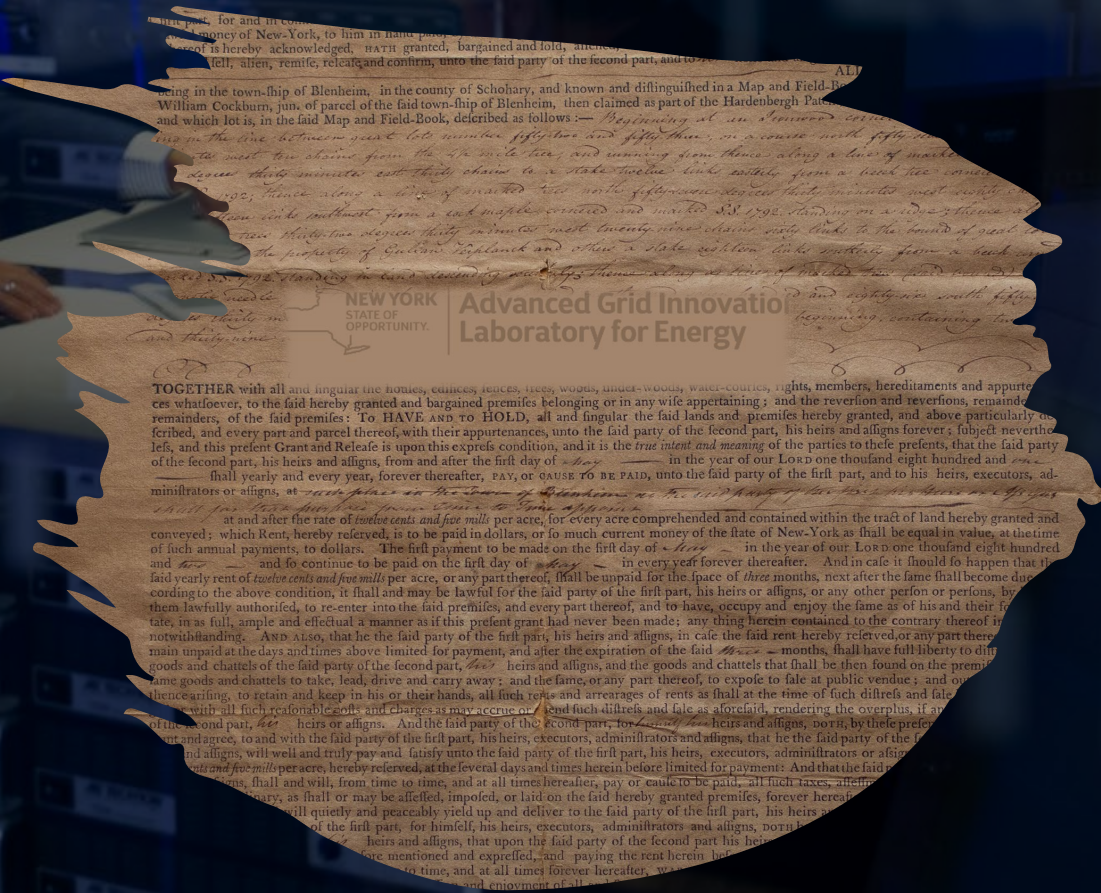


# ADVANCED GRID INNOVATION LABORATORY FOR ENERGY

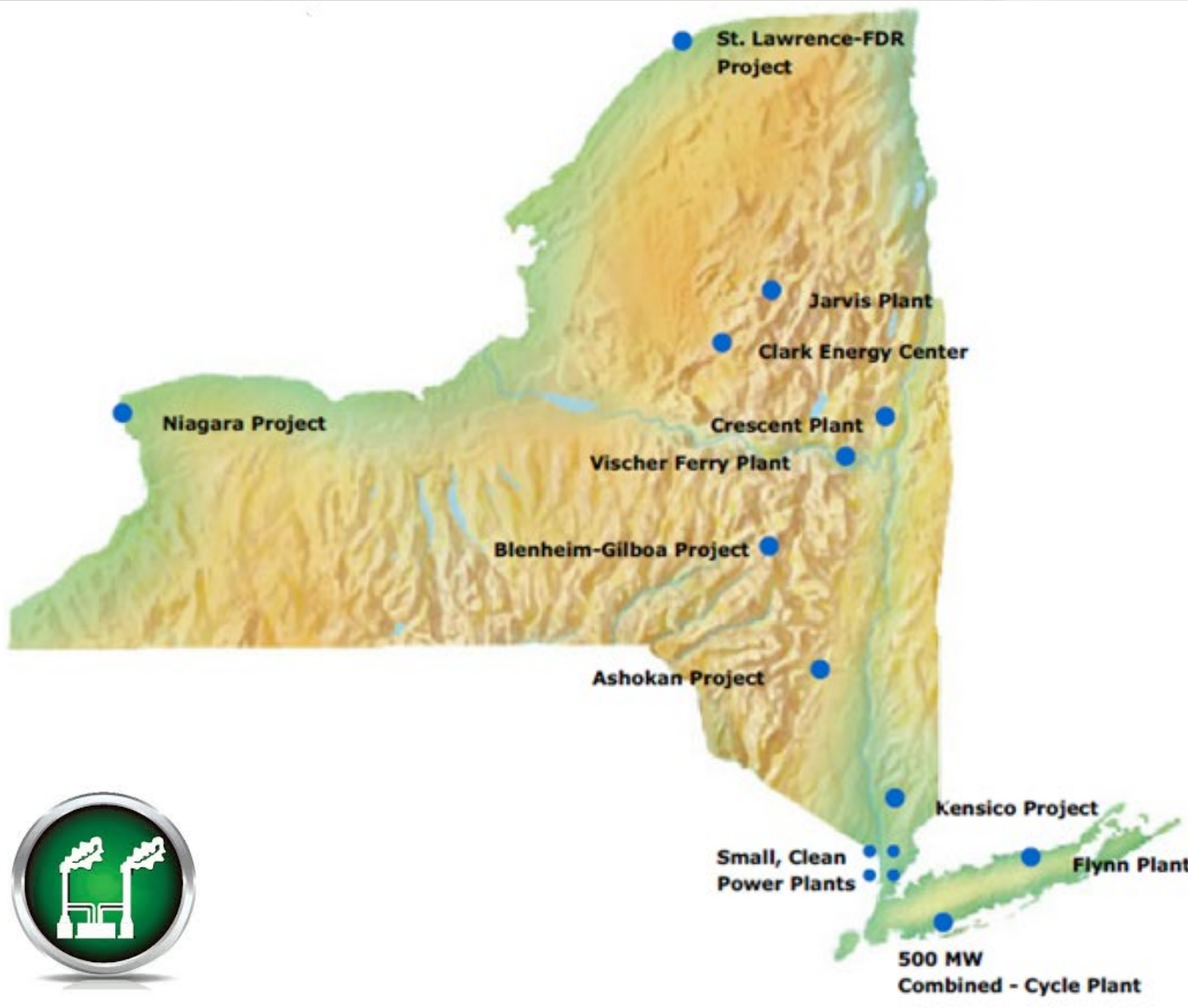
Enabling an affordable, reliable, low-carbon future



# NYPA Overview

- Established by the NY State Legislature in 1931.
- Largest state public electric utility in the United States.
- Wholesale power supplier throughout New York State and neighboring states as required by law.
- Provides, with generation and power purchases, about 25% of New York State's electricity. No Distribution System
- New York State Canals is a subsidiary since 2017
- Non-profit energy corporation, does not use tax revenues or state credits, finances projects through bond sales and cash from operations

