Welcome to the waiting room. We'll begin shortly.

Reminder: Today's webinar will be recorded and a copy of the slides will be emailed to you.

ASHP Installer Best Practices Sub-Committee

- Dave Lis, Director, Technology and Market Solutions
- Derek Koundakjian, Buildings and Technologies Associate
- April 22, 2021

Webinar Logistics

- Attendees will begin muted
- There will be several opportunities to comment/ask questions. We will ask you to "raise your hand" on sidebar if you want to be unmuted
- If you're using phone for audio, please enter Audio pin so that we can unmute you during these times
- Feel free to communicate via question box on the sidebar to make comments/ask questions

Slides/Recording will be circulated following call

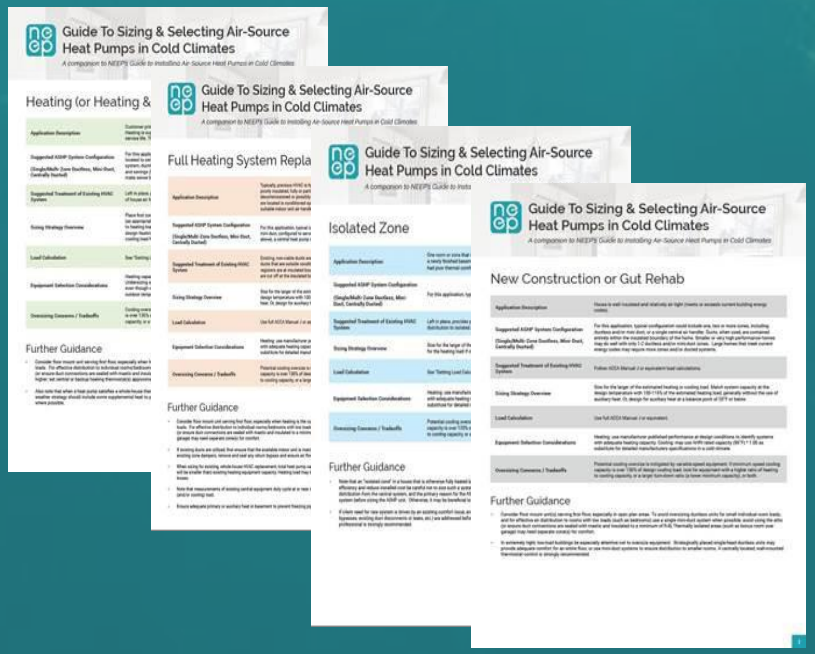
Meeting Agenda

- Introduction
- ccASHP Sizing and Design Training Overview
  - Matt Christie, *TRC*
- Q&A
- Discussion facilitated by NEEP
- Wrap Up/Adjourn

ASHP Market Transformation Strategies

1. Increase Consumer Education and Awareness
2. Increase Installer/Builder Awareness of, and Confidence in, ASHP through expanded training and education
3. Reduce Upfront Costs of installed systems through robust and aligned promotional programs and the support of alternative business models
4. Mobilize State and Local Policymakers to expand support for ASHPs
5. Promote Advanced Control technologies to allow automated coordination among multiple heating systems
6. Enable the promotion of climate-appropriate ASHPs through Improved Performance Metrics
7. Develop more accurate tools to predict energy, cost and GHG savings associated with ASHP installation through collection and analysis of Real World Performance Data

NEEP Installer Best Practice Resources (Size/selection and Install)



neep.org/ASHPInstallerResources

NYS Clean Heat – Contractor Reqs. Change

– Sizing and Design Training

April 22, 2020

Matt Christie - TRC

NYS Clean Heat ASHP Participating Contractor Requirements

Current

At the ***company*** Level:

- EPA's Section 608 Technician Certification (Refrigerant handling)
- Certificate of Installation Training
  - From manufacturer, within the last 5 years
- Confirmed to have read the NEEP *Guide to Sizing & Selecting Air-Source Heat Pumps in Cold Climates*
- Certificate of Insurance

