



Residential Building Heat Pump & Envelope Conversion Strategies

*Presented Live at the
NY-GEO 2023
Conference
Albany, New York on
April 27, 2023*

Moderator:

Brendan Thomas / *CMC Energy Services*

Panel:

Courtney Moriarta / *NYSERDA*

Matt Dennis / *Halco Energy*

Matt Desmarais / *Energy Catalyst*

Doug Presley / *Dandelion Energy*

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Residential Building Heat Pump & Envelope Conversion Strategies

Thursday, April 27 • 1:30–2:30 PM • Salon D

During the 2022 State of the State address New York's Governor Kathy Hochul announced a plan to achieve 2 million climate-friendly, electrified or electrification-ready homes by 2030. Most electrification projections have been based on 85% ASHPs and 15% GSHPs. So 300,000 homes converted to GSHP in 7 years is 42,852/year, 3,571 per month and 178 per day. That's a lot of home conversions! This panel of diverse stakeholders will provide perspectives what needs to happen, and how to pick up the pace in the conversion of the low-rise residential building sector.

Moderator

- Brendan Thomas / CMC Energy Services bthomas@cmcenergy.com
 - Replacing: Amanda Schneck / WaterFurnace International & NY Geo Board Member Amanda.Schneck@waterfurnace.com

Panel

- Courtney Moriarta / NYSERDA Courtney.Moriarta@nyserda.ny.gov
- Matt Dennis / Halco Energy mattd@halcoenergy.com
- Matt Desmarais / Energy Catalyst mattd@energycatalysttech.com
- Douglas Presley / Dandelion dpresley@dandelionenergy.com

MATT DENNIS

HALCO ENERGY

[Link to Project Photos](#)

NY-GEO



ENERGY CATALYST TECHNOLOGIES

Groundbreaking Clean Heat

Presented by:
Matthew Desmarais, CEM EIT
Founder
Energy Catalyst Technologies





Peak Heating Load at 0°F:

64,000 BTU/hr

43,600 BTU/hr

35,000 BTU/hr

63,000 BTU/hr

Heat Capacity of existing baseboard/radiators with 120F hot water:

57,000 BTU/hr
89% of Load

29,000 BTU/hr
66% of Load

42,000 BTU/hr
120% of Load

46,000 BTU/hr
73% of Load



Cast iron radiators



Baseboard
High indoor temperature



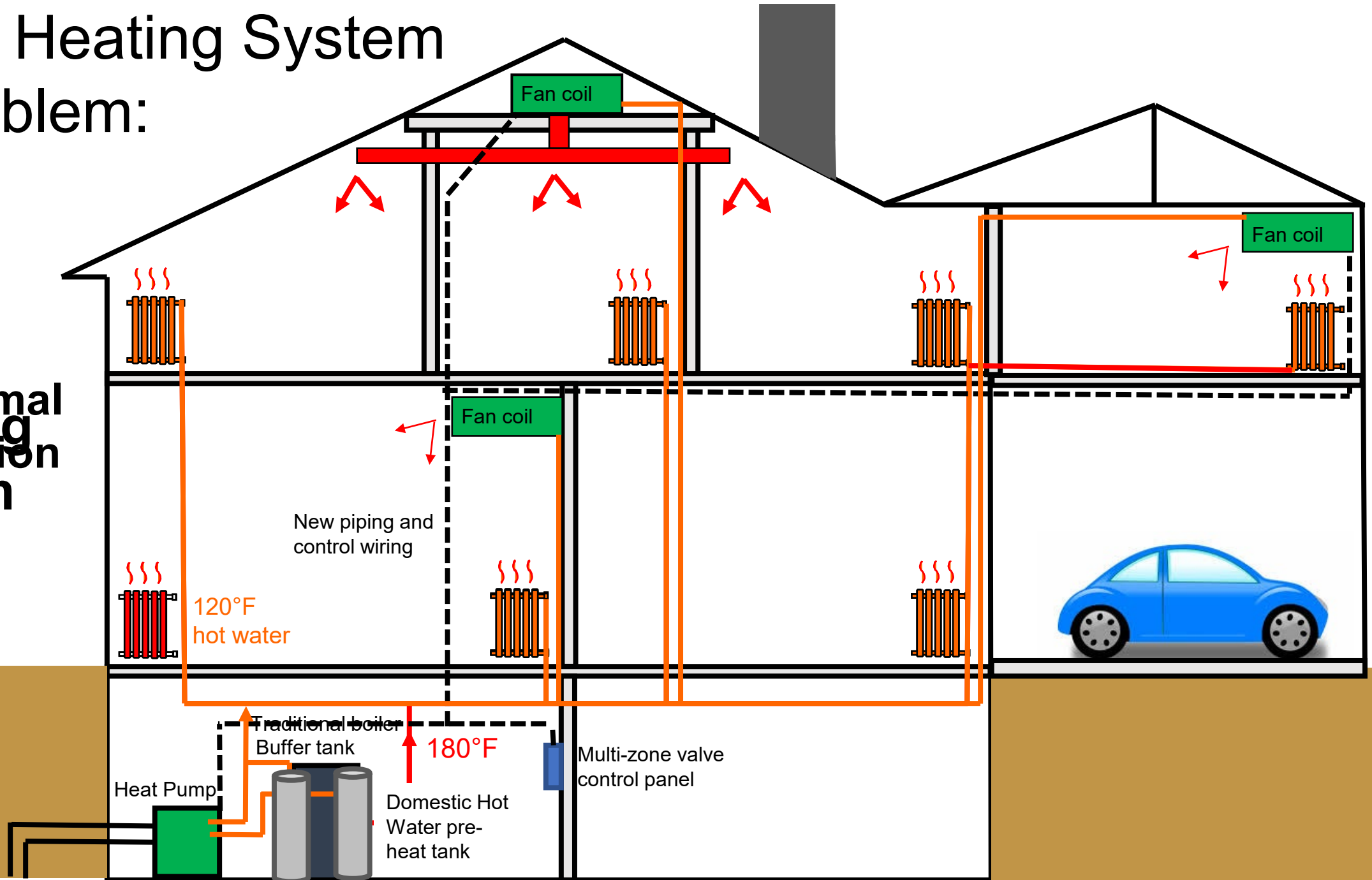
Cast iron radiators
Low indoor temperature