# NYPA Overview – Generation Assets



**16 hydro and natural gas generation plants (~6GW, 80% hydro and 20% gas):**

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



# NYPA Overview – Transmission Assets



## 1400 circuit miles:

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

# NYPA's AGILE

Enabling an Affordable, Reliable, Low-Carbon Future

## New York's Low- to No-Carbon Future: State Targets

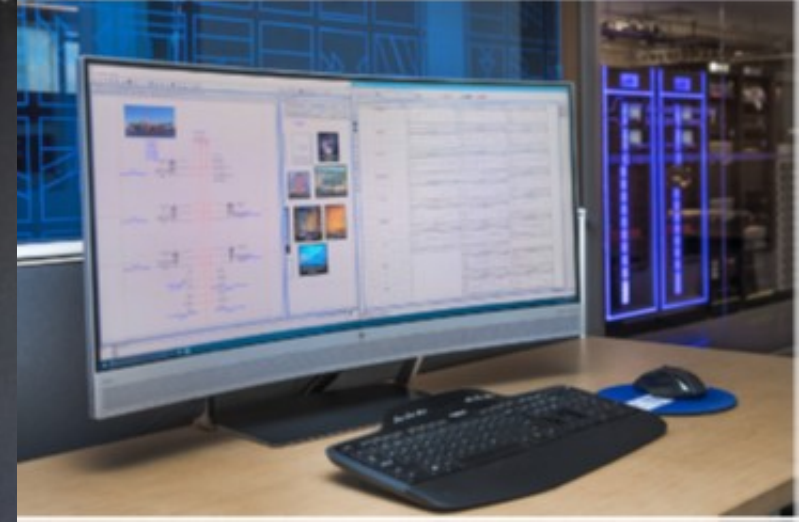
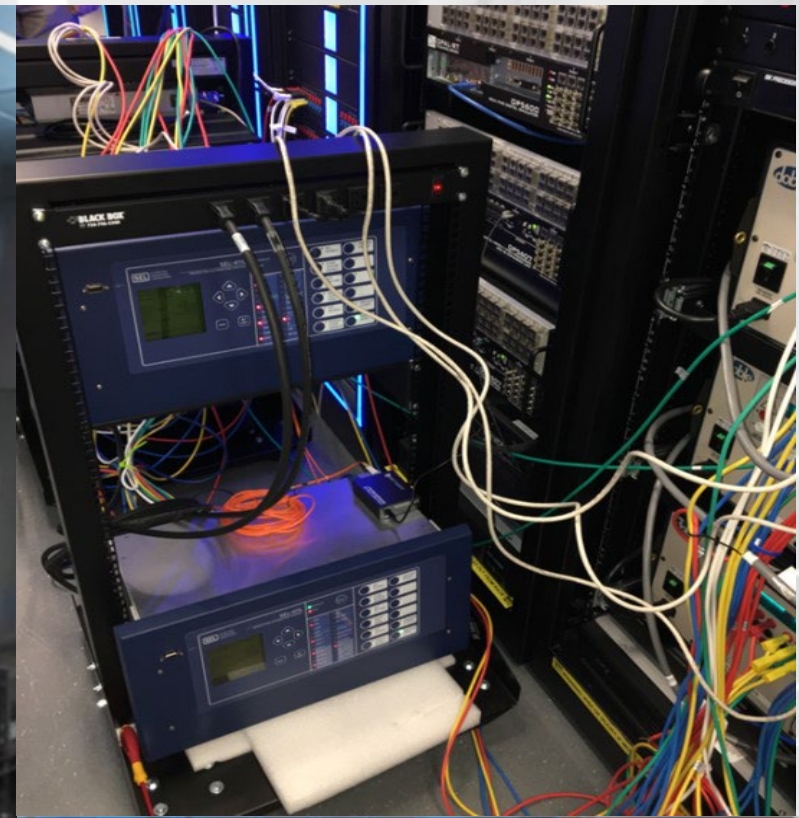