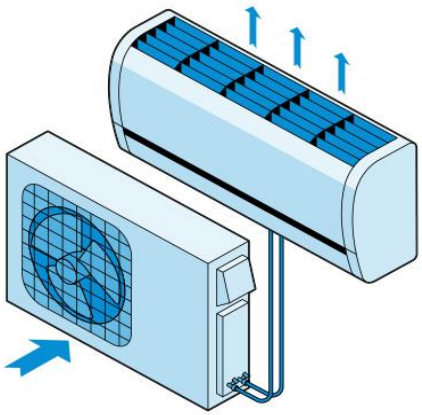
Jan 1, 2022

New Contractor Enrollees

At the ***company*** Level:

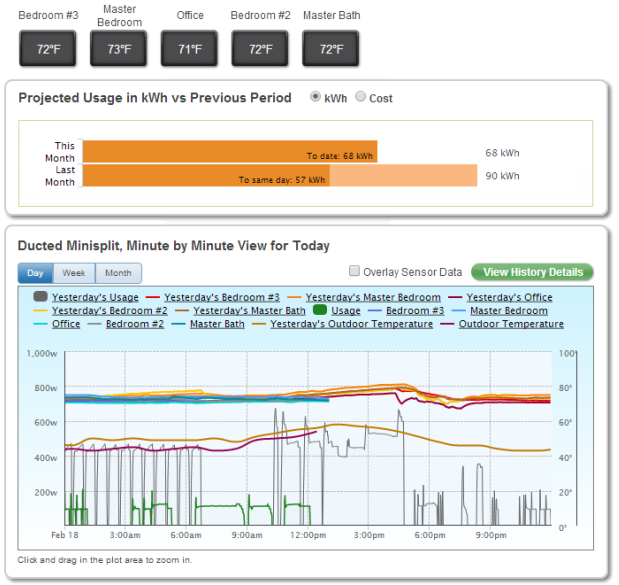
- EPA's Section 608 Technician Certification (Refrigerant handling)
- Certificate of Installation Training
  - From manufacturer, within the last 5 years
- Confirmed to have read the NEEP *Guide to Sizing & Selecting Air-Source Heat Pumps in Cold Climates*
- Certificate of Insurance
- Certificate of ***cold-climate sizing and design*** training
  - From manufacturer, within the last 5 years

NYS Clean Heat – Contractor Qualifications Research



Importance of Sizing and Design

- Installation training and quality decently enforced by
  - Manufacturer trainings
  - Optional 3rd party trainings – NATE, ESCO, ACCA
  - Market forces – call backs, warranty,
  - Program QA/QC
- Sizing/design is more important for heat pumps, specifically VCHPs, than with traditional HVAC to earn EE savings.
  - Sizing/Design trainings absent in the marketplace
- Goldilocks principle – must size to both the partial-loads and high-loads
  - Highest efficiency running at 60-80% of nominal capacity
- VCHPs can mask poor design in terms of comfort – but not savings, energy loads, energy bills, and early-breakdown



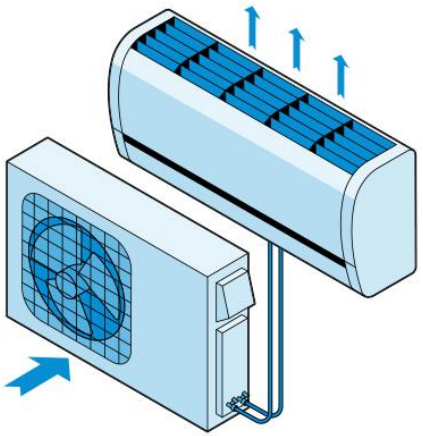
Manufacturer led trainings

- Common norm for licensed installers
- Manufacturer-required to sell their product
- Vary in depth, quality, scope, and reach
- Conducted by the manufacturer and/or the distributor
- Subject matter expert consensus: Trainings are mostly for installation and commissioning skills.
  - *Occasionally*, design and specification

Findings Summary

- There is no blueprint
- Universal recognition that **load-calcs, sizing, and design** is underserved
  - Manual J's are either not done, or made to match the initial judgment
- Universal recognition that **cold-climate specific knowledge** is underserved
  - Load-matching across operating conditions is essentially not taught
- Need for **in-person** *'comfort consultant'* as key individual needing design knowledge
- Knowledge **+** Experience is the winning formula
  - The "badge" doesn't really matter

