# How Incentives Impact Design Choices

**Speakers:** Jeff Love / *Sustainable Comfort, Inc.*
Adam Shelly / *Ecosystem*
Victor Braciszewski / *SmithGroup*

SUSTAINABLE COMFORT

# Energy Incentives for MF Housing

Jeff Love – Managing Director

# Learning Objectives

- Overview of Incentives / Tax Credits associated with Geothermal Installations
- Additional funding for MF Housing Related to Energy Efficiency

# What We Do

LEED® FOR HOMES

Net Zero

Enterprise green communities®

Passive House

ENERGY STAR PARTNER

Carbon Neutral Ready

EPA Indoor airPLUS QUALIFIED HOMES

phius

Electrified

ZERO ENERGY READY HOME U.S. DEPARTMENT OF ENERGY

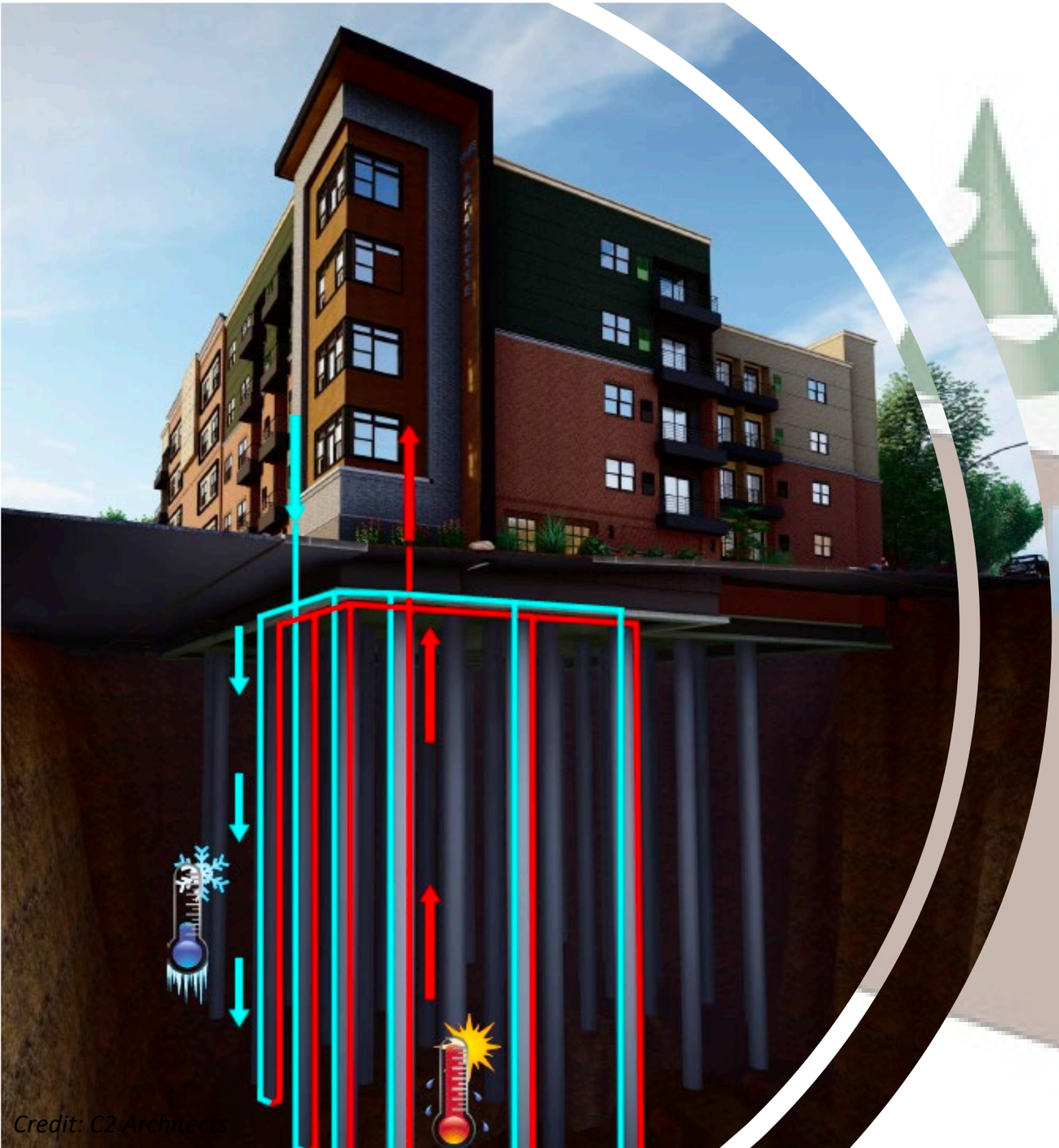
# Why Do High Performance Buildings Matter?

NY State to go Carbon Neutral by 2050

Gas Moratoriums in NY. All electric buildings coming

Electric grid to source 70% renewable energy by 2030

- **Combining all electric building technologies with high performance insulation and envelopes critical to reduce fossil fuel use.**



*Credit: C2 Architects*

# Ground Source Heat Pumps

# What if I don’t Care about Sustainability?

- **Federal**
  - Energy Tax Credit
  - 179D Tax Credit
  - 45L Tax Credit ($500 - $5000 / Unit)
  - Hear / Her Rebates ($14,000 / Unit)
  - HUD Green and Resilient Retrofit Program ($40,000 - $80,000 / Unit)
  - Climate Capital Green and Resilient Retrofit program
- **New York State**
  - Homes and Community Renewal Clean Energy Initiative (CEI)
  - HCR Climate Friendly Homes Fund (CFHF)
  - Clean Heat Program
  - Affordable Multifamily Energy Efficiency Program (AMEEP)
  - NYSERDA Low Carbon pathways (LCP)
  - NYSERDA Flextech

# Homes and Community Renewal CEI

| Clean Energy Incentive Term Sheet Summary | | | |
|---|---|---|---|
| Rehab Type* | Substantial Rehab Term Sheet** | Moderate Rehab Level 2 | Moderate rehab Level 1 |
| MEP Scope | Full MEP replacement | Full or partial MEP replacement | No MEP Replacement |
| Associated Term Sheet Goals | **Goal 1:** Full electrification of heating ($13,500-$22,000 per unit based on envelope performance)<br>**Goal 2:** Full electrification of DHW ($4,000/unit)<br>**Goal 1 & 2 Adder:** Enabling Electrical upgrades for Goals 1 and 2 (up to $4,000/unit) | **Goal 1:** Partial/Hybrid electrification of heating, with basic envelope improvements (Up to $13,500/unit)<br>**Goal 2:** Partial/Hybrid electrification of DHW (Up to $4,000/unit)<br>**Goal 1 & 2 Adder:** Enabling Upgrades (Up to $4,000/unit) | **Goal 3:** Stretch Energy Upgrades - efficiency improvements + pathway to electrification (up to $15,000/unit) |
| Maximum CEI Incentive and Associated Scope | **Max Incentive:** $30,000/unit<br>**Scope:** Full electrification of heating, DHW, enabling upgrades, with advanced envelope | **Max Incentive:** $21,500/unit<br>**Scope:** Partial or hybrid electrification of heating and DHW, includes enabling upgrades | **Max Incentive:** $15,000/unit<br>**Scope:** 20% energy savings, envelope to meet code, electrical upgrades to support future electrification |
| Incentive Structure | Plug-and-play: incentive provided for each goal met | Incentive scales with % electrified | Incentive accessible for meeting Goal 3 requirements |
| Maximum Incentive | **$9,000,000** | **$3,225,000** | **$2,250,000** |

