The State Energy Planning Board Meeting will begin at 1:00 pm

NEW YORK STATE | Energy Planning Board

State Energy Planning Board Meeting

June 25, 2025

Welcome and Roll Call

Agenda

1. Opening remarks from the Chair
2. Review and approve May 27, 2025 Board Meeting Minutes
3. Discuss analysis for the State Energy Plan
4. Discuss select State Energy Plan topic areas.
5. Other Business
6. Next Steps

Opening Remarks

Doreen M. Harris

President & CEO, NYSERDA

State Energy Planning Board Chair

State Updates

Northeast States Collaborative on Interregional Transmission

- Coalition of 9 Northeast states (NY CT DE ME MD MA NJ RI VT) to explore enhanced transmission ties
- Released RFI to identify potential interregional transmission opportunities
- This work will help cost-effectively enhance grid reliability and resilience, improve market efficiency, expand clean energy use, and reduce costs for consumers

New York Essential Plan Cooling Program

- Newly announced program would provide free air conditioners for New Yorkers enrolled in the Essential Plan
- Part of New York's 2022 Extreme Heat Action Plan

New York Power Authority Advanced Nuclear Project

- NYPA will develop and construct a zero-emission advanced nuclear power plant in Upstate New York
- NYPA, in coordination with the Department of Public Service (DPS), will seek to develop one or more new nuclear energy facilities capable of producing at least 1 gigawatt of electricity, either alone or in partnership with private entities
- NYPA will evaluate technologies, business models, and locations for this first nuclear power plant and secure the key partnerships needed for the project
- This work will be in coordination with the forthcoming studies included in the master plan for Responsible Advanced Nuclear Development in New York, led by the NYSERDA and DPS

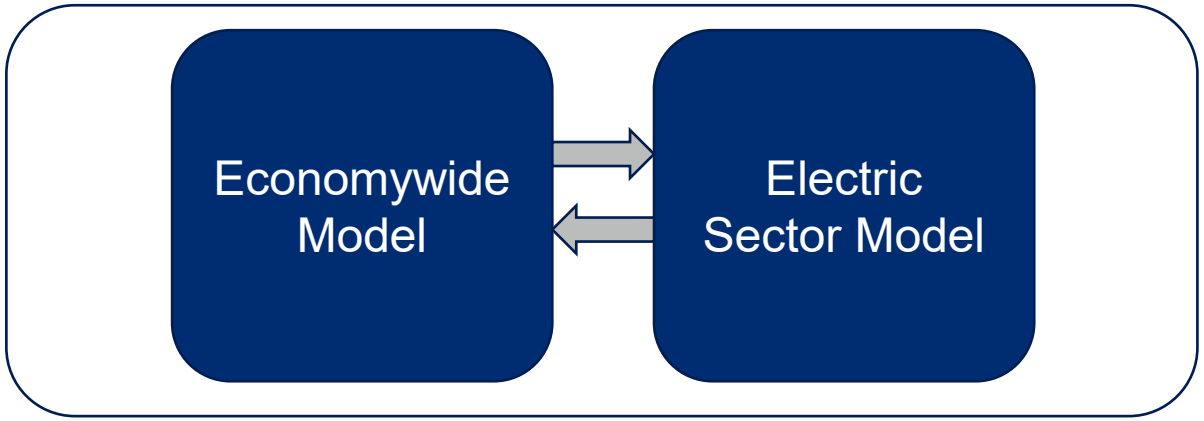
Review Minutes of the May 27, 2025 Meeting of the Board

Analysis for the State Energy Plan

NYSERDA

State Energy Plan: Pathways Analysis

Pathways analysis modeling approach



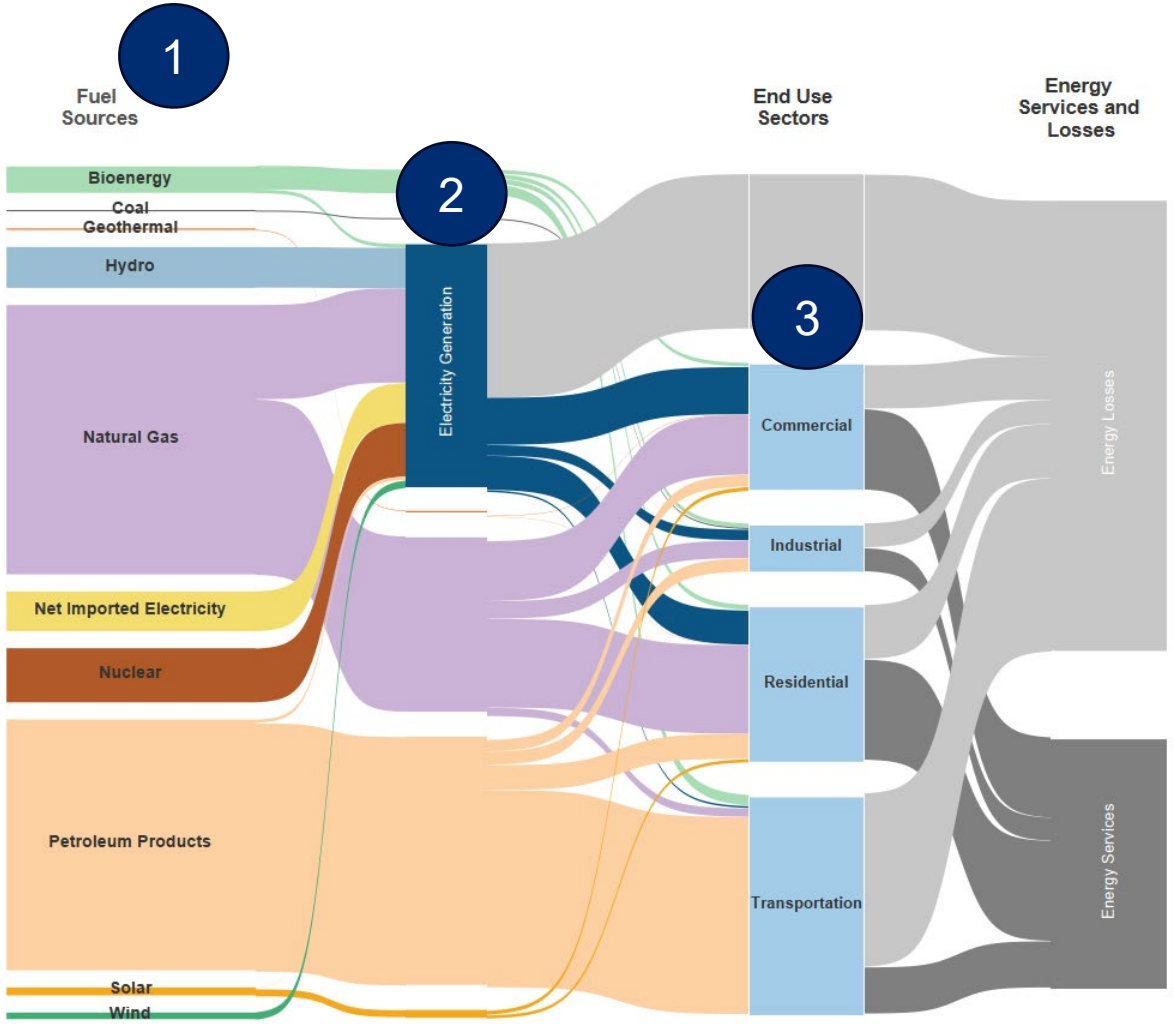
> Economywide Model

- Takes as input key data from other NYSERDA industry studies and program data
- Models stocks, turnover, and sales of equipment across sectors, e.g., buildings, transport
- Outputs fuel use, electric loads and peaks, and gross and net emissions across sectors
- Takes as input nonenergy sector data, e.g., waste, ag.
- Incorporates refrigerant emissions, fugitive gas system emissions, and health outcomes from additional modules
- Aggregates societal cost, health and carbon benefits

> Electric Sector Model

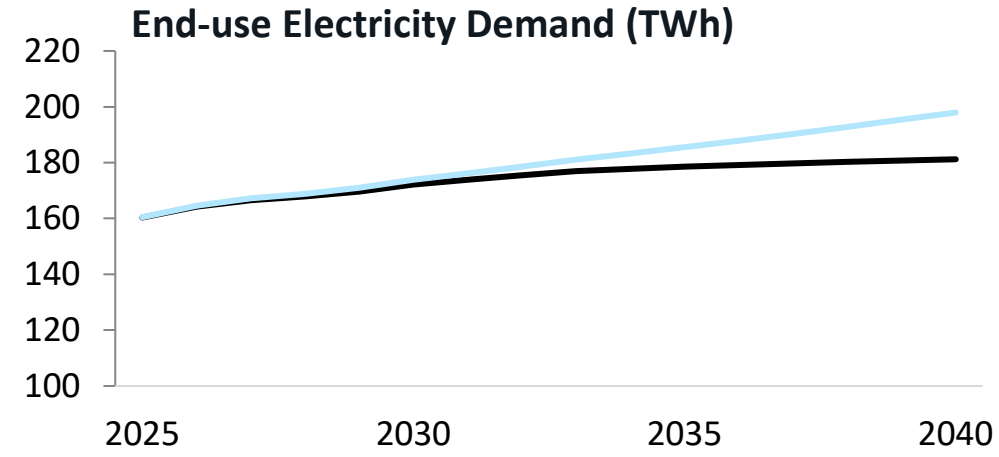
- Takes as input the loads and peaks from the Economywide Model
- Builds an electric system that meets the scenario load shapes, maintains reliability standards, and achieves Scenario-specific constraints
- Outputs cost and emission data for the electric sector to feed back into economywide model

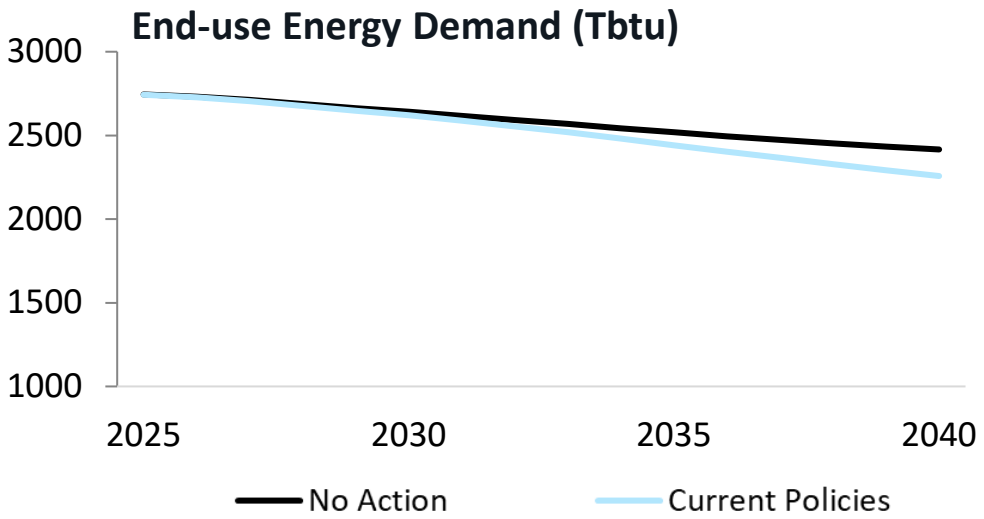
Energy Use in New York State



1. Fossil fuels are still the dominant source of primary energy. Petroleum and natural gas account for 75%
2. Within the power sector, gas is the largest source of fuel for electricity generation, followed by nuclear and hydro, and other renewables represent a growing share
3. Primary consumers of energy are buildings (50%) and transportation (40%)

Scenario framework (1/2)





No Action

> Extension of historic policy interventions and native market adoption

> Includes federal policies but excludes going forward impact of New York's Climate Act and subsequent clean energy policies

> Acts as a point of comparison to understand incremental benefits and costs of pursuing clean energy deployment

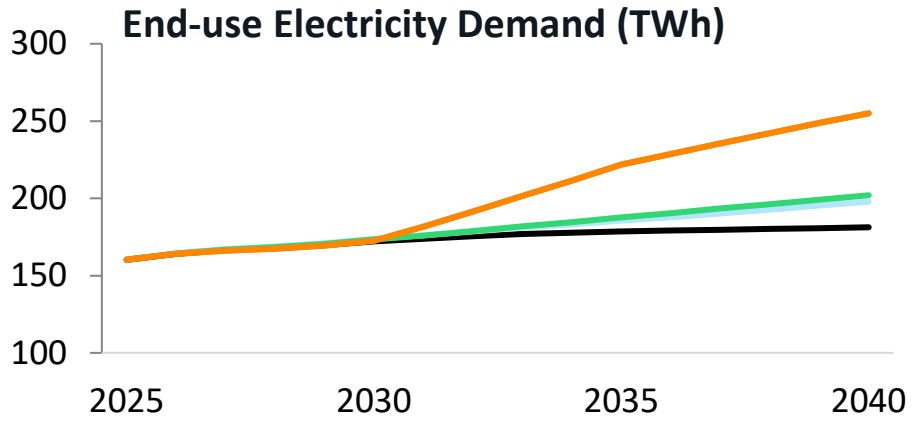
> Sensitivities will be run to explore potential impacts from federal uncertainty

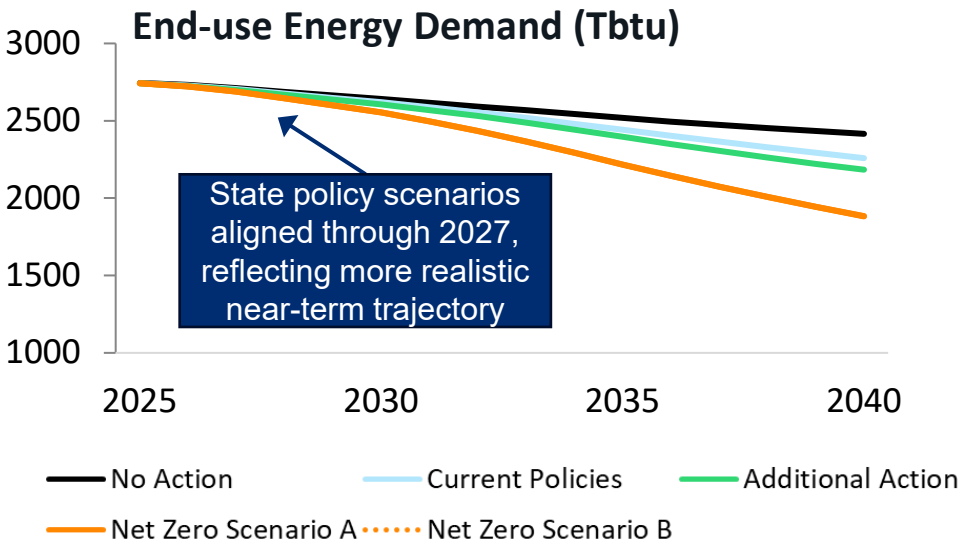
Current Policies

> Includes progress from State and Local actions, for example:

- Advanced building codes and all electric new construction, alongside utility, NYSERDA, HCR energy efficiency and electrification programs
- Current progress toward transportation initiatives
- Deployment of clean electricity generation in line with CES biennial review

Scenario framework (2/2)





Additional Action

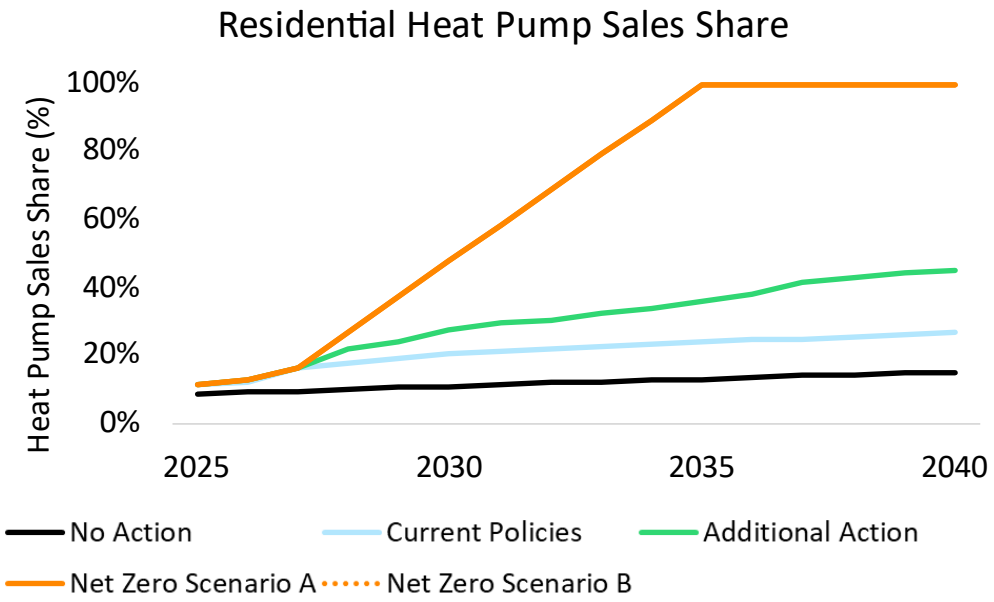
- > Includes all policies from Current Policies
- > Assumes ongoing progress from additional policies and programs for continued market adoption into future years, in particular building and industry electrification and efficiency
- > Representative policies could include increasing investments and other recommendations from the Energy Plan