# NYPA's AGILE

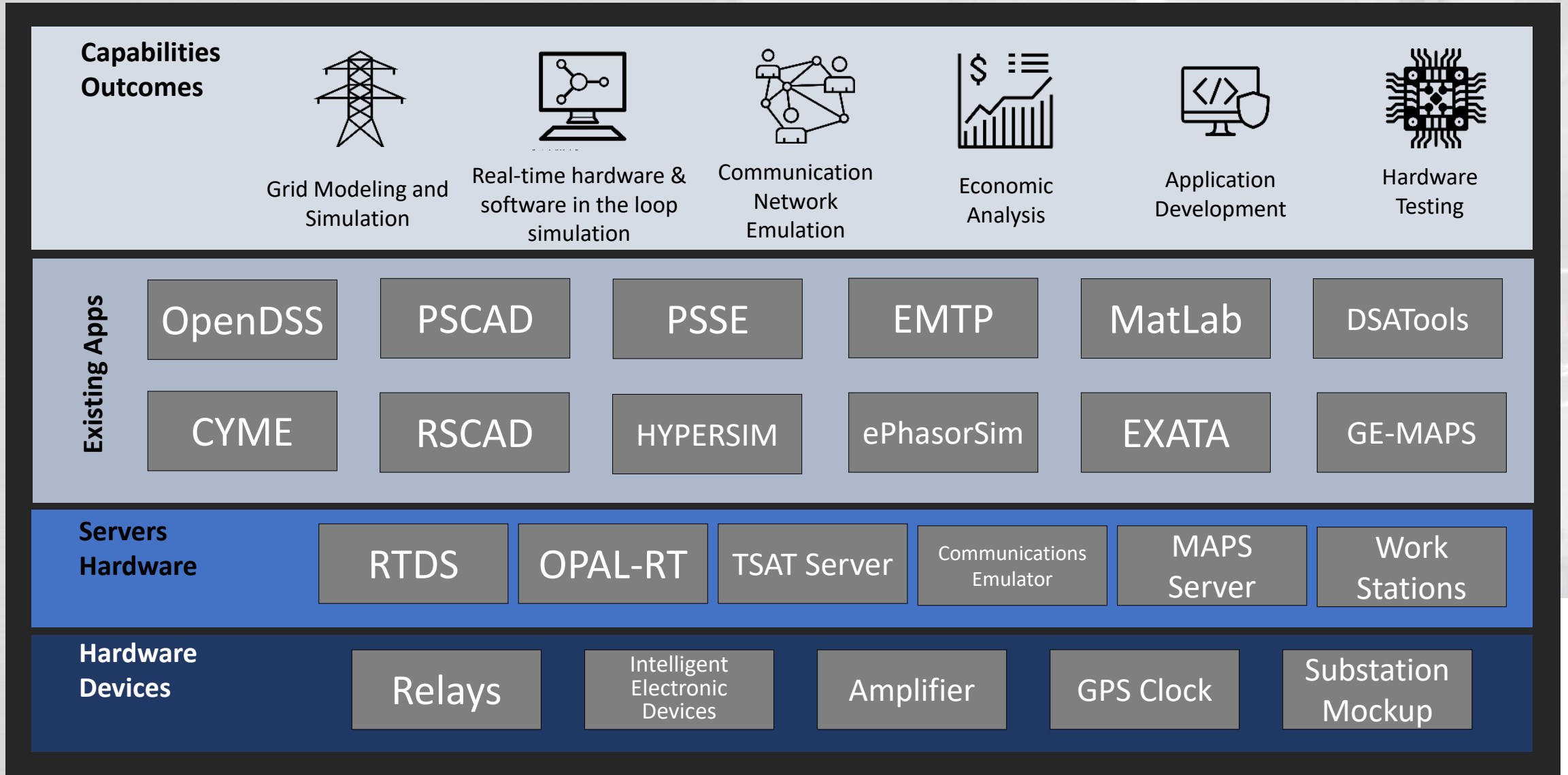
Enabling an Affordable, Reliable, Low-Carbon Future