# Clean Heat Program

- ***Statewide Utility Rebate Program to Drive Adoption of Electric MEP equipment***
  - https://cleanheat.ny.gov/resources-for-applications/
  - Incentivizes installation of High Efficient MEP equipment, ~$1,000 - $2,000 per unit
  - Only eligible for full load heating capacity, not partial load
  - 5 Years, V 13 of the program manual

# HCR Climate Friendly Homes fund (CFHF)

- Mid-Cycle Retrofit
- Up to $25,000 per unit
- Target: Electrification of smaller buildings (5-50 units), recently changed to (5-150 units)
- Incentives for full or partial conversion
- Must be HTFC/DHCR/HFA
- https://communityp.com/wp-content/uploads/2024/12/CFHF-Terms-Overview_12.23.24.pdf

## Affordable Multifamily Energy Efficiency Program (AMEEP)

- **Utility program for LMI Mod Rehabs**
- **$900 - $1,200 per unit depending on scoring**

## NYSERDA Low Carbon Pathways (LCP)

- **NYSERDA program for Mod Rehabs**
- **Envelope Pathway: $5000/unit.**
- **Ventilation Pathway:  $750/Unit**
- **Heating and Cooling pathway: $750/Unit**
- **DHW Pathway: $750/Unit**

# Example Project – Steamboat Square Revitalization

- **Location – 20 Rensselaer St. Albany, NY (1 of 4 phases)**
  - 88 Units (LMI)
  - 40% Energy Savings
- **Geothermal Cost - $5,178,500**
  - Geothermal Tax Credit – N/A
  - Clean Heat - 632,667
  - NYS CEI - $1,100,000
  - MPP- $660,000
  - Attorney General office - $352,000
    - Total Incentives - **$2,744,667**

# Steamboat Square Revitalization Project Team

- **Albany Housing Authority** – Owner/Operator & Developer
- **Edgemere Development** – Development Partner
- **MR2 Construction Services -** Owner's Construction Rep
- **SWBR** – Architect **Engineered Solutions** – MEP Engineer
- **AOW Construction –** General Contractor
- **Collett Mechanical –** Mechanical Contractor
- **Claverack Pump Service** – Geothermal Driller
- **Sustainable Comfort** – Green Building Consultant
- **Aztech Geothermal** – Geothermal Consultant

SWBR

A·O·W CONSTRUCTION

Collett

Claverack WELL & PUMP SERVICE

ALBANY HOUSING AUTHORITY

Edgemere Development Inc. Real Estate Development Consulting

cpc Community Preservation Corporation

engineeredsolutions

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Aztech Geothermal

MR² CONSTRUCTION SERVICES

ALBANY HOUSING AUTHORITY

# Questions

- What is the name of NYS Homes and Community Renewal  Initiative for electric MEP equipment
- How many funding sources are there for MF Housing Related to Energy Efficiency

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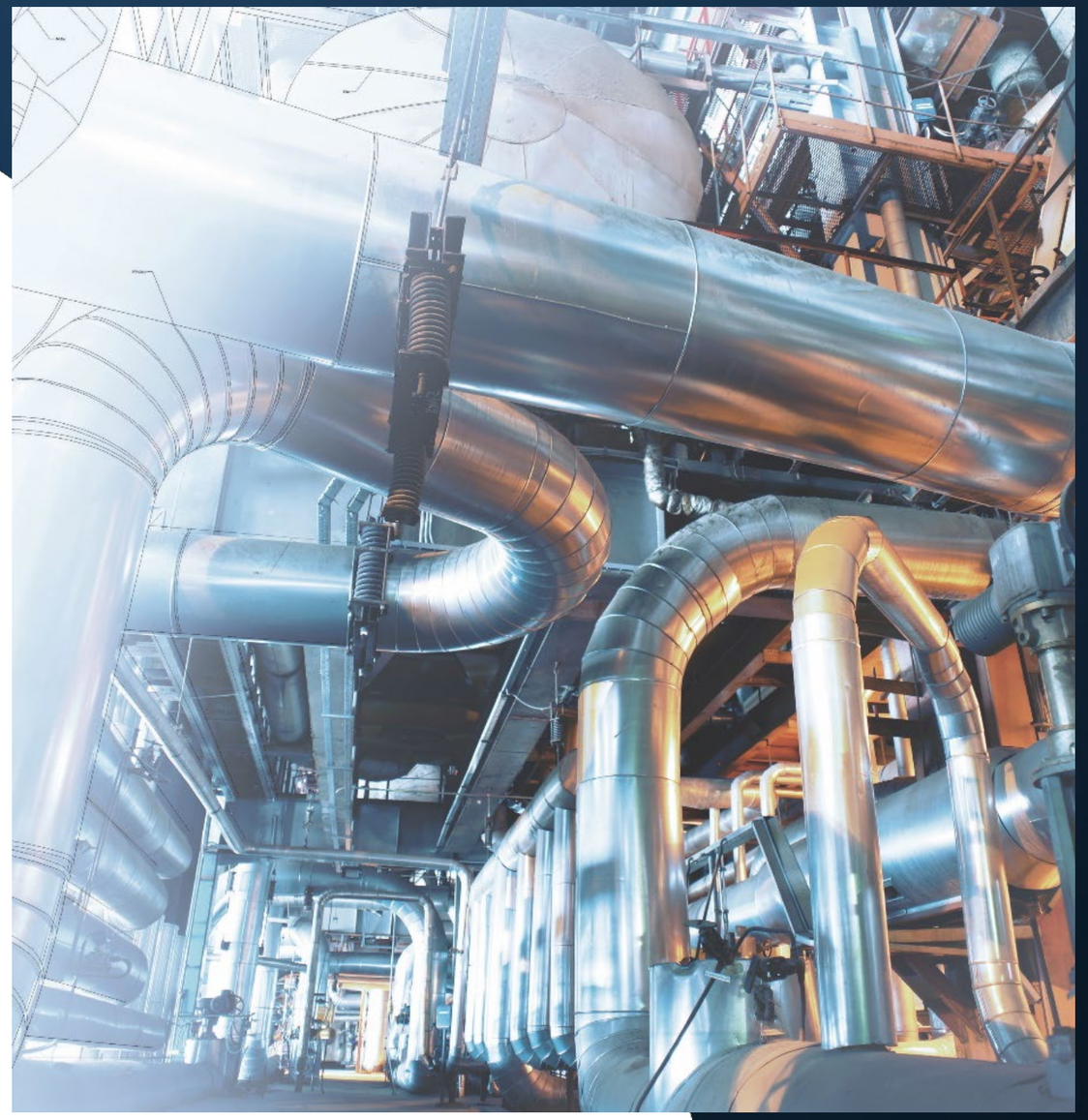
# DESIGNING FOR VALUE

## Navigating Local Incentives and Performance Requirements in GSHP Systems



Adam Shelly

# THIS IS WHAT YOU NEED TO KNOW

1. Incentives are not just subsidies to your existing design

2. They should be viewed as design determinants and inputs

3. Good design unlocks
   - better performance
   - far more incentive value
   - future LL97 penalty avoidance

# INCENTIVES AS DESIGN INPUT

Incentive programs have specific technical criteria.

