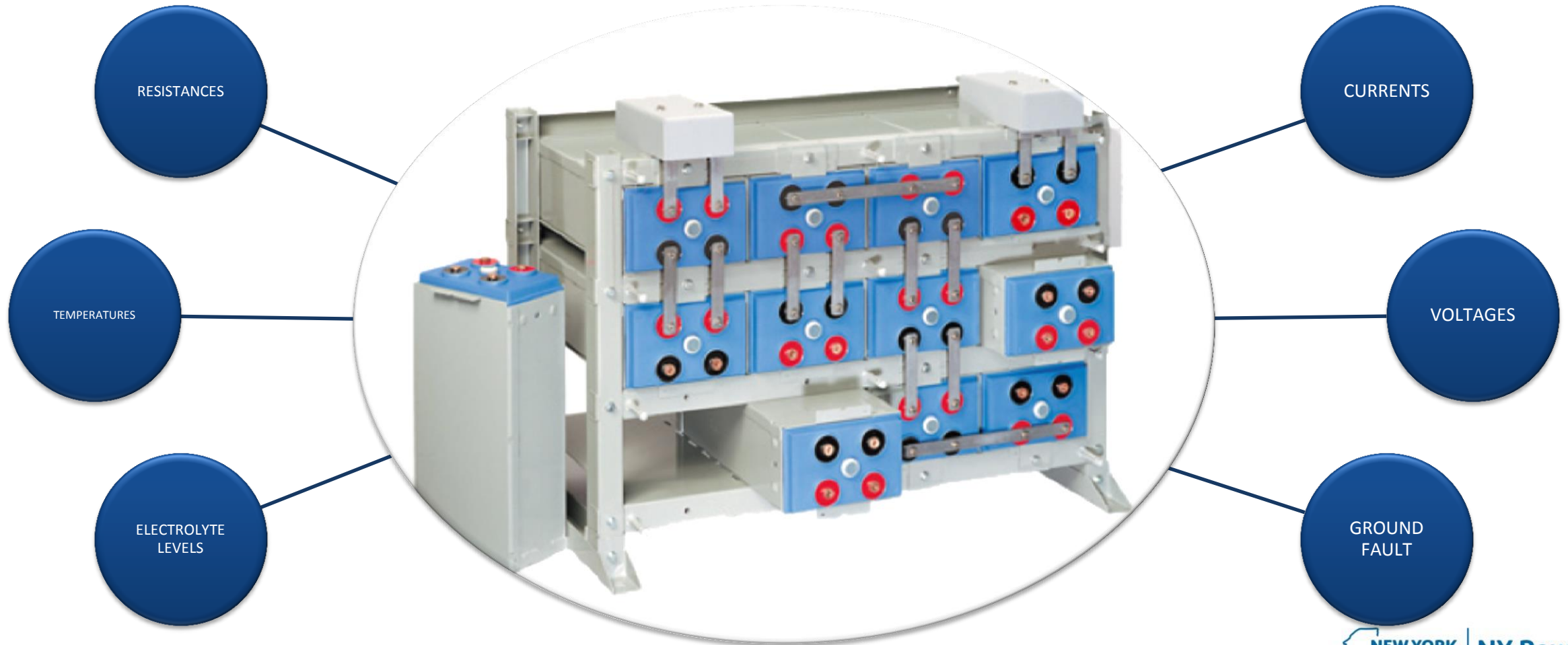
Transformers & Reactors



Circuit Breakers



Battery Banks



Deployment of 914 sensors across NY State

NIA	# Sensors
Hydro Turbine Generator	64
Transformer	96
Circuit Breaker	88
Battery Bank	15
System 1	2
Total	265

CEC	# Sensors
Transformer	40
Circuit Breaker	26
Battery Bank	10
Reactor	16
Total	92

