

The Digital Utility

Advanced Energy Conference

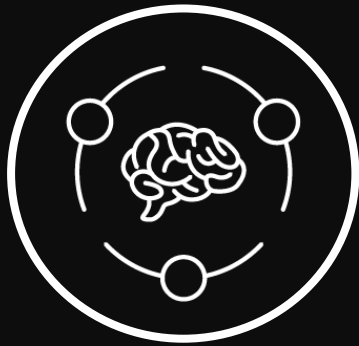
March 2018
New York, NY



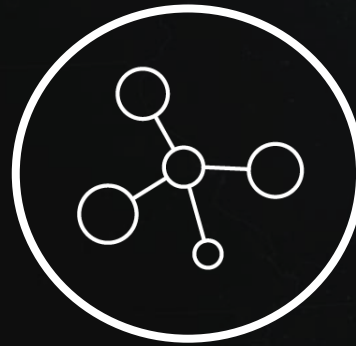
What is digitization?

“Digitization is the process of connecting devices through digital communications, **collecting and sharing data**, and analyzing that data to create **actionable business insights**.”

Digitization- some facts.



By 2020, a fully digitally-engaged generation will emerge



40 % of businesses adequately harnessing data



80% of business processes affected by digitization by 2020

The Fourth Industrial Revolution (4IR) and the role of energy.



Digitization and the power of data are essential in helping NY meet its REV & state energy goals.



Improve the efficiency of the electric grid

Reimagine the grid with the customer at the center

Building a decarbonized energy future- Part A.

Germany



- Increased to **30% renewables** in 2016
- **Emissions decreased only 2%** in lieu of storage
- **2nd highest electricity price** in Europe with **retail pricing up 50%** since 2007
- Renewable surcharges account for roughly **23%** of a household electricity bill

California



- California increased their renewables generation by **17% between to from 2011-2017 to 17,210 MW**
- **Solar intermittency** requires increased flexibility with daily ramp-up from trough to peak has rising from **<10% in 2012 to ~80% in 2017**
- Cost of electricity in CA increased **12%** since 2008 as compared to an average 3% decrease nationwide¹