Get these in your drawings and specifications!

Designers must understand the “incentive logic” as well as the thermodynamic logic

| CLEAN HEAT | NYSERDA GSHP | ITC |
|---|---|---|
| Load Fraction Coverage | Modeling | Dual Use |
| Loop Temperatures | QA | Ownership |
| Controls | Documentation | Domestic Content |

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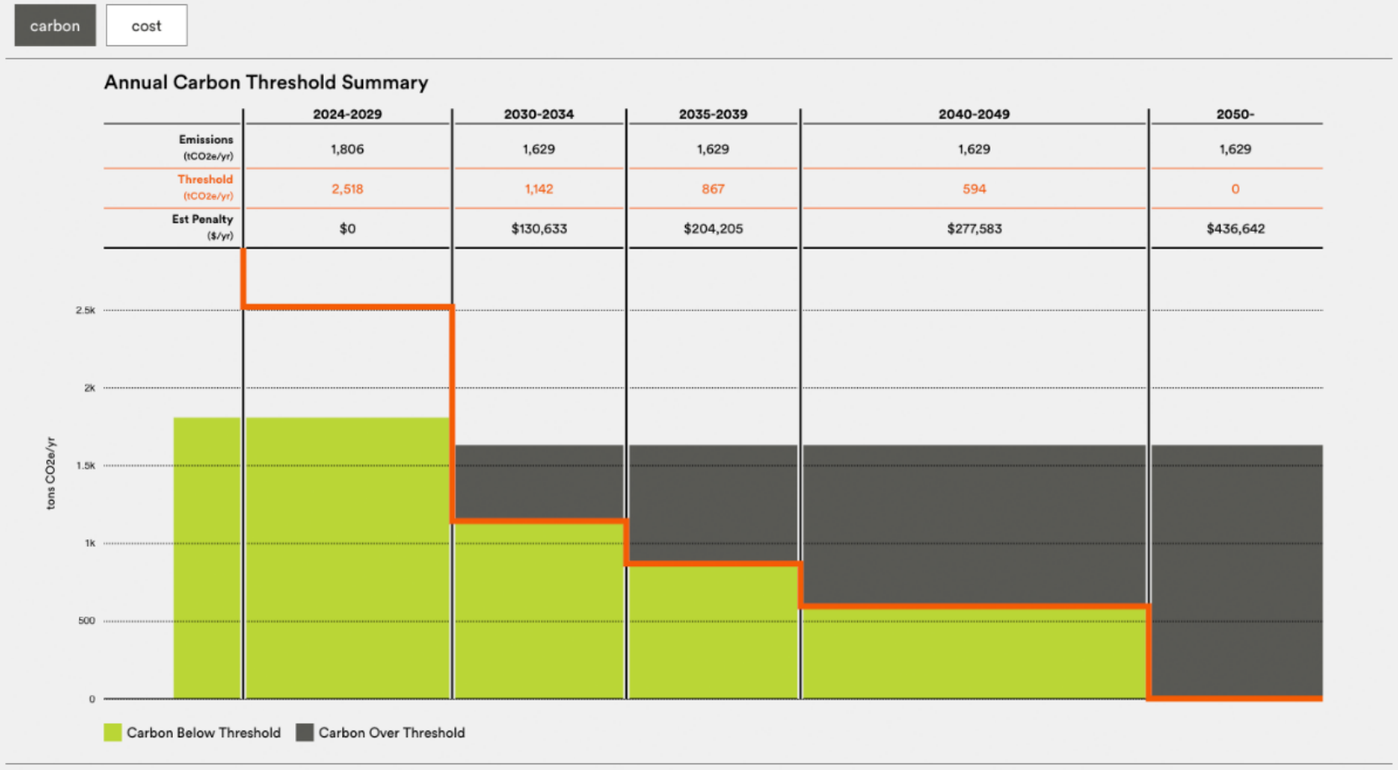
# NYC'S PRESSURE COOKER

**Local Law 97**

- Emissions caps driving deep retrofits
- High penalties: $268/ton $CO_2$ above building emissions limits

**Aging infrastructure + space constraints**

**high-stakes design decisions**




*Source: Building Energy Exchange, NYC*

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# DESIGNING AROUND LL97

## Design decisions directly influence emissions performance

Undersized borefield → backup fossil fuel systems → higher emissions

Right-sized GSHP with thermal storage = better compliance outcomes

# THE INCENTIVE MULTIPLIER


Financial & Incentive Stack

- **Stacking / Double Dipping**
- **“Hypothetical Case Study”: Planned 14-story multifamily in Brooklyn**
  - $500K from ConEd Clean Heat for full-load GSHP system
  - $150K bonus from NYSERDA for QA and control strategies
  - 30% ITC
  - 10% improved ROI from incentive-informed design choices

CONSTRAINED SPACES

# DESIGN TRADEOFFS

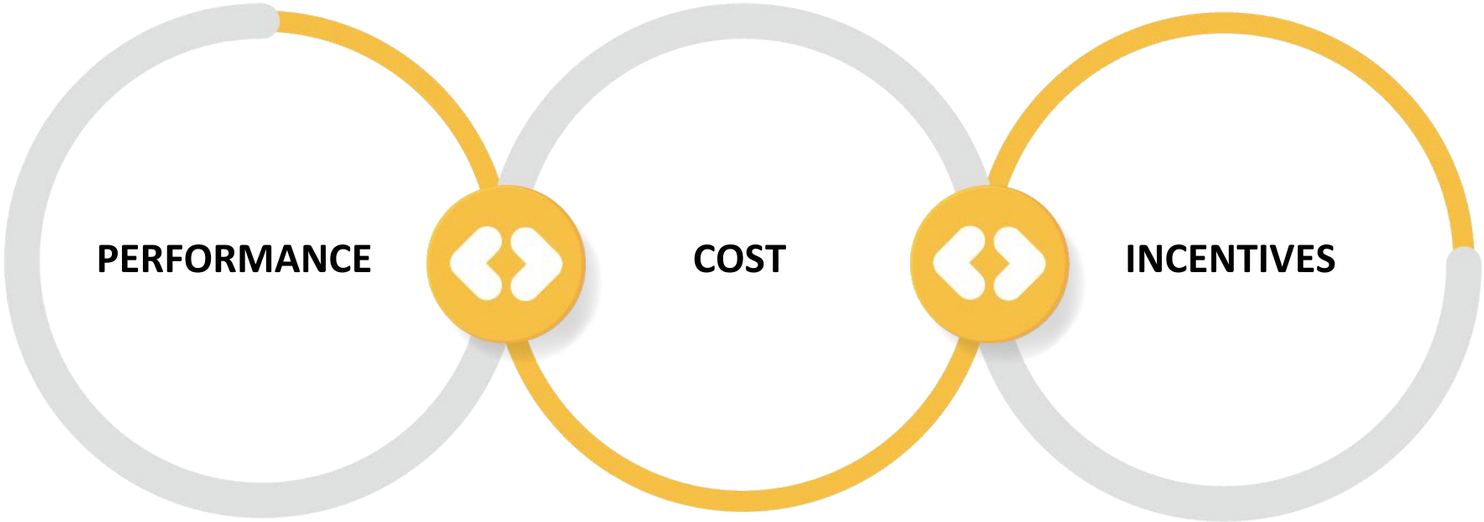
## Each Choice Impacts Upfront Cost + Incentive Eligibility

Incentives (un)intentionally favor certain tech configurations

Benefits of engaging with utilities early—potential for custom incentives or load relief bonuses

Real-world GSHP adaptations in NYC: thermal sharing between adjacent buildings, use of hybrid loop systems (with VRF or boilers)

# TYING IT TOGETHER




Design must be informed by program metrics and policy trends.

