NEW YORK STATE | Downtown Revitalization Initiative

NEW YORK STATE | NY Forward

DRI | NY FORWARD DECARBONIZATION OVERVIEW

STRATEGIES FOR BUILDING DECARBONIZATION

AUGUST 17, 2026

NORESCO

AGENDA

- Decarbonization: What and Why?
- DRI | NY Forward Decarbonization Compliance
- Decarbonization Strategies
- Common Concerns
- Questions

DECARBONIZATION
WHAT AND WHY?

WHAT IS DECARBONIZATION?

Gases that trap heat in the atmosphere are called **greenhouse gases (GHG)**.

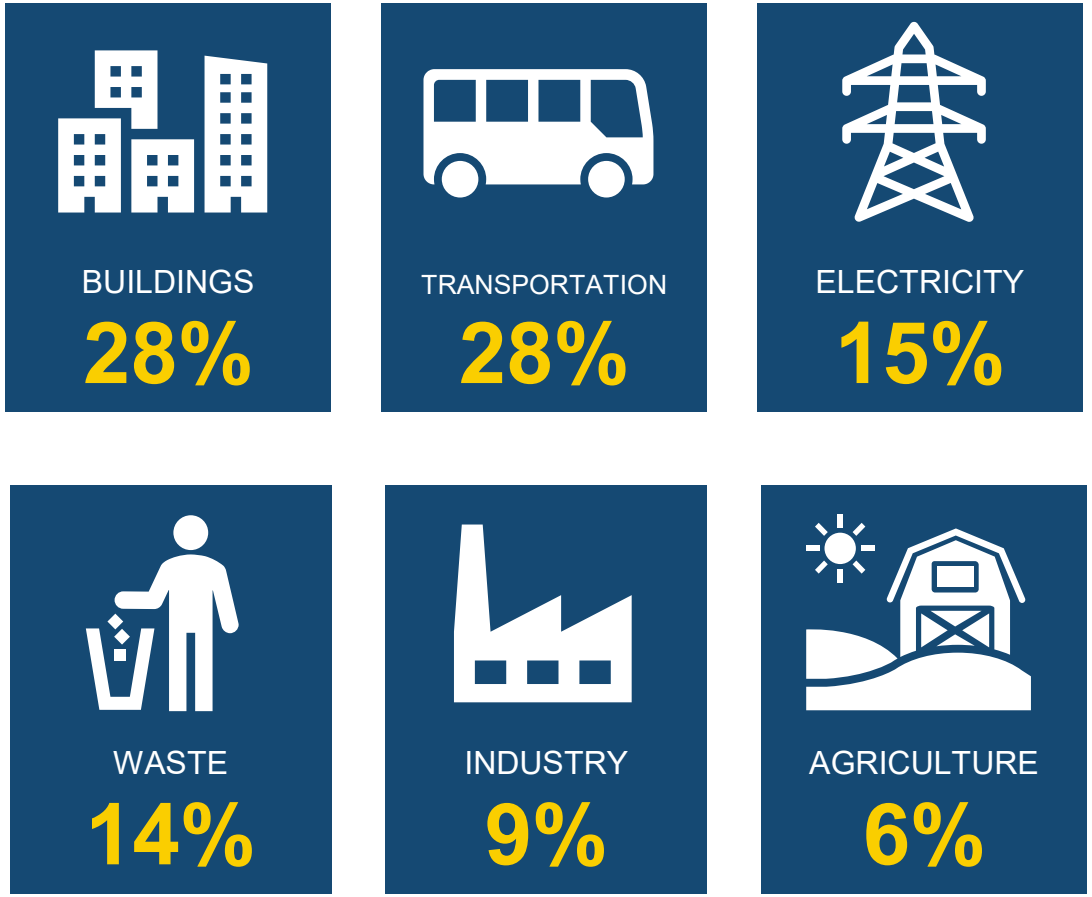
Decarbonization is the reduction of GHG emissions.

Building decarbonization is the mitigation of GHG emissions through the reduction of building energy demand followed by the conversion of existing equipment and systems, especially systems powered by fossil fuel combustion processes, to highly efficient equipment and systems.

Building electrification is the shift from fossil fuels to electricity for all building systems and appliances.

WHY DECARBONIZATION?

2025 New York State GHG Emissions



Source: 2025 Statewide GHG Emissions Report (Summary Report)

- New York Climate Leadership and Community Protection Act (Climate Act)
- **Reduce GHG emissions by 85% by 2050.**
- Buildings upgraded and/or built through the DRI and NY Forward projects provide a great opportunity to help reduce emissions

BENEFITS OF DECARBONIZATION

Energy Efficiency

Moving to more efficient building systems, such as lighting and HVAC, reduces energy use and associated energy costs

Maximize Usable Square Footage

Electric HVAC equipment maximizes available square footage (e.g. heat pump installed on walls near ceiling vs. steam radiator taking up floor space).