Net Zero Scenarios

- > Explore 2 pathways to achievement of 2050 economywide limit
- > All net zero scenarios continue to lean on significant energy efficiency, electrification, methane mitigation, and end-use load flexibility, while increasing scale and introducing new levers
- > Differentiation is focused on the extent to which hybrid heat pumps can mitigate peak load impacts
  - Net Zero A: Limited use of hybrid heat pumps
  - Net Zero B: Expanded use of hybrid heat pumps

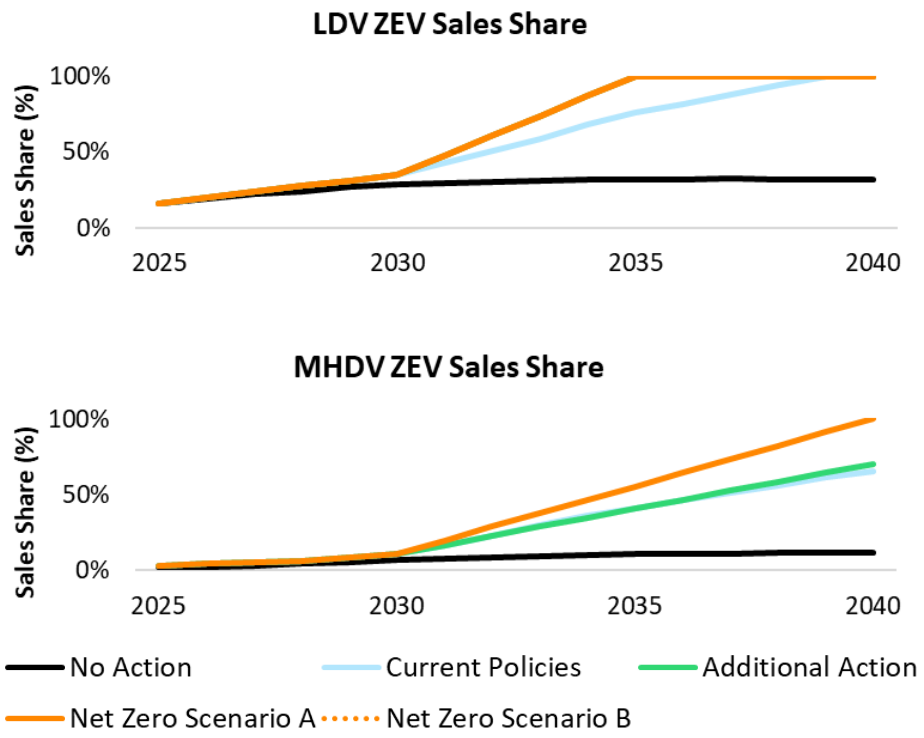
Sectoral Modeling

Buildings: residential sector



- In all cases, new construction, investments in efficiency, and HVAC turnover (with increasing deployment of heat pumps) drive change in the Buildings Sector energy use
- The No Action Case sees only moderate heat pump (750K) and shell deployment (1M) from legacy codes and organic adoption through 2040
- All electric new construction, advanced building codes, NYSERDA, utility, and HCR programs, and further actions drive increased heat pump (1.2-1.7M) and shell (2.9-3.3M) adoption in the Current Policies and Additional Action cases
  - Efficiency is a bedrock strategy. Shell adoption outpaces heat pump adoption in CP/AA, mitigating cost and electric system impacts
- Achievement of Net Zero goal would require achieving 100% sales of heat pumps starting in 2035 and more aggressive adoption of energy efficiency

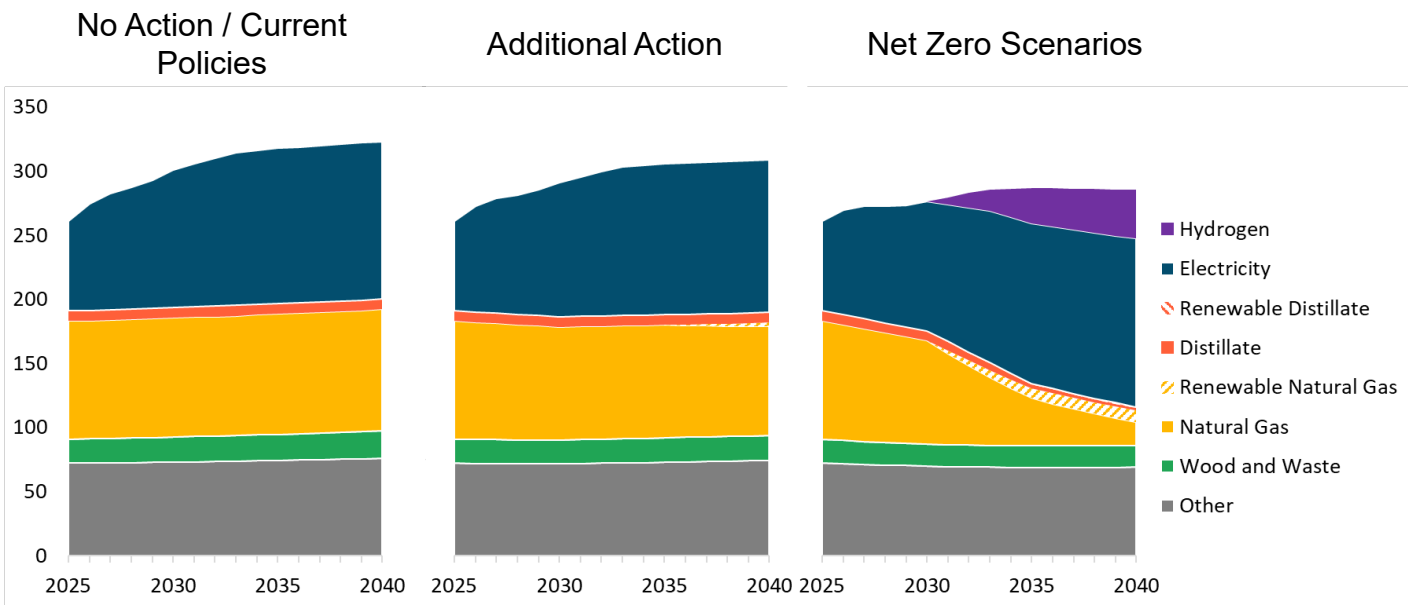
Transportation: light, medium, heavy duty



- The Transportation sector is expected to undergo meaningful shifts to vehicle electrification, a transition which is already underway but threatened by recent federal action
- The No Action case sees some adoption of light-duty and medium-duty ZEVs due to federal incentives, organic growth, and commercial adoption (2.4M LDV, 50k M/HDV by 2040)
- Transportation initiatives drive significant incremental ZEV adoption across all segments in the CP/AA policy scenarios (5.1-5.7M LDV, 220k M/HDV by 2040)
- The gap in ZEV sales between Net Zero and CP/AA cases is comparatively narrow, reflecting the value of existing policies. However, the pace of adoption is accelerated in the Net Zero cases (5.7M LDV, 290k M/HDV by 2040)
- Renewable fuel blending can be another important lever for decarbonizing the broader transportation sector
  - Additional Action achieves 20% renewable distillate, 35% renewable jet fuel by 2040

Industry

Industry Final Energy Demand by Fuel (TBtu)

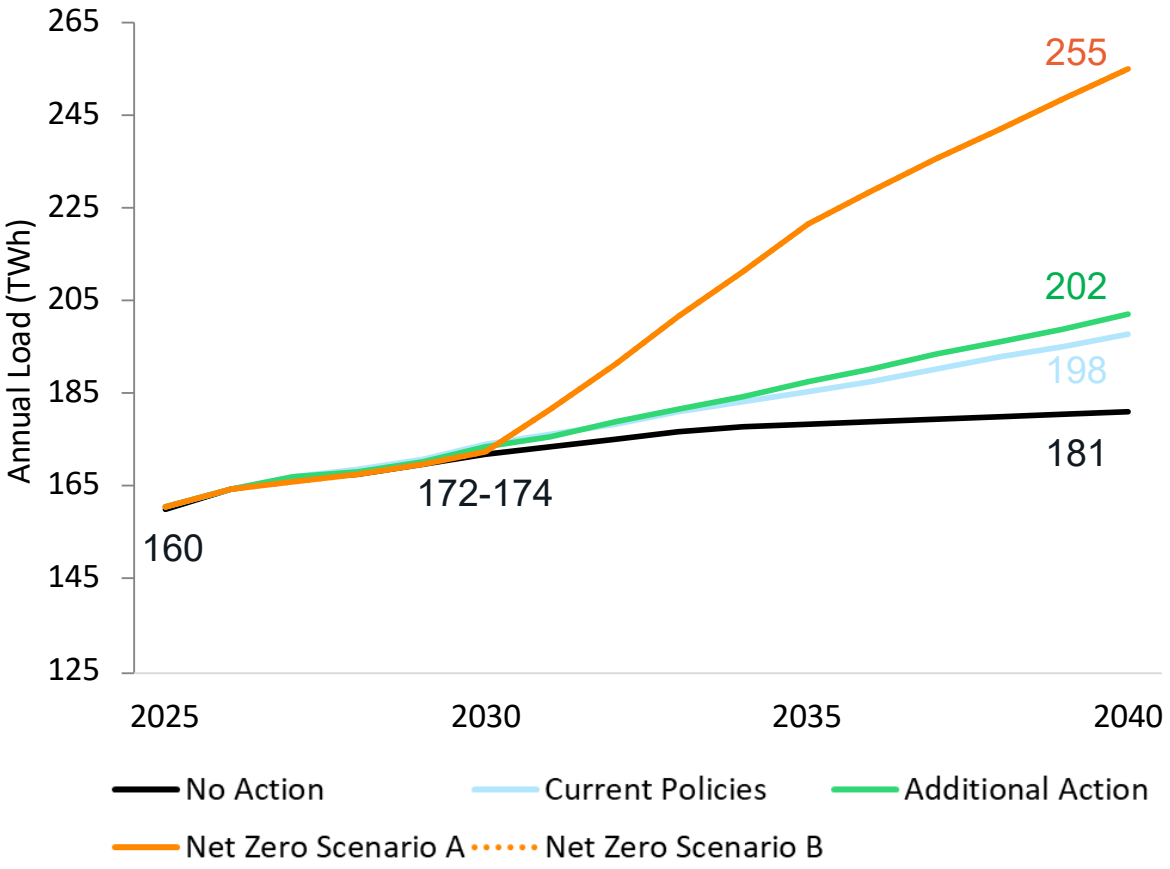


Projected growth in industrial activity is consistent in all scenarios shown

- Industrial activity is projected consistently to grow in all cases
- Large loads from new industrial activity (+16 TWh) will create additional energy needs. Planning early to ensure abundant supply for these loads can ensure continued opportunities for economic growth
- Additional Action Scenario introduces moderate additional industrial efficiency measures
- Achieving deep decarbonization in the Net Zero cases requires additional efficiency and fuel switching from fossil fuels to electricity and hydrogen for hard to electrify processes

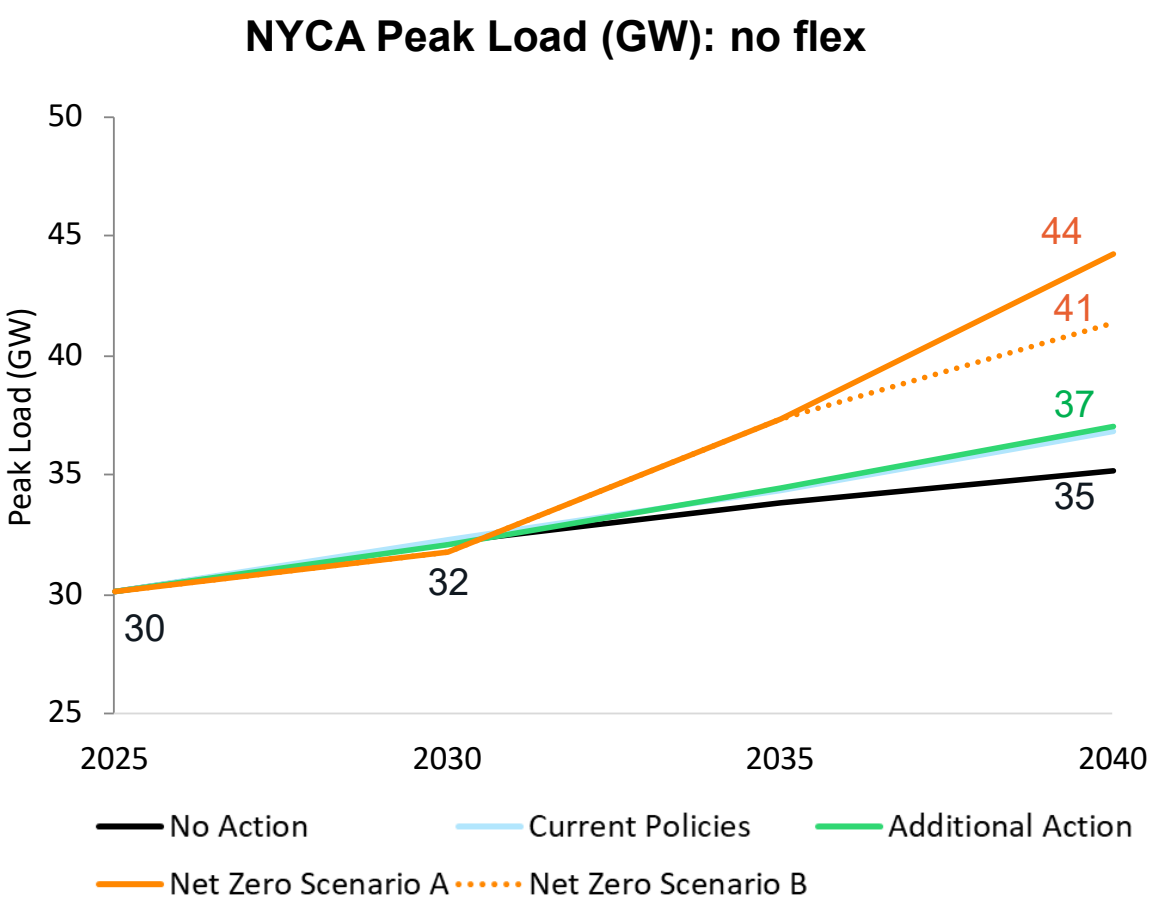
Economywide results

Annual loads



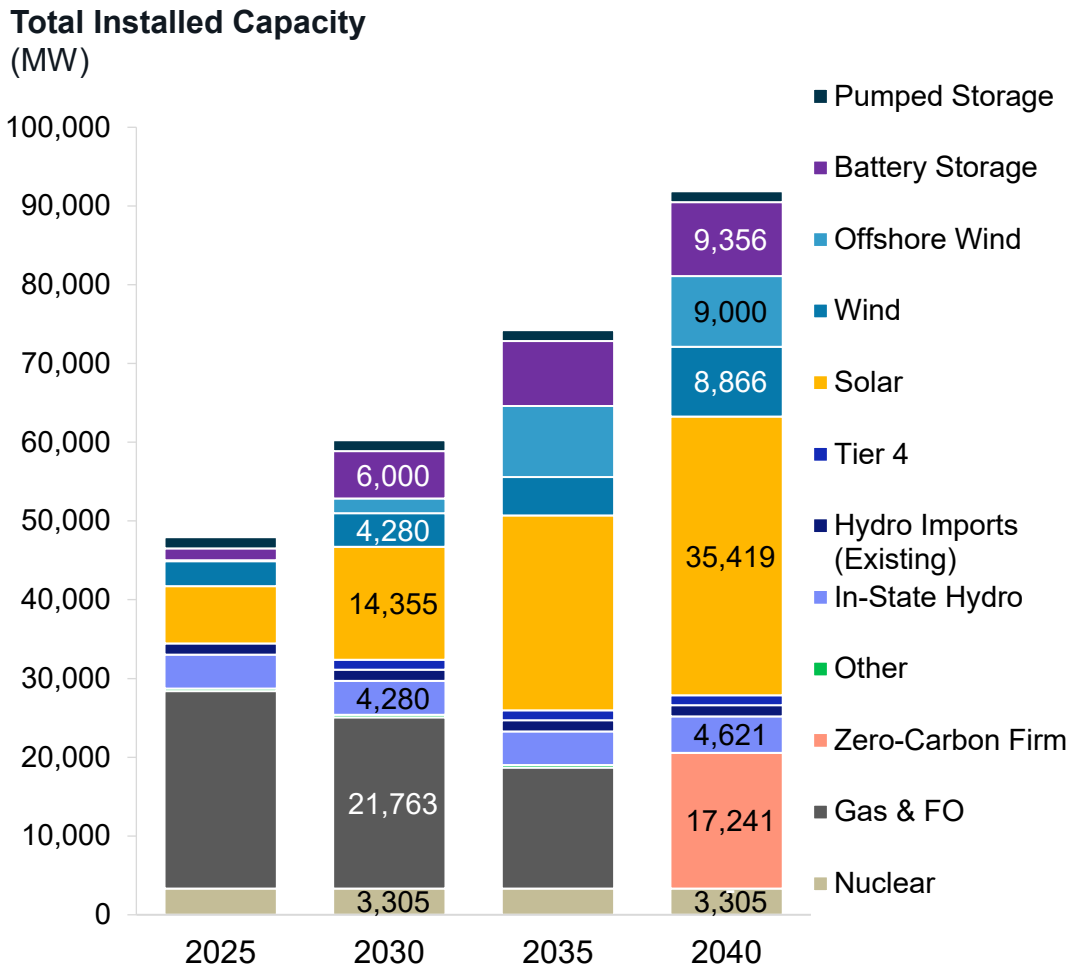
- Loads grow in all cases over the study period, driven especially by new large loads (+16 TWh) and to various extents vehicle electrification
- Vehicle electrification drives significant additional load growth (+14-17 TWh) in Current Policies and Additional Action
- Building efficiency plays an important role in offsetting building electrification load growth in Current Policies and Additional Action, underscoring the importance of these investments
- The Net Zero cases see the greatest load growth driven by significant additional building and industrial electrification which would require a transformational infrastructure buildout