Engage utilities/programs before design development

Proactive design improves system performance and maximizes the economic return from incentive programs

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# THANK YOU!

**ADAM SHELLY**

Director, Innovation & Project Development

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# [TO BE DELETED AT EVENT] Bio:

Adam Shelly is Director, Innovation and Project Development, for Ecosystem Energy Services. He focuses on developing new markets and partnerships. Named AEE's International Energy Engineer of the Year in 2022 and recognized as a Crain's New York Notable Leader in Sustainability in 2024.  He is a co-founder of TENS.NYC, a platform for advancing thermal energy networks in NYC.

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# [TO BE DELETED AT EVENT] Objectives:

1) Know to use financial incentives as design determinants and inputs, not just end of project subsidies
2) Designing around financial constraints as well as space constraints

# [TO BE DELETED AT EVENT] Questions:

1) When should you speak with utilities and programs about their incentive requirements?
2) What can design decisions influence?

# ENERGY TAX CREDIT: DUAL USE EQUIPMENT

Exploration of Geo Incentives

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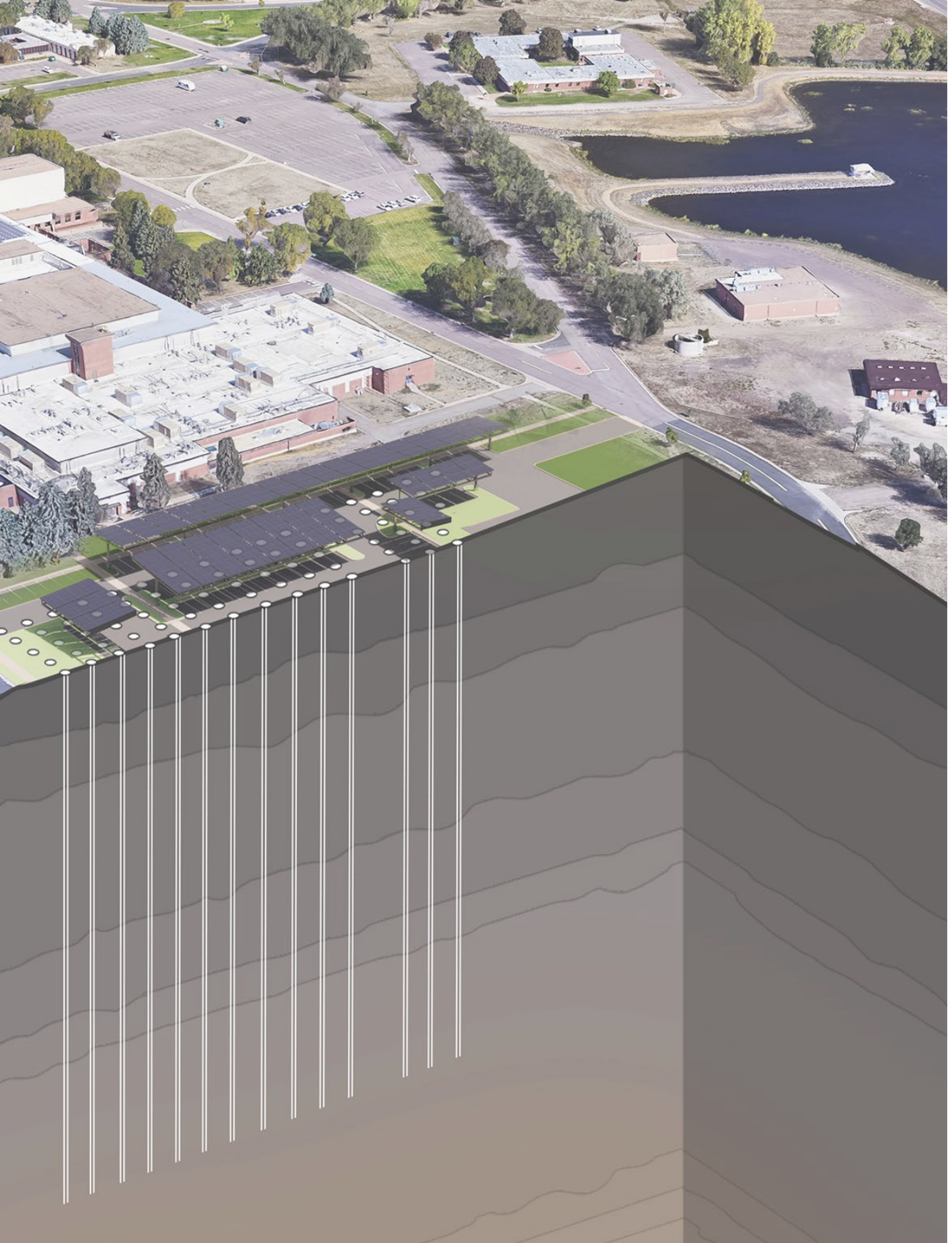


## VICTOR BRACISZEWSKI

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Victor is a lead mechanical engineer on the multidisciplinary IMPACT team at SmithGroup, a national architecture and engineering firm. In this role, he provides expertise to project teams in the design of mechanical systems, while specializing in plant energy modeling and design of geothermal heating and cooling systems. His design work spans a variety of markets, including higher education and science and technology. Victor holds a Bachelor of Science in Mechanical Engineering from The University of Michigan.

**SMITHGROUP**

Design a Better Future

# LEARNING OBJECTIVES

- Learn key aspects of the Energy Tax Credit
- Learn how to evaluate Dual Use Property as it applies to common GSHP and hybrid GSHP system types

# QUESTIONS

- What are some key aspects of the Energy Tax Credit?
- What are examples of “unqualifying” and “qualifying” energy sources?

# OUTLINE

- Key Aspects of the **Energy Tax Credit** (aka Investment Tax Credit) and **Geothermal Heat Pump Property**
- How to Evaluate **Dual Use Property**

# ENERGY TAX CREDIT

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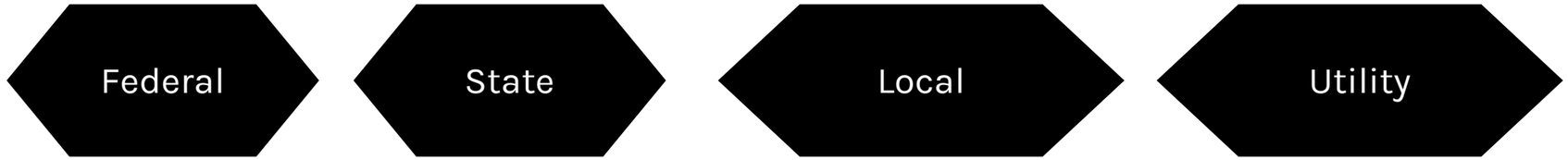
*AKA INVESTMENT TAX CREDIT (ITC)



# ENERGY TAX CREDIT*

*AKA INVESTMENT TAX CREDIT (ITC)

Federal | State | Local | Utility

**Inflation Reduction Act (IRA)**

- **Investment Tax Credit (ITC)**
- **Section 48 <u>Energy Credit</u>**
  - **Ground Source Heat Pumps**

