

Discussion with the Newburyport Energy Advisory Committee

Ed Young, National Grid

April 27, 2023

nationalgrid



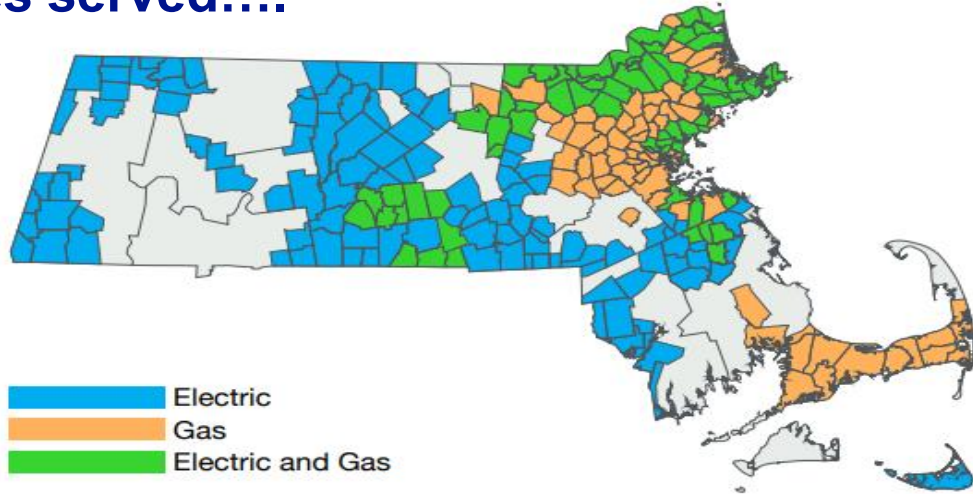
Introduction

- **Strategy consulting for energy companies @ S&P Global (formerly IHS Markit / CERA)**
- **MBA @ MIT (2011), MPA @ Harvard (2012)**
- **Corporate strategy @ InterGen an international IPP (CCGT, coal, wind)**
- **National Grid, a US & UK “pipes and wires” utility**
 - Director of Corporate Strategy
 - Chief of Staff @ National Grid Ventures, then @ National Grid US
 - Head of Strategic Planning and Business Performance, New England
 - Head of Future of Electric, New England

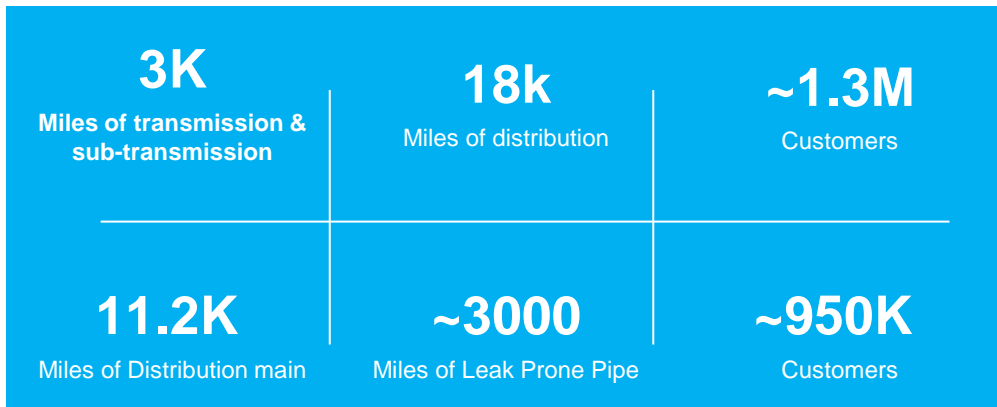
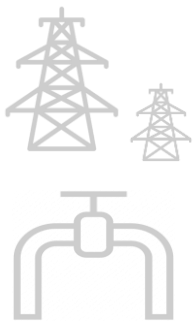


About National Grid

2.3 million customers in 219 towns and cities served....



... via our networks...