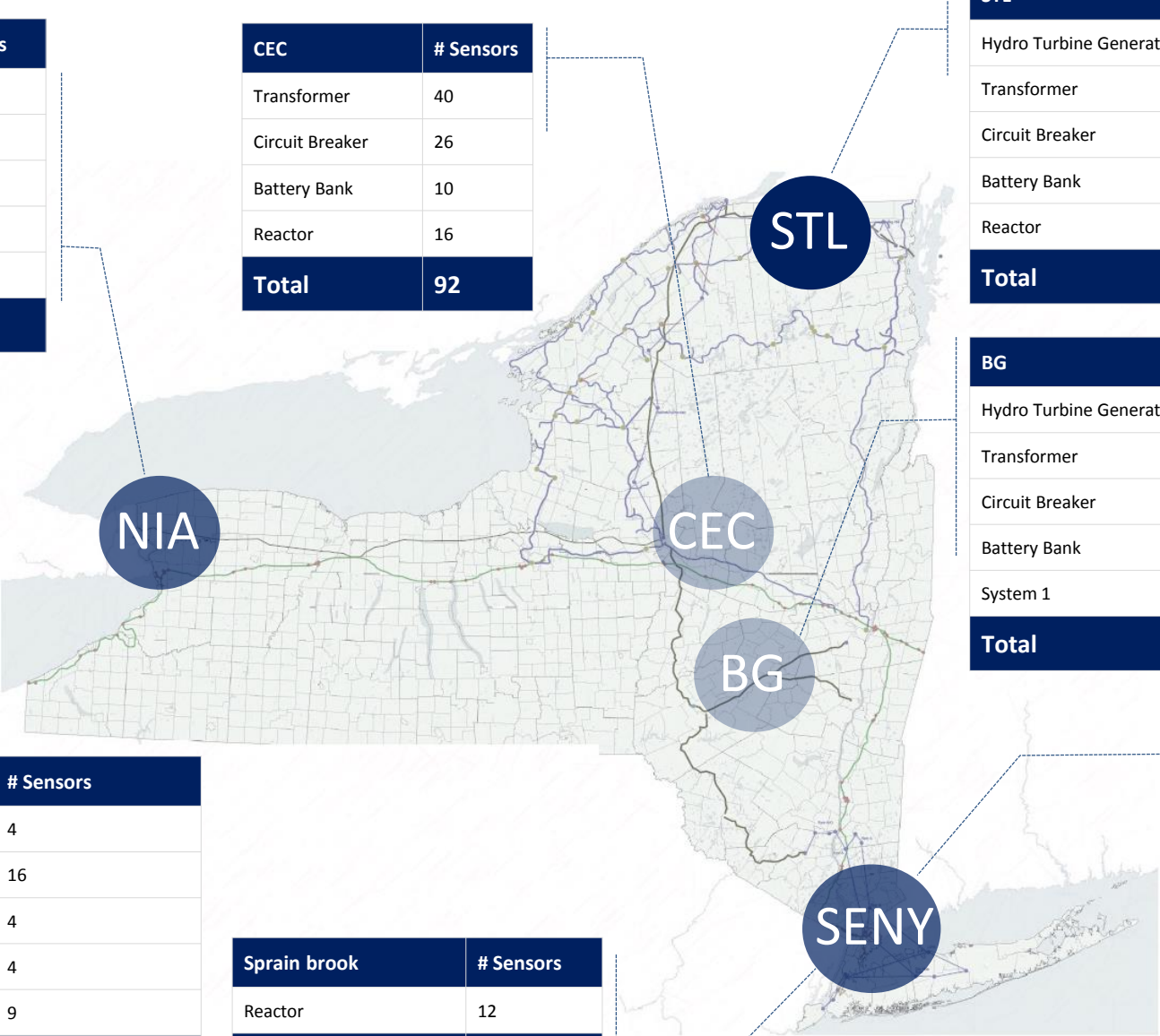
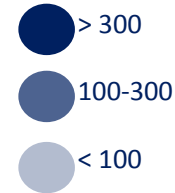
STL	# Sensors
Hydro Turbine Generator	16
Transformer	124
Circuit Breaker	101
Battery Bank	33
Reactor	32
Total	306

SCPP	# Sensors
Combustion Turbine Generator	9
Transformer	36
Circuit Breaker	6
Battery Bank	7
System 1	4
Total	62

BG	# Sensors
Hydro Turbine Generator	32
Transformer	24
Circuit Breaker	13
Battery Bank	1
System 1	1
Total	73

500MW	# Sensors
Combustion Turbine Generator	8
Steam Turbine Generator	2
Transformer	22
Circuit Breaker	9
Battery Bank	6
Reactor	8
System 1	1
Total	56

Regional Sensor Deployment (#)



SENY Transmission	# Sensors
Cable System	4
Transformer	16
Circuit Breaker	4
Battery Bank	4
Reactor	9
Total	37

Sprain brook	# Sensors
Reactor	12
Total	12

Flynn	# Sensors
Transformer	8
Circuit Breaker	1
Battery Bank	1
System 1	1
Total	11

Asset Management benefits at NYPA

- Establish a systematic approach (PDCA) to make optimized decisions to achieve Asset Management objectives
- Drive toward a culture of continuous improvement to enhance asset availability and reliability performance
- Overall risk reduction with lower rates of failures of assets
- Improved Operation and Maintenance and capital savings
- Address compliance requirements

Retirement wave at US utilities

- 78 million baby boomers eligible for retirement in the next 5 to 10 years
- They are 28% of US population and 68% of existing workforce.
- 25 % increase in demand for engineers and smart grid workers by 2025
- 105,000 new Smart Grid workers by 2030
- NYPA has about 1700 employees
- Public data for similar size electric utility: 25% of Avista 1600 employees to retire in 5 years

Workforce skills at NYPA Digital Utility

- Information, Communications and Technology knowledge
- Cloud and cyber security training
- Data analytics and artificial intelligence training
- Renewable energy, battery storage and electrical vehicle knowledge
- Technically certified worker with continuing education plans
- Understand the elimination of lines between operations, information and customer technologies.
- Capable of accessing and managing data from the edge of the grid and ability to share it with customer and third parties.

NYPA Digital Utility and Universities

- NYPA promotes student internships and provides them with feedback for areas of improvement/additional training.
- NYPA can provide access to up to date technologies which can be included in modernized university curriculum.
- NYPA develops joint projects with universities and use their labs, professors and students resources.
- NYPA capable of organizing on site technical visits and seminars delivered by experienced industry engineers per university request.
- NYPA keeps close contact with research universities, EPRI, and national labs

Sustainable workforce at NYPA

- NYPA promotes talent recruitment at student fairs and national events
- Hires and retains highly qualified personnel to implement key projects
- Trains existing workforce on new technologies
- Runs in house and online education programs in cooperation with universities and recognized training institutions
- Provides career path for development and personal growth.
- Promotes a collaborative work environment and innovation
- Offers a robust benefits package and pension options