Health Benefits

All-electric appliances, especially electric stoves and cooktops, reduce indoor air pollutants. Good building envelopes protect against pest infestation and other asthma triggers.

Increased Resilience

Weatherization and solar + storage help keep the power on and temperatures consistent in the event of a power outage or extreme weather event.

Occupant Comfort

Improved comfort from increased air-flow/movement, addressing previously unmet cooling needs (through heat pumps), and noise reduction.

Safety

Reduced risks associated with aging gas infrastructure leaks; induction cooktops reduce instances of fire and burns.

DRI | NY FORWARD
DECARBONIZATION COMPLIANCE

PROJECT COMPLIANCE MATRIX

Building Type	DRI / NY Forward Decarbonization	
	REQUIRED	OPT IN
New Buildings ≤ 5000 ft2		●
New Buildings > 5000 ft2	●	
Building Addition > 5000 ft2	●	
Non-Substantial Renovation		●
Substantial Renovation ≤ 5000 ft2		●
Substantial Renovation > 5000 ft2	●	

COMPLIANCE PATH OPTIONS

1 Energy Code Credits

- **Utilizes the 2025 ECCCNYS or 2025 NYS ASHRAE 90.1**
- Projects must achieve 110% of the total credits required by code
- Number of energy credits is determined by building use type and climate zone

2 ENERGY STAR

- EPA program to determine building energy performance
- **SCORE OF 90 OR BETTER**

- **Target Finder**
- Project building performance
- Basic building information required

3 Third-Party Certifications

Energy & Environment Focus

- Building Cleaner Communities (NYSERDA)
- ENERGY STAR Certification
- LEED BD+C, ID+C, O+M, Homes, ND
- Green Globes
- BREEAM
- Passive House
- Living Building Challenge

Occupant Focus

- WELL
- Fitwel
- Living Building Challenge

Other

- Enterprise Green Communities
- SITES
- National Green Building Std.

COMPLIANCE PATH SELECTION GUIDANCE

Project Characteristic	PATH 1 Energy Code Credit	PATH 2 ENERGY STAR	PATH 3 Third-Party Certification
New Construction	●	●	●
Complete Renovation of Existing Building	●	●	●
Partial Upgrades to Existing Building	●		
Historical Building (limitations on upgrades)	●		
Low Performing Building (high energy use)	●		
High Performing Building (very low energy use)		●	●
Planning for Energy Modeling/Simulation		●	
Familiar with Portfolio Manager		●	
ENERGY STAR score needed elsewhere		●	
Third-party certification needed elsewhere			●
Desire added recognition in community			●
Seeking credits for ESG reporting		●	●
Jurisdiction requires third party certification			●

COMPLIANCE DOCUMENTATION OVERVIEW

CATEGORY	Deliverable	PATH 1 Energy Code Credit	PATH 2 ENERGY STAR	PATH 3 Third-Party Certification
COMCheck	2025 Energy Conservation Construction Code of New York State **– OR –** 2025 New York State ASHRAE Standard 90.1	●	●	●
Drawings	Design Drawings	●	●	●
	Product Specification sheets	●	●	●
Other	Photos of Installed Equipment	●	●	●
	Energy Model Input/Output Summary		●	
	ENERGY STAR Statement of Energy Design Intent Report		●	
	Copy of Third-Party Certification Submittals and Correspondence			●

DECARBONIZATION STRATEGIES

STEPS TO DECARBONIZE A BUILDING

1. Understand Current or Projected Energy Consumption
2. Reduce Energy Loads & Maximize Energy Efficiency
3. Implement Building Electrification
4. Integrate Building Automation Systems
5. Incorporate Distributed + Renewable Energy
6. Add Energy Storage Systems
7. Address Embodied Carbon

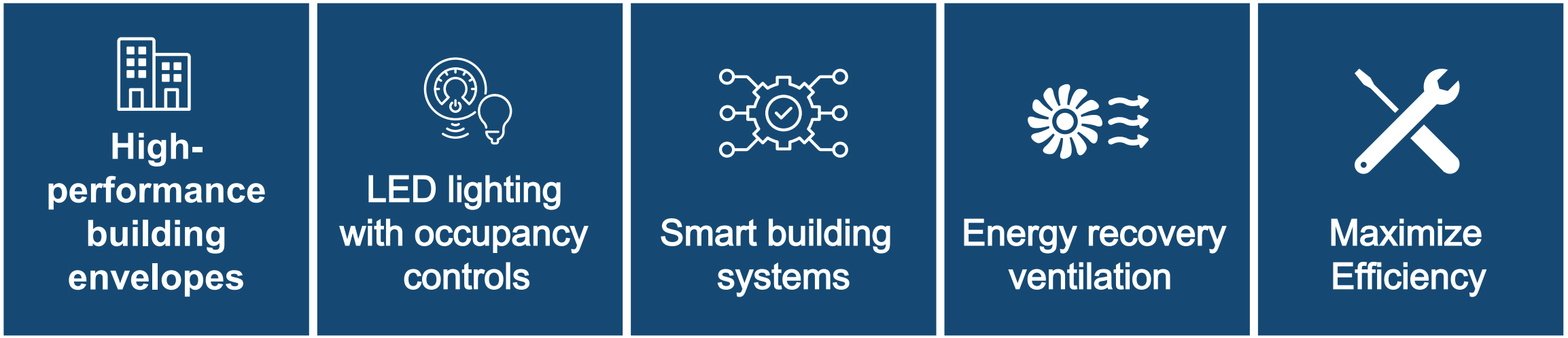
For more information on these steps, reference the Decarbonization Community Toolkit: https://www.ny.gov/sites/default/files/2024-08/DRI_NYF_Decarb_Toolkit.pdf