# WHO IS ELIGIBLE FOR THE ENERGY CREDIT?

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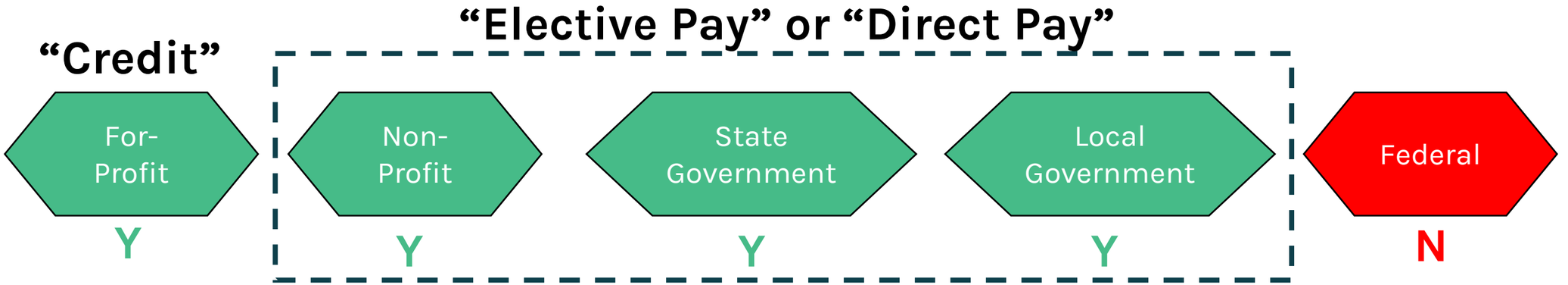
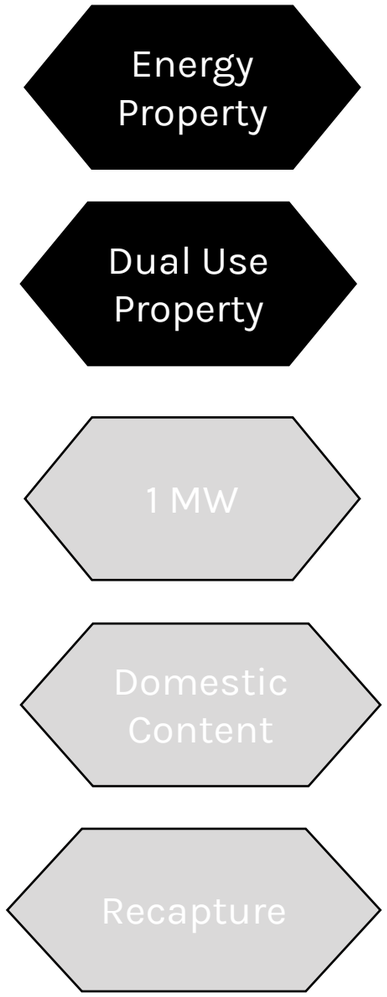


# ENERGY CREDIT: GEOTHERMAL HEAT PUMP PROPERTY

| Credit Type | Base Credit | Domestic Content Bonus | Energy Community | Total Range |
|---|---|---|---|---|
| Base Credit | 6% | 2% | 2% | 6%-10% |
| 5x Bonus Credit | 30% | 10% | 10% | 30-50% |

**UP TO A 50% COUPON ON YOUR G$HP $Y$TEM!**

# ENERGY CREDIT KEY IDEAS




**Base scope eligible for credit**

**Extra scope may be eligible for credit**

**Geothermal Heat Pump Property (GHP):** Equipment that uses the ground as thermal source/sink to cool a structure

If **dual use property uses energy derived from** both a qualifying source (**e.g., GHP**) and a non-qualifying source it will **qualify as energy property** if its use of **energy from non-qualifying sources does not exceed 50% of its total energy input** during an **annual measuring period**.

# ENERGY CREDIT KEY IDEAS


**Base scope eligible for credit**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**Geothermal Heat Pump Property (GHP):** Equipment that uses the ground as thermal source/sink to cool a structure

If **dual use property uses energy derived from** both a qualifying source (**e.g., GHP**) and a non-qualifying source it will **qualify as energy property** if its use of **energy from non-qualifying sources does not exceed 50% of its total energy input** during an **annual measuring period**.


**Projects larger than 3,412 kBtu/hr Heating or 284 Tons cooling (>1 MW)** need to meet extra requirements to get direct pay and credit bonuses


If not met (and project is over 1 MW), then **no direct payment available if project starts in 2026**


**~6-year period after GHP is placed into service** where you need to keep qualifying energy above 50% and meet prevailing wage and apprenticeship requirements

# ENERGY CREDIT TAKEAWAYS

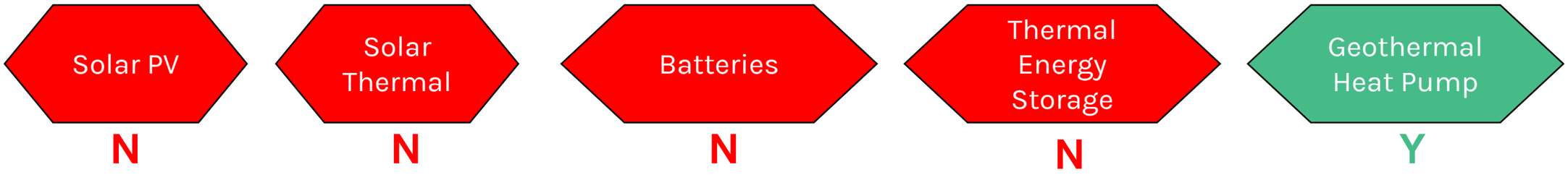
- Credit **still exists** (it is written into tax law)
- Credit amount is **not limited** (no “bank account” to deplete)
- Only after IRA (2022), “credit” is offered as **direct pay** to tax exempt entities
- **Dual use** is only available to geo systems

| Geo Projects | Check Amount | Applied Dual Use? |
|---|---|---|
| School District in the Pacific Northwest | $7,970,000 | **Y** |
| City Transit Center in the Midwest | $2,270,000 | **Y** |
| School District in Iowa | $873,000 | **Y** |
| Public Library | $472,000 | **Y** |