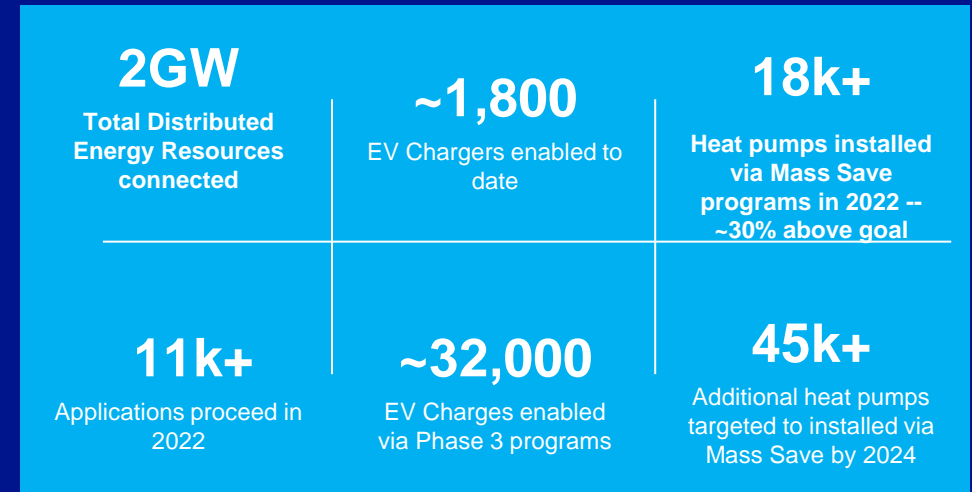


National Grid

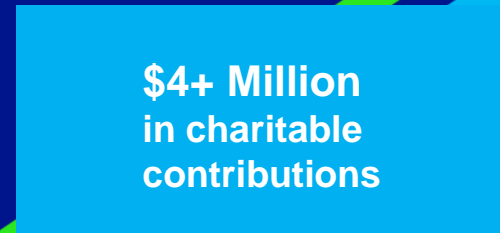
... by our teams....



... making connections...



... and supporting our communities.



Increasing supply, demand, and evolving customer needs requires rapid network growth

MA Growth Drivers



Reduction in GHG Emissions

- 50% reduction in GHG emissions by 2030
- 85% reduction in GHG emission by 2050



Installation of onshore renewables

- 27 GW of solar by 2050
- 1 GW onshore wind by 2050
- 1,000 MWh of energy storage by 2025
- 5.8 GW of energy storage by 2050



New offshore wind capacity

- 5.6 GW by 2030
- 23 GW of offshore wind by 2050



Significant uptick in EV adoption

- 900K electric vehicles (EV) by 2030
- 5 million light-duty EVs by 2050 (97% of all LDVs)
- 353K medium/heavy duty ZEVs by 2050 (93% of MHDVs)