Baseboard
High indoor temperature

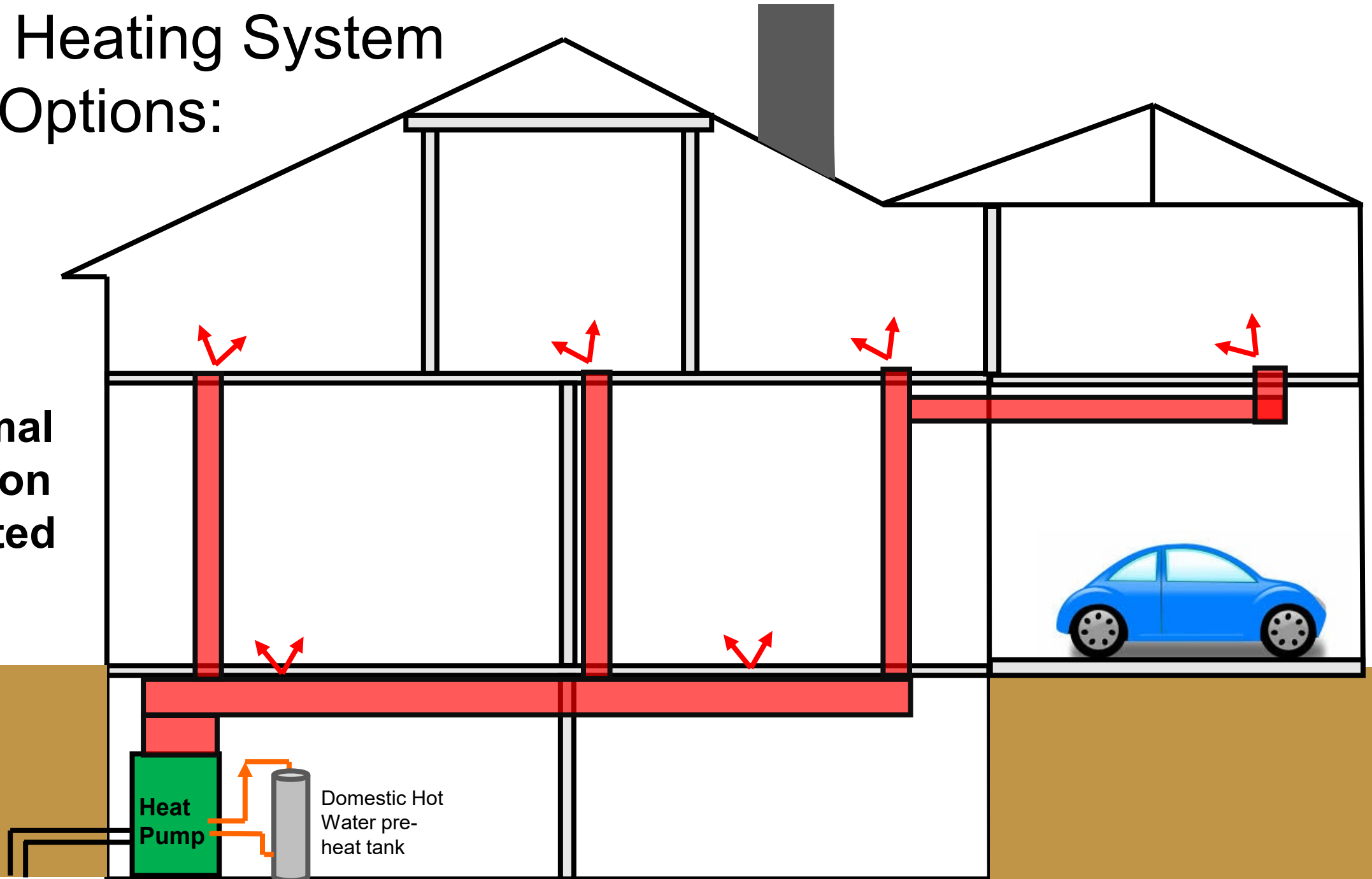
Existing Heating System

The Problem:



Existing Heating System Retrofit Options:

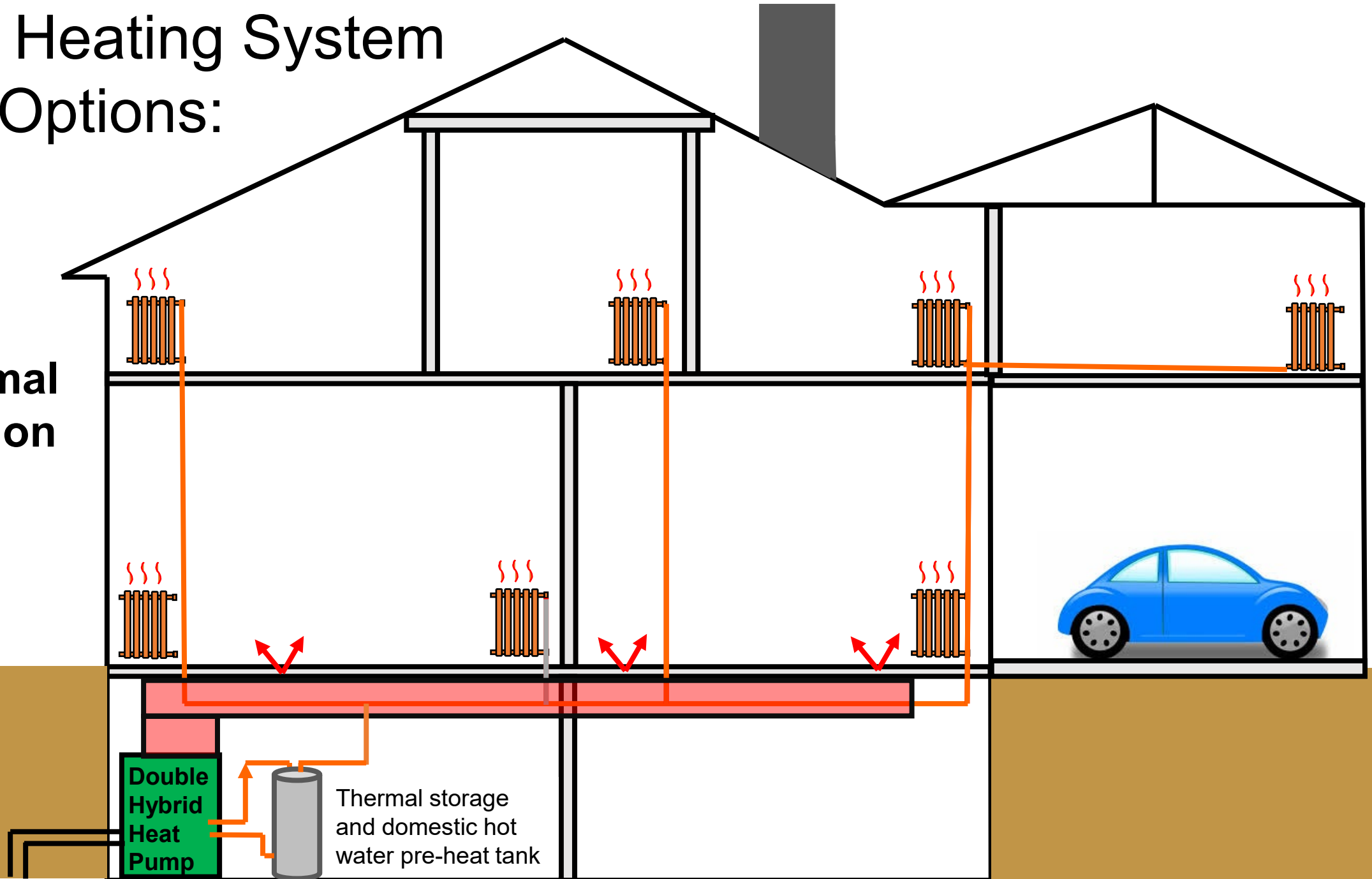
**Geothermal
Conversion
fully ducted**



Existing Heating System

Retrofit Options:

**Geothermal
Conversion
Double
Hybrid**

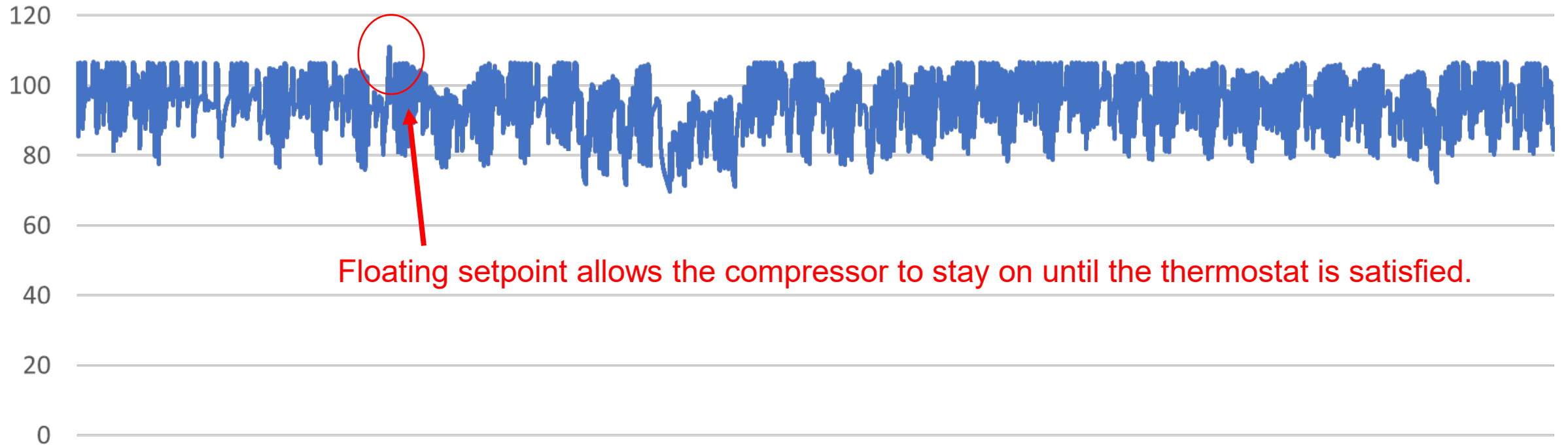


3 Keys to Converting Homes with Baseboards

1. Don't guess, measure heating capacity
 - Length and type of heat emitters
2. Anticipate weak spots
 - Ask the homeowner, "are there any cold rooms?"
 - Baseboard in series may need to be re-piped
3. Think through the controls
 - Hot water reset is essential, but can be a double edge sword
 - More zones is better