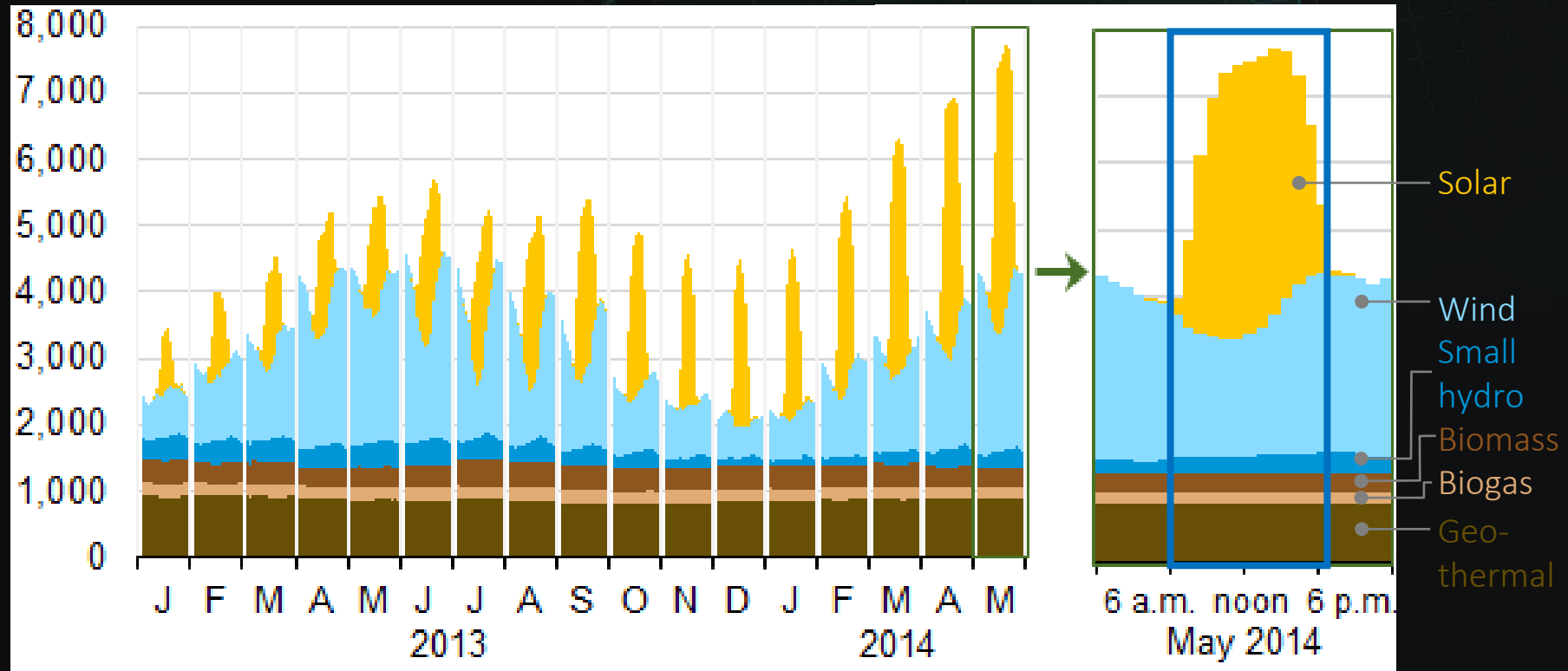
¹ Adjusted for inflation

Building a decarbonized energy future- Part B.

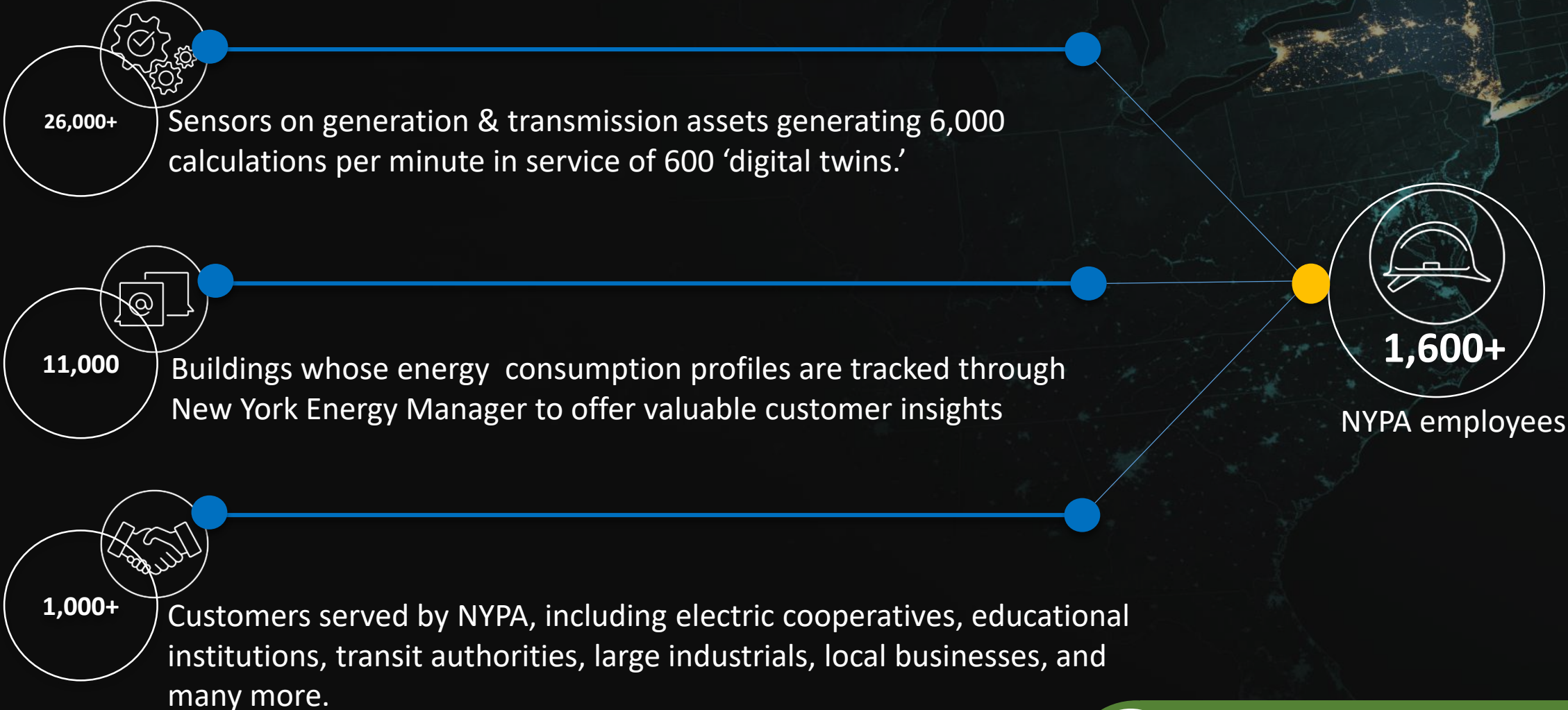
System reliability stressors

- Generation oversupply midday, with ramping challenges after sunset
- Unpredictable seasonal peaks
- Few dispatchable DER resources installed

Average California daily renewable electricity production profile by month (MW)



NYPA is seizing this challenge as an opportunity to place digitization at the heart of its ambitious strategic plan.