Heat Pumps

- Over 2 million homes with whole-home ASHPs by 2050

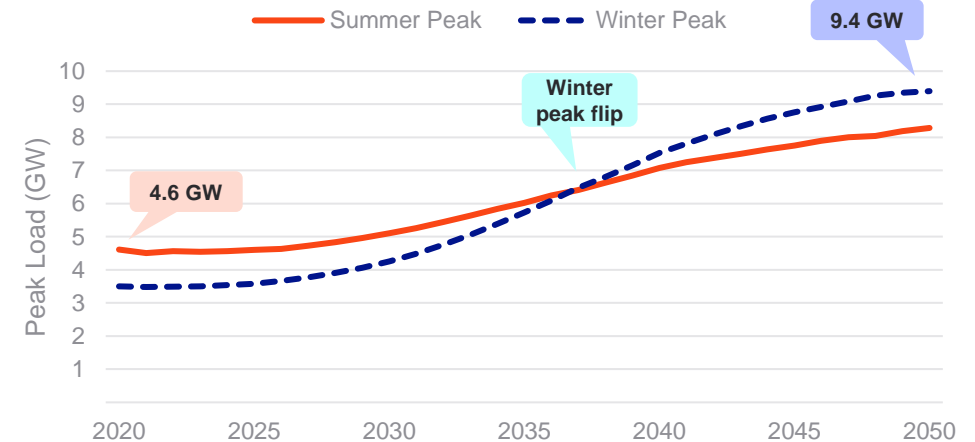


Advanced Metering

- Installing 1.4m advanced meters at customer homes by 2028

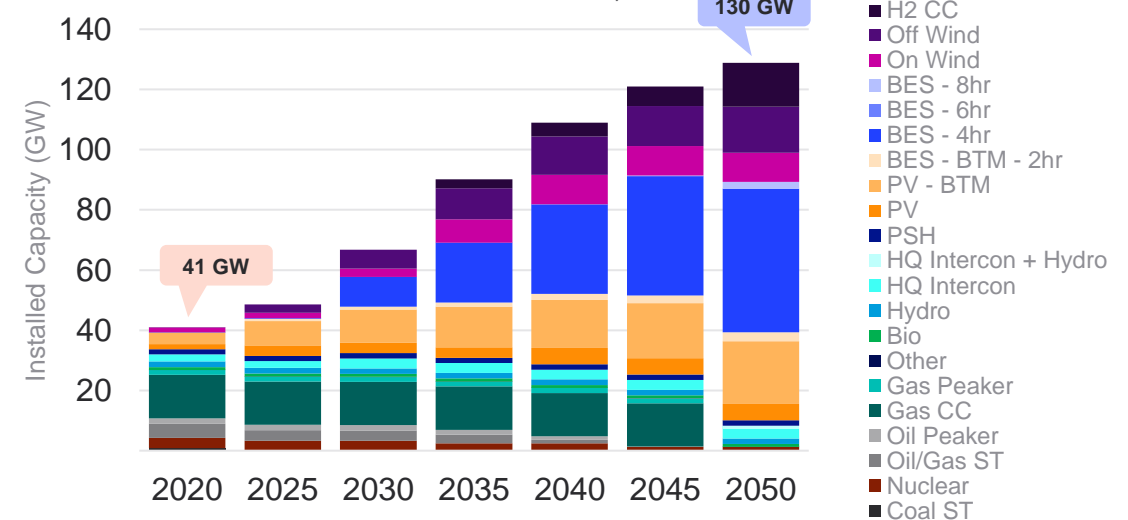
MECO Peak Load

Source: ELF Base Case



ISO-NE Installed Capacity, GW

Source: Market Fundamentals (electric net zero scenario)



Increasing supply, demand, and evolving customer needs requires rapid network growth

- New renewable supply and changing consumer demands are growth drivers which are shifting our customers' needs

MA Growth Drivers



Reduction in GHG Emissions

- 50% reduction in GHG emissions by 2030
- 85% reduction in GHG emission by 2050



Installation of onshore renewables

- 27 GW of solar by 2050
- 1 GW onshore wind by 2050
- 1,000 MWh of energy storage by 2025
- 5.8 GW of energy storage by 2050



New offshore wind capacity

- 5.6 GW by 2030
- 23 GW of offshore wind by 2050



Significant uptick in EV adoption

- 900K electric vehicles (EV) by 2030
- 5 million light-duty EVs by 2050 (97% of all LDVs)
- 353K medium/heavy duty ZEVs by 2050 (93% of MHDVs)



Heat Pumps

- Over 2 million homes with whole-home ASHPs by 2050



Advanced Metering

- Installing 1.4m advanced meters at customer homes by 2028

1) Install and connect lots of renewables

Increasing supply, demand, and **evolving customer needs** requires rapid network growth

- **New renewable supply and changing consumer demands are growth drivers which are shifting our customers' needs**

MA Growth Drivers



Reduction in GHG Emissions

- 50% reduction in GHG emissions by 2030
- 85% reduction in GHG emission by 2050



Installation of onshore renewables

- 27 GW of solar by 2050
- 1 GW onshore wind by 2050
- 1,000 MWh of energy storage by 2025
- 5.8 GW of energy storage by 2050



New offshore wind capacity

- 5.6 GW by 2030
- 23 GW of offshore wind by 2050



Significant uptick in EV adoption

- 900K electric vehicles (EV) by 2030
- 5 million light-duty EVs by 2050 (97% of all LDVs)
- 353K medium/heavy duty ZEVs by 2050 (93% of MHDVs)



Heat Pumps

- Over 2 million homes with whole-home ASHPs by 2050



Advanced Metering

- Installing 1.4m advanced meters at customer homes by 2028

2) Shift transportation fuel use to the electric network

Increasing supply, demand, and **evolving customer needs** requires rapid network growth

- **New renewable supply and changing consumer demands are growth drivers which are shifting our customers' needs**