Annual peaks



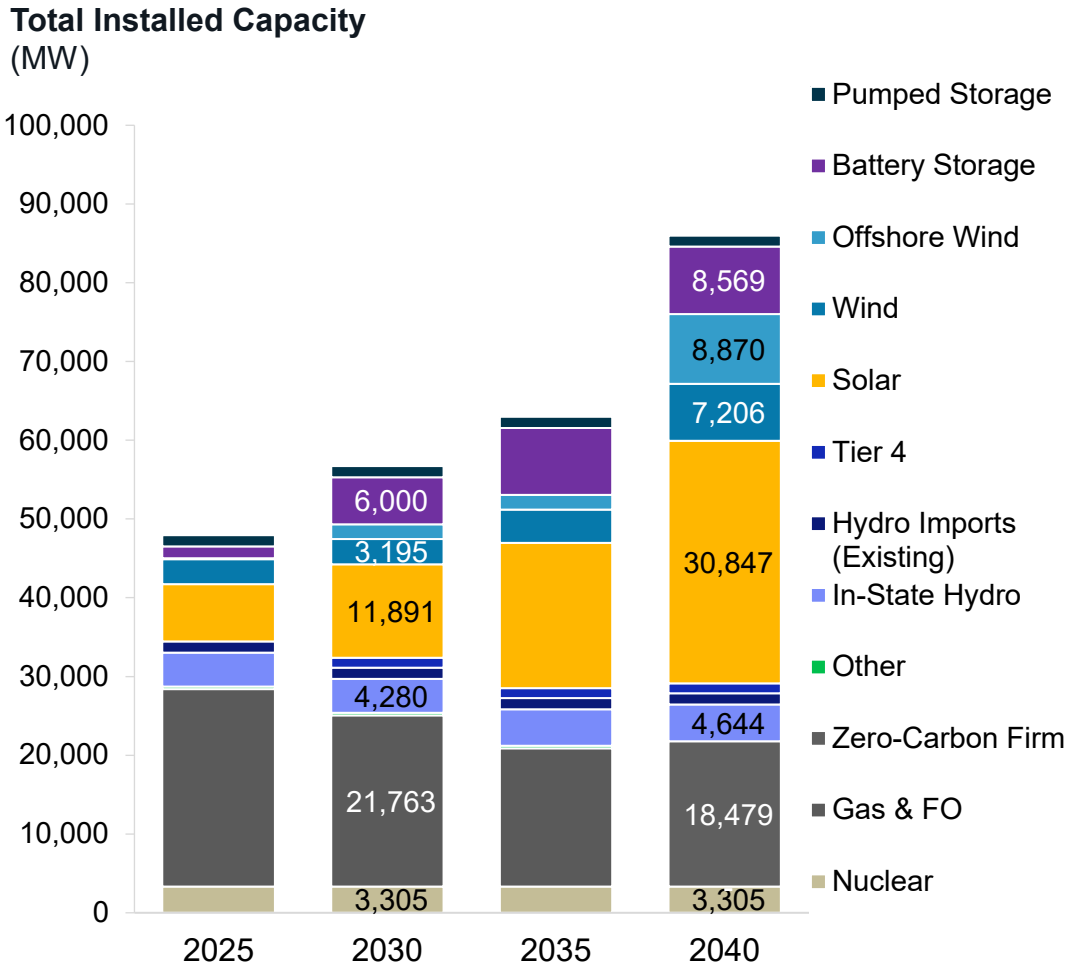
- New large loads (+2.5 GW) and vehicle electrification to varying degrees will drive peak load growth in all cases, necessitating a system expansion
- Vehicle electrification further increases peak growth in the Current Policies and Additional Action cases (+3.5 GW)
- Accelerated heat pump adoption in the Net Zero cases drives further peak growth, but the effects are somewhat mitigated in Net Zero B due to the increased hybrid heating
- No Action, Current Policies, and Additional Action remain summer peaking through 2040. Net Zero A becomes winter peaking, while Net Zero B becomes dual peaking
- Flexible loads can play an important role in mitigating peak growth (contributing up to 1 GW in peak reductions by 2040 in Current Policies and Additional Action)

Electric Sector Results: Additional Action



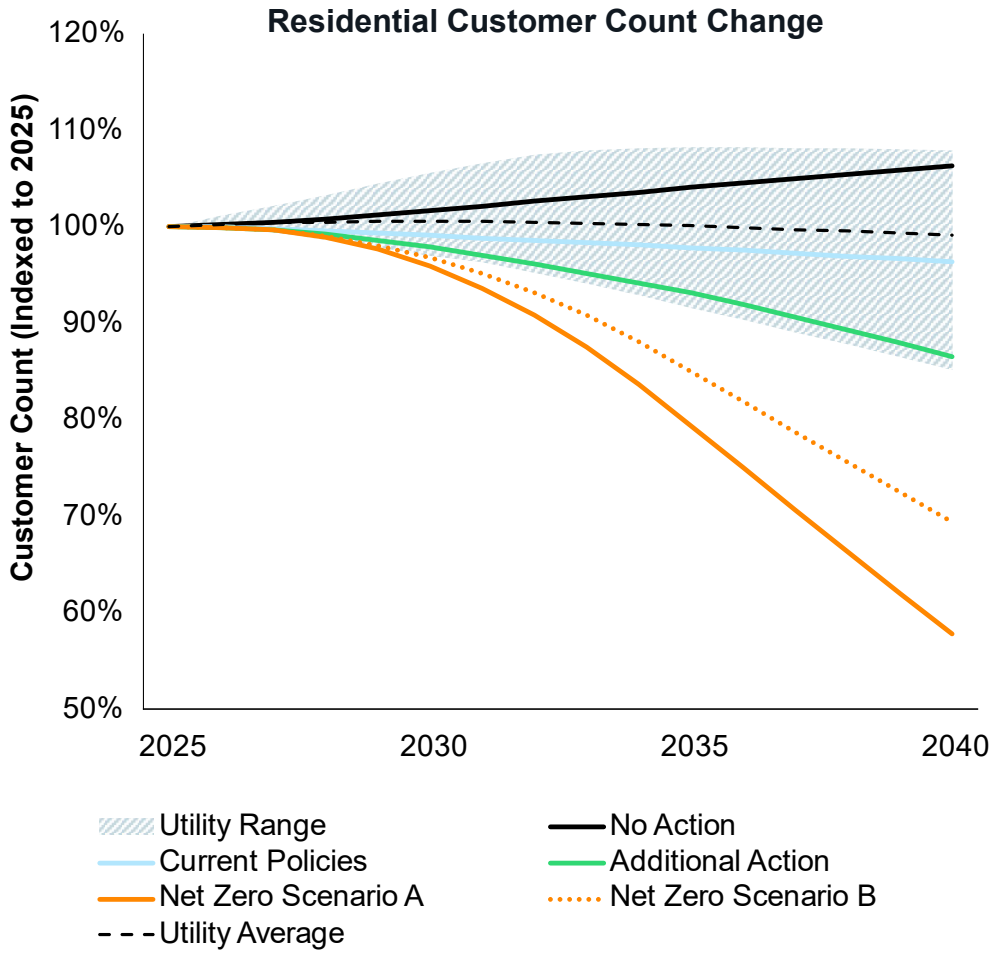
- Realization of the 70% renewable goal is consistent with the CES biennial review. A significant ramp up of deployment will be needed to achieve 0x40
- Meeting growing loads and peaks while achieving 0x40 and maintaining reliability requires a significant buildout of a diverse set of resources
- Preserving existing hydro and nuclear is essential for 0x40
- Many aging combustion units retire over the model period. 6 GW are repowered, and the 17 GW fleet is converted to run on Hydrogen by 2040
  - Overall the combustion fleet is smaller due to availability of other firm resources, like storage and Tier 4 hydro imports
  - Zero emission resource definition is under development and hydrogen serves as an illustrative resource for firm dispatchable power

Limited build rate sensitivity on Additional Action



- Deployment challenges (including federal impact on attrition and permitting) could lead to a meaningful reduction in renewable build rates
  - While there are still significant additions of renewables, this sensitivity shows a meaningful reduction in solar and wind capacity compared to the core scenario in 2040
- Zone J repowers 2.2 GW of combustion units in 2035, and overall combustion needs in 2040 are 1.2 GW higher than the core scenario, but still lower than the start of the modeling period
- While gas generation is 50 TWh lower than 2025, 15 TWh of natural gas generation is needed in 2040 to meet energy needs. Alternately this need could be met via:
  - ~2 GW of new nuclear and likely additional transmission
  - RNG combustion in the power sector
  - Some blend of these two resource options (new nuclear and RNG)

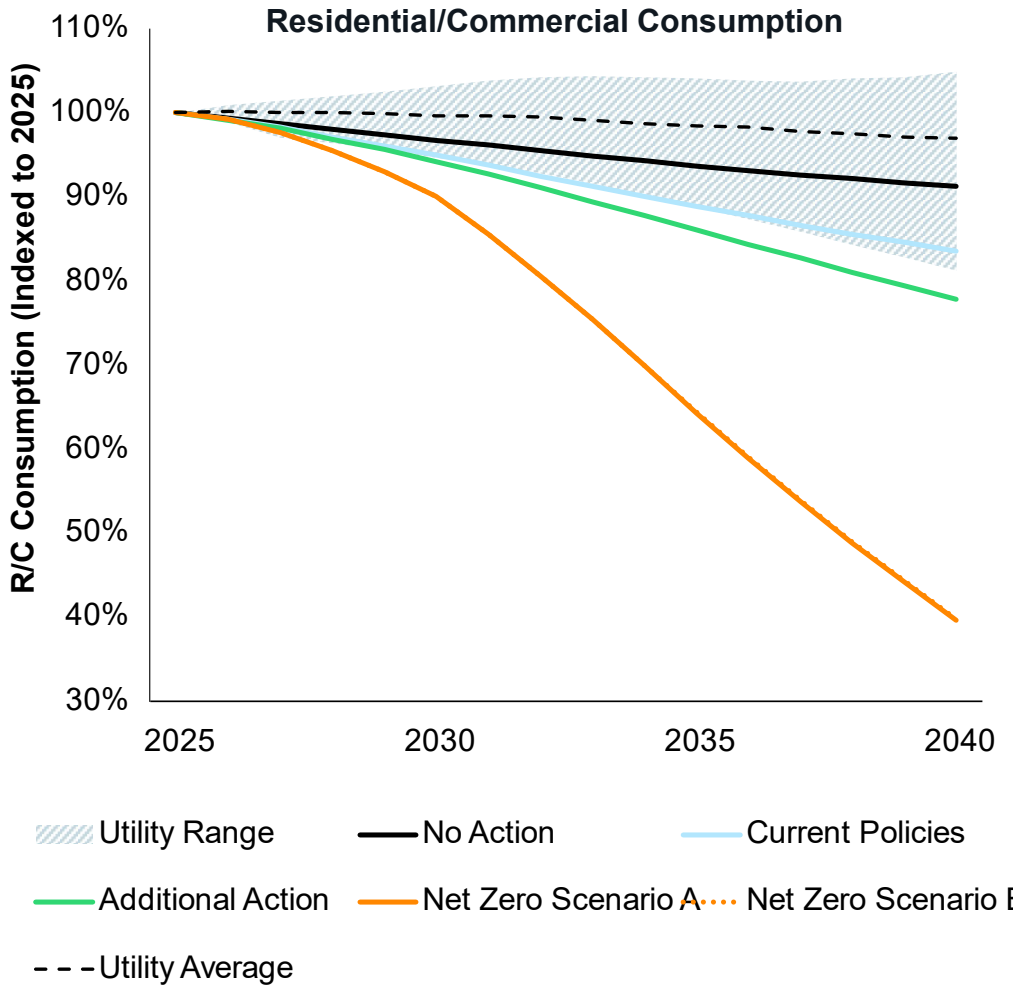
Gas system (1/2): Infrastructure



- The gas system remains a significant energy delivery resource in all cases over the study period which will require continued investment for safe and reliable provision
- In the No Action case, new construction and fuel switching from oil and electric resistance would lead to gas system expansion
- All electric new construction and building electrification programs show potential to stem near term statewide customer growth in Current Policies and Additional Action cases, with impacts felt more fully in the later period
  - Utility Long Term Plans suggests a range of future customer counts, with significant regional variability
- The strategic use of hybrid heating to minimize electric peaks in Net Zero B yields a larger gas network. However, each customer would need to use less gas to preserve the economywide emissions limit

Note: utility range reflects aggregate residential and commercial data due to lack of disaggregated data across all utilities

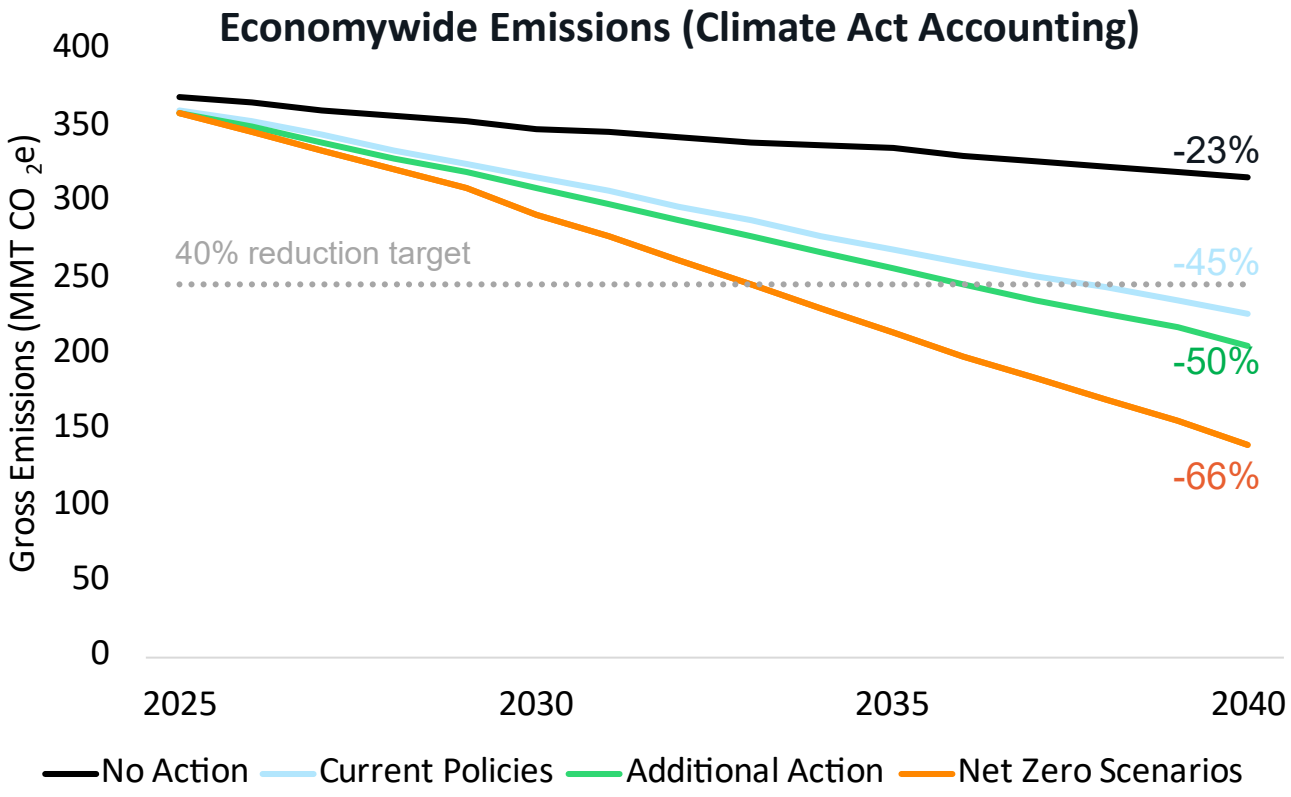
Gas system (2/2): residential/commercial consumption