STRATEGIES FOR DECARBONIZATION

Load Reduction Strategies	•High-performance building envelopes •LED lighting with occupancy controls •Energy recovery ventilation to optimize heating/cooling demand •Smart electric appliances
Building Electrification	•Up-to-date electrical capacity and service •Cold climate air-source heat pumps (ASHP) or ground-source heat pumps (GSHP) for space heating and cooling •Heat pump water heaters with storage tanks and demand-flexible controls •Electric induction cooktops and heat pump dryers
Advanced Controls	•Load flexibility and advanced controls of hot water, HVAC, and smart appliances
Distributed Energy Resources	•Solar PV integrated with battery storage •Bi-directional Electric Vehicle (EV) charging equipment

LOAD REDUCTION

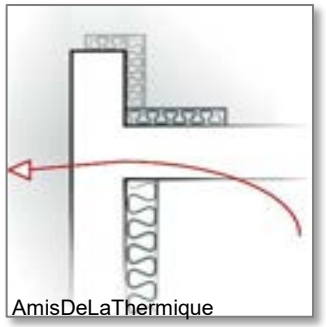
- Electric load is the amount of electricity required to operate anything electrical including lighting, HVAC, appliances, as well as anything plugged in to outlets.
- Heating/Cooling load is the amount of heating or cooling required to maintain spaces comfortably for occupants and equipment.
- Common areas to reduce load include:



LOAD REDUCTION: HIGH-PERFORMANCE BUILDING ENVELOPES

The **building envelope** includes any components between conditioned and unconditioned spaces. Typically, exterior walls, including windows, doors, insulation, framing, drywall and exterior surface such as brick.

- In heating dominated climates, high performance envelopes significantly reduce the energy loads on a building



Insulation + thermal bridging

Window replacement, shading, films

Weatherization + air sealing, vapor barriers

Cool roofs

LOAD REDUCTION: LED LIGHTING WITH OCCUPANCY CONTROLS

Lighting performance can be improved by installing LED fixtures, using occupancy sensors to turn lights off when spaces are empty, and using skylights to increase natural light.

- Interior
- Exterior
- Occupancy controls + scheduling
- Daylighting + skylights

LOAD REDUCTION: SMART BUILDING SYSTEMS

Smart building systems can automatically schedule on and off times for appliances, machines, and anything plugged in to reduce energy usage.

- Potential applications include:
  - Appliances
  - Vending
  - Computers
  - Plug loads

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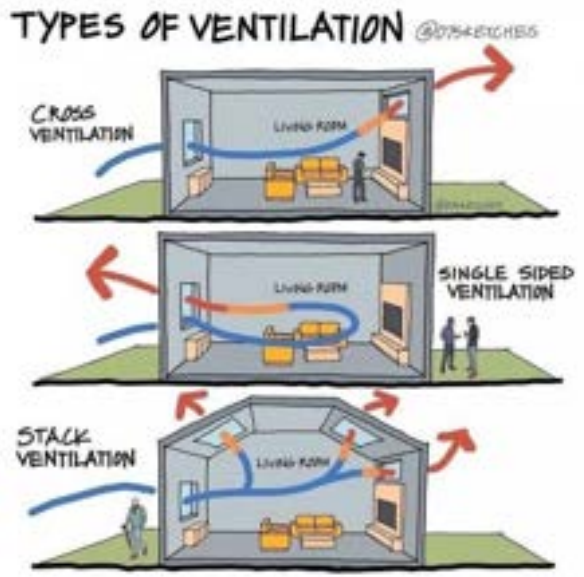
LOAD REDUCTION: VENTILATION STRATEGIES

Cooling and/or heating outside air (ventilation) is a big part of energy use from HVAC systems. Using strategies to reduce the amount of ventilation needed can greatly reduce HVAC energy use. Similarly, reducing air leaks and heat loss for ductwork that transports conditioned air can reduce the amount of air, and energy, needed to keep a space comfortable.