Hot Water Reset is a Compressor's Best Friend

Winter Hot Water Supply Temperature





“We love that we could reuse our radiators and still use geothermal.”
-Emily Templeton, Homeowner



“Our home is warmer and more comfortable now than it was before”
-Garrett DeGraff, Homeowner

How can we accelerate geothermal conversions in NYS?

1. Heat the homes we already have.
2. Stop changing the utility rebate rules.
3. Provide long term, low interest loans. If utilities can amortize a gas pipeline over 50+ years, why can't we do the same with geo?

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Key Levers to Improve the Customer Experience

1. Cost (including up-front cost) – this is an economic decision
2. Simplicity vs. inconvenience

Cost Reduction

Federal Tax Incentives /
Rebates / Funding

State / Local Incentives

State / Utility Financing

+

Remove Barriers

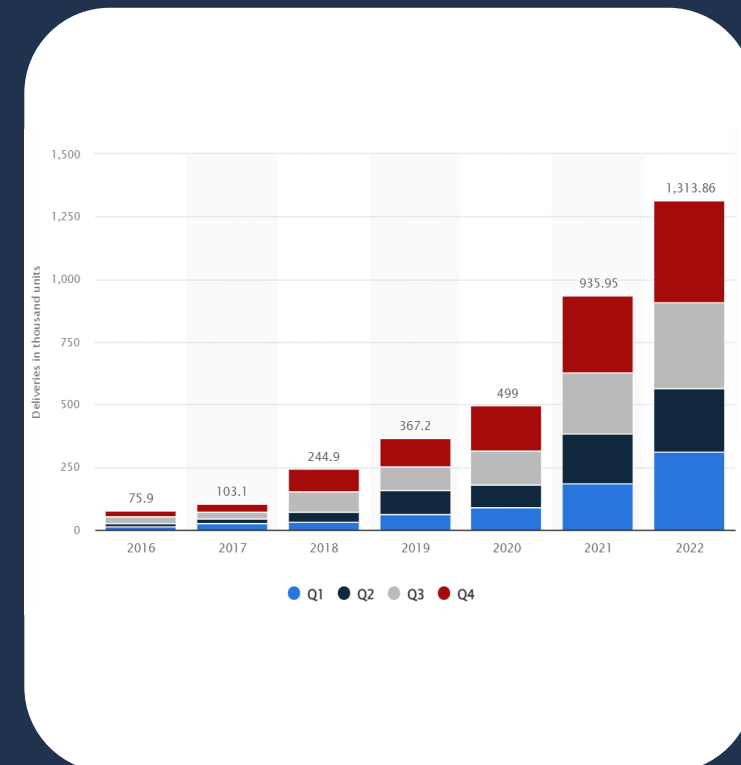
Regulatory

Technology

Workforce

=

Results





Cost Reduction

Federal Tax Incentives / Rebates

- Federal tax credit (25D): 30%
- IRA Rebates
- Defense Production Act
- Third-party ownership (TPO)
- R&D for Geothermal Heat Pumps

State / Local Incentives

- Clean Heat incentives - must sustain
- State income tax credits - \$5,000
- Property tax exemption
- Sales tax exemptions

State / Utility Financing

- 0% Clean Heat loan up to \$50,000
- On-bill financing
- Repeal 100' Rule / electrification option



Remove Barriers

Regulatory:

- Streamlined permitting for GSHP [and cost impacts]
- Drilling deeper than 500' [and cost impacts]
- All-Electric Buildings / building codes
- Electrification rate design
- Energy Cost Disclosure for Sale/Lease

Technology:

- Faster / Better / Cheaper Heat Pumps [and cost impacts]
- Main panel upgrades
- Ease of installation

Workforce:

- Education and training pipeline
- Licensing requirements



Results – This is Achievable!