> In combination, statewide Residential and Commercial consumption declines across the cases with improved energy efficiency and electrification
  - Utility Long Term Plans suggest a range of potential consumption scenarios, with regional variability
  - Regional variation and peak day needs could still require local gas system investment

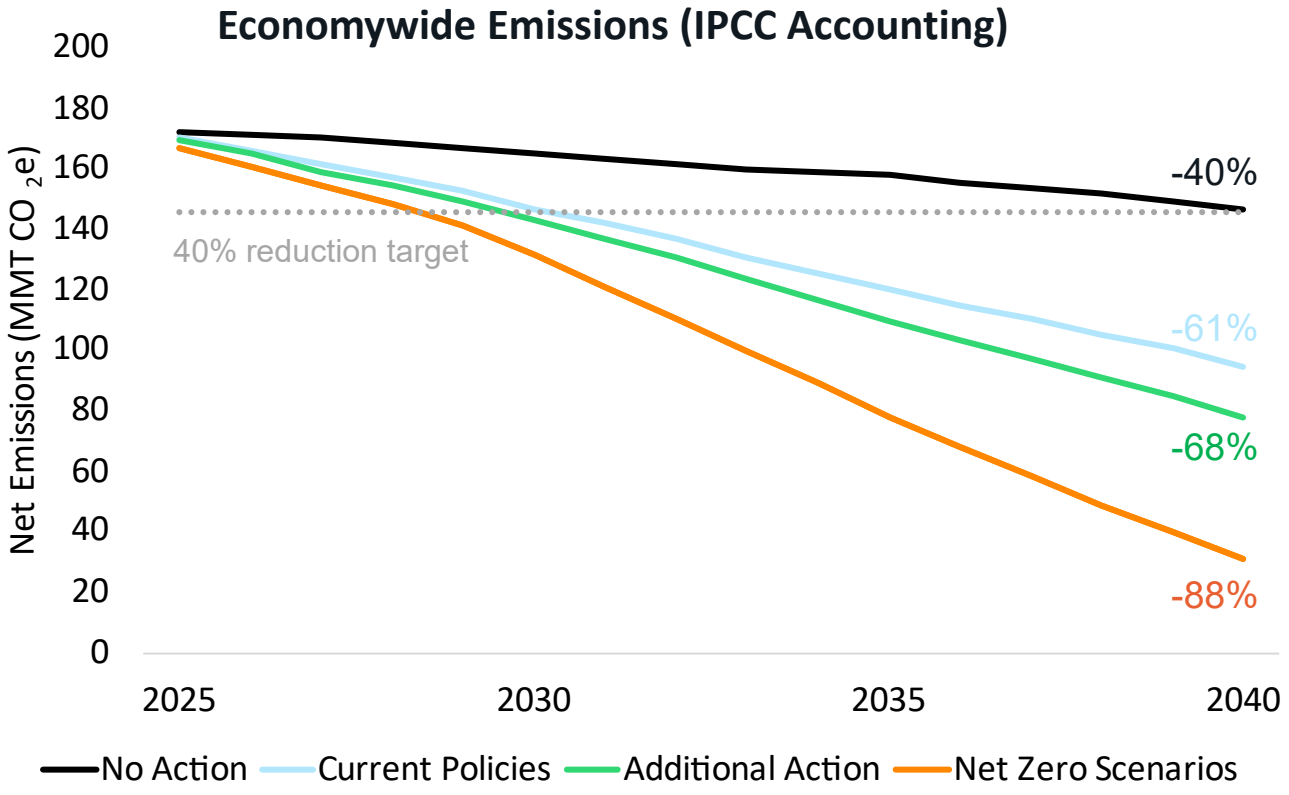
> The Net Zero cases see transformational consumption decline with accelerated building electrification and shell adoption

Economywide emissions



- According to most recent reporting, emissions were 9.4% below the 1990 statewide emission limit baseline, and 20% below 2005 statewide emission levels
- Major drivers of carbon reduction across all cases include: transportation electrification, device efficiency improvements, building shell improvements
  - NY clean energy policies lead to further carbon reduction in CP/AA including: renewables deployment, more aggressive building/transportation electrification, improved building codes
  - While there is significant uncertainty, this progress is threatened by recent federal action but strengthened by state action such as the recent $1 billion decarbonization commitment

Economy-wide emissions (IPCC accounting)



> When applying the conventional format for governmental accounting, most recently reported emissions were 23% percent below the 1990 statewide emission limit baseline

> Current Policies are within 2 MMT of 40% net reduction by 2030, Additional Action and Net Zero cases achieve 40% reduction by 2030

Key takeaways (1/3)

- **Near term (2030) infrastructure story**
  - Energy system is evolving in meaningful ways – new loads causing system growth, replacement of aging stock leading to improved efficiency, some native adoption of technologies is already underway
  - State actions are helping to accelerate this evolution – major drivers of change include:
    - Clean electricity progress, such as 6 gigawatts of distributed solar, completion of South Fork Wind, 1 gigawatt Champlain Hudson Power Express transmission line for new hydropower import along with Empire Wind 1 and Sunrise Wind under construction, and contracting for 10 gigawatts of large-scale renewable energy projects
    - Transportation initiatives
    - All electric new construction, advanced building codes, and heat pump and efficiency programs
    - $1 billion decarbonization commitment by New York State in 2025
  - Incremental progress by 2030 is muted as it will take time for effects to translate into stock transformation

Key takeaways (2/3)

- **Long term (2040) infrastructure story (Current Policies and Additional Action)**
  - The impacts of existing policies will be felt more fully over time. By 2040, **17-24%** of the residential heating stock is heat pumps, and **53-59%** of the LDV stock is ZEV
  - A significant transformation of the energy system occurs in both Current Policies and Additional Action
    - By 2040, electric loads increase **23-26% to 198-202TWh** and peaks increase **22-23% to 37 GW**
    - Gas consumption in buildings declines **16-22%** when compared to 2025, but the gas system remains a crucial energy delivery system across all cases and regional variation and peak day needs could require new gas system infrastructure
  - Final energy served by electricity increases from 19% in 2025 to **28-29%** in 2040, and final energy served by direct fossil fuel consumption decreases from 78% in 2025 to **63-67%** in 2040
  - A significant scale up of renewables deployment is needed to achieve 0x40, which is threatened by economic and emerging federal policy challenges

Key takeaways (3/3)

Emissions Outlook: Navigating External Uncertainties

- New York State's existing policies are establishing a foundation for economywide emissions reductions, with notable progress in power generation, transportation, and buildings
- However, progress has been impacted by factors including disruptions caused by the COVID-19 pandemic and subsequent inflation and supply chain disruptions and global events, such as the energy supply and price impacts resulting from the Russian invasion of Ukraine
- In addition, evolving federal policies and tariffs introduce uncertainty into the state's near-term emissions trajectory

Long term

- Timelines to achieve a 40% reduction in emissions continue to be influenced by external shifts
- Under the current set of assumptions the planning scenarios will hit 40% reduction as soon as 2036
- Achieving the long-term net-zero economywide emissions goal by 2050 will likely necessitate substantial incremental efforts beyond what existing policies currently envision

Board Discussion

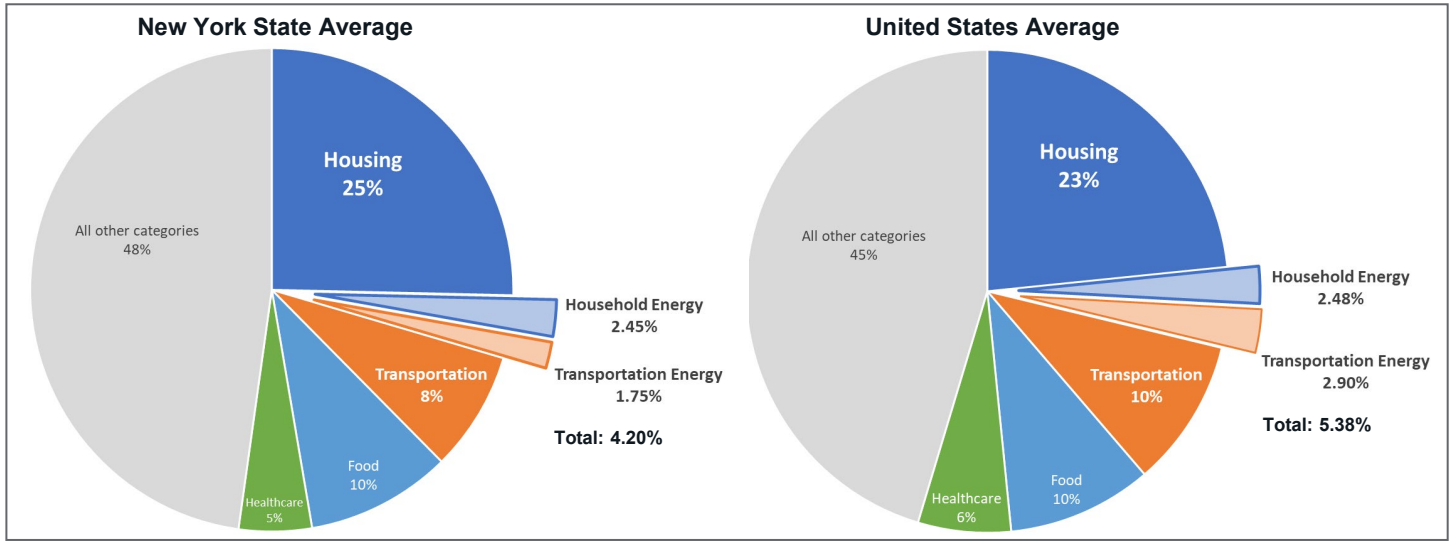
NYSERDA

State Energy Plan: Household Energy Affordability Analysis

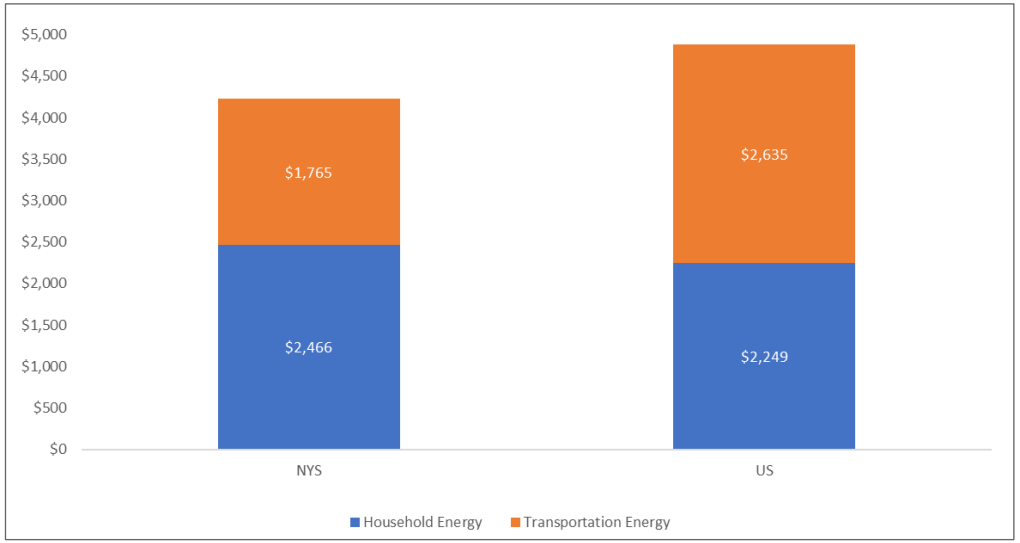
Energy Affordability in New York Today

Across the US and across New York, households face affordability challenges

Household spending as share of income, New York State and United States



Average household and transportation energy expenditures



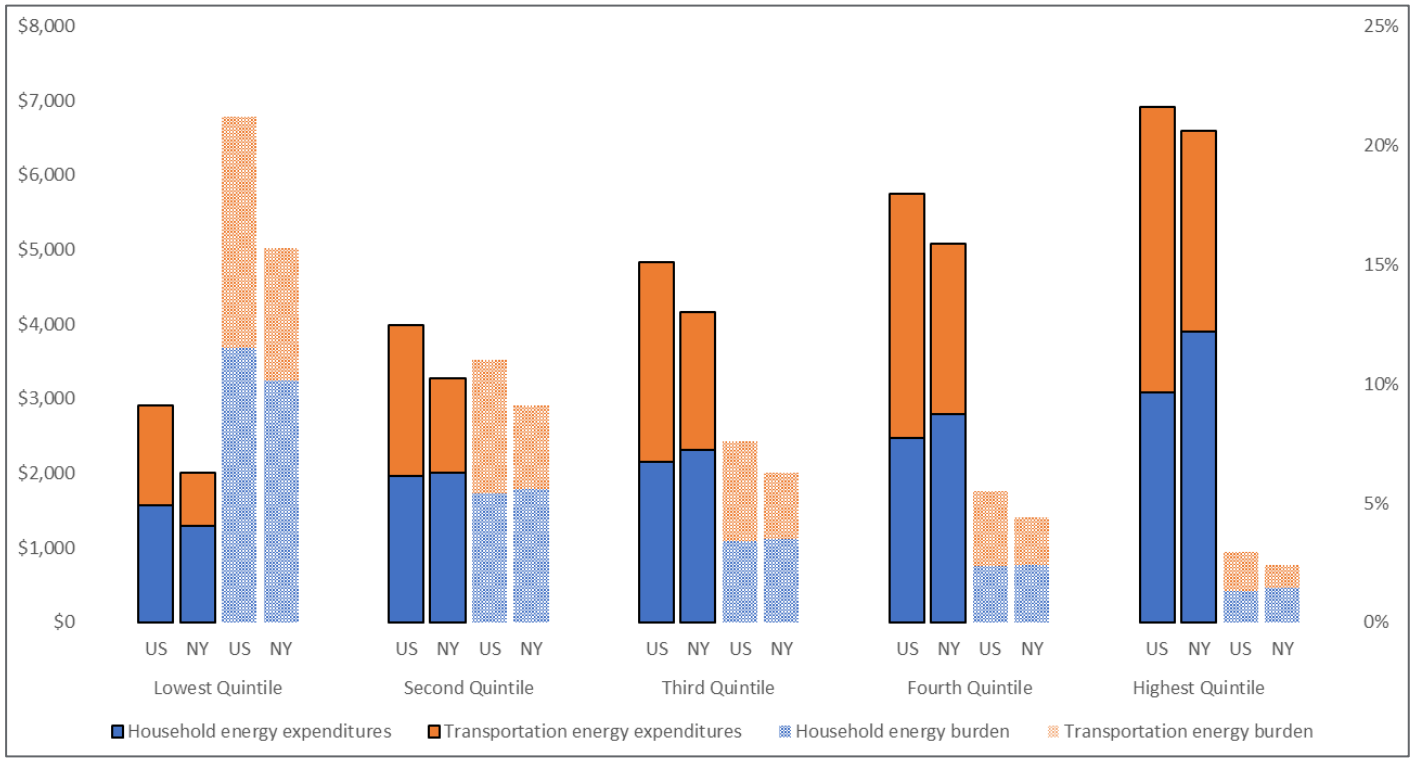
- There are many drivers of household affordability, and expenditures in areas such as housing, transportation, food, and healthcare are significant
- As a subset of housing and transportation costs, energy is an important, but not a primary driver of affordability challenges
- Energy prices are higher in NYS than the US average, but average energy consumption is lower, leading to lower combined household and transportation energy expenditures than the national average as well as the top outmigration states from New York

