

Vermont Climate Action

December, 2023

Agenda

- **Local Climate Solutions: Background and Introduction**
- **Local Climate Solutions**
 - Action 1: Municipal Building Electrification
 - Action 2: School Electrification
 - Action 3: EV Charging Infrastructure and Fleet Electrification
 - Action 4: Bulk Purchasing Programs
- **Final Takeaways**



Local Climate Solutions

Background and Introduction



Local Climate Solutions | Background

Summary

Vermont's Climate Action Plan, guided by the Global Warming Solutions Act, focuses on reducing emissions and enhancing climate resilience. This plan, adopted by the Vermont Climate Council, is designed to meet the emissions reduction requirements outlined in the Global Warming Solutions Act and to prepare for the impacts of climate change.

While the State has proposed bold new climate initiatives like the Affordable Heat Act (a clean heat standard), local governments still play an essential role in advancing climate action. Given the State's uniquely green and clean supply of electricity, various electrification measures should be seen as high priority actions for local governments to consider and for stakeholders to advocate for. This presentation will cover some of these actions, illustrating relevant examples.



Action 1

Municipal Building Electrification



Municipal Building Electrification

Why?

- Municipal buildings, like a town hall, are typically some of the largest energy consumers in smaller towns and cities
- Electrifying these buildings can greatly reduce emissions
- Local government leaders have direct jurisdiction over these projects

Examples of Electrification

- Replacing HVAC and hot water heating with high efficiency electric equipment such as ground or air source heat pumps
- Improving energy efficiency through weatherization and lighting updates

Case Study: Santa Ana City Hall

Actions

- Lighting upgrades, solar shading, and HVAC updates (automated energy efficiency programming)

Impact

- 15% site energy savings
- 19% Site electricity savings
- 42% lighting savings
- 6% HVAC savings



Action 2

School Electrification

School Electrification

Why?

- Schools, like municipal buildings, are typically large energy consumers
- Electrifying these buildings can greatly reduce emissions, improve indoor air quality for children, and reduce heating and cooling costs

Examples of Electrification

- Replacing HVAC and hot water heating with high efficiency electric equipment such as ground or air source heat pumps
- Improving energy efficiency through weatherization and lighting updates

Case Study: Odyssey Elementary, Utah

Actions

- Envelope upgrades (more insulation)
- HVAC replacement (ground source heat pump)
- Rooftop solar PV

Impact

- Halved the operating costs
- $\frac{1}{3}$ the site EUI of comparable schools



Action 3

EV Charging and Fleet Electrification



EV Charging and Fleet Electrification

Why?

- Publicly available EV charging infrastructure is crucial to EV adoption
- Municipal vehicle fleets can represent significant emissions

Examples of Electrification

- Installing publicly available EV charging infrastructure in front of public buildings, like a town hall
- Creating a fleet electrification plan, including strategies to transition school buses, city fleet vehicles, and police cars.

Case Study: Charlotte, NC

Actions

- Created a new fleet procurement strategy
- Ensures EV's replace old fleet vehicles
- Plan for 2020 to 2030

Impact (future)

- 31% reduction in emissions
- 67% reduction in cost per mile



Action 4

Bulk Purchasing Programs

Bulk Purchasing Programs

Why?

- New energy efficient electric systems (e.g. rooftop solar systems, geothermal systems, heat pumps) can pose affordability challenges
- Bulk purchasing organized by a local group can reduce the upfront cost

Examples of Electrification

- Group buy programs for rooftop solar: residents all agree to install solar, then a large contract can be signed with a company with lower costs

Case Study: Grow Solar Chicagoland

Actions

- Created a group buy program for solar panels
- Held outreach and recruitment events
- Tailored installation process

Impact

- 280+ properties enrolled, 2000+ kwh
- Close to 3 million lbs of CO2 avoided annually from program



Final Takeaways

Takeaways

1. **Vermont has a clean grid** - take advantage of that through electrification!
2. The State is doing great work, but **local action will accelerate progress** toward the VT Climate Action Plan goals.
3. Focusing on **locally controlled initiatives** and actions is a recipe for success. Revising something like an existing capital improvement plan can be high impact with lower barriers.
4. **Work with you neighbors**, especially those who may be disenfranchised and/or low or moderate income, to advocate!