- **Reducing outdoor air ventilation**
  - Reduce outdoor airflow (ASHRAE 62.1/62.2)
  - Minimize terminal box airflow (e.g., during heating)
  - Minimize exhaust/makeup airflow
  - Natural ventilation
  - Demand controlled ventilation
  - Circulating fans



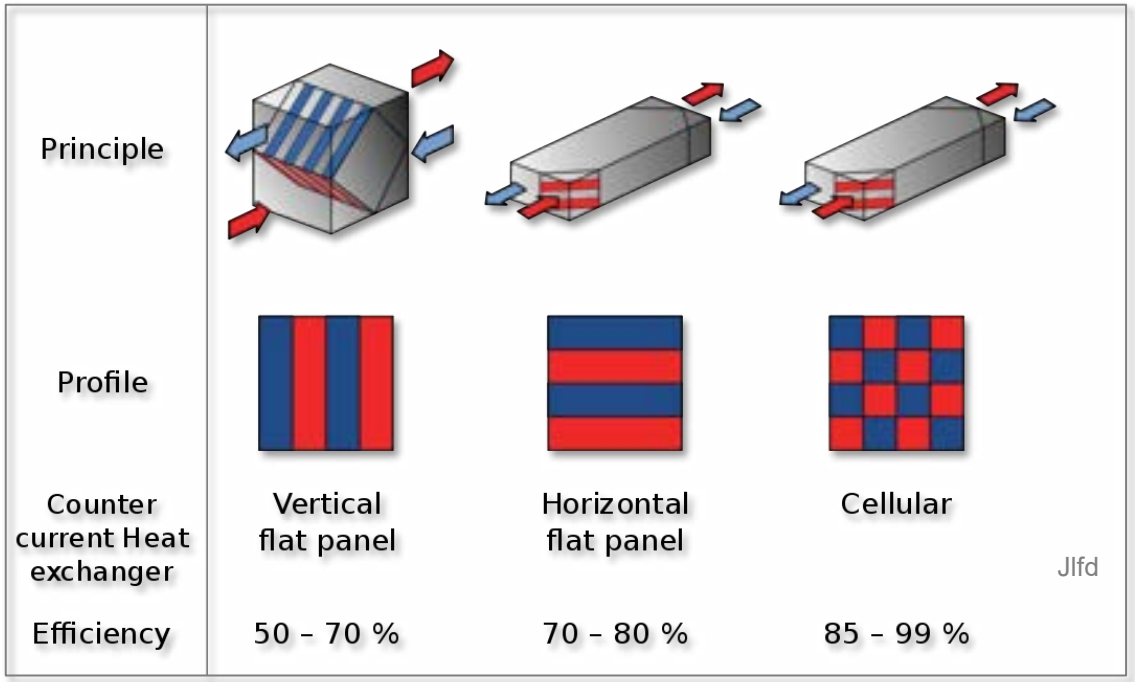
LOAD REDUCTION: VENTILATION STRATEGIES

- **Reducing losses through ductwork**
  - Insulate ductwork/piping
  - Air sealing of ductwork

LOAD REDUCTION: ENERGY RECOVERY VENTILATION

Energy recovery ventilation is a process that exchanges the energy in exhausted air or water and uses it to “precondition” incoming fresh air or water.

- HVAC
- Natural ventilation
- Exhaust systems
- Domestic Hot Water Systems
- Be creative



Exchanger Concept

DHW LOAD REDUCTIONS

Domestic hot water (DHW) load can be reduced directly by lowering supply temperatures and indirectly by reducing losses and loads.

- Reduce load
  - Lower DHW supply temperature (120°F)
  - Higher efficiency faucets/showers
  - DHW heat recovery (drain water heat recovery)
- Reduce Losses
  - Insulate water heater tanks
  - DHW piping insulation

MAXIMIZE EFFICIENCY: RETRO-COMMISSIONING OR RECOMMISSIONING

- **Retro-commissioning** is a process of inspecting existing systems and building components seeking to improve how equipment and systems function together, on a system that has never been commissioned.