**R&D Output cannot be deployed w/o thorough testing in a close-to-real environment**

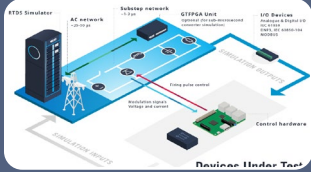


# AGILE Technology Stack



# AGILE Use Cases and Applications

A cross-section of Lab-enabled capabilities that the Lab is providing



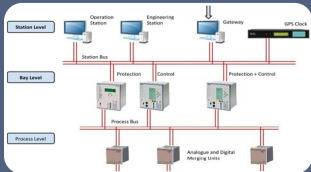
## Equipment Configuration and Testing

- Test equipment in realistic field conditions
- Validate the performance of novel technologies



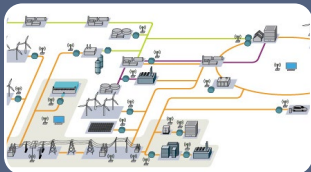
## Novel System Protection Schemes

- Validate protective relaying behavior and settings
- De-risk novel protection schemes



## Digital Substation and IEC 61850

- Create replicas of substation intelligent electronic devices
- Perform closed-loop testing using communication protocols



## Distribution Automation and DERMS

- Simulate the performance of distribution automation system
- Integrate distributed energy resources and storage



## Cyber Security

- Create testbeds used for tabletop exercises
- Evaluate and test intrusion detection and mitigation schemes