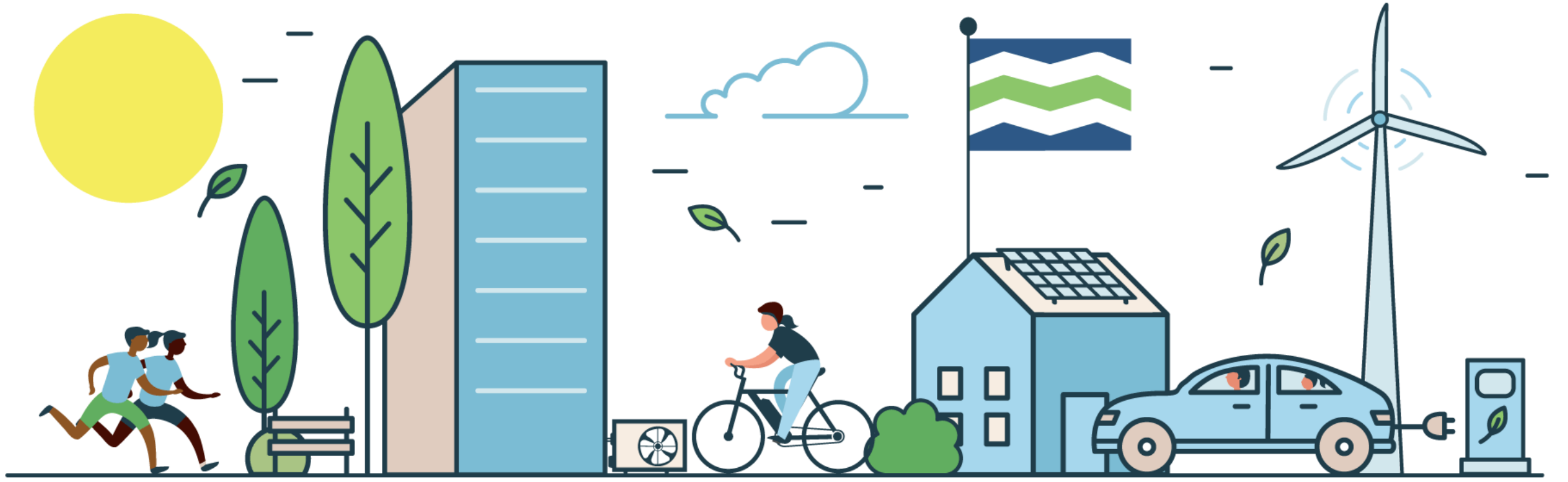


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NET ZERO ENERGY

BURLINGTON VERMONT



Timeline and Context for Thermal Energy Policy Development in Burlington:

- 2019 Net Zero Energy Roadmap presented by Mayor Weinberger and Burlington Electric
- October 2020 Mayor's Building Emissions Reduction Proposal
- Town Meeting Day Ballot Questions Charter Change March 2021
- **Rental Weatherization Standards Adopted May 2021**
- **Renewable Heating Ordinance Adopted Summer/Fall 2021**
- Charter Change Enacted by Legislature/Governor Spring 2022
- Council Resolution May 2022 for Decarbonization
- BED/DPI Interim Report July 2022
- BED/DPI Final Report December 2022
- Town Meeting Day 2023 Ballot Question
- **Carbon Fee Ordinance Development 2023 (finalized November 2023)**





Buildings Covered Under Carbon Fee Policy:

- New Construction
- Large Existing Commercial/Industrial Buildings over 50,000 Square Feet
- Municipal/City Buildings

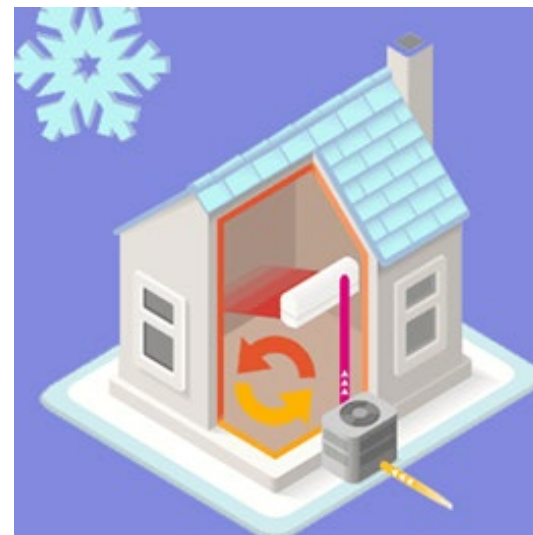
Buildings Not Covered Under Carbon Fee Policy:

- ALL Existing Residential Buildings (including single-family, multi-family, rental, condo, and affordable housing buildings)
- ALL Existing Small Business Buildings
- ALL Existing Commercial/Industrial Buildings under 50,000 square feet



New Construction:

- **100% Renewable** - Require, starting in 2024 new construction to be 100 percent renewable for thermal energy, including heating, water heating, cooking, appliances, and other systems.
- **Definition Aligned with Clean Heat Standard** - includes geothermal heat pumps, air source and water source heat pumps, heat pump VRF, advanced wood heating, and conventional systems with renewable fuel supply (such as renewable gas, biodiesel, renewable hydrogen, or renewable district energy).
- **Alternative Compliance Carbon Pollution Impact Fee** – If a building does not use a renewable fuel or technology, assess at time of permit a carbon pollution impact fee accounting for the lifetime emissions of the fossil fuel system.





Policy Large Existing Buildings and City Buildings:

- **Requirement** - Requires, starting in 2024, 100 percent renewable technology or fuels for replacement heating or water heating systems at time of permit. If using fossil fuel system, carbon pollution impact fee applies for large existing buildings (with cap of 75% of installed cost of conventional system).
- **Definition of large existing building**- Over 50,000 square feet of space conditioned area. Approximately 80 buildings in the City. Exempts all residential/multi-family/affordable housing, as well as small businesses. Exemption process for historic buildings.
- **Credit for Emissions Reduction** – A building owner taking action to reduce emissions outside the scope of the policy, gets early action credit against future compliance.





Use of Carbon Pollution Impact Fee Proceeds:

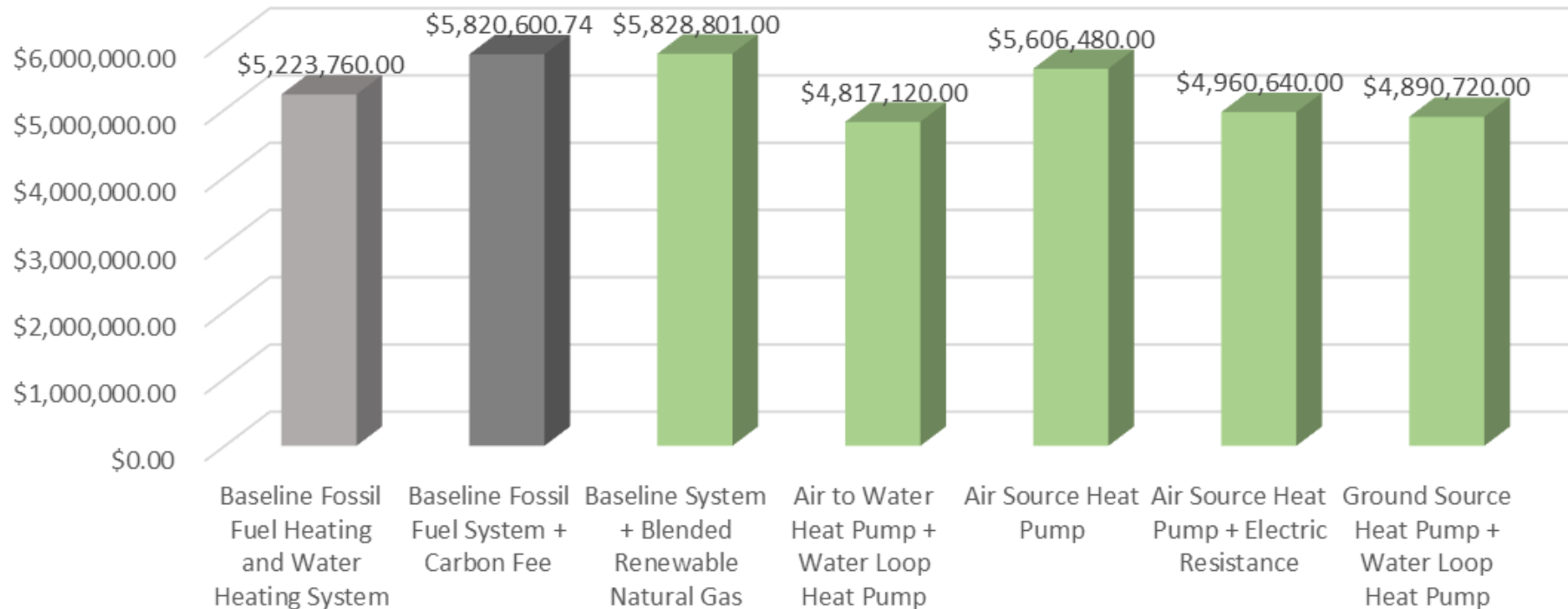
- **Clean Heating Technologies for Low-Income Burlingtonians** – Create new city fund to support installation of clean heating technologies for low-income households and renters, consistent with Advisory Question 7 from Town Meeting Day 2021.
- **For Existing Building Payors** – For fee payors in existing buildings, provides a portion available back to the payor if submit a plan to reduce emissions at their building or facility.