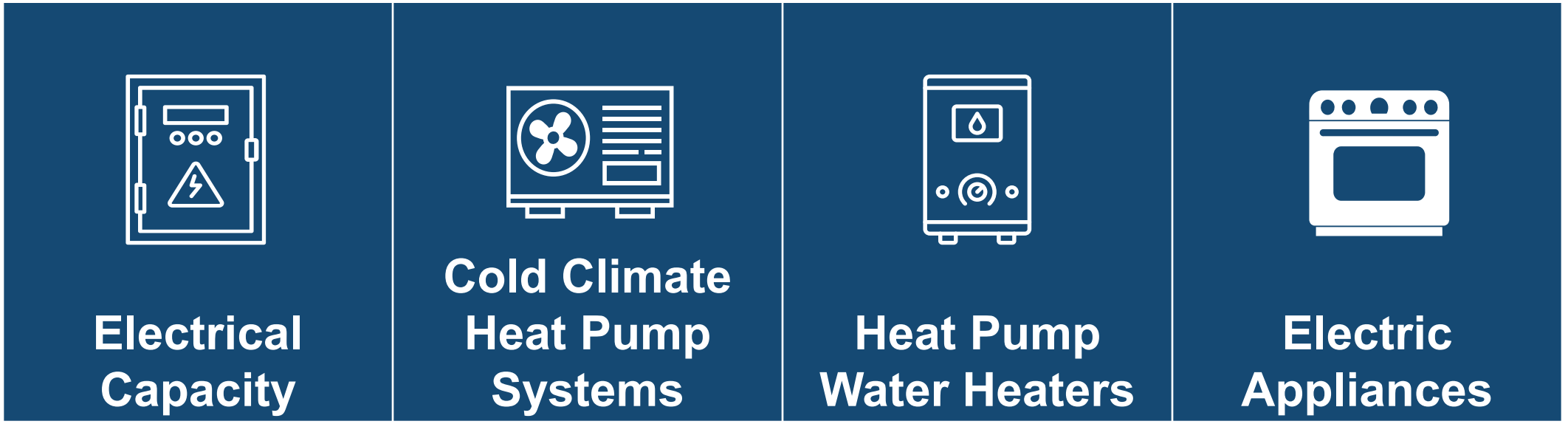
- **Recommissioning** inspects and recalibrates an existing system that was commissioned before and has deviated from optimal function.


MTA Capital Construction Mega Projects

BUILDING ELECTRIFICATION

Building electrification is the transition away from gas-powered equipment to fully electric powered equipment. It significantly reduces site emissions.

Common areas to electrify include:



BUILDING ELECTRIFICATION: ELECTRICAL CAPACITY

- The move to electric buildings systems for applications like space and water heating may require increased electrical capacity for these new systems.
    - Electric ready (no savings)
    - Electric demand analysis
    - Utility service upgrade


FuriousYogi

BUILDING ELECTRIFICATION: HEATING HOT WATER TEMP.

For space heating electrification, consider **existing HVAC system heating hot water (HHW) temperatures** compared to **heat pump HHW supply temperatures**. Strategies to address differences in HHW temperature are:

- Adjust building HHW system to operate at lower temps
- Install high temperature heat pumps
- Install cascading heat pumps (AWHP -> WSHP) for higher HHW temp
- Use boiler to supplement for peak days (can be challenging)

BUILDING ELECTRIFICATION: COLD CLIMATE HEAT PUMP SYSTEMS

- Heat pumps use electricity to move heat from indoors to outdoors during the summer (cooling season), and then reverse direction to move heat from outdoors to indoors during the winter (heating season).

- Heat pumps appropriate for cold climates include:
  - Air-source heat pumps
  - Variable refrigerant flow (VRF)
  - Water-source heat pumps
  - Ground-source heat pumps

NEEP Cold Climate Heat Pump Resource: https://neep.org/heating-electrification/ccashp-specification-product-list

BUILDING ELECTRIFICATION: HEAT PUMP WATER HEATERS

- Heat pump water heaters use electricity to move heat from one place to another instead of generating heat directly. This makes them much more efficient than electric resistance or natural gas water heaters.
  - Heat pump water heaters
  - Storage Tanks
  - Demand-flexible controls