The AGILE platform will enable enhanced statewide testing, planning, and integration of new energy technology.

Advanced Grid Innovation
Laboratory for energy
(AGILE)

Enabling digital simulations of the New York grid that will allow joint planning amongst key New York grid stakeholders.



Optimized siting, integration and value extraction of LSR's and grid scale storage



Improved planning and operations of grid scale assets as a result of moving to a much more distributed energy grid of the future



Rapid testing and deployment of cross utility jurisdictional technologies such as blockchain and EV billing and settlement systems

Our iSOC will optimize the performance & efficiency of NYPA's generation & transmission assets.



Avoided capital expenditures
Insights to increase efficiency without replacement of existing components

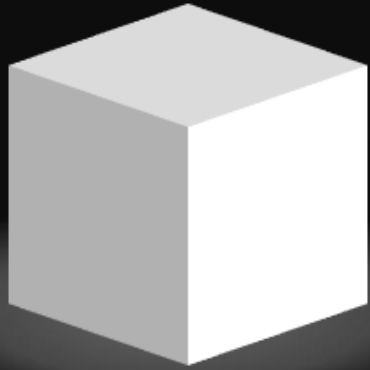


Optimized market participation
Avoiding forced outages keeps assets in the market



Proactive maintenance
Differentiating normal wear & tear from potential unit failure

A digitized energy system will enable greater customer empowerment & choice.

