

# Climate Study Assumptions – Phase 1

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# Overview

- Provides information on assumptions to be used for additional scenarios in the NYISO Climate Change project for review and comment by stakeholders.
- Provide guidance to Itron on energy and emissions impacts related to the Climate Leadership & Community Protection Act (CLCPA) and other state energy policy initiatives

# Assumptions for Reference Case

- **Reference Case:**

1. Uses 2019 Gold Book data for overall energy and peak growth rates, Solar PV, Electric Vehicles, Energy Efficiency, and Distributed Energy Resources.
2. Storage will be treated as a supply-side resource. The 2019 Gold Book included 2,281 MW of storage capacity by 2030. Only the charging associated with storage energy was included in the energy forecast. The NYISO estimated a reduction in retail customer demand of 200 MW at time of system peak load in 2030 attributable to storage. The hourly impacts of this resource is dependent on how storage is modelled as a Supply Resource.
3. Increases annual average temperature by about 0.7 degrees F per decade. Winter minimum temperatures increased at a slightly higher rate; summer maximum temperatures increased at a slightly lower rate.
4. Energy efficiency reductions from the period from 2015 to 2030 totaled about 18,100 GWh.

# Assumptions for Accelerated Climate Change Case

- **Accelerated Climate Change Case**

1. Builds upon the Reference case.
2. Increases temperature trend in average annual temperature by 1.4 degrees F vs. 0.7 degrees F per decade.
3. Increase in the number of days above 90 degrees F during July

# Assumptions for Energy Policy Case 1

- **Energy Policy Case 1 (Excluding CLCPA impacts)**

1. Increases annual average temperature by about 0.7 degrees F per decade.
2. Increase energy efficiency in the Reference Case to reach the Clean Energy Standard goal by obtaining an additional 2,200 GWh per year in energy efficiency by 2025 with a continuation of additional energy efficiency impacts through 2050.
3. Behind-the-Meter Solar PV: Increased to 6,000 MW-DC by 2025. Thereafter, add an additional 3,000 MW-DC by 2050.
4. Electric Vehicles: Continue to use the Medium case for electric vehicles as was used in the Gold Book. This results in about 13,200 GWh in 2040.
5. Increase heat pump penetration by conversion of 25% of existing natural gas units in 2016 to electric heat pumps by 2050.
6. Storage: Treated as a supply-side resource, not a load reduction. Obtain 3,000 MW storage in all sectors by 2030; increase storage capacity by an additional 2,000 MW by 2050. The hourly impacts of this resource is dependent on how storage is modelled as a Supply Resource.