Training Design Guide

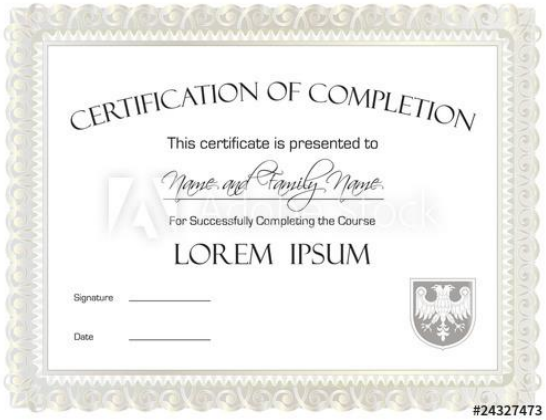


Proposed VCHP Design/Sizing training

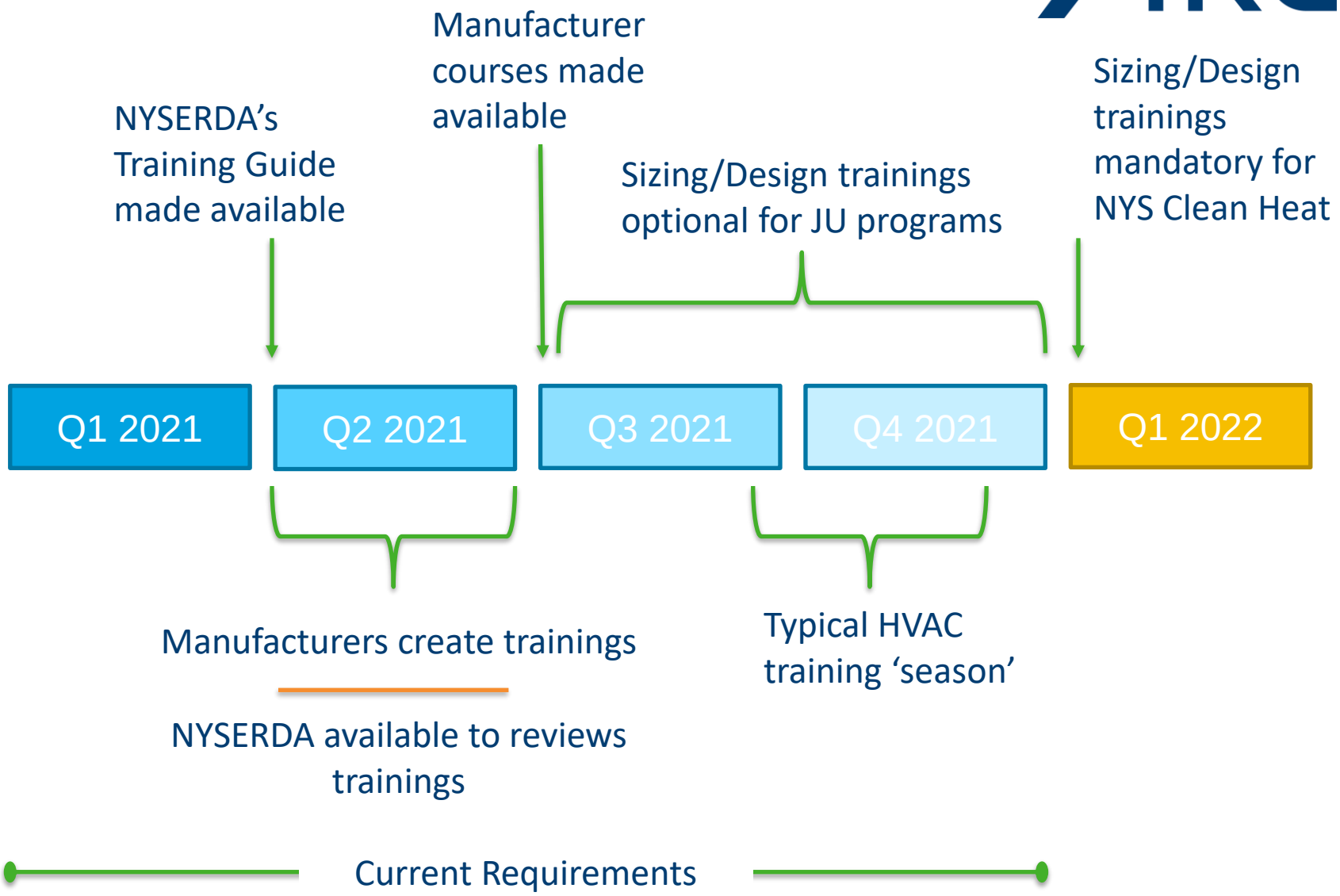
- Delivered by the manufacturers through existing training channels (distributors)
- Half-day to full-day
- In-person or on-line
- Training designed to fulfill a ***course curriculum guide***
  - Create a standalone module, or embed into a broader training
  - Off-the-shelf, brand agnostic training available for manufacturers to use outright, or adapt-from
  - Provide a certificate of completion
- NYSERDA support is available to review your trainings