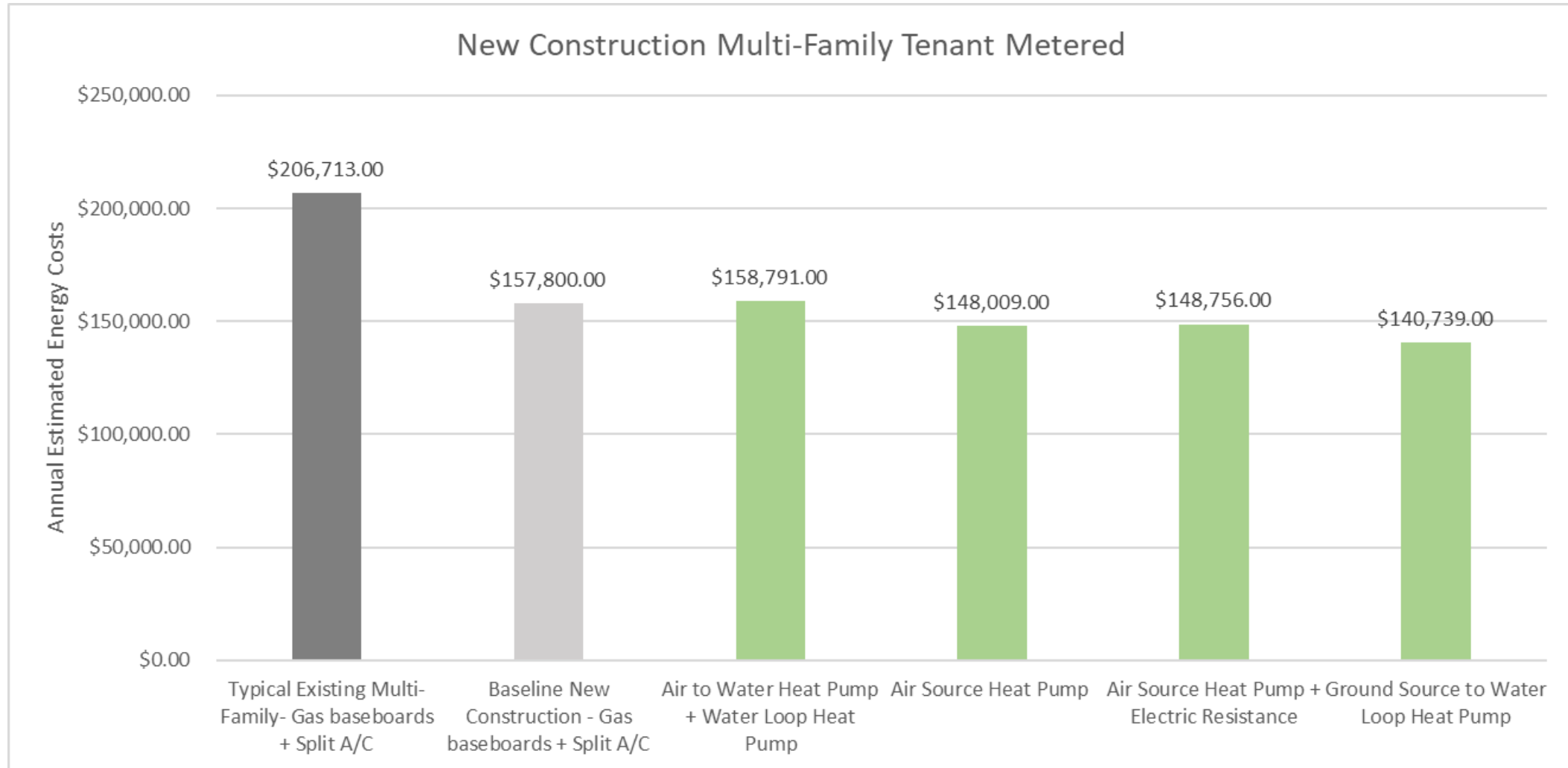
Analysis, New Multi-Family Building Example ~ 150,00 sq ft Upfront Capital Cost