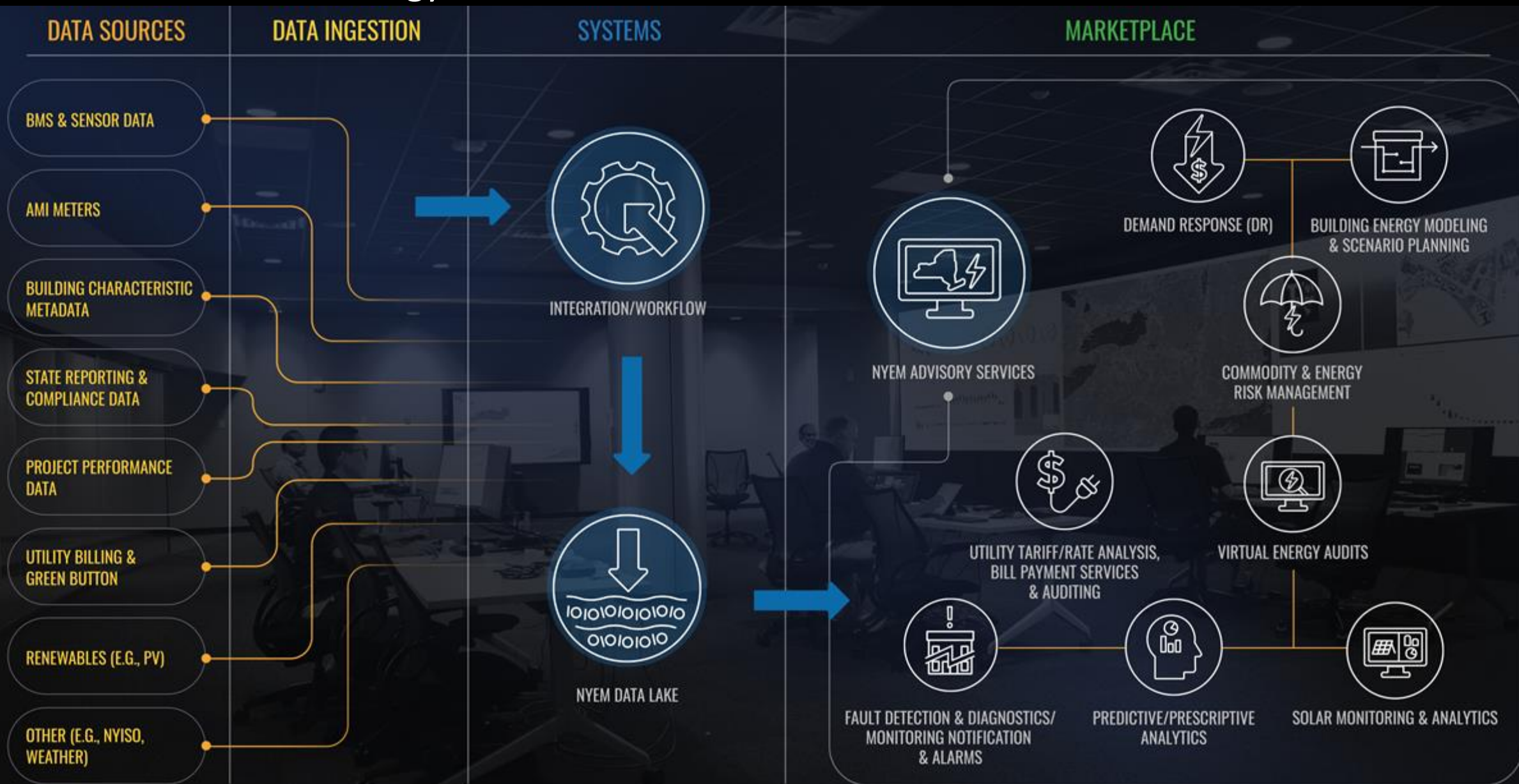


- Mass produced
- One product fits all
- Supply driven

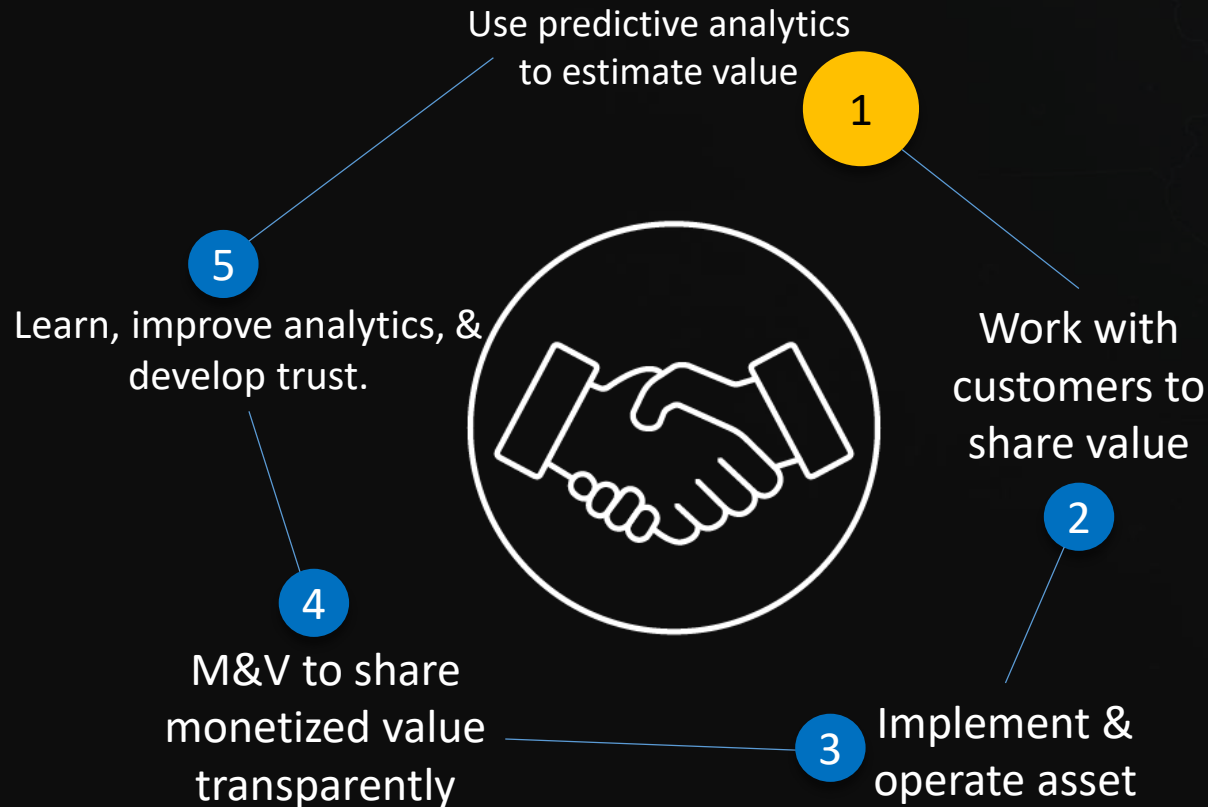


- Mass customization
 - Self selection
 - Demand-driven

Our NYEM platform will use advanced data analytics to provide flexible and customized solutions to customer energy needs.