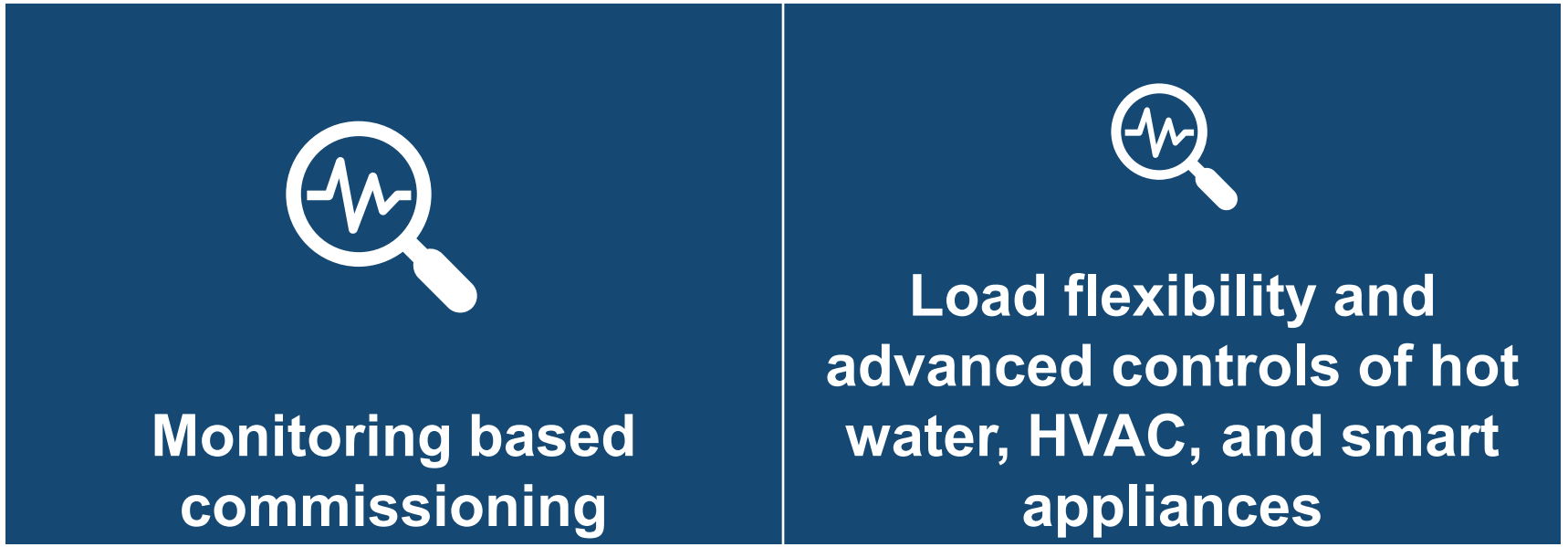
BUILDING ELECTRIFICATION: ELECTRIC APPLIANCES

- Electric appliances replace conventional natural gas-powered appliances to increase efficiency and decrease emissions as well as improve indoor air quality.
  - Induction cooktops
  - Heat pump dryers

ADVANCED CONTROLS

Advanced controls support decarbonization by automating on/off schedules and temperature setpoints, as well as collecting valuable building operational data in real time.

Common controls areas include:



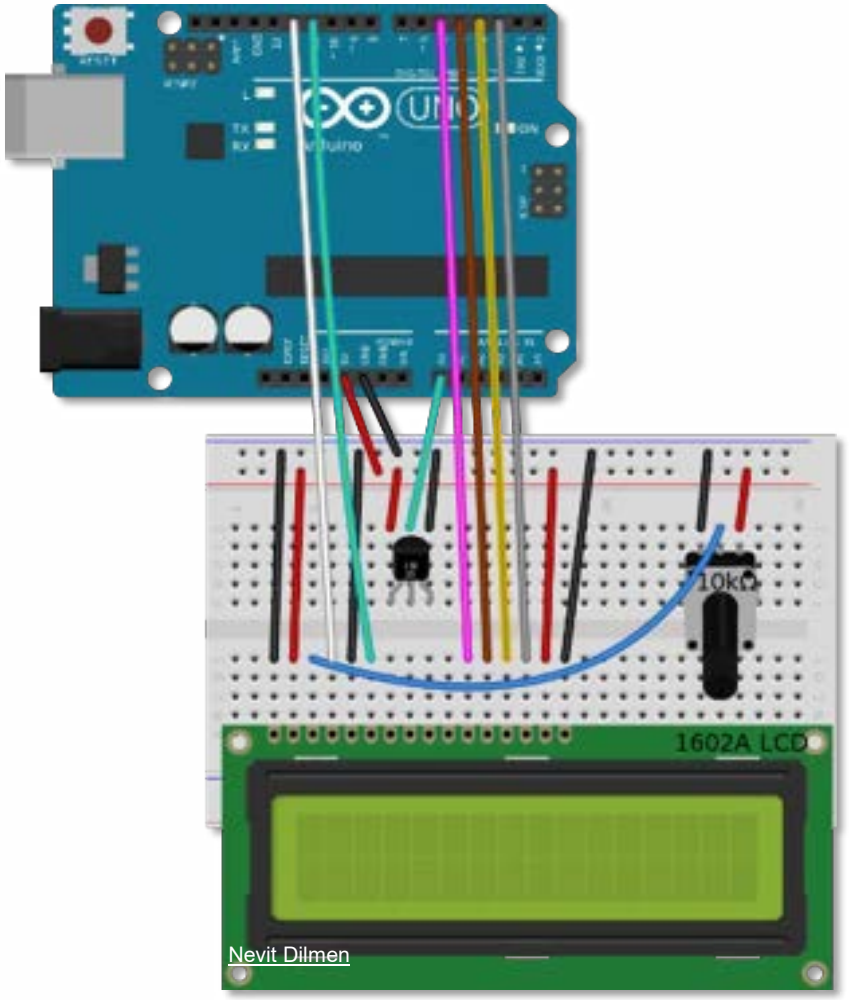
ADVANCED CONTROLS: MONITORING BASED COMMISSIONING

Monitoring based commissioning provides ongoing commissioning of systems to maintain optimal function.