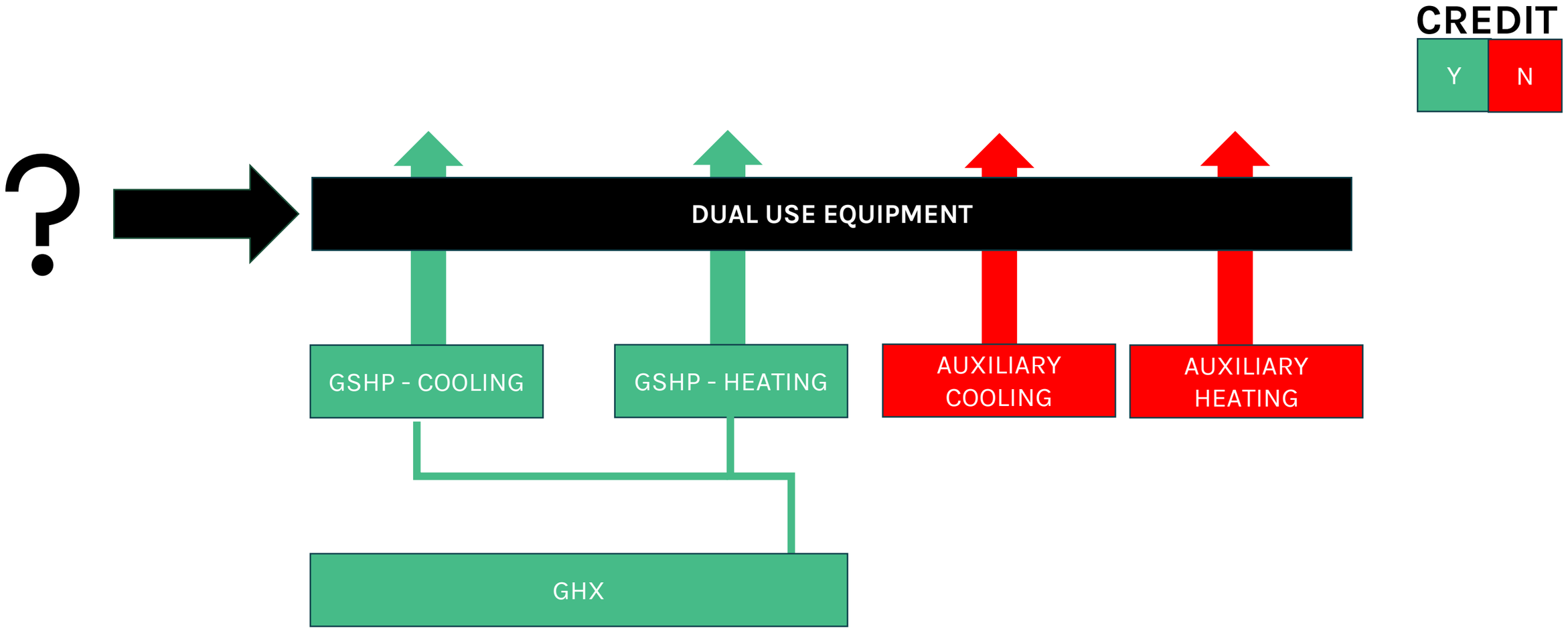
**SOURCE: ENERGY TAX SAVERS (MARCH 2025)**

# DUAL USE EQUIPMENT

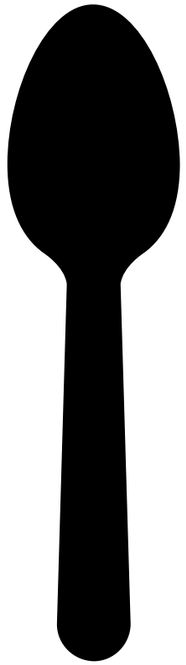
# WHICH TECHNOLOGIES ARE ELIGIBLE FOR DUAL USE?



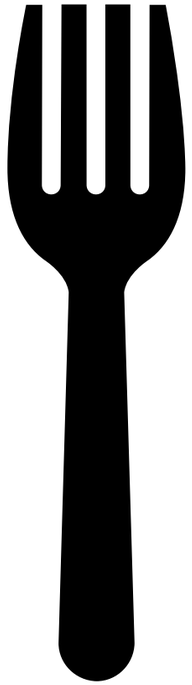
# HYBRID PLANT: GSHP + AUXILIARY HEATING AND COOLING



# WHAT IS “DUAL USE EQUIPMENT”?



**“Qualified Energy”**
**FROM GSHP**



**“Unqualified Energy”**
**OTHER EQUIPMENT**

# WHAT IS “DUAL USE EQUIPMENT”?

100%

GSHP

“Qualified Energy”

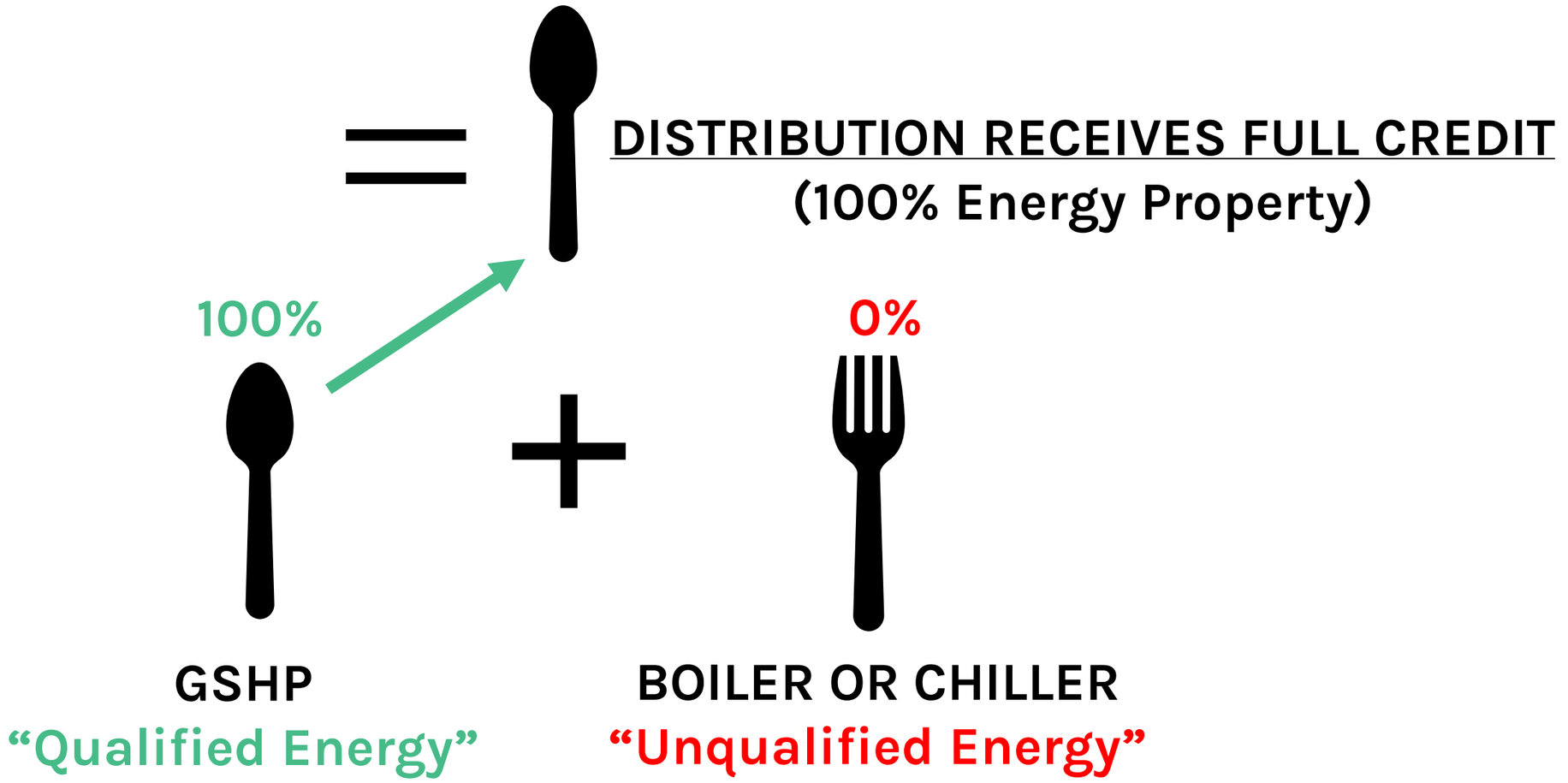
+

0%

BOILER OR CHILLER

“Unqualified Energy”