Proposed VCHP Design/Sizing training

- Heat pump basics
  - VCHP differences
  - Cold climate specification
- Load calculations
- System sizing and specification
  - Sizing for heating first
  - Load-matching principles for cold-climate product selection
- System design options
  - Displacement vs. replacement/whole-house
  - Ducted, ductless, short duct
  - Indoor unit locations, duct design
- Thermostats and controls
- Design examples
  - Common errors
  - Best practices
- Student evaluation criteria
- Certificate of completion specification



Timeline



Process

Manufacturer's Role:

- Review the ***course curriculum guide***
- Create new, or adapt existing, trainings to fulfill the guide's prescriptions
  - Manufacturer's can use NYSERDA's brand agnostic version of the training in ***full*** or in ***part***
- Option of sending the planned training to NYSERDA for their review and support
  - NYSERDA also available to support train-the-trainer when requested
- Begin offering trainings to contractors.
  - Issue certificate of training completion to those who take it
- Finalized manufacturer guidance will be posted to NYS Clean Heat Program Resources Landing Page

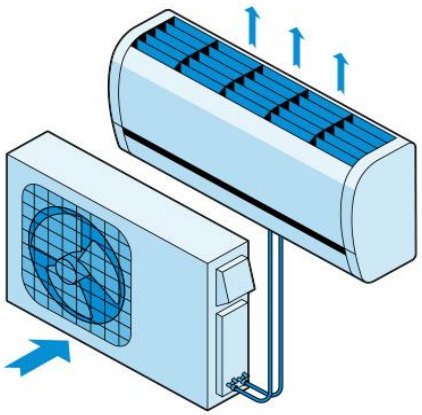
ASHP Contractors:

- On or after January 1, 2022 all new ASHP installers seeking to become a NYS Clean Heat Participating Contractor must include proof of this training with their contractor application, prior to that date documentation is voluntary.