# Future Direction

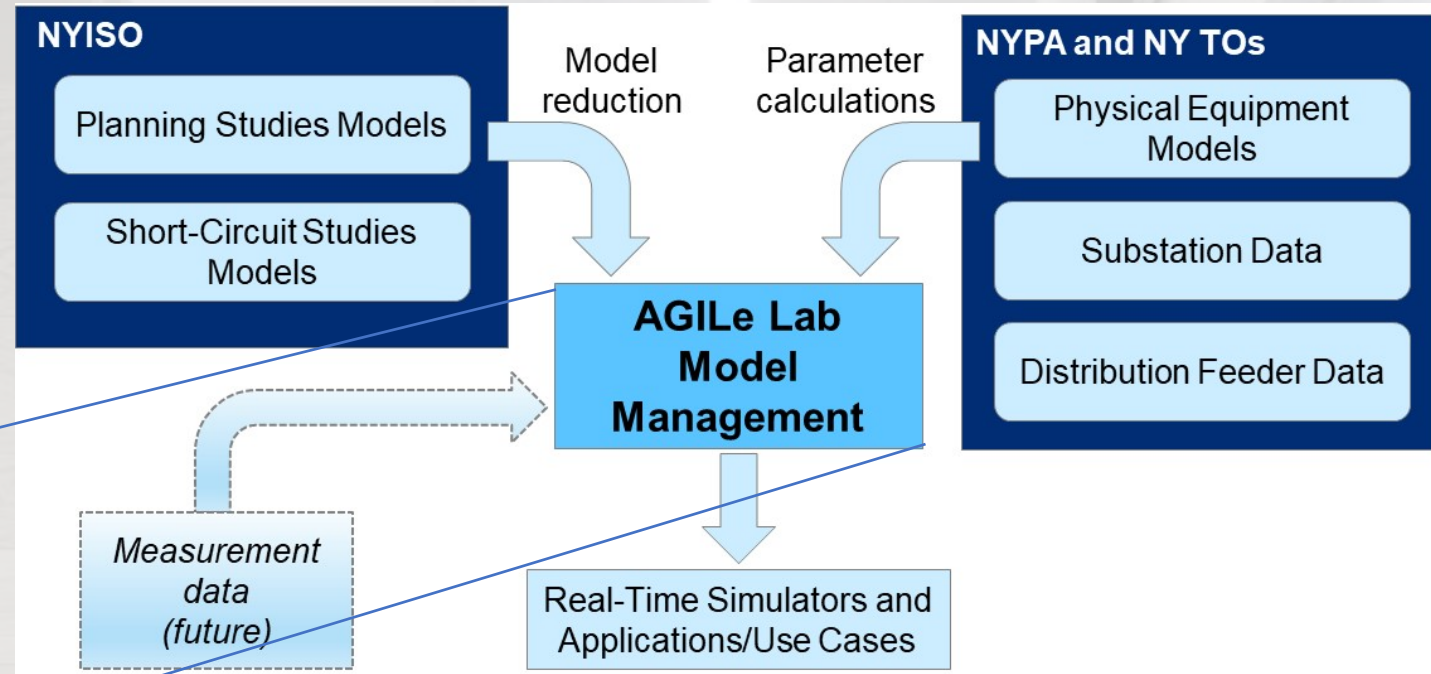
AGILE Phase II

- A world-class power systems laboratory that

1. Includes unique simulation and testing facility
2. Run by power system technologist



# New York State Grid Suite of Models in AGILE



# Modeling Strategy

**NYS Grid Base**  
230kV+  
~300 buses

**Long Island**  
~345 buses

**Central-West**  
~390 buses

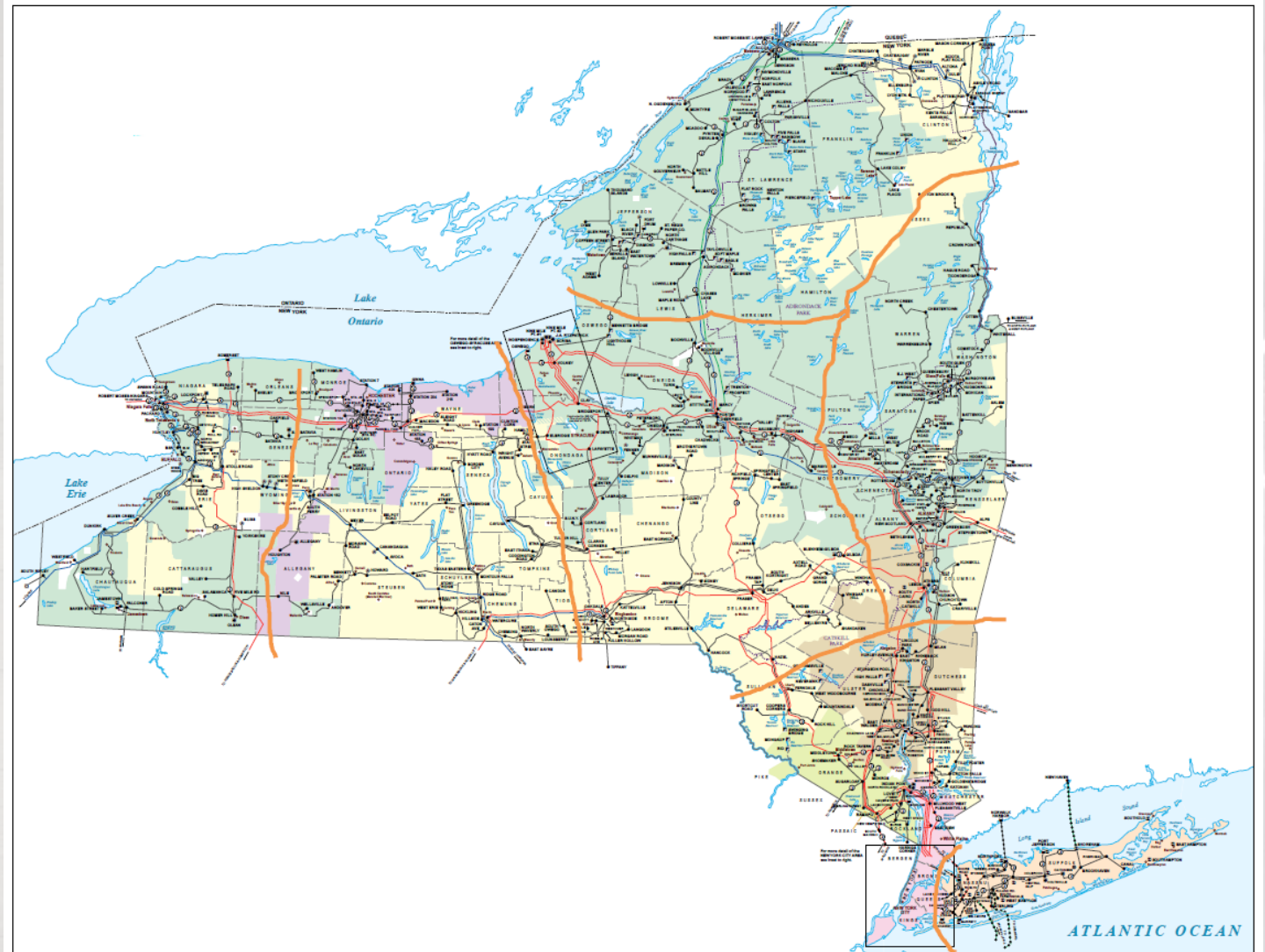
**Central-East**  
~530 buses

**Northern**  
~225 buses

**Western**  
~510 buses

**Eastern**  
~350 buses