Sources: US Bureau of Labor Statistics. Consumer Expenditure Surveys. New York and US. Accessed 4/16/25, https://www.bls.gov/cex/tables.htm#geo.
US Bureau of Economic Analysis.. Regional Data, GDP and Personal Income. Accessed 5/2/25, https://www.bea.gov/itable/regional-gdp-and-personal-income

Energy Affordability in New York Today

Across the US and across New York, low- and moderate-income households are more likely to experience energy affordability challenges

Energy and transportation expenditures and associated burden by income quintile, United States and New York State

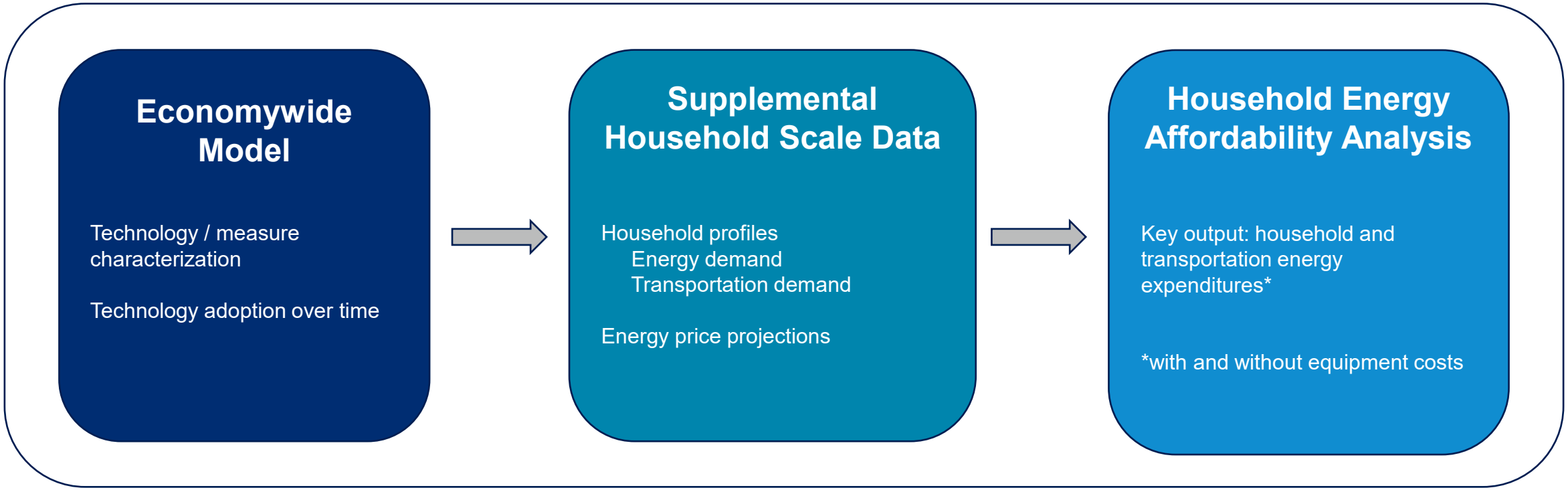


- On average, expenditures and burdens follow an overall pattern of lower expenditures but disproportionate burden at lower incomes
- Combined household and transportation energy expenditures and associated *burdens—the share of income devoted to energy*—are lower in NYS than the US across income quintiles
- In addition to energy burden, lower income and more vulnerable households experience *energy insecurity — for example, foregoing other expenses to pay for energy, keeping one's home at an unsafe temperature, or getting behind on an energy bill*—at above average rates.

Sources: US Bureau of Labor Statistics. Consumer Expenditure Surveys. New York: Quintiles of Income before taxes, 2021-2022 and US: Quintiles of Income before taxes, 2021 & 2022. Accessed 4/16/25, https://www.bls.gov/cex/tables.htm#geo.
US Census Bureau. Household Pulse Survey. https://www2.census.gov/programs-surveys/demo/tables/hhp/2024/cycle09/housing4_cycle09.xlsx ; US Energy Information Administration. Residential Energy Consumption Survey. https://www.eia.gov/consumption/residential/data/2020/

Energy Affordability Analysis

Analyzes **household and transportation energy expenditures** for household profiles and journeys that are representative of the scenarios from the economywide pathways analysis.

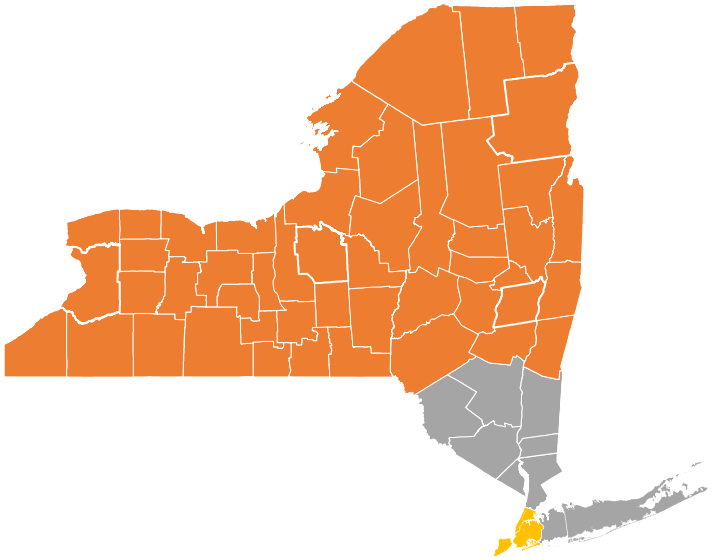


Energy Affordability Analysis

Includes **nine** household profiles across **three** regions of NYS.

Household Profiles
NYC, Low Income
NYC, Moderate Income
NYC, Average Income
Downstate, Low Income
Downstate, Moderate Income
Downstate, Average Income
Upstate, Low Income
Upstate, Moderate Income
Upstate, Average Income

Analysis Regions



New York City **Downstate** **Upstate**

Energy Affordability Analysis

For each household profile, analyzes future **household and transportation energy expenditures** for **four** journeys involving different technology mixes and fuel types.

Four Illustrative Household Journeys

Reliance on fossil fueled heating & transportation

Reliance on electric heating & transportation

Starting Point	Conventional Replacement	Moderate Efficient Electrification	High Efficient Electrification
		Includes building weatherization/efficiency retrofits, which are critical for realizing affordable operating costs	
Fossil fueled heating & transportation with average existing equipment	Fossil fueled heating & transportation with new, more efficient equipment	Some electrification of heating/transportation, basic building envelope efficiency measures	More electrification of heating / transportation, basic or medium building envelope efficiency measures, efficient electric appliances

Energy Affordability Analysis – Selected Profiles

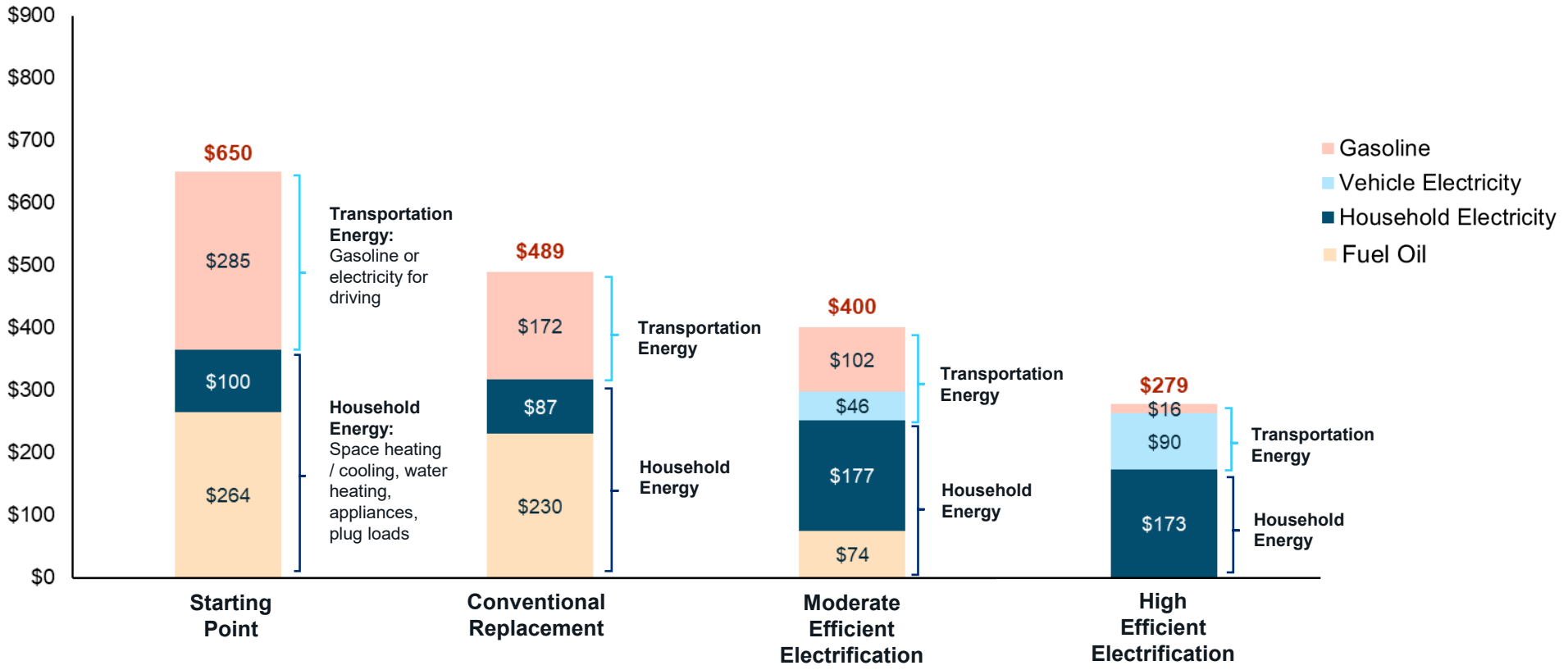
Interpreting Results

Household energy and transportation expenditures by fuel four household journeys

Note: These are modeled profiles. Results may differ across real-world households due to differences in condition and energy use patterns.

Given this potential variation, including both household and transportation energy expenditures into the scope of analysis is important to capture the full affordability story for most households.

Total Monthly Household and Transportation Energy Expenditures* – 2031
Upstate, Single Family, Oil Heat, Moderate-income Household (Real 2025 $)



* Average monthly expenditures. Does not include equipment costs

Energy Affordability Analysis – Selected Profiles

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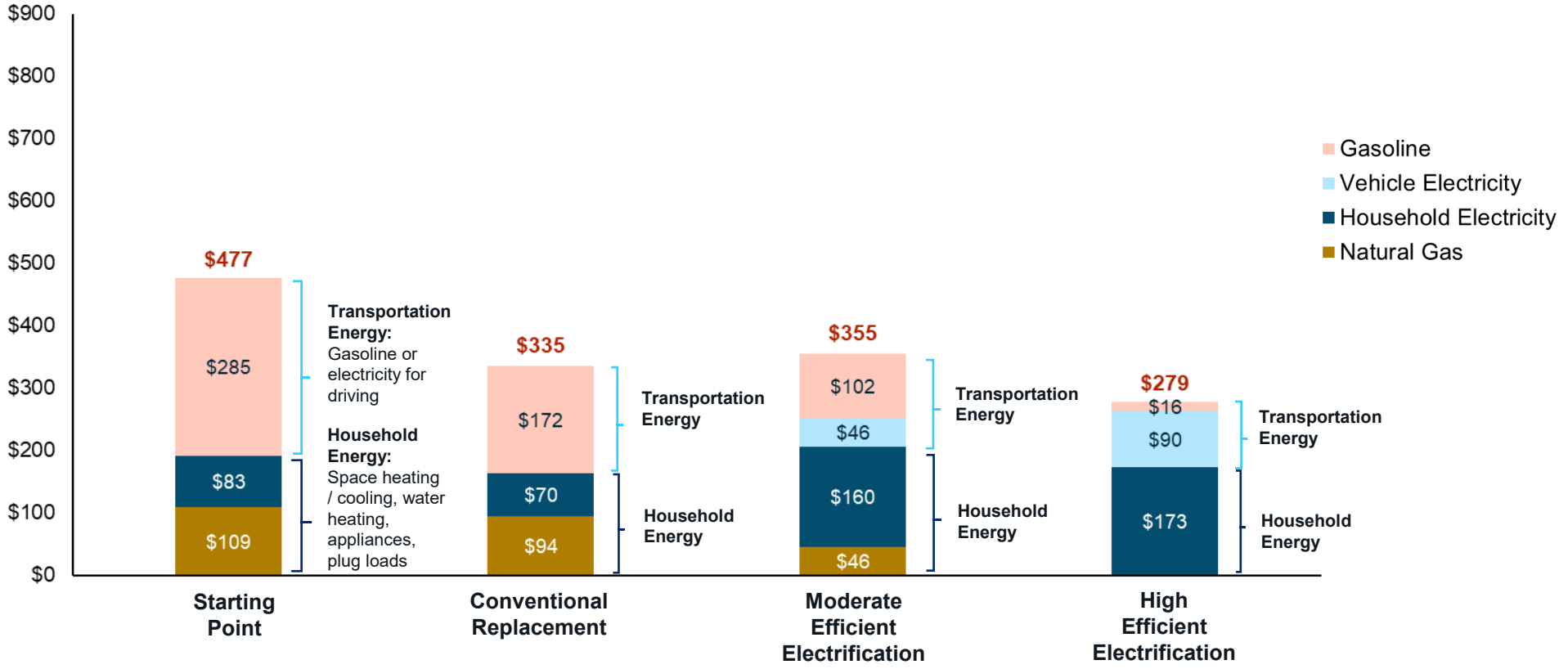
Total Monthly Household and Transportation Energy Expenditures* – 2031
Upstate, Single Family, Natural Gas Heat, Moderate-income Household (Real 2025 $)



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Energy Affordability Analysis – Selected Profiles

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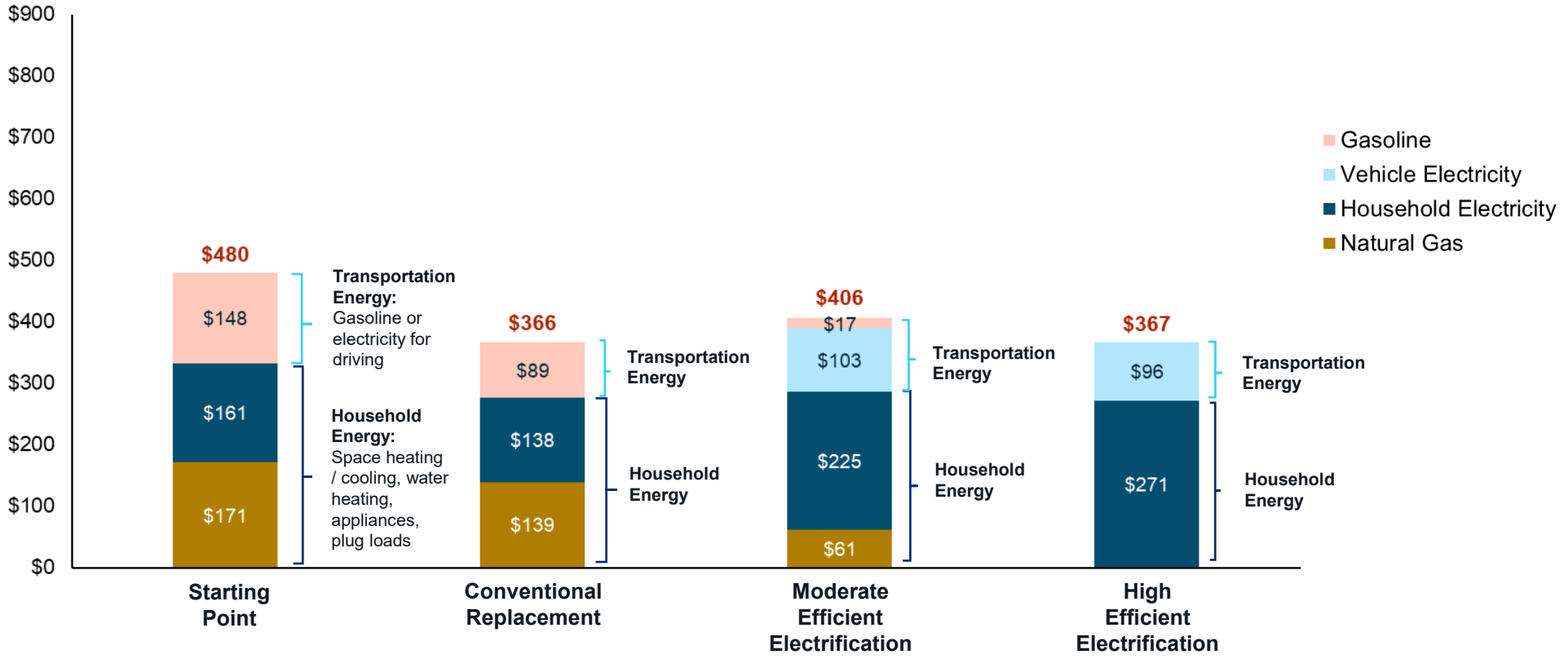
Total Monthly Household Energy and Transportation Expenditures* – 2031
NYC, Multifamily, Natural Gas Heat, Moderate-income Household (Real 2025 $)