MA Growth Drivers



Reduction in GHG Emissions

- 50% reduction in GHG emissions by 2030
- 85% reduction in GHG emission by 2050



Installation of onshore renewables

- 27 GW of solar by 2050
- 1 GW onshore wind by 2050
- 1,000 MWh of energy storage by 2025
- 5.8 GW of energy storage by 2050



New offshore wind capacity

- 5.6 GW by 2030
- 23 GW of offshore wind by 2050



Significant uptick in EV adoption

- 900K electric vehicles (EV) by 2030
- 5 million light-duty EVs by 2050 (97% of all LDVs)
- 353K medium/heavy duty ZEVs by 2050 (93% of MHDVs)



Heat Pumps

- Over 2 million homes with whole-home ASHPs by 2050

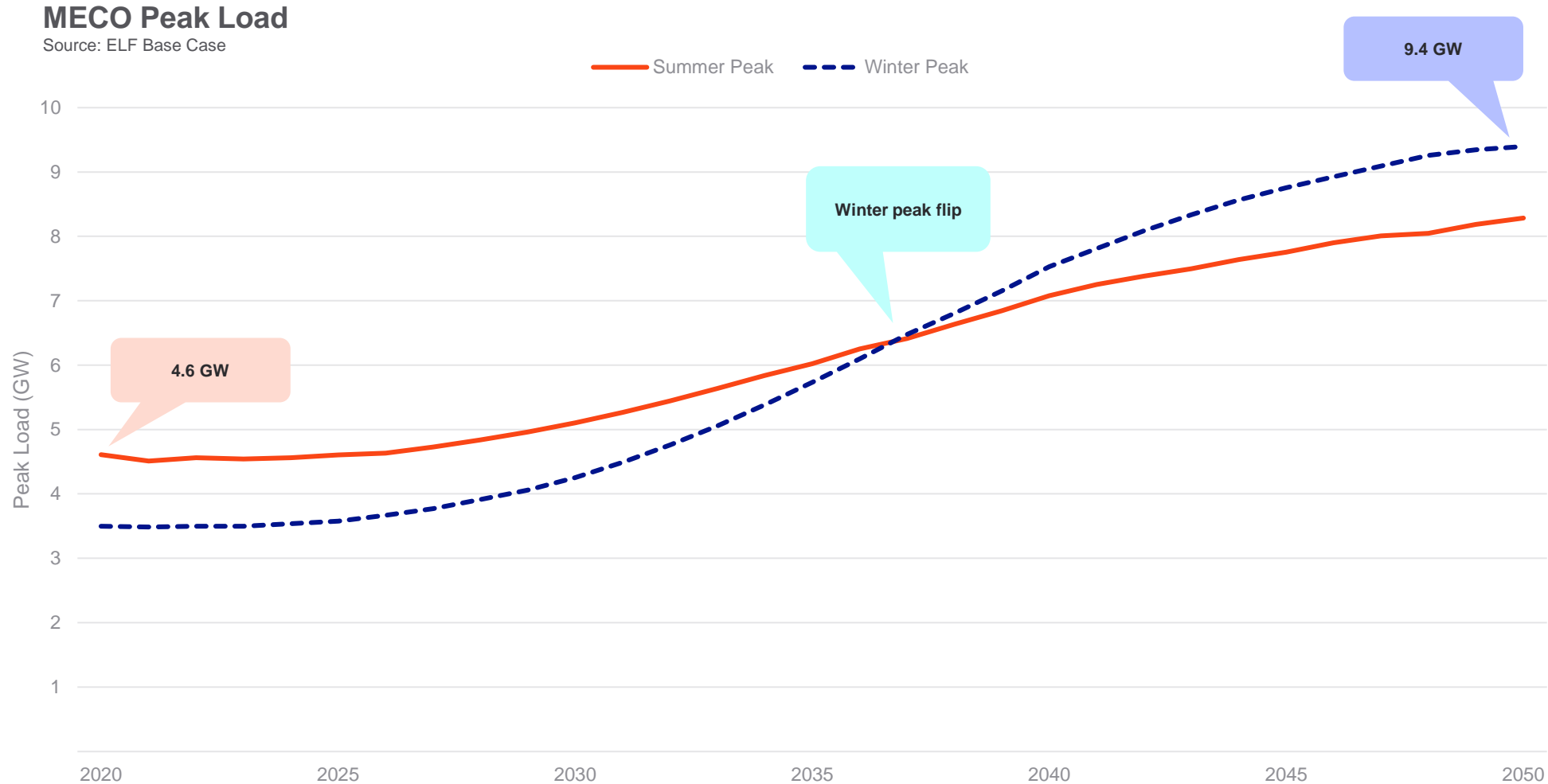


Advanced Metering

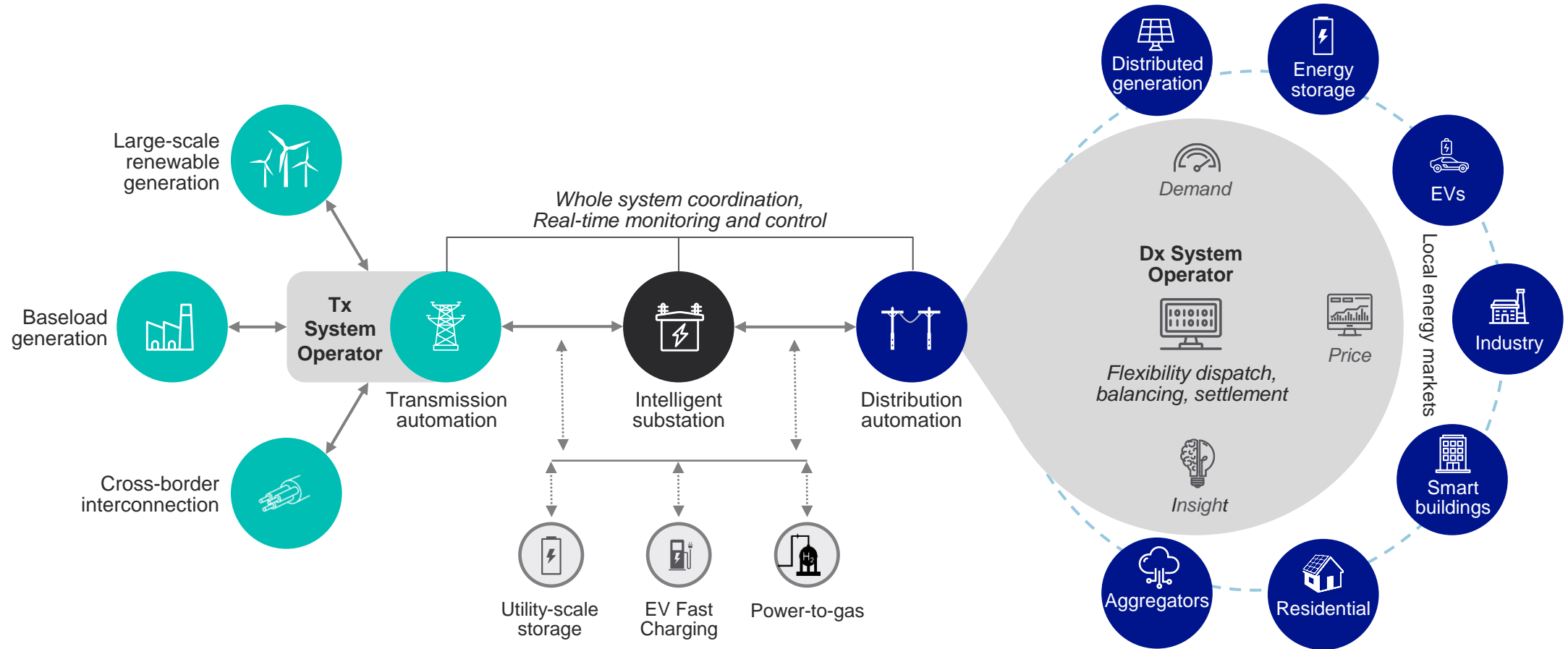
- Installing 1.4m advanced meters at customer homes by 2028

3) Shift building heating load to the electric network

Increasing supply, demand, and evolving customer needs requires **rapid network growth** >> An electric system built to its current size over 100+ years will need to double in size in 25 years.



We will transform our networks into an integrated, intelligent, customer-centric utility platform that is at the heart of the energy transition



nationalgrid