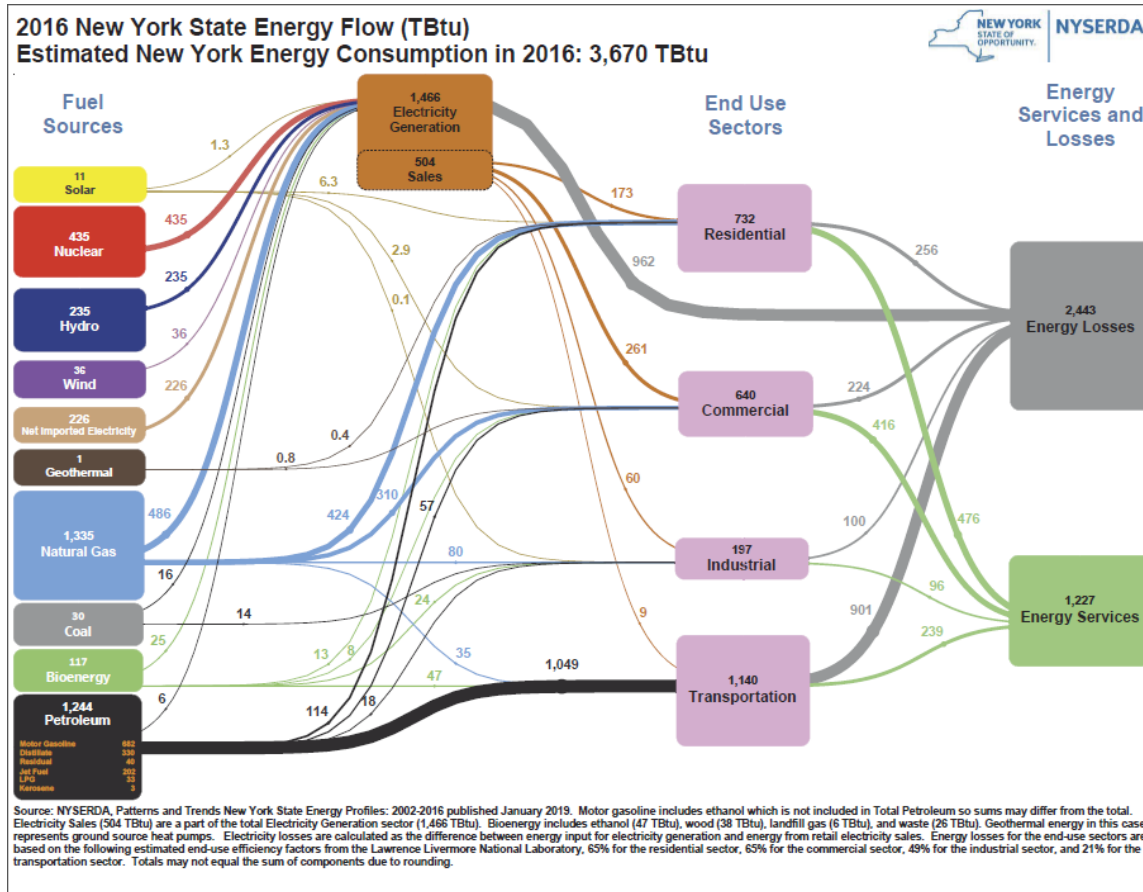
# Assumptions for Energy Policy Case 2

- **Energy Policy Case (Excluding CLCPA impacts)**
  1. Accelerates the increase in annual average temperature by about 1.4 degrees F per decade, from an increase of 0.7 degrees F per decade.
  2. Other assumptions are the same as Energy Policy Case 1

# Assumptions for CL&CPA Case

- **Climate Leadership & Community Protection Act (CLCPA)**
  1. Builds on energy policy case and accelerated climate change case.
  2. Directs 70% electricity production from renewable energy sources by 2030 and 100% electricity production from carbon-free sources by 2040.
  3. Achieves 85% reduction in greenhouse gases (GHG) by 2050 in residential, commercial, industrial and transportation sectors from 1990 GHG emission levels.
  4. Replaces fossil-based technologies with electric technologies
    - End uses include space heat, water heat, clothes dryers and cooking in residential & commercial sectors. Industrial sector sees modest improvements in energy intensity.
    - Residential electric space heat technology is primarily air source heat pump, with resistance heating for supplemental and secondary heating needs.
  5. 85% reduction in transportation greenhouse gases via transition to electric vehicles.