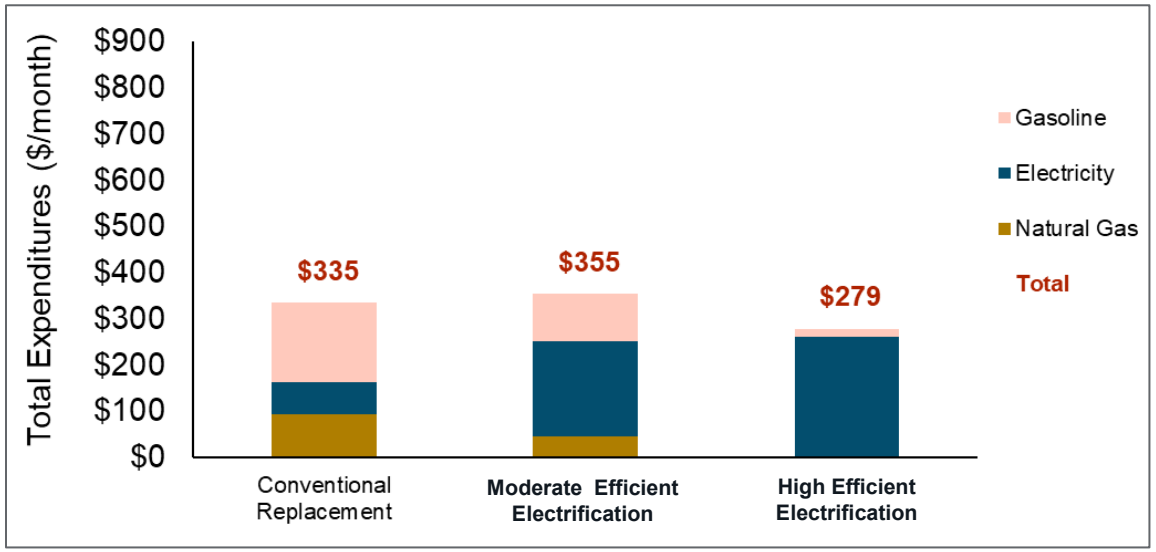


* Average monthly expenditures. Does not include equipment costs

Energy Affordability Analysis with Equipment Costs

- Although energy expenditures decline across household profiles and journeys relative to the starting point, households pursuing efficient electrification see net costs when including up-front cost for vehicles, heating systems, efficient appliances, and building envelope measures

Upstate, Single-Family Housing, Driver - 2031
Excluding Levelized Equipment Costs (Real 2025 $)



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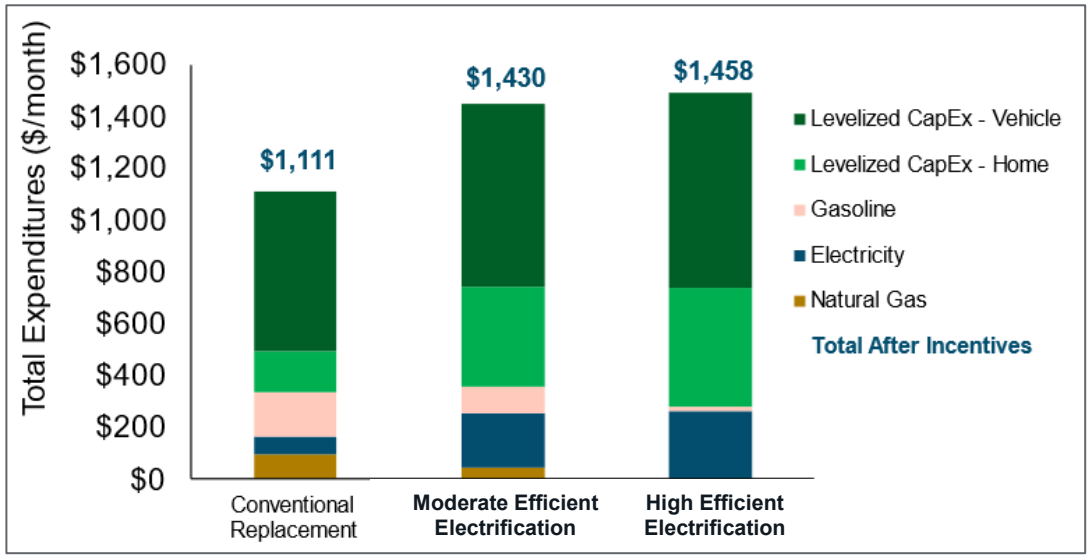


* Levelized equipment costs distribute up-front costs (i.e. Capital Expenditures, or CapEx) over an effective financing lifetime. Up-front vehicle CapEx costs include two cars. Up-front home CapEx costs include heating and cooling systems, building shell efficiency, water heating, and appliances.

Energy Affordability Analysis – Key Takeaways

- Across profiles and journeys, in real dollar terms households may see gradually declining rates of energy consumption and energy spending as more efficient equipment is adopted.
- For driving households, both conventional replacement and vehicle electrification can lower transportation energy spending relative to the starting point. Vehicle electrification can further reduce transportation energy spending relative to conventional replacement outside of NYC.
- Households well-served by transit, including in NYC, are able to keep overall energy costs lower than average by minimizing or avoiding transportation fuel expenditures.
- Households that heat with a delivered fuel, such as heating oil, can realize substantial savings from efficient electrification.
- For some households that use natural gas heating, household energy costs could increase with heat pump adoption alone. However, the combined impacts of heat pump adoption, building envelope efficiency, and more efficient lighting and appliances can lower household energy expenditures.
- Although households pursuing efficient electrification may experience lower combined operating costs, analysis shows these households would see net costs when including the combined up-front costs for vehicles, heating systems, efficient appliances, and building envelope measures.

Energy Affordability - Conclusions

- **Across New York, households face affordability challenges**; low- and moderate-income households are more likely to experience energy affordability challenges.
- To understand how energy costs impact people, it is important to look comprehensively at **both household and transportation energy spending.**
- **Energy saving measures, such as building envelope efficiency, efficient appliances and equipment, fuel efficient and electric vehicles, and transit use, can lower overall household energy costs.** Many households pursuing these measures are likely to see net reductions in operating costs due to the combined impacts of a variety of efficiency measures, including efficient electrification, on household and transportation energy spending.
- **Policy and market solutions that focus on lowering up-front costs and other barriers to adoption for a range of energy efficiency measures have the potential to enable households to realize lower, more affordable operating costs.** This can in turn help to alleviate energy insecurity and energy burdens.

Board Discussion

The State Energy Planning Board Meeting will resume after a 10-Minute Break

State Energy Plan Topic Areas:

- Electricity
- Nuclear
- Natural Gas
- Petroleum

Topic Area: Electricity

Economic growth, changes in demand patterns, and environmental policy objectives have and will continue to drive changes in both the electric supply portfolio and the State's power delivery systems.

These changes must be managed within the constraints imposed by Federal and State reliability requirements and at a justifiable cost to ratepayers. New York has successfully managed significant system changes over the last decade, but the pace of decarbonization and the emergence of new sources of energy demand present major challenges.

New York State will continue to support the deployment of clean energy resources including large scale renewables (LSR), distributed and community solar to meet demand and preserve reliability.

Key Existing State Actions

- Clean Energy Standard
- NY-SUN
- Statewide Solar for All
- Renewable Action through Project Interconnection and Deployment (RAPID) Act
- NYSERDA's On-the-Job Training Program

Related Recommendations

- **Support the LSR industry and increase clean energy supply by continuing CES solicitations and leveraging additional recommendations from the CES Biennial Review process.**
- **Continue to build-out distributed solar through NY-Sun to achieve the 10 GW goal; and leverage Statewide Solar For All as a cost-effective way to drive additional development while maximizing LMI benefits.**
- **Monitor the effectiveness of the RAPID Act with respect to the pace of additions and local community engagement.**
- **Support strategies that expedite and streamline development including advancing Clean Energy Zones and leveraging NYPA's authority to build renewables.**
- **Continue to support workforce development by directing efforts to those in disadvantaged communities and fossil fuel workers transitioning to clean energy jobs.**
- **Continue to evaluate the State's existing clean firm capacity resources since they will be critical to achieving a zero-emissions grid.**
- **The State will need to be strategic about the pace of combustion unit retirements and/or replacements as it works to pursue achievement of its clean energy targets.**

The State will continue to leverage and expand the deployment of storage and demand side resources, including energy efficiency measures and flexible technologies, to lower the cost of the clean energy transition and to enhance grid reliability.

Key Existing State Actions

- Grid of the Future (GOTF) proceeding
- Clean Energy Fund
- Solicitations to Effectuate the Recommendations of the Energy Storage Roadmap

Related Recommendations

- **Improve integration of flexible resources into grid planning and grid operations.**
- **Continue to evaluate the contributions of longer duration storage to enhance the reliability of the electric grid.**
- **Investigate opportunities for flexible resources to provide grid-forming capabilities.**
- **Identify opportunities to enhance energy efficiency and managed electrification measures and other building upgrades.**
- **The State needs to continue to lead the nation in storage safety.**

The State will need to be strategic in identifying and integrating clean firm technologies that have the attributes necessary to support the achievement of a zero emissions electric grid by 2040.

Key Existing State Actions

- Zero Emissions by 2040 Proceeding
- DPS Staff Whitepaper
- 0x40 Techno-economic Study

Related Recommendations

- **Identify viable clean firm technologies that can be deployed statewide and downstate to address reliability needs.**
- **Evaluate financial mechanisms that may be needed to support the development of technologies that meet the 0x40 definition.**
- **Continue to support innovation and demonstration projects.**

The State will continue to advance smart and strategic energy system planning to enhance system reliability and drive down the cost of necessary transmission and distribution system investments.

Key Existing State Actions

- Coordinated Grid Planning Process
- Proactive Planning Proceeding
- Public Policy Transmission Planning Process
- NYISO CRP, RNA, Outlook

Related Recommendations

- **Continue to ensure the state's planning processes provide actionable information for decision-makers regarding future system needs and cost-effective solutions.**
  - Continue to strengthen collaboration between NYS agencies, NYISO and Utilities to enhance Coordinated Grid Planning Process (CGPP) in future cycles.
  - Improve coordination of distribution and transmission planning under CGPP.
  - Continue progress towards adoption of cost-saving advanced transmission technologies.
  - Enhance interregional coordination.
- **Continue collaborative efforts to address distributed interconnection costs and processes**
- **Consider new transmission and distribution system cost allocation options.**
- **Pursue integrated electricity and natural gas system planning**
- **Consider ways to coordinate transmission deployment and the strategic use of energy storage.**

The State needs to evaluate wholesale market and retail rate structures to ensure they properly value and compensate new energy resources and market services and prioritize energy affordability for consumers.

Key Existing State Actions

- Order 1920
- Capacity Market Project
- Demand Curve Reset
- Marginal Cost of Service Proceeding

Related Recommendations

- **Assess whether the current capacity market construct sends the proper incentives for the portfolio of resources that will be needed to support resource adequacy as we transition to a zero-emission grid.**
- **Explore how to support a glide-path to a zero-emission grid, such that technologies with the attributes needed to maintain reliability in 2040 are incentivized to be online and operational in the years leading up to 2040.**
- **Evaluate whether the current mix of ancillary services (and future planned changes from NYISO, *i.e.*, Dynamic Reserves and Uncertainty Reserves) are adequate through 2040.**
- **Examine additional reliability attributes that are not currently compensated through competitive market products and identify a pathway for ensuring that future portfolios maintain these attributes.**
- **Identify additional planning or operational rules that should be further examined and potentially adjusted to support a zero-emission electric system (*e.g.*, examine the loss of source limitations that constrain the sizing of offshore wind transmission networks).**
- **Examine the role of electricity rates and program incentives to enable deployment of DERs and flexible resources.**

Future investments in our energy system must be designed to withstand the impacts of a changing climate.

Key Existing State Actions

- Electric Utility Climate Vulnerability Studies and Plans
- Proceeding for Extreme Heat Protections, Practices and Procedures

Related Recommendations

- **Consider whether the current reliability-related metrics (*i.e.* loss of load expectation) should be supplemented given the evolving nature of the grid and the increased risks of high-impact reliability events.** Establishing criteria for metrics like expected unserved energy (EUE) may help supplement traditional LOLE-based criteria by providing information about risks of long-duration outages.

- **The State should continue to incorporate the impacts of climate change into future planning scenarios.**

Topic Area: Nuclear

Nuclear energy has provided reliable and zero-emission electricity to the state's energy system for decades, provides unique benefits that align with the scale of emerging energy needs and is entering a new phase of technological advancement and deployment opportunities.

Nuclear energy's present and potential role in New York:

- Nuclear power is currently responsible for ~20% of NY's electricity supply
- Reflecting expected load growth and ongoing decarbonization of the electricity mix, the pathways analysis indicates nearly 20 GW of dispatchable emission free generation needed by 2040
- Advanced nuclear technologies are rapidly emerging with significant improvements in modularity, scale, and safety; but most of these technologies have not yet been deployed, resulting in uncertainty on cost and timeline of first-of-a-kind deployment

Extending the ZEC program in New York State would help maintain the current nuclear fleet.

Key Existing State Actions

- Clean Energy Standard and Zero-Emission Credit Program

Related Recommendations

- **Evaluate the extension of the Zero Emission Credit (ZEC) program** prior to any federal relicensing application deadlines to ensure the continued operation of the existing nuclear fleet to meet the CLCPA's zero emission by 2040 target.

  Any extension should be done with ratepayer protection in mind, in addition to the reliability needs of the grid.

An in-depth examination of key considerations for advanced nuclear is warranted for long-term planning

Key Existing State Actions

- 0x40 nuclear techno-economic study
- Blueprint for Consideration of Advanced Nuclear Technologies
- Advanced Nuclear Master Plan process
- NRC State Liaison Officer program

Related Recommendations

- **Proceed in development of the Master Plan** for Responsible Development of Advanced Nuclear in New York as underway since January 2025
- The Master Plan process should examine the key issues raised by the January 2025 Blueprint for Consideration of Advanced Nuclear Technologies and develop recommendations for implementation of advanced nuclear technologies in the State

Blueprint Topics

- Technical feasibility
- Regulatory, safety, siting, resiliency and waste
- Environmental and Climate Justice
- Policy Options, including on risk-sharing mechanisms
- Supply chain, workforce and economic development
- R&D and nuclear fusion

Multistate collaboration may be useful in moving project development forward

Key Existing State Actions

- NASEO/GAIN First Mover Initiative
- NYSERDA state nuclear coordination program

Related Recommendations

To achieve economies of scale and de-risk new nuclear development, **the State should pursue opportunities to partner with other states** to build out:

- An advanced nuclear reactor 'order book' to help de-risk and lower the cost of new reactor projects. Increasing the number of orders for select reactor designs may help vendors achieve an economy of scale and reduce capital cost to developers.
- Supply chain for construction of new reactors
- The workforce needed to construct and operate new reactors

The State should pursue opportunities for early deployment action.

The State's zero emissions by 2040 target is urgent and development timelines of nuclear projects can be long. Nuclear projects require significant early development efforts critical to prepare the way for deployment.

Key Existing State Actions

- NYPA to develop 1GW Advanced Nuclear Plant
- NYSERDA Advanced Nuclear Request for Information (RFI)
- NASEO/GAIN First Mover Initiative
- Advanced Nuclear Master Plan process
- NYSERDA support for DOE grant applications

Related Recommendations

- **Pursue opportunities for early deployment action in parallel with ongoing initiatives.**
- Early development efforts must prioritize affordability for energy consumers and minimize financial and other risks to the State.
- Early deployment actions should be undertaken in coordination with the Master Plan process and in collaboration with other states.

Topic Area: Natural Gas

Natural Gas

- **Natural gas accounted for 39% of New York's primary energy consumption in 2022** providing essential energy services like residential and commercial space heating, water heating, and cooking, electricity generation, and support for industrial processes.
- **Even as New York's natural gas consumption is expected to decrease gradually over time, the natural gas system will likely remain a crucial part of meeting the state's energy demands across all scenarios throughout the SEP planning horizon.**

Gas planners must continue to ensure safety and reliability
by proactively addressing existing risks as well as emerging risks.