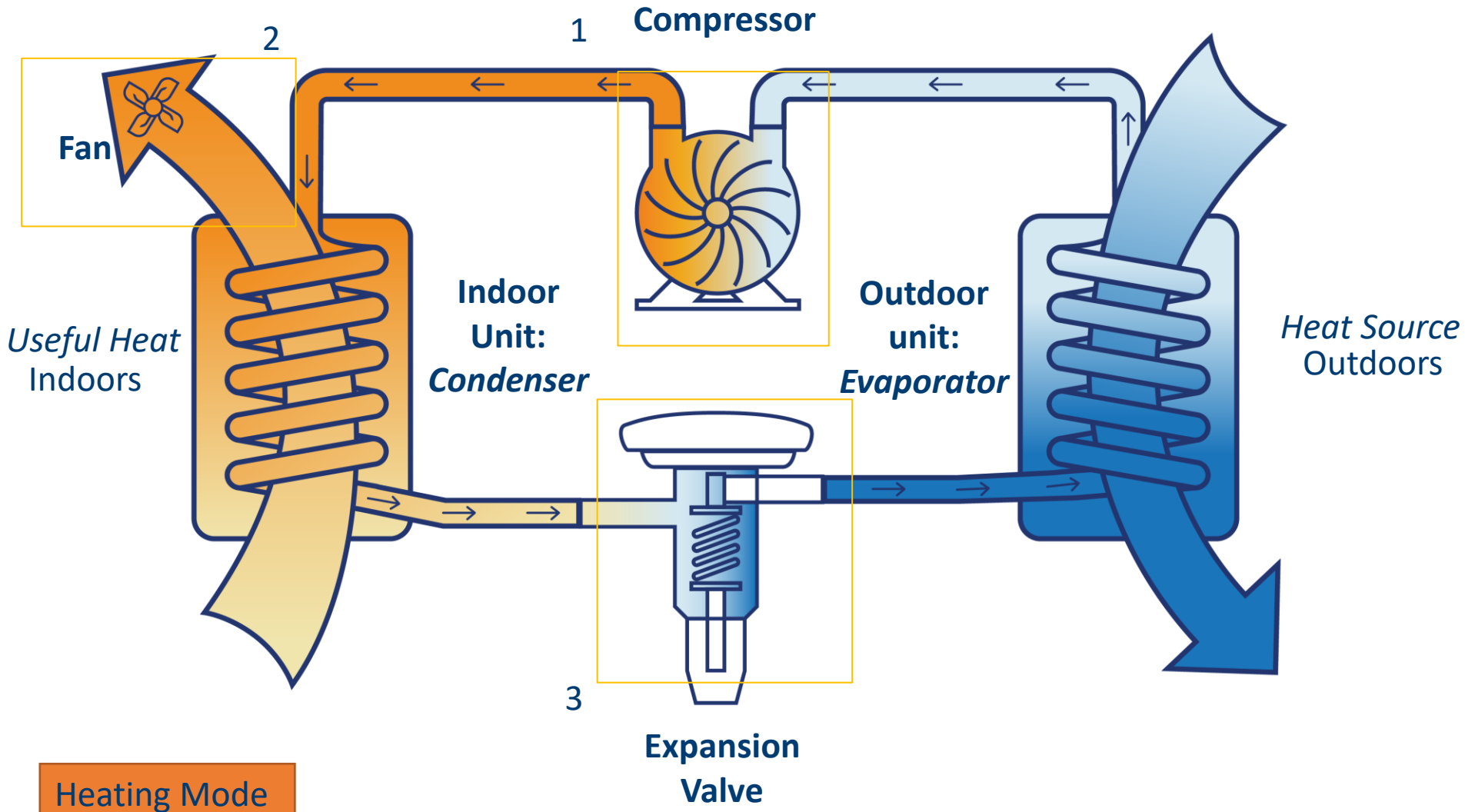
Beyond NYS Clean Heat

- Universal challenge instilling a “size for heating” reality has impacted utility program’s verified savings claims
- Utilities in other territories have expressed interest referencing this same training, once it exists
- Other NYSERDA initiatives will encourage non-NYS Clean Heat participating contractors to take this training too