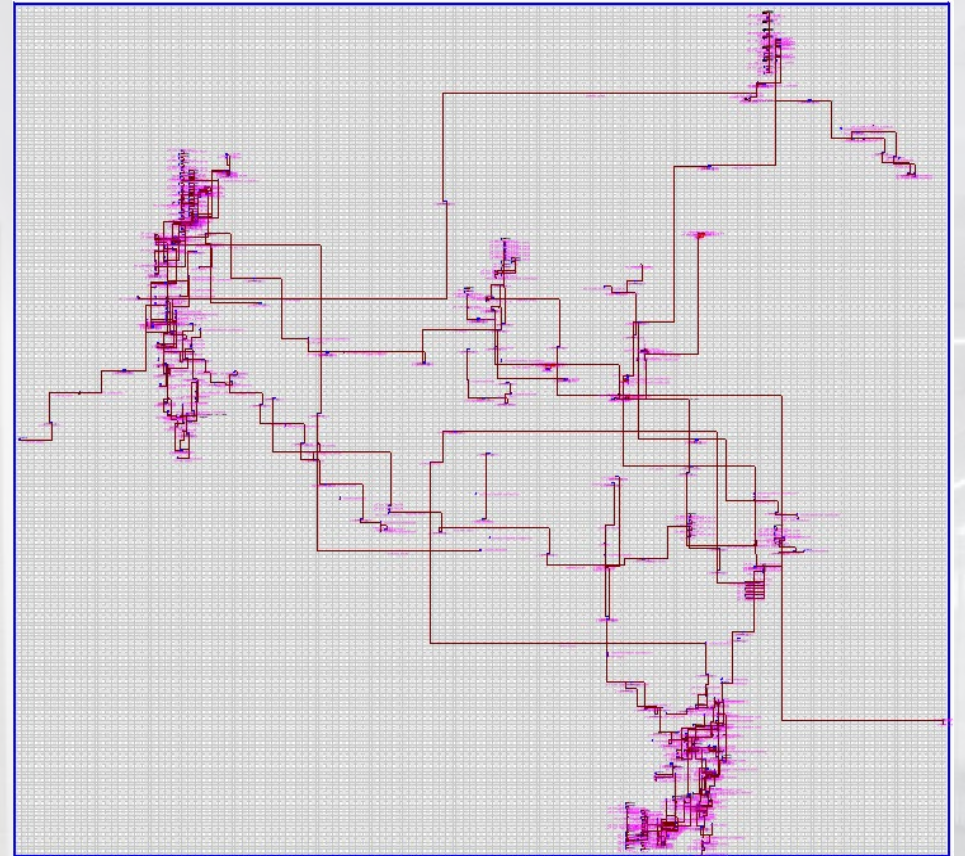
**South-East**  
~870 buses



# EMTP Model of NYS Grid



- The model covers 230kV+ buses.
- It was developed to support interconnection studies:
  - EMTP preserves the mutual couplings between multiple lines, while there are limitations in other platforms for mutuals
  - EMTP can convert R, X, C values to typical tower geometry when this information is missing for some lines
  - IBR system impact study



# QUESTIONS?

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**NY Power  
Authority**