Key Existing State Actions

- Emergency planning and coordination
- Winter reliability and preparedness planning
- Pipeline safety regulations
- Utility Climate Vulnerability Studies and Resiliency Plans

Related Recommendations

- **Continue to support a reliable and resilient gas system.** Where appropriate and possible, efforts should be enhanced.
  - Emergency planning for hazards
  - Proactive coordination between responsible parties
  - Compliance with pipeline safety regulations
  - Installation of on-system safety devices
  - Demand management
  - Diverse supply portfolio
  - Study and plan for climate change vulnerabilities

Gas utility planning and investment standards need to be evaluated to ensure that they maintain reliability while protecting affordability as the climate and patterns of consumer demand change.

Key Existing State Actions

- Utility Climate Vulnerability Studies and Resiliency Plans
- Long-Term Gas Planning Proceedings

Related Recommendations

- **Gas utilities should evaluate whether their planning and investment standards properly balance reliability and ratepayer costs** based on the best and latest available climate science and data regarding customer usage patterns.
- **Reliability and resiliency should be considered when evaluating investment in new gas supply infrastructure**, including the potential to reduce vulnerability to upstream supply disruptions or other gas system constraints.

Natural gas system use is expected to decline in the long run due to State policy and shifting customer preferences towards electric substitutes.

However, natural gas consumption may grow in some regions in the near-term.

Key Existing State Actions

- Climate Act of 2019
- All-Electric Buildings Act of 2023
- Long-Term Gas Planning Proceedings
- New Efficiency: New York

Related Recommendations

- **Gas businesses, policymakers, regulators must proactively adapt to this shifting landscape to ensure safe, reliable, and affordable energy.**
- **Design State policies, regulations, and programs to reduce GHG emissions while maintaining safety, reliability, and energy affordability.**

The projected decline in gas system use must be considered through the lens of energy affordability and must be proactively addressed through long-term and integrated planning. Utilities must invest efficiently—including in NPAs and demand management—to reduce stranded asset risk and maintain affordability.

Key Existing State Actions

- Long-Term Gas Planning Proceedings
- Non-Pipelines Alternatives Framework
- UTENs Proceeding

Related Recommendations

- **Require gas utilities to identify and prioritize investment in areas where the gas system will be necessary in the long-term.**
- **Advance integrated planning** by directing gas and electric utilities to jointly plan for optimized energy system investment.
- **Continue to prioritize investments in NPAs such as targeted electrification and energy efficiency.**
- **Continue to prioritize lower cost alternatives to pipe replacement such as pipe repair and re-lining where safe and technically feasible.** Pursue innovation in this area.
- **Develop planning practices, data sets, and analytical tools that can support integrated planning and the successful identification and deployment of NPAs.**

New approaches may be needed to give the PSC and gas utilities greater flexibility to proactively plan for safe, strategic reduction in gas system investment.

Key Existing State Actions

- Long-Term Gas Planning Proceedings
- Part 230 Straw Proposal

Related Recommendations

- **Continue to evaluate and develop policies to enable the PSC to strategically manage gas system affordability** including costs borne by ratepayers from system expansion or incomplete customer participation in NPAs.

Innovative cost recovery practices may be needed to support the operational viability of gas utilities, ensure energy affordability, and improve alignment between cost causation and cost allocation in some scenarios.

Key Existing State Actions

- Long-Term Gas Planning Proceedings

Related Recommendations

- **Research innovative cost recovery practices to evaluate their potential risks and benefits under various scenarios.** These practices may include:
  - Accelerated depreciation
  - Changes to rate design
  - Securitization
  - Cost sharing with non-gas ratepayer entities

Alternative fuels will play a role in decarbonizing the gas sector but must be implemented strategically.

RNG: can reduce emissions in the gas system as part of a broader strategy for decarbonizing the agriculture and waste sectors.

Hydrogen: analysis is needed to demonstrate which energy services provided by natural gas should be decarbonized using hydrogen.

"Certified"/"differentiated" gas: reductions in upstream methane emissions must be substantiated.

Key Existing State Actions

- Long-Term Gas Planning Proceedings

Related Recommendations

- **RNG** should be sourced from sustainable feedstocks and targeted to difficult-to-electrify end uses.
- **Hydrogen** should not be blended into the broader natural gas distribution system currently, given the potential for negative impacts.
- **"Certified"/"Differentiated" gas** should not be accounted for differently in the State's annual GHG inventory. Agencies should continue to monitor developments in this field.

There must be a just transition for gas sector workers and businesses. The State will work closely with utilities and labor organizations to ensure current gas sector workers have access to continued economic opportunities throughout the clean energy transition. Additional research is needed to determine the most effective workforce interventions.

Key Existing State Actions

- Long-Term Gas Planning Proceedings
- UTENs Proceeding

Related Recommendations

- **The State should work closely with utilities and labor organizations to leverage gas sector employees' existing skills in the clean energy transition to maximize economic opportunity for current gas sector workers.**
- **Research the employment impacts of the clean energy transition on fossil fuel sector workers, including in the gas sector, to support the development of just transition policies.**

The gas transition must be strategically managed to ensure DACs have equitable access to clean energy and are not unduly burdened financially or otherwise.

Key Existing State Actions

- Long-Term Gas Planning Proceedings
- UTENs Proceeding

Related Recommendations

- **Adopt clean energy program design elements that ensure DACs and LMI customers have equitable access to clean energy upgrades.**
- **The PSC should direct gas utilities to explore and pilot community-scale heat planning, especially in DACs, in the context of future LTPs.**

The challenges facing the gas sector over the coming decades require a strategic gas system transition plan. The State should work collaboratively with select utilities and other key gas sector stakeholders to develop an initial plan that sets utility-specific targets and evaluates changes to utility policy, investment, planning, and cost recovery.

Key Existing State Actions

- Long-Term Gas Planning Proceedings
- UTENs Proceeding

Related Recommendations

- **DPS Staff in collaboration with NYSERDA should conduct an initial Gas System Transition Plan with one or more utility and other key stakeholders, to be published concurrently with the next SEP update.** The initial plan shall evaluate
  - scenarios that align with this SEP;
  - strategic reduction in gas system investment; and
  - innovative cost recovery practices.

- **This plan should be leveraged to develop a statewide strategic Gas System Transition Plan.**

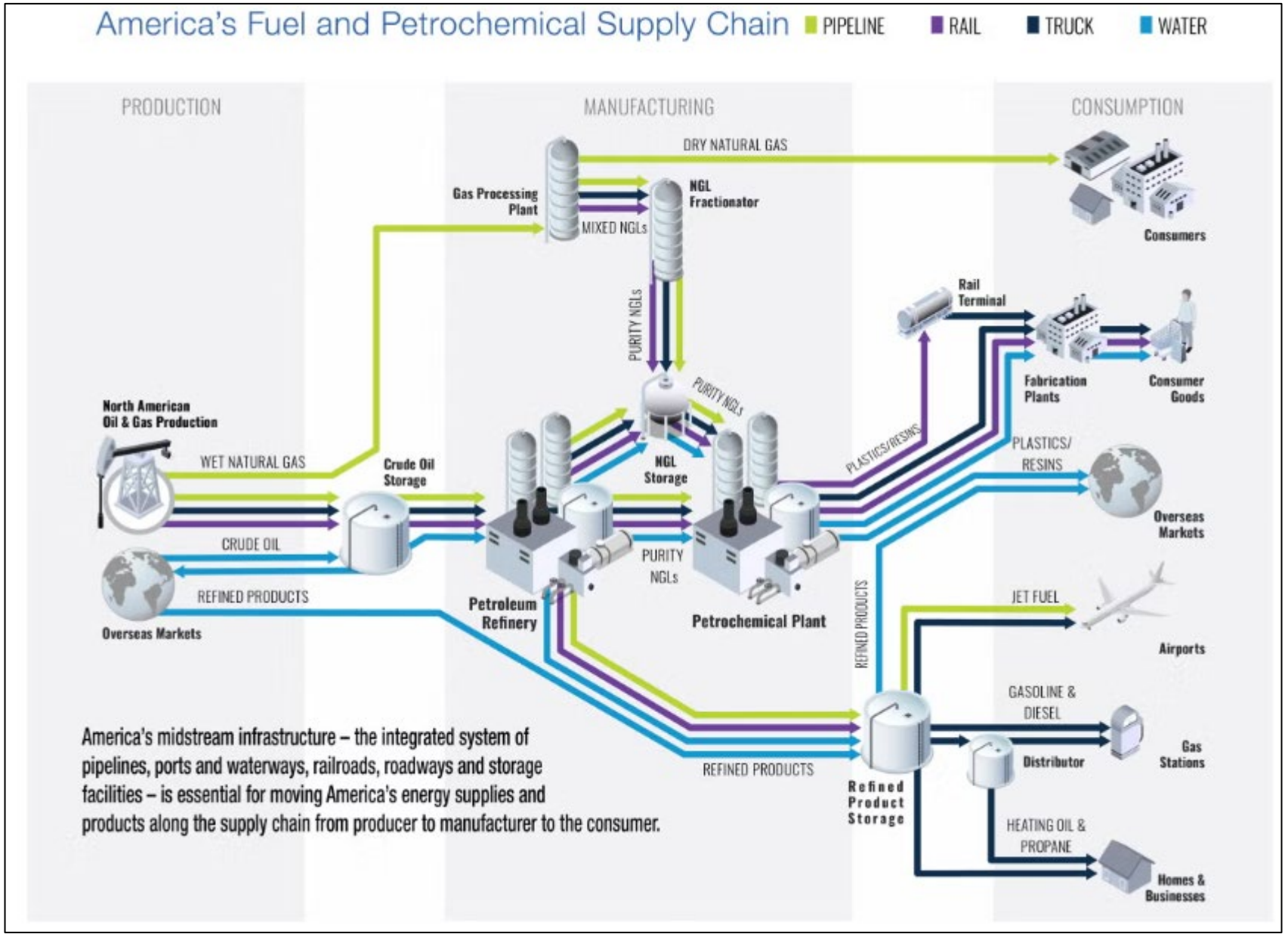
Topic Area: Petroleum

Petroleum fuels. Also known as delivered fuels, are liquid products refined from crude oil. The most widely used petroleum fuels in New York State are:

- Distillate (heating oil; diesel)
- Motor gasoline
- Aviation fuels
- Propane

New York relies on petroleum. As of 2022, Petroleum fuels represented ~36% of primary energy consumption statewide. Petroleum fuels play an important role in New York for use in the transportation, residential, and industrial sectors.

Petroleum is a strategic back-up fuel for electricity generation. While overall consumption of petroleum products have declined over time, these fuels will continue to play a critical role in supporting reliability through 2040.



Source: American Fuel and Petrochemical Manufacturers (AFPM)

New York relies on deliveries of petroleum products. Multiple transportation modes make up the NYS supply chain.

Resiliency needs cover each link of the supply chain. Marine, rail, and road resources must be monitored and protected.

NEW YORK STATE Energy Planning Board

Continued support for petroleum fuel monitoring, critical infrastructure, and resilience are important to keep New York fueled.

Key Existing State Actions

- NYS Environmental Conservation Law §19-0327
- Bioheat Blending Mandate

Related Recommendations

- **Resilience.** To support resilience through monitoring and preparation:
  - Require businesses that manage petroleum fuels terminals in NYS to report at a regular interval to DEC, NYSERDA, and the Dept. of Agriculture and Markets on volumes of petroleum products and alternative fuels that are received and delivered.
  - Evaluate the supply chain to identify infrastructure or supply points that are critical to keeping NYS fueled. Explore strategies to support the hardening of these resources.
- **Continue to monitor and report on petroleum fuel markets and the supply chain on a regular basis**, providing transparent and up to date information for consumers and policymakers.

Support alternative fuel use within the existing petroleum system infrastructure to lower emissions while maintaining reliability and resilience

Key Existing State Actions

- NYS Environmental Conservation Law §19-0327
- Bioheat Blending Mandate

Related Recommendations

- **To increase the production and delivery of alternative fuels, explore new approaches to support market growth.**
  - Policy approaches will need to be flexible and allow for the integration of alternative fuels as technologies and fuel supplies become available.
- **Leveraging existing petroleum system infrastructure for the supply and delivery of alternative fuels can help to increase alternative fuel use while minimizing costs and other impacts.** More research, development, and deployment of alternative fuels, infrastructure, and end-use technologies will be needed.

Board Discussion

State Energy Plan Topic Areas:

Alternative Fuels

Buildings

Topic Area: Alternative Fuels

Low-carbon alternative fuels are an important complement to electrification in the State's clean energy transition strategy.

Key Existing State Actions

- Bioheat Blending Mandate
- Clean Hydrogen Research & Development
- Clean Transportation Standard Study

- **Electrification and zero-emissions technologies remain the first energy transition solutions** as these typically have greater health and decarbonization benefits in the long term at a lesser cost and alternative fuels will be of limited supply.
- Low-carbon alternative fuels should be directed towards end uses in a way that maximizes greenhouse gas emissions reductions while minimizing cost and environmental impacts and avoiding impacts associated with co-pollutant emissions.
- The primary targets for alternative fuel use will be supplemental heating and difficult-to-electrify end-uses such as industrial processes, aviation, some medium- and heavy-duty transportation, and limited power generation.

Alternative fuels should be carefully managed to realize greenhouse gas emissions reductions.

Emissions Accounting Categories Related to Alternative Fuels

Emissions	Lifecycle Analysis	Out-of-State Fuel Production (Climate Act Accounting, Gross)	In-State Fuel Production (Climate Act Accounting, Gross)
Land Use	✓	X	X
Feedstock Production/Processing	✓	X	✓
Fuel Production/Transport	✓	X	✓
Biogenic Combustion	0	✓	✓

Alternative fuels should be carefully managed to realize greenhouse gas emissions reductions.

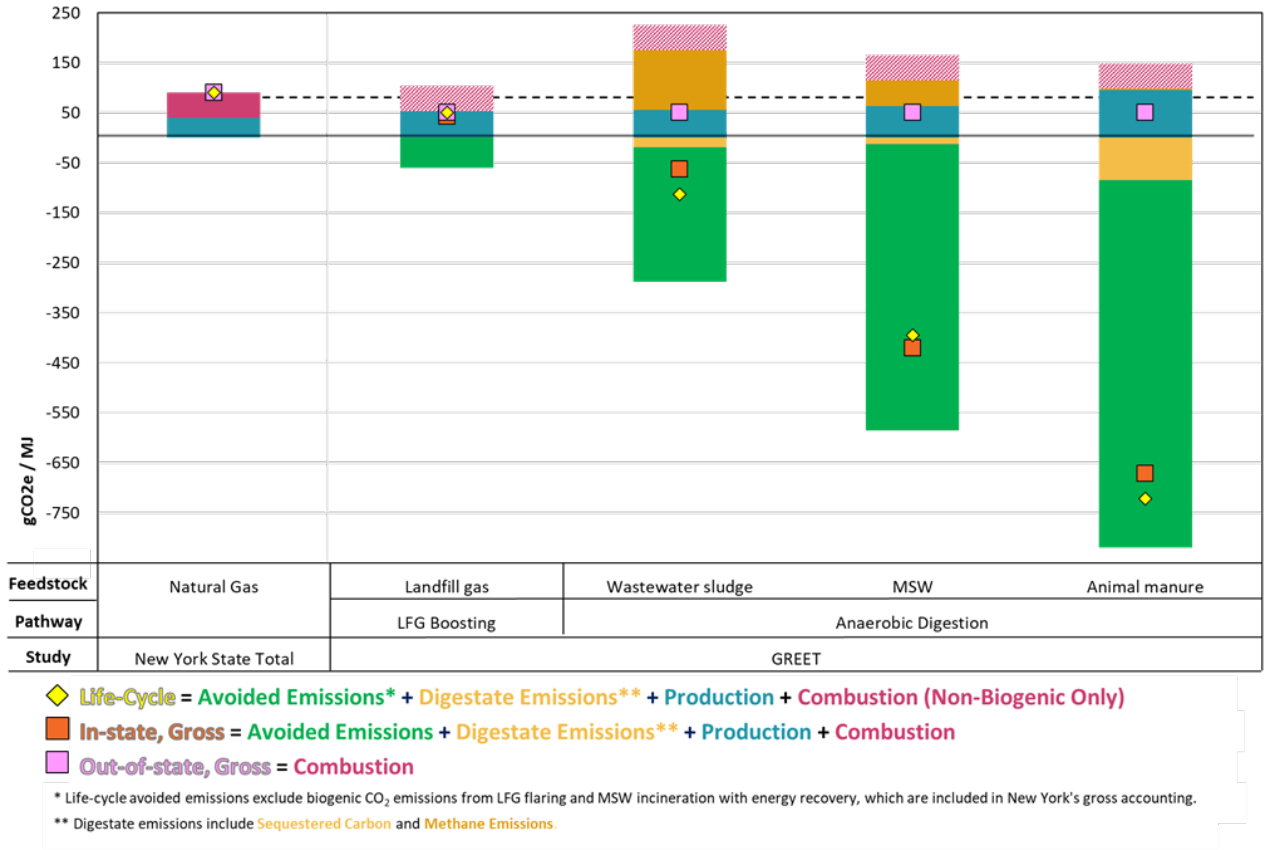
Both lifecycle analysis (LCA) and Climate Act Accounting have an important role in policymaking in New York.