ADVANCED CONTROLS: LOAD FLEXIBILITY AND ADVANCED CONTROLS

Load flexibility and **advanced controls** of hot water, HVAC, and smart appliances offer several opportunities to reduce emissions including:

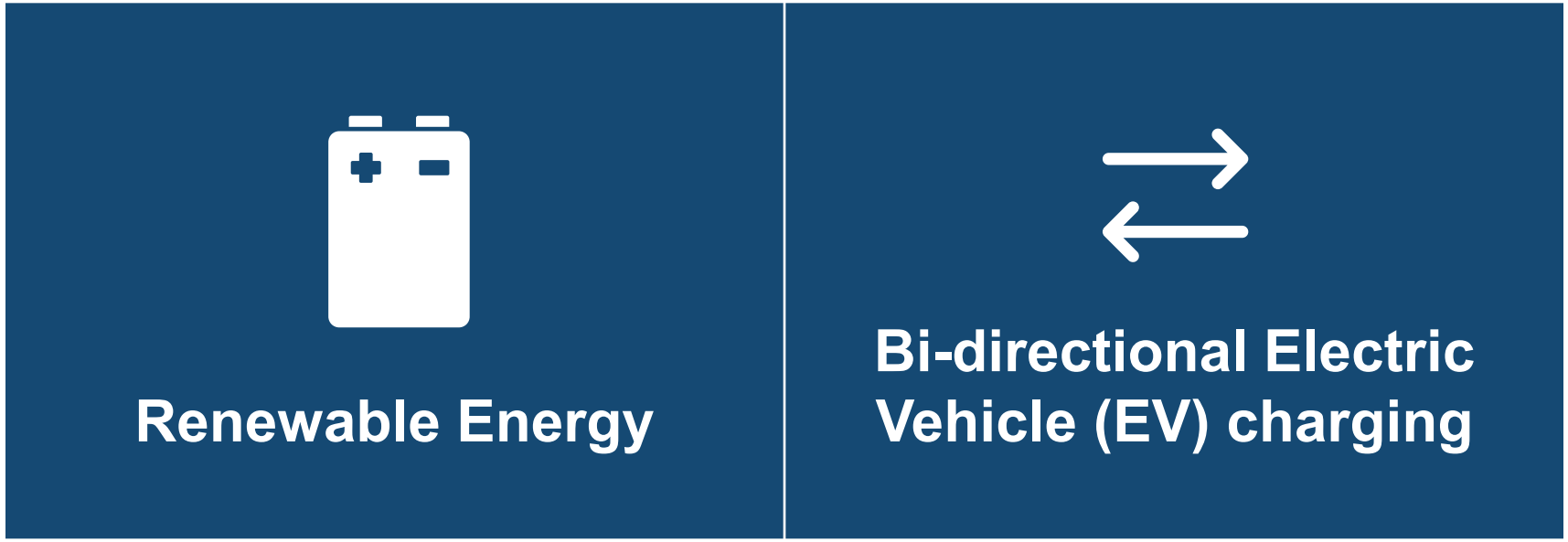
- Schedule optimization
- Reset strategies
  - Temperature
  - Pressure
- Ventilation strategies
  - CO / CO2
  - Economizers
- Demand response



DISTRIBUTED ENERGY RESOURCE (DER)

Distributed energy resource (DER) systems are small-scale power generation or storage technologies that provide an alternative to or an enhancement of the traditional electric power system.

Common DER areas include:



DER: RENEWABLE ENERGY

- Renewable energy sources may be located on or off site to provide energy derived from natural processes such as sun or wind.
  - Solar Photovoltaic arrays
  - Wind systems

DER: BI-DIRECTIONAL ELECTRIC VEHICLE (EV) CHARGING

Bi-directional Electric Vehicle (EV) charging allows energy to flow both into and out of a vehicle to provide backup power.

Bi-directional EV charging can act as a unique form of battery energy storage – but has logistical complications to be addressed for effective use.

FREQUENTLY ASKED QUESTIONS

FREQUENTLY ASKED QUESTIONS (1 OF 2)

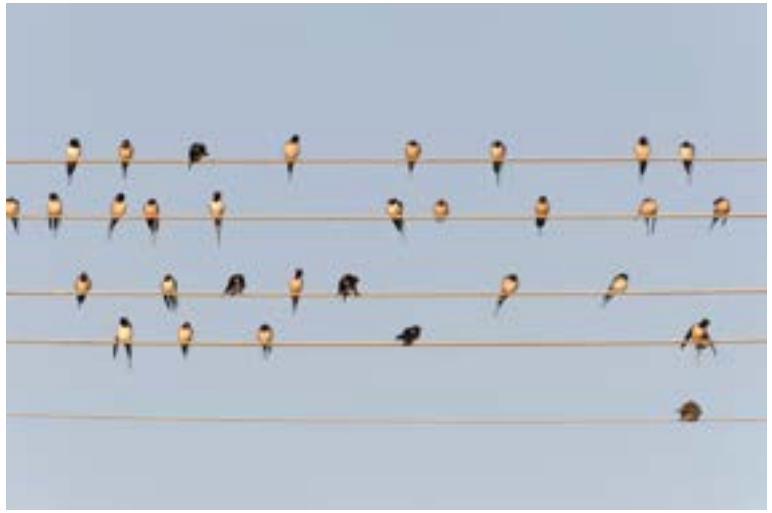
Do decarbonization strategies differ between new construction and substantial renovation?