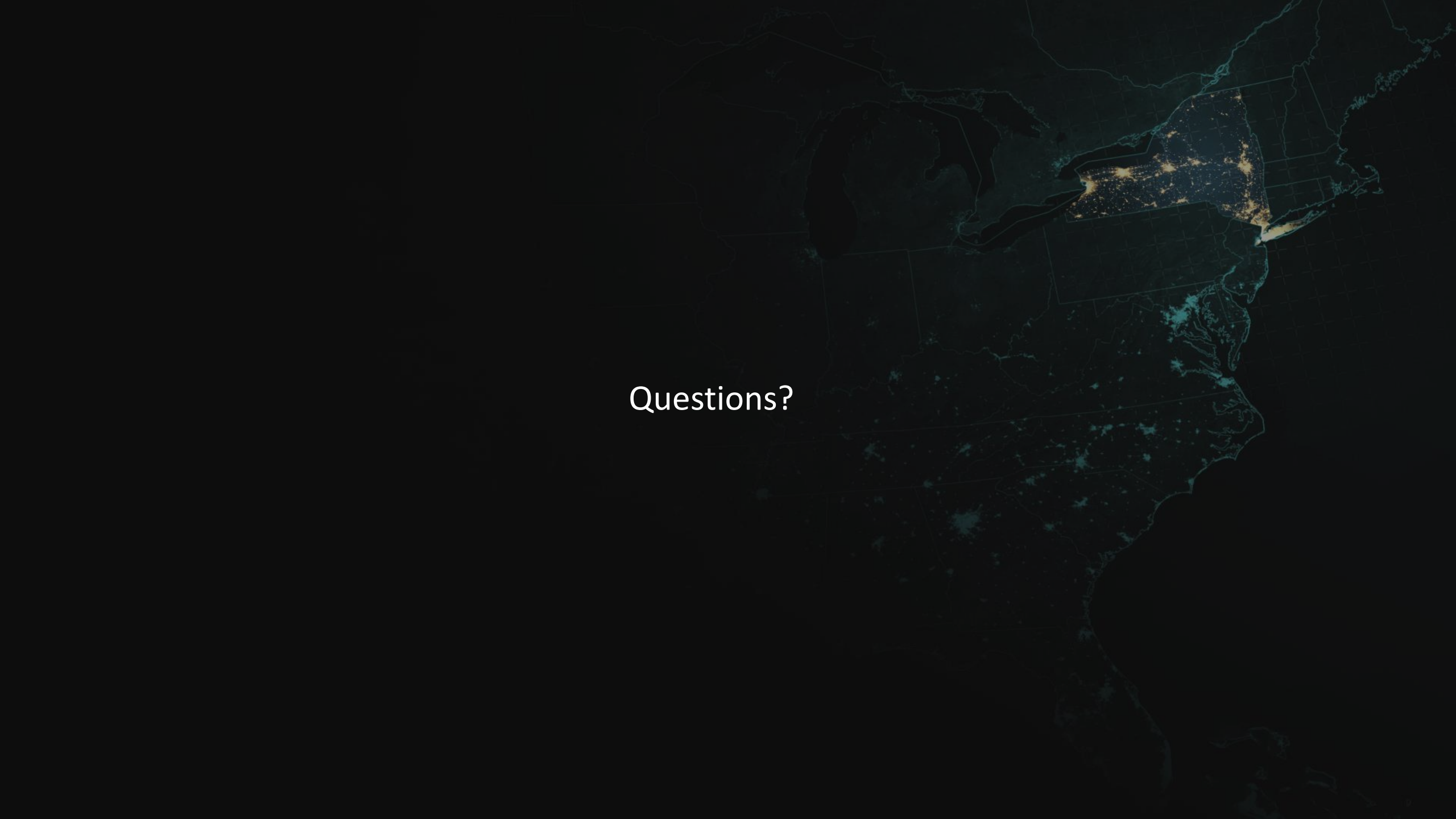


Project EDGE: harnessing the power of predictive analytics and measurement & verification to optimize the value of DER's and scale new utility business models.



Additional Market Energy Sales	Customer's NYPA Bill Savings	Additional Capacity Sales
Avoided Market Rate Energy Purchases	Avoided NYISO Charges	Renewable Energy Credits
Resiliency Services	Value of 'D'	Distribution Services

Digitization allows a value-based approach to delivering DERs to customers



Questions?