# WHAT IS “DUAL USE EQUIPMENT”?



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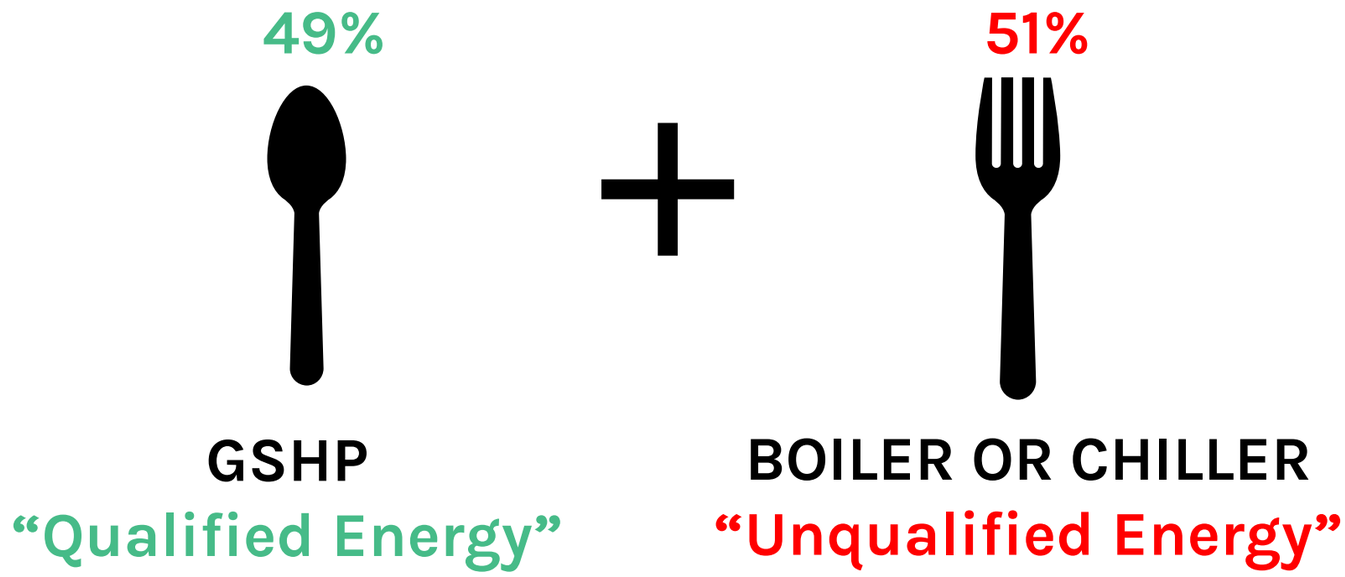

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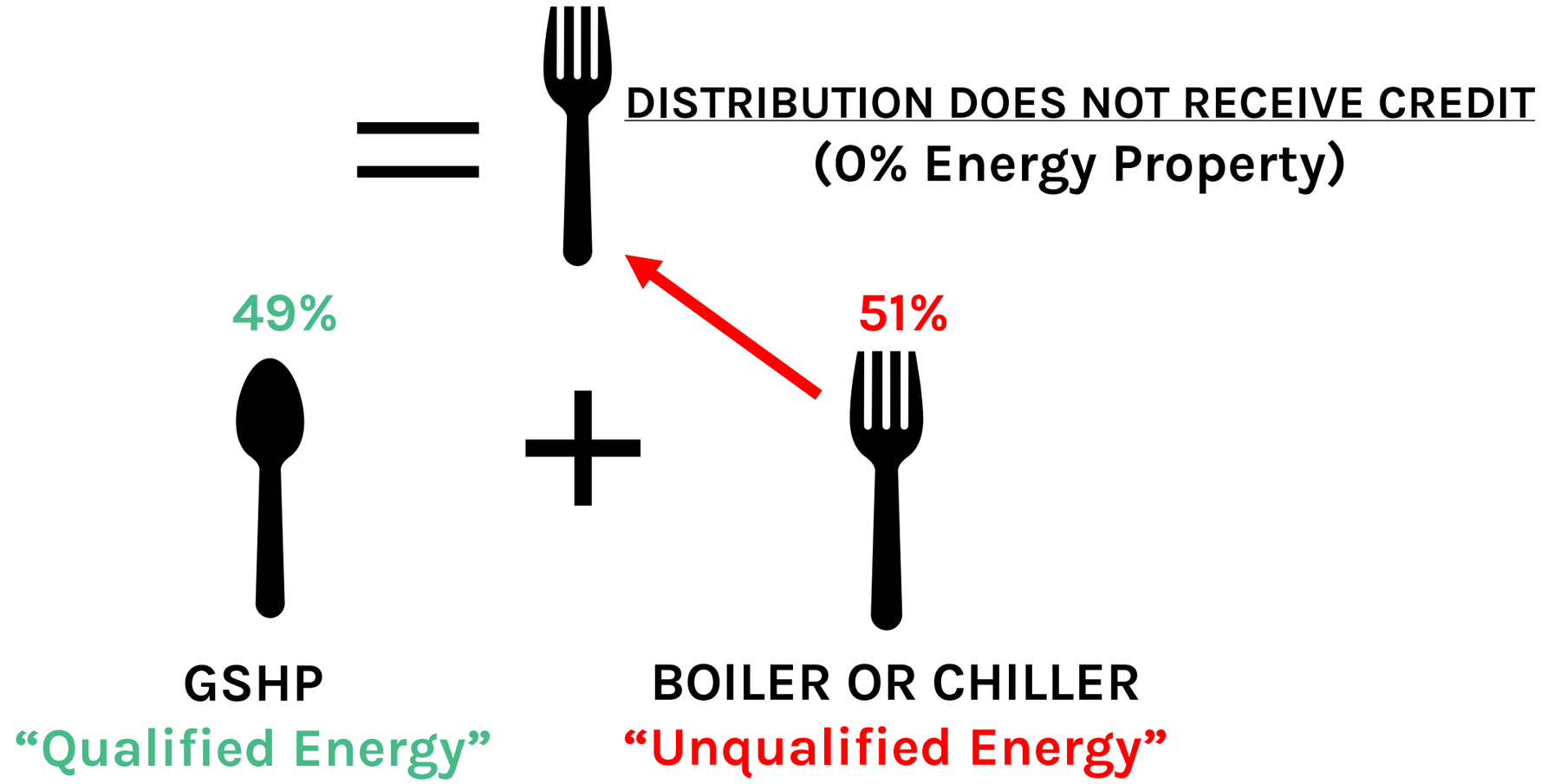
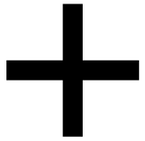


# WHAT IS “DUAL USE EQUIPMENT”?

>50%

GSHP

“Qualified Energy”



<=50%

BOILER OR CHILLER

“Unqualified Energy”