Upfront Capital Cost Comparison - New Building Example



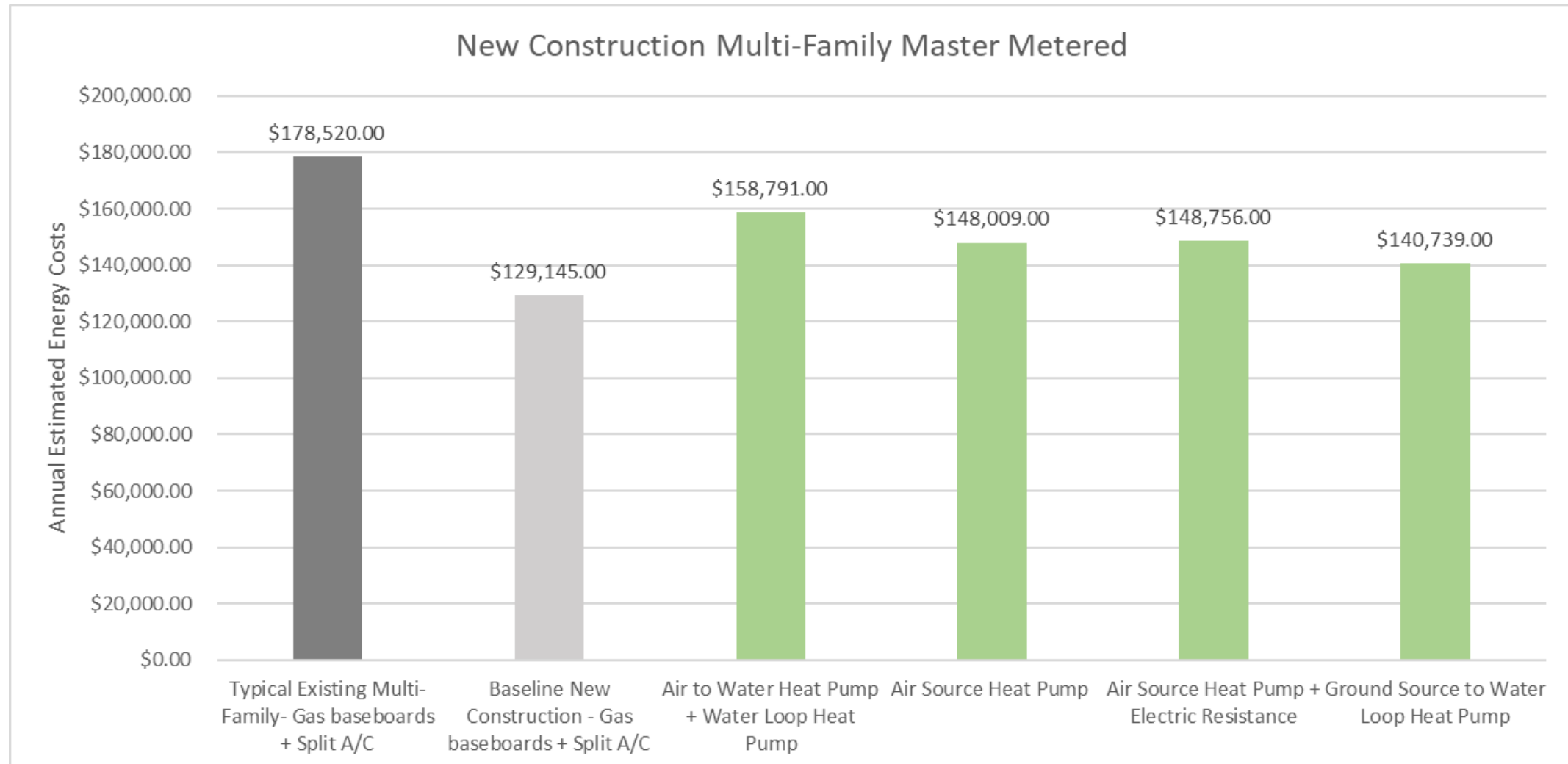


Analysis, New Multi-Family Building Example: Energy Operating Cost Estimates Tenant Metered