Example Slides

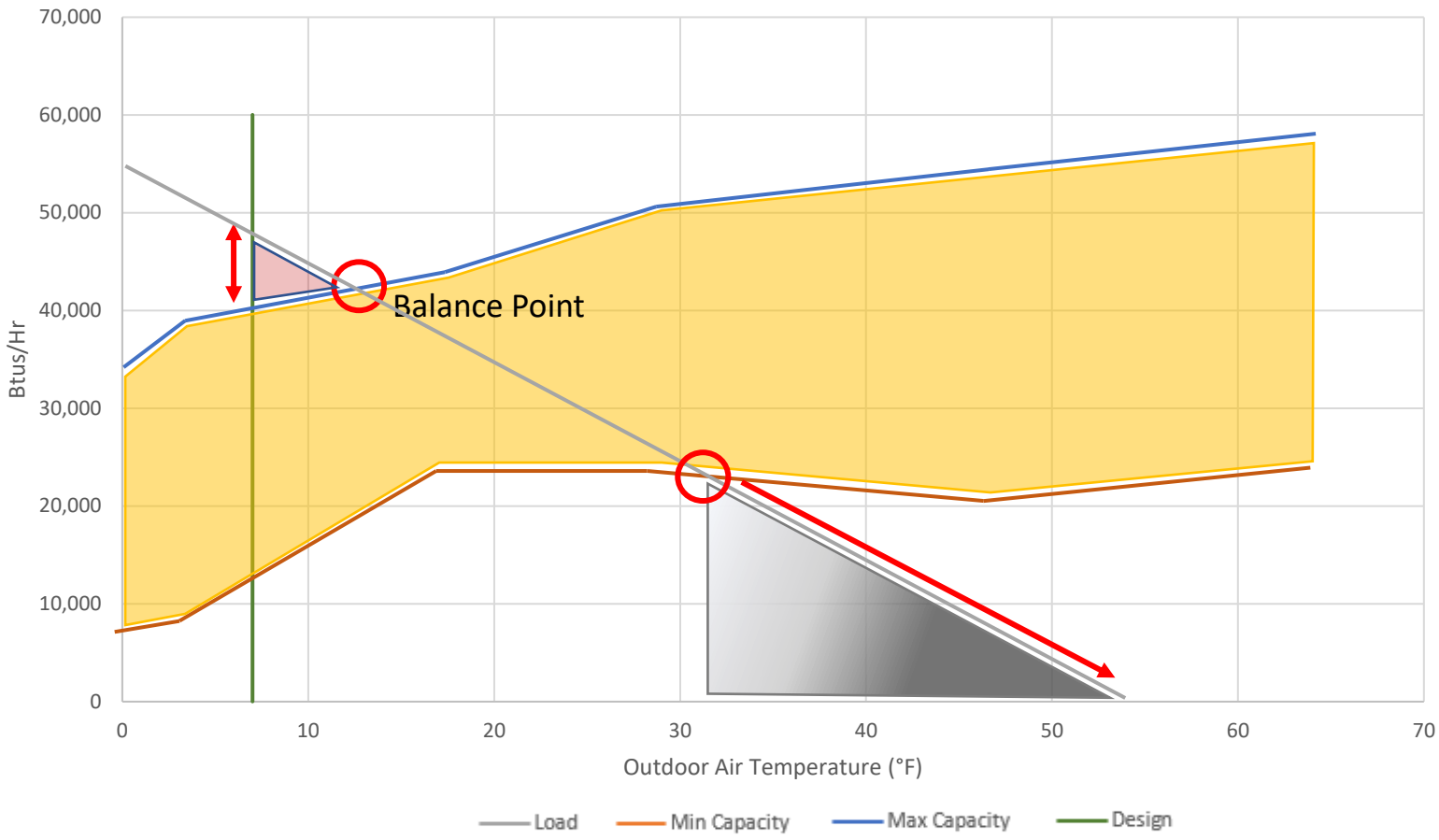


Heat Pump Components



Heating Mode

Goldilocks Sizing

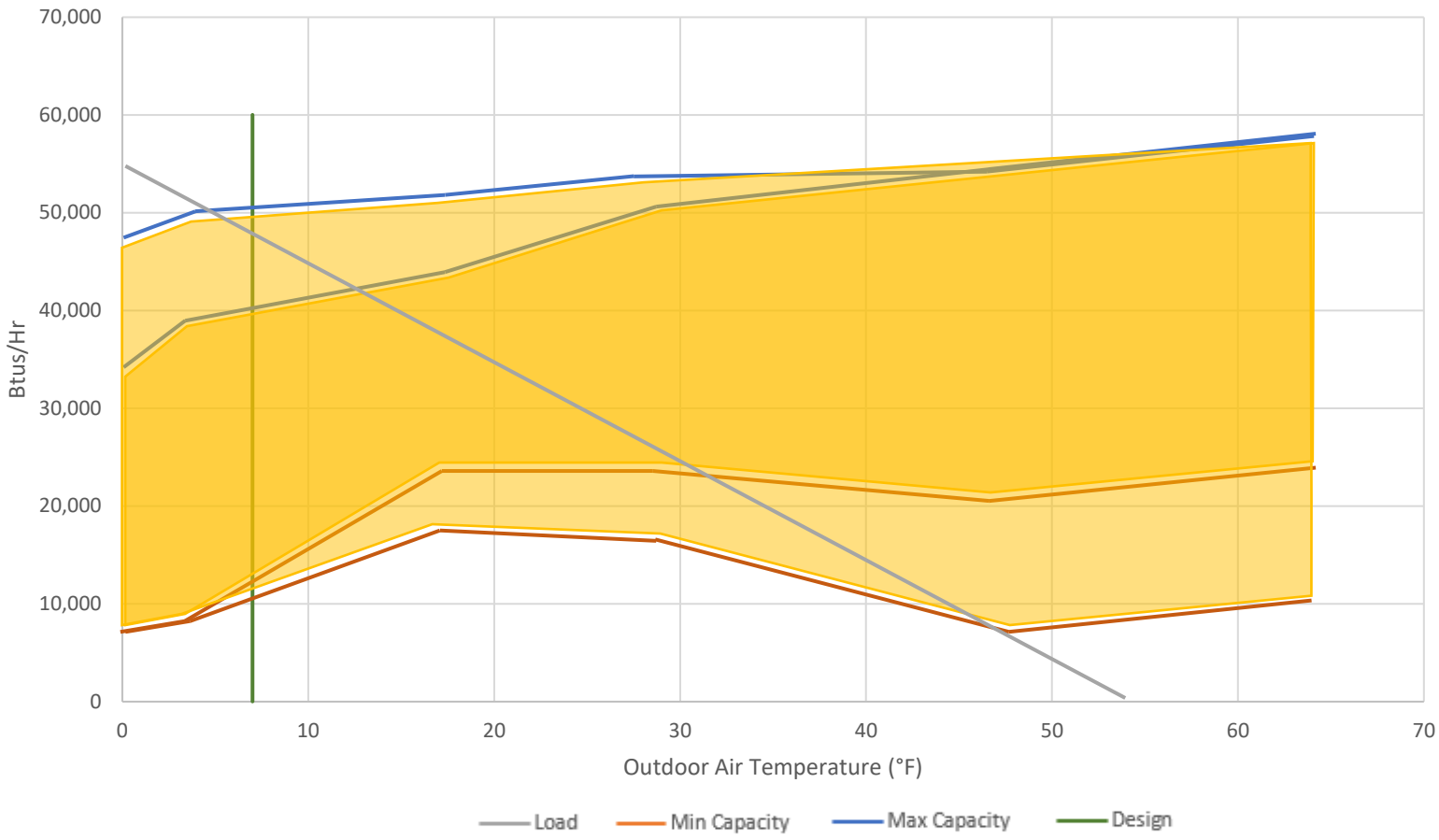


Backup Heat

Modulating Heat Pump

Short Cycling, Inefficient Operation

Better Sizing – Different HP?



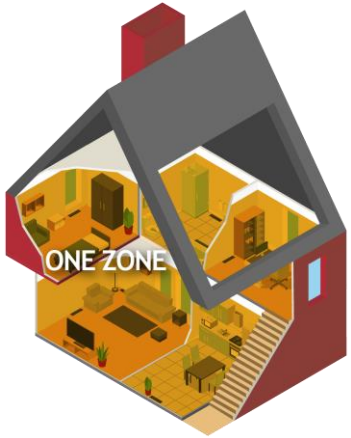
Modulating
Heat Pump

Design Intention #2: Zones vs. Whole Home

- The home is split into zones, each with its own heating
- Each zone has its own thermostat and controls
- Best for larger homes
- Best for complicated layout

Zonal

- One thermostat controls the entire home
- Best for smaller homes of simple geometry
- Best with ducted systems



Whole Home

Thank You

Matthew Christie
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Open Mic– Stakeholder comments, questions, observations

- “Raise your hand” on sidebar if you want to be unmuted
- Feel free to communicate via question box on the sidebar to make comments/ask questions

THANK YOU!

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April 22nd, 2021

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