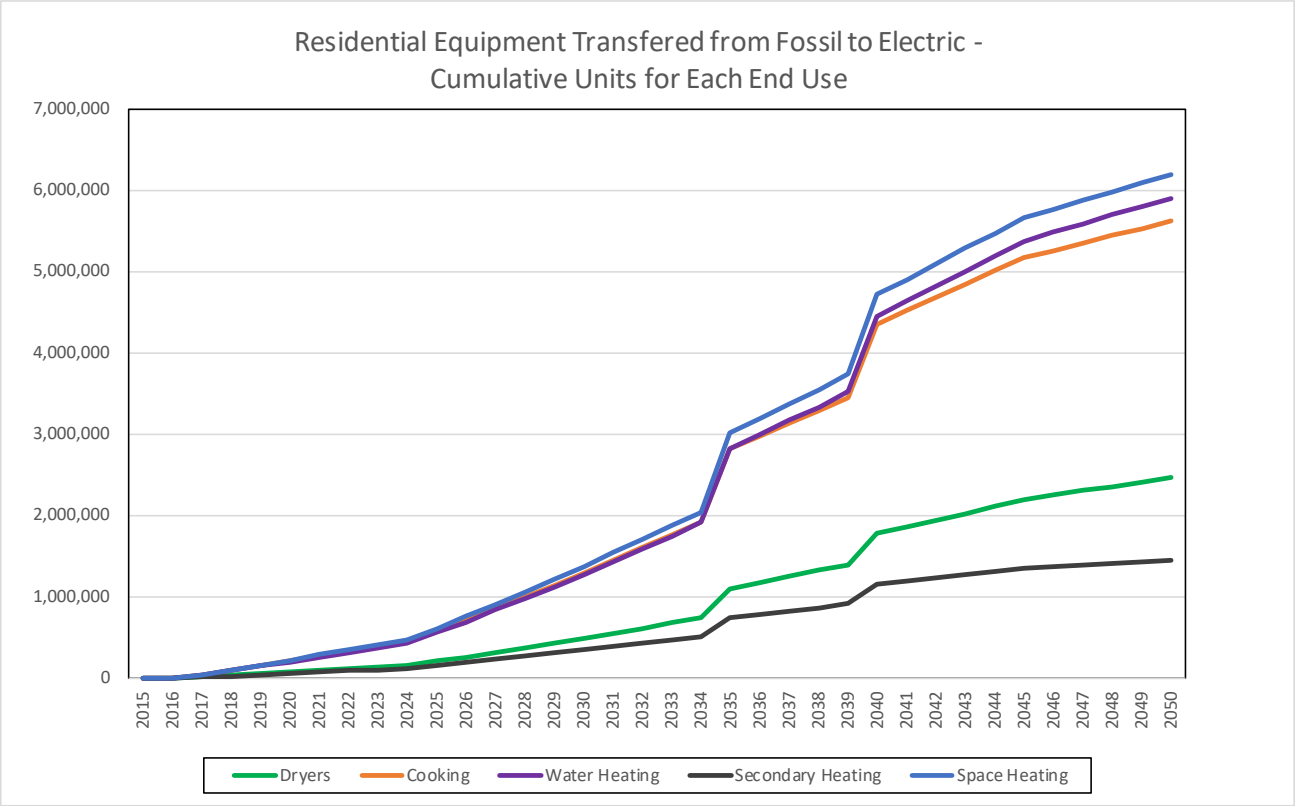
# Energy Flow Chart for New York



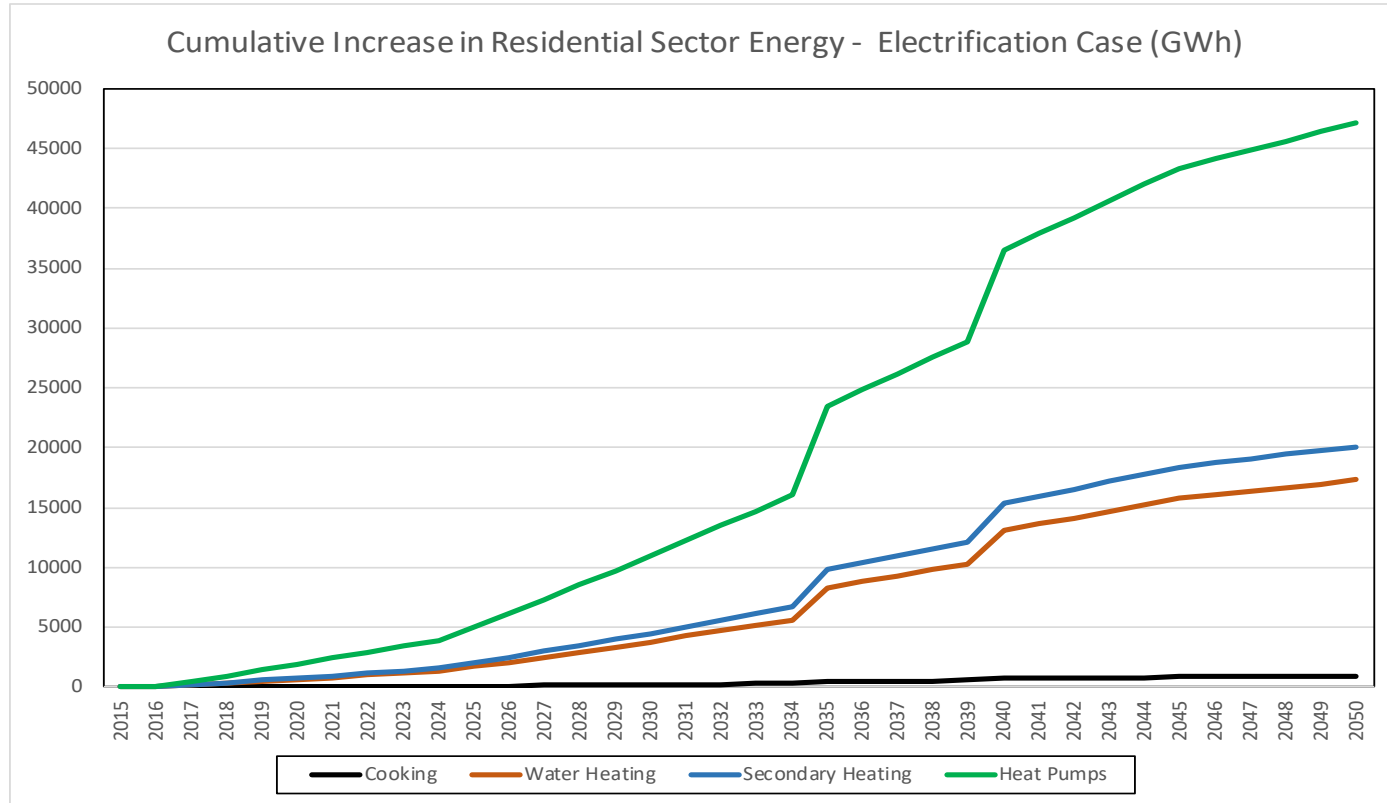
Emissions reductions are obtained from four end use sectors by switching from fossil fuels to electricity