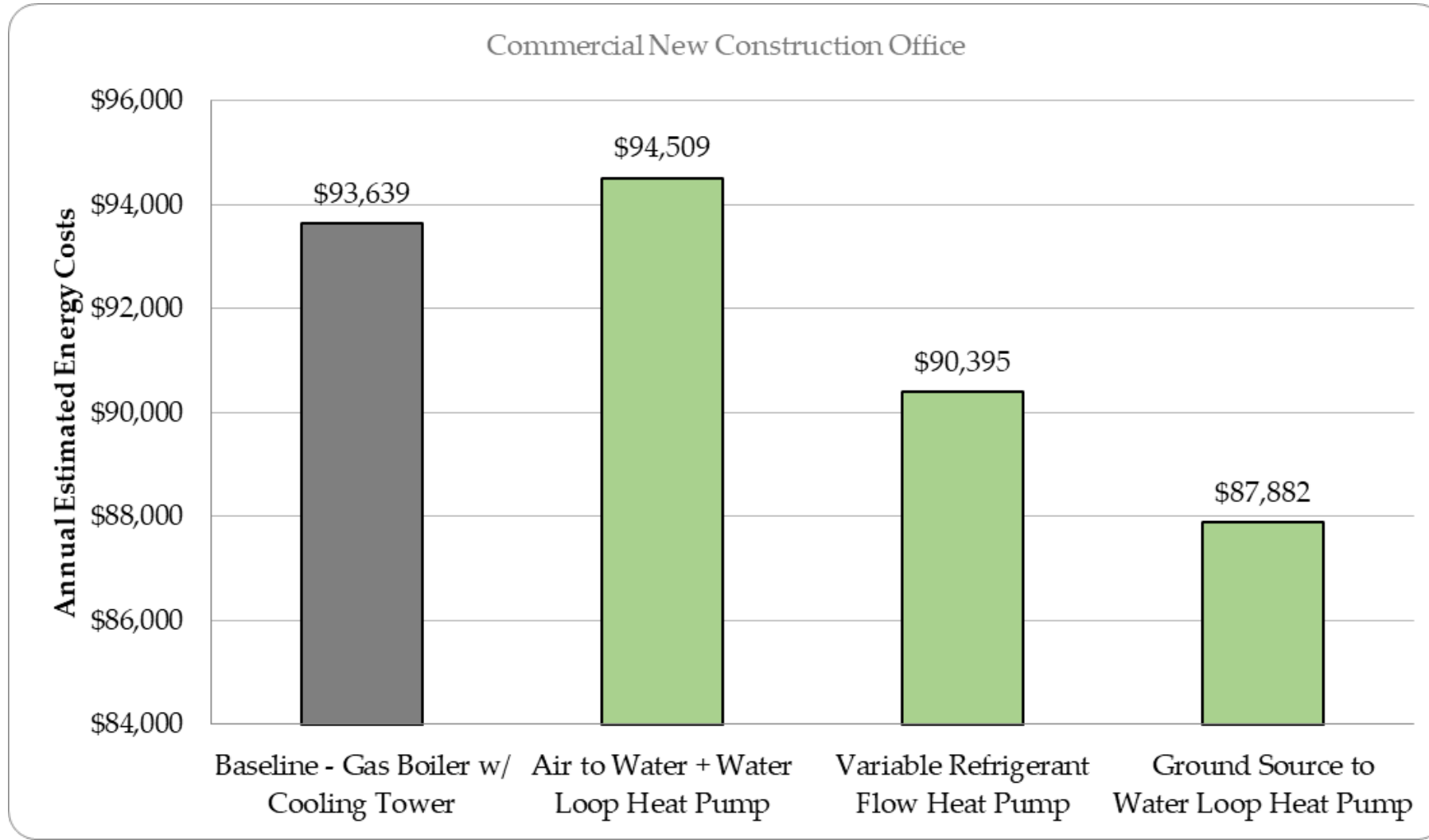


Analysis, New Multi-Family Building Example: Energy Operating Cost Estimates Master Metered





Analysis, New Building ~ 60,000 sq ft Office Example: Energy Operating Cost Estimates





Analysis, Existing Building Example ~ 50,000 sq ft:

Upfront Capital Cost Comparison - Existing Building Example