- Some strategies are easier in new construction
  - Envelope changes
  - HVAC distribution changes (e.g. ductwork)
  - Large electrification

What about historic buildings?

- Historic buildings often have increased challenges
  - Limits on changes to envelope
  - Difficulty adding electrical infrastructure
- Find a webinar focused on historic buildings posted to the DRI|NYF webpages

FREQUENTLY ASKED QUESTIONS (2 OF 2)



Do projects need to be all-electric?

- DRI/NYF decarb compliance paths do not require all-electric solutions (but can include them)

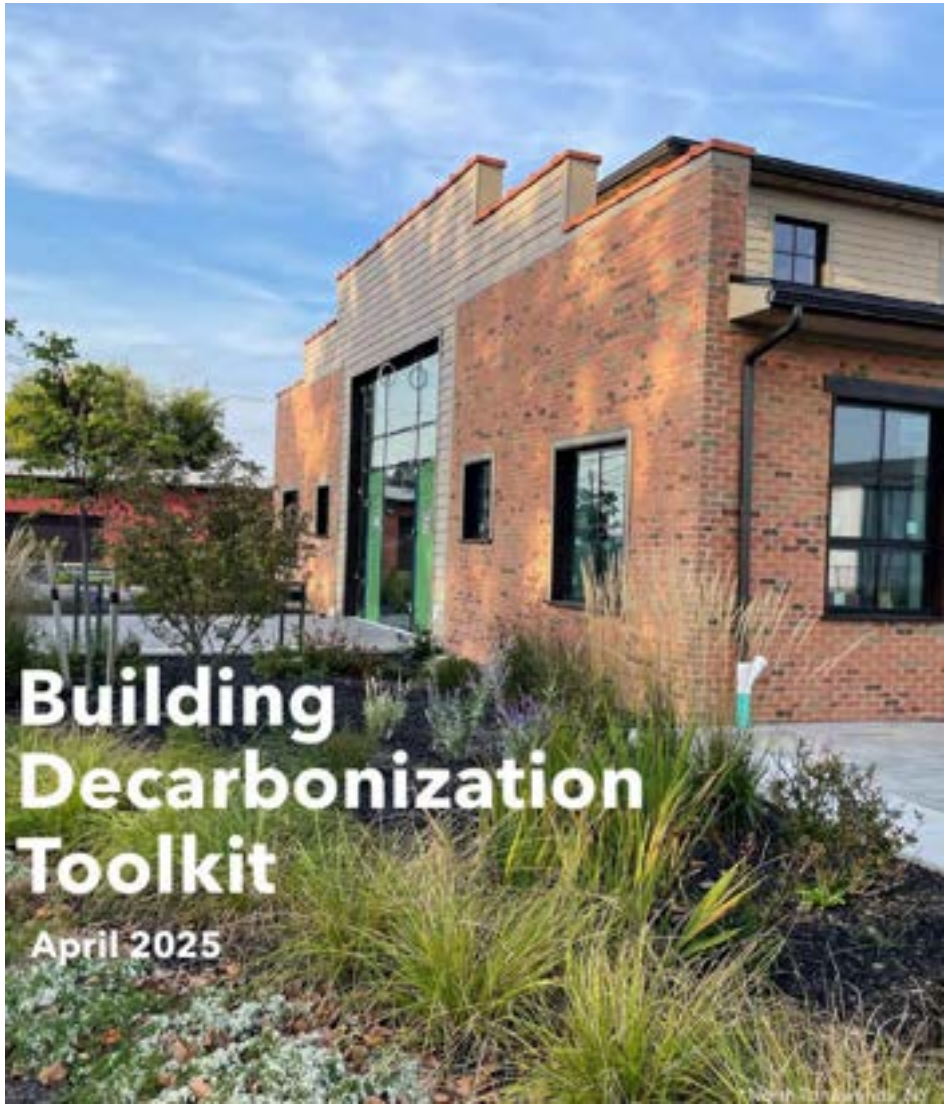
What about electricity outages?

- Envelope and energy efficiency strategies help buildings stay a comfortable temperature for longer
- Solar PV systems can provide electricity for key systems
- Battery storage systems really increase resilience (but can be expensive)
- Dual-fuel systems can use gas for backup heat

BUILDING DECARBONIZATION TOOLKIT

A resource developed for DRI/NYF to plan your project with decarbonization strategies in mind

[Link to Toolkit: https://www.ny.gov/sites/default/files/2024-08/DRI_NYF_Decarb_Toolkit.pdf](https://www.ny.gov/sites/default/files/2024-08/DRI_NYF_Decarb_Toolkit.pdf)



THANK YOU

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