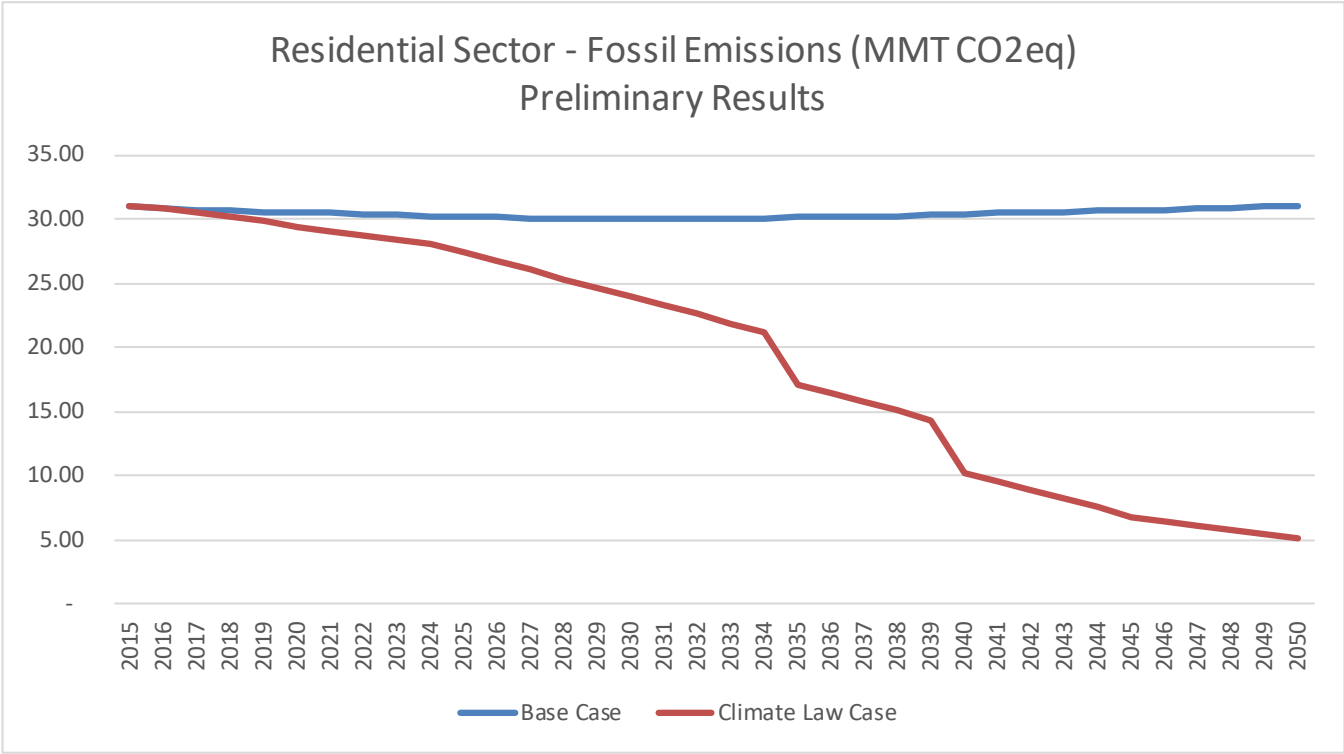
# Example for Residential Sector – Fossil Units Converted to Electricity For Each End Use



# Example for Residential Sector – Increase in Electric Energy Usage



# Example for Residential Sector – Emissions Reductions in Residential Sector



# Questions?

# Our mission, in collaboration with our 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 policymakers, stakeholders and investors in the power system