Lifecycle Analysis	Climate Act Accounting
• LCA can be used to differentiate between feedstocks, fuels, and end-uses as to which may yield greater global GHG emissions reductions and to calculate emissions reductions from current business-as-usual and alternative fuel production for specific projects. • LCA may be used in programmatic or policy design. • LCA should be applied to specific alternative fuels being considered for use to ensure the specific production pathway for that fuel is consistent with NYS and Climate Act principles.	• The Climate Act Accounting determines the amount of GHG emissions reductions from alternative fuel use in NYS and progress towards the emissions reductions requirements as set forth in the Climate Act. • Climate Act Accounting will be used to inform the Statewide GHG Emissions Report and any GHG emissions claim made by entities in the state—like individual facilities, utilities, and others. • It may be used by policies, programs, or regulations implemented by the State.

Alternative fuels should be carefully managed to realize greenhouse gas emissions reductions.

- Climate Act Accounting can create an incomplete picture of the emissions from alternative fuel use that is shown in LCA accounting.
- LCA shows that waste-based feedstocks maximize GHG emissions reductions.
- In-state sourcing is preferred to maximize local GHG emissions reductions.
  - NYS-feedstocks could provide benefits—which could include waste management, emissions reductions, economic development opportunities, leakage avoidance, and supply security.
- Recognizing the supply limitations, the State remains open to regionally sourced and other low-impact feedstocks to advance global GHG reduction.

Climate Act Accounting and LCA Emissions for Renewable Natural Gas



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Alternative fuels should be carefully managed to realize greenhouse gas emissions reductions.

Fuel-Specific Considerations

Renewable Natural Gas: RNG reduces GHG emissions across all fuel feedstocks, especially waste-based feedstocks. In-state waste-based RNG provides substantial inventory benefits.

Renewable Diesel: Both LCA and Climate Act accounting indicate lower benefits from use of liquid biofuels than RNG as liquid fuels have lower or no avoided emissions, but LCA continues to show meaningful global climate benefits, especially from waste fuels.

Sustainable Aviation Fuel: SAF provides a variety of unambiguous benefits, including to public health and to energy transition in a sector where alternative technologies are limited. As a result, the State should adopt a more expansive approach to SAF sourcing to avoid erecting burdensome restrictions to deployment.

Hydrogen: Based on currently available technologies, NYS is focused on hydrogen produced (in- or out-of-state) with clean energy. NYS will continue to assess new technologies for hydrogen production as they become available. At this time, NYS does not support blending of hydrogen into the natural gas infrastructure.

Analysis shows that alternative fuels typically have equal or lesser net co-pollutant emissions compared to their fossil fuel counterparts.

It is important to accurately and robustly track and account for the fuels and associated emissions as they move from production (in- or out-of-state) to end-use to ensure emissions reductions.

- NYS must balance integrity and credibility of emissions reduction claims and administrative burden to ensure emissions reductions and accelerate alternative fuel deployment.
- Delivery of fuels to NYS for use within the state is of critical importance and NYS should prevent double counting where possible.
    - There must be a clear physical and contractual path linking alternative fuel production to use.
    - In order to avoid, costly, new dedicated infrastructure and deliver alternative fuels to where they are needed most, alternative fuels will need to be produced and used within the existing energy system (transportation via trucking, pipeline, rail, and utilizing storage facilities etc.). If an attribute tracking system is adopted by the State, it should reflect this priority.
    - A mass balance approach to fuels tracking is preferred — this supports regional sourcing and local benefits, while allowing alternative fuels to leverage existing infrastructure.

Topic Area: Buildings

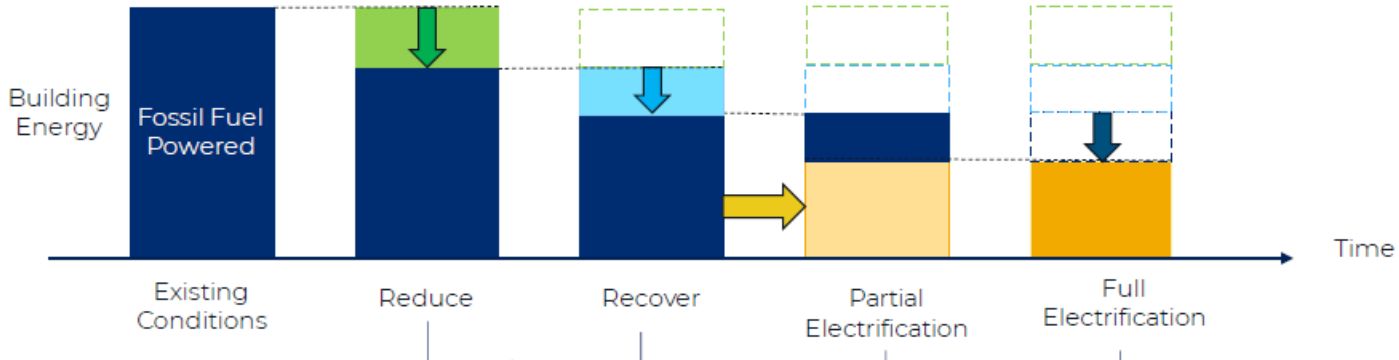
Modernizing and decarbonizing buildings will deliver comfort, health and safety, climate resiliency, and economic benefits to New Yorkers. The energy transition highlights the opportunity to invest in and expand access to quality housing, with a focus on support for low-and-moderate income households and buildings in disadvantaged communities.

Five strategies to improve and decarbonize New York's buildings sector, keep buildings comfortable, prioritize affordability, and support reliability of the grid and gas system:

1. Prioritizing energy efficiency and weatherization
2. Advancing efficient electrification to reduce on-site fossil fuel use
3. Continuing innovation and market development for new and emerging clean building technologies
4. Enabling demand management and load flexibility at scale
5. Reducing embodied greenhouse gas and refrigerant emissions

In existing buildings, a phased approach to major capital improvements is an effective way to manage the associated cost and disruption. In large buildings, Resource Efficient Decarbonization is a proven strategy. A similar appliance-by-appliance or room-by room approach can be taken in smaller buildings.

Resource Efficient Decarbonization



Reduce Energy Load

- Building Envelope Improvements
- Control Optimization
- Ventilation Improvements
- Dedicated Outside Air System
- Hydronic Distribution
- Lower Heating Supply Temp.
- Terminal Units Replacement

Recover Wasted Heat

- Waterside Heat Recovery
- Airside Heat Recovery
- Wastewater Heat Recovery
- Thermal Energy Networks

Partial Electrification

Replace fossil fuel inputs and prioritize the techno-economic portion of load

- Air Source Heat Pumps
- Water Source Heat Pumps
- Geothermal
- Thermal Layering

Full Electrification

In-time, replace or remove the remaining peak load equipment

- Heat Pumps
- Thermal Storage
- District Thermal Network
- Grid-interactivity

Financial incentives and affordable financing will continue to be needed to reduce upfront costs and motivate New Yorkers to make energy upgrades in buildings. Energy efficiency and decarbonization deliver significant value to building owners and occupants but upfront and operating cost barriers persist.

Key Existing State Actions

- Comfort Home
- NYS Clean Heat
- Green Jobs-Green NY (GJGNY)
- Federal and State tax credits (e.g., State Geothermal Income Tax)

Related Recommendations

- **Continue to offer financial incentives** that support strategic decarbonization and are tailored by market segment to offer flexibility in the way that buildings reduce energy use, displace fossil fuel consumption, and efficiently electrify
- **Prioritize support for energy upgrades likely to deliver both energy and cost savings.** Focus outreach to homes heating with oil, propane, or electric resistance to encourage near-term heat pump adoption; help make switching from gas equipment more financially viable.
- **Expand access to affordable financing programs** like GJGNY, zero or low-cost predevelopment lending, and high-impact credit enhancements.
- **Ensure efficient and effective rollout of the three-part rate design adopted by the PSC under the standby rate proceeding,** consisting of a customer charge, contract demand charge, and daily as-used demand charge.

Prioritizing State support to make energy-related upgrades for low-and-moderate income households and buildings in Disadvantaged Communities will help make homes and communities healthier places to live while addressing historical inequities.

Key Existing State Actions

- EmPower+
- Weatherization Assistance Program
- Energy Affordability Program & Guarantee Pilot
- Affordable Multifamily Energy Efficiency Program (AMEEP)
- Climate Friendly Homes Fund

Related Recommendations

- **Ensure that State and utility programs that support energy upgrades in LMI housing focus on weatherization in the near term** and take an "efficiency-first" approach to electrification.
- **Identify and pursue new and expanded funding sources for health and safety upgrades that are needed to enable energy upgrades, as well as increased funding for energy upgrades in LMI housing**. Consider how existing funding for emergency replacement and deferred maintenance can be leveraged to improve housing quality while saving energy and lowering costs.
- **Continue to simplify and streamline access to LMI programs.**

Prioritizing State support to make energy-related upgrades for low-and-moderate income households and buildings in Disadvantaged Communities will help make homes and communities healthier places to live while addressing historical inequities.

Related Recommendations (continued)

- **Consider opportunities to expand or modify energy bill assistance.** This should include continuing to expand opportunities to participate in community solar projects that provide electric bill savings to income-eligible households and/or that benefit affordable housing or buildings in disadvantaged communities.
- **Continue to support opportunities for LMI residents and buildings in DACs to pair electrification with solar energy** to benefit both the building owner and residents.
- **Consider updates to policies that enable equitable electrification for regulated affordable housing.**

Market development support is needed to help expand the clean energy workforce and support existing supply chain actors and businesses in adapting to effectively deliver clean energy technologies, all while increasing awareness and confidence in clean heating solutions among consumers and contractors.

Key Existing State Actions

- Green Jobs-Green NY
- Empire Building Challenge
- Buildings of Excellence
- Flex Tech
- Clean Heat Connect
- Experience Clean Heat
- Talent Pipeline and On-the-Job Training

Related Recommendations

- **Continue to provide free audits for single-family homes and small businesses** and consider opportunities to scale virtual remote audits
- **Continue to cost-share technical assistance and energy planning** to help larger, more complex buildings cost-effectively decarbonize following the Resource Efficient Decarbonization model
- **Continue to support workforce development and training** for critical growing building occupations
- **Continue to engage key weatherization and heat pump supply chain actors,** including manufacturers, distributors, and contractors
- **Explore providing product stocking incentives** to motivate local distributors to stock a range of efficient heat pump products at affordable prices, increasing availability and consumer choice

Innovation and market transformation will expand decarbonization solutions across various building types. Public investments and strategic public-private partnerships are critical to spur further innovation, demonstration, and commercialization, bring emerging solutions to market, and lower costs.

Key Existing State Actions

- Empire Technology Prize / Empire Building Challenge
- Clean Heat for All Challenge
- Induction Stove Challenge

Related Recommendations

- **Continue State support for innovation and demonstration for drop-in decarbonization solutions** like efficient cold climate window heat pumps, packaged terminal heat pumps, and others.
- **Accelerate technology transfer, product testing, and commercialization** of advanced technology for cold climate regions.
- **Support development of growth stage companies and capital partners** to scale clean energy solutions and new business models.
- **Coordinate with federal government, other cold climate states, incubators, and industry leaders on RD&D** to support next generation of solutions.

Decarbonizing the buildings sector will require coordinated effort with gas system and electric grid planning to enable a shift beyond building-by-building conversions to networked solutions, including thermal energy networks (TENs).

Key Existing State Actions

- UTENJA proceeding
- Utility Thermal Energy Network Pilots
- Large-Scale Thermal Program
- TENs at SUNY campuses

Related Recommendations

- **Develop a TENs Roadmap for NYS** to identify market barriers and develop solutions to support TENs development.
- **Advance analysis of TENs,** including geospatial analysis, thermal resource data, customer acquisition approaches, and grid and energy system benefits of thermal networks and thermal storage versus stand-alone building solutions.
- **Continue to advance regulatory framework development for TENs** in a manner that provides increased market and regulatory certainty for different types of systems. Topics to address include customer protections, standards for sale/purchase of thermal resources for TENs, and supplier-of-last resort rules.

Decarbonizing the buildings sector will require coordinated effort with gas system and electric grid planning to enable a shift beyond building-by-building conversions to networked solutions, including thermal energy networks (TENs).

Related Recommendations (continued)

- **Explore the role of area-based thermal energy planning and develop resources that support municipalities and communities to identify locations with high potential and local support for TENs.** Work with municipalities to identify a package of rules/standards/benefits (e.g., zoning, permitting, etc.) that can support prioritized TENs development. Could also include State-supported technical assistance, training, and capacity building for how to consider TENs in local planning and redevelopment.
- **Explore how to provide sustained funding support for TENs deployment**, including on SUNY campuses, to showcase their viability and benefits and bring high-quality vendors to NYS.
- **Consider a funding mechanism to help make private TENs projects financially viable** given project development risks. Possibilities include insurance, backstop, or credit enhancements.

Expanding mechanisms to integrate and monetize flexible equipment loads will be important for managing operating costs, optimizing grid investments, and maintaining grid reliability.

Key Existing State Actions

- Grid of the Future proceeding
- Utility demand response programs
- Flexible load standards for electrified appliances, in development

Related Recommendations

- **Continue to develop product standards for flexible load capabilities** in HVAC thermostats, and other equipment.
- **Consider opportunities to expand utility demand response programs,** adapting them to enable mass-market participation and support load flexibility at scale.

Regulatory frameworks are important to drive broad and sustained improvements in building energy performance and to reduce emissions from building operations and equipment.

Key Existing State Actions

- Zero emission new construction codes
- Advanced product and appliance standards

Related Recommendations

- **Continue to support capacity-building and education for local governments** to help support successful implementation of new code requirements.
- **Oversee enforcement of the zero-emissions new construction requirement**, including monitoring compliance rates and market trends, continuing to provide technical support, and continuing to undertake training activities to support enforcement and related activities.
- **Continue to evaluate energy use intensity as part of the next iteration of the energy code** to further reduce energy use in new and substantially renovated buildings.
- **Continue to evolve appliance standards** to incorporate improvements in energy performance and demand response capability requirements, as appropriate.

Lessening the environmental impact of the buildings sector requires managing refrigerants and embodied greenhouse gas emissions.

Key Existing State Actions

- Clean Air Act, EPA § 608 and 609
- AIM Act
- 6 NYCRR Part 494
- Mechanical, Residential, and Fire Code updates
- Executive Order 22
- Buy Clean Concrete Mandates

Related Recommendations

- **Support training and/or certifications** for industry technicians, system designers, and other stakeholders on proper use of alternative refrigerants and best practices for leak detection and reclamation.
- **Advance R&D to enable adoption of the next generation of low and ultra-low GWP refrigerants.**
- **Track and evaluate the need for further code improvements** to support the roll-out of ultra-low GWP refrigerants and/or incorporate embodied emissions requirements.
- **Advance partnerships with other states** to increase market purchasing power and demand for low-emissions construction materials to support diversification of product options.
- **Integrate embodied greenhouse gas considerations into programs** that are designed to bring awareness to sustainable building practices.

As buildings of all ages, functions, and locations across New York State are vulnerable to the impacts of climate change, design and investment decisions should account for the long-term impacts of climate risk.

Key Existing State Actions

- NYS Climate Impacts Assessment
- Environmental Bond Act
- Resilient Retrofits Program
- Clean Green Hospitals
- Building of Excellence
- Empire Buildings Challenge

Related Recommendations

- **Pair energy efficiency/weatherization measures with resilience measures** in State and investor-owned utility building programs. Such measures should include back-up battery energy storage solutions and should inform broader community and building-level resilience strategies.
- **Consider piloting a "resiliency first" energy storage incentive** starting with public sector facilities.

Board Discussion

Other Business

Thank you for your participation in this meeting of the State Energy Planning Board

For more information, please visit the State Energy Plan website:

energyplan.ny.gov