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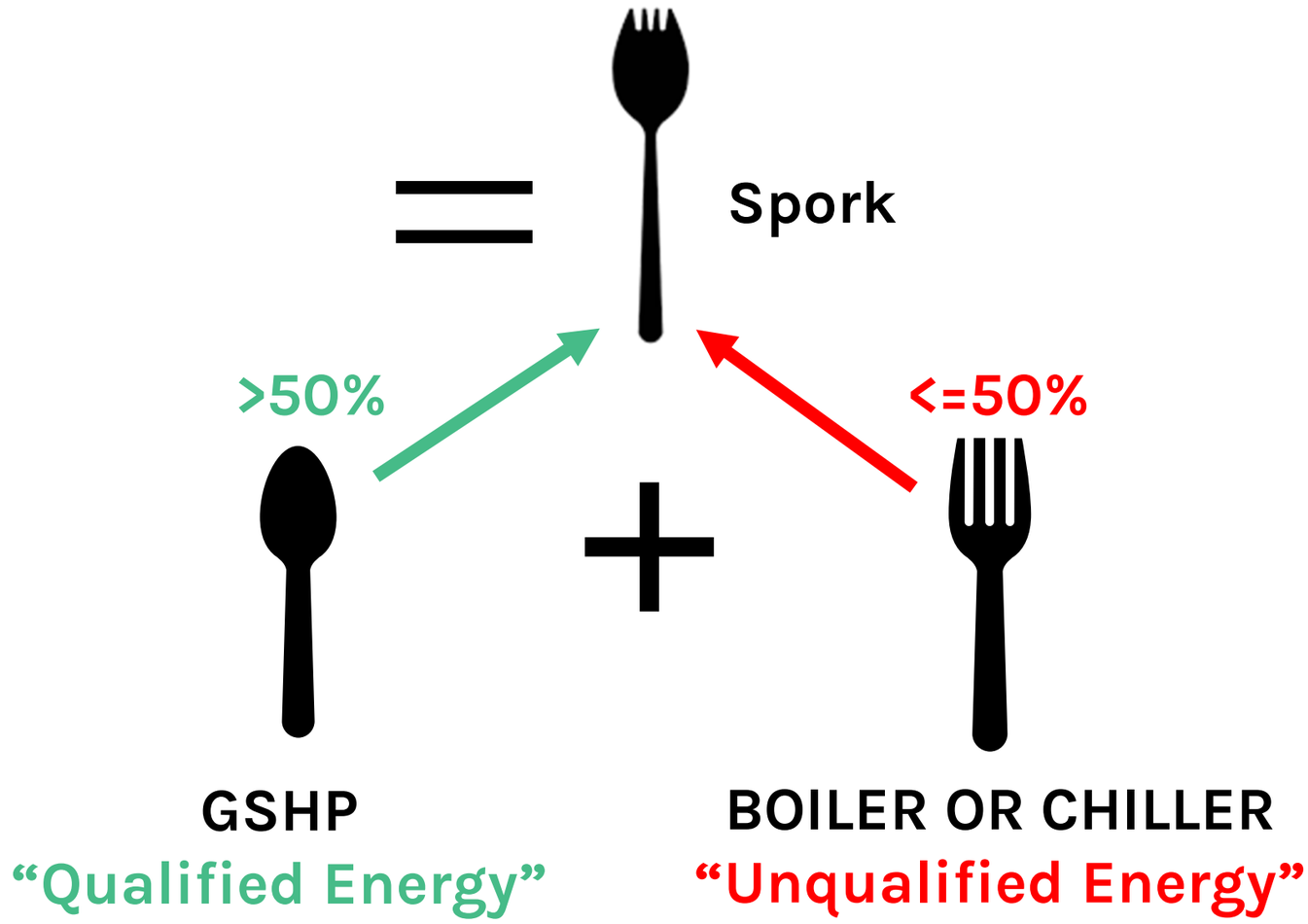

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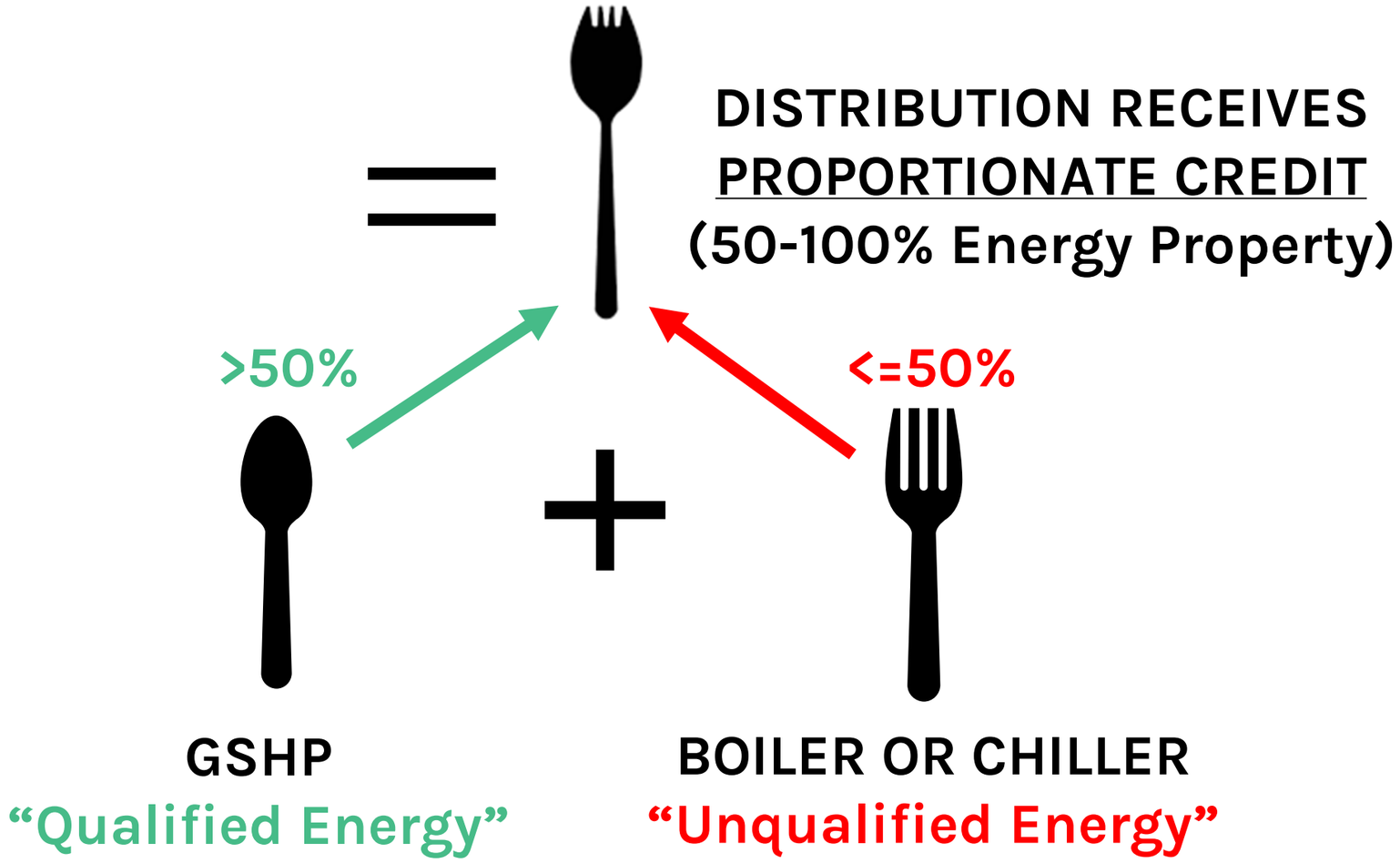


# CREDIT CALCULATION

## Dual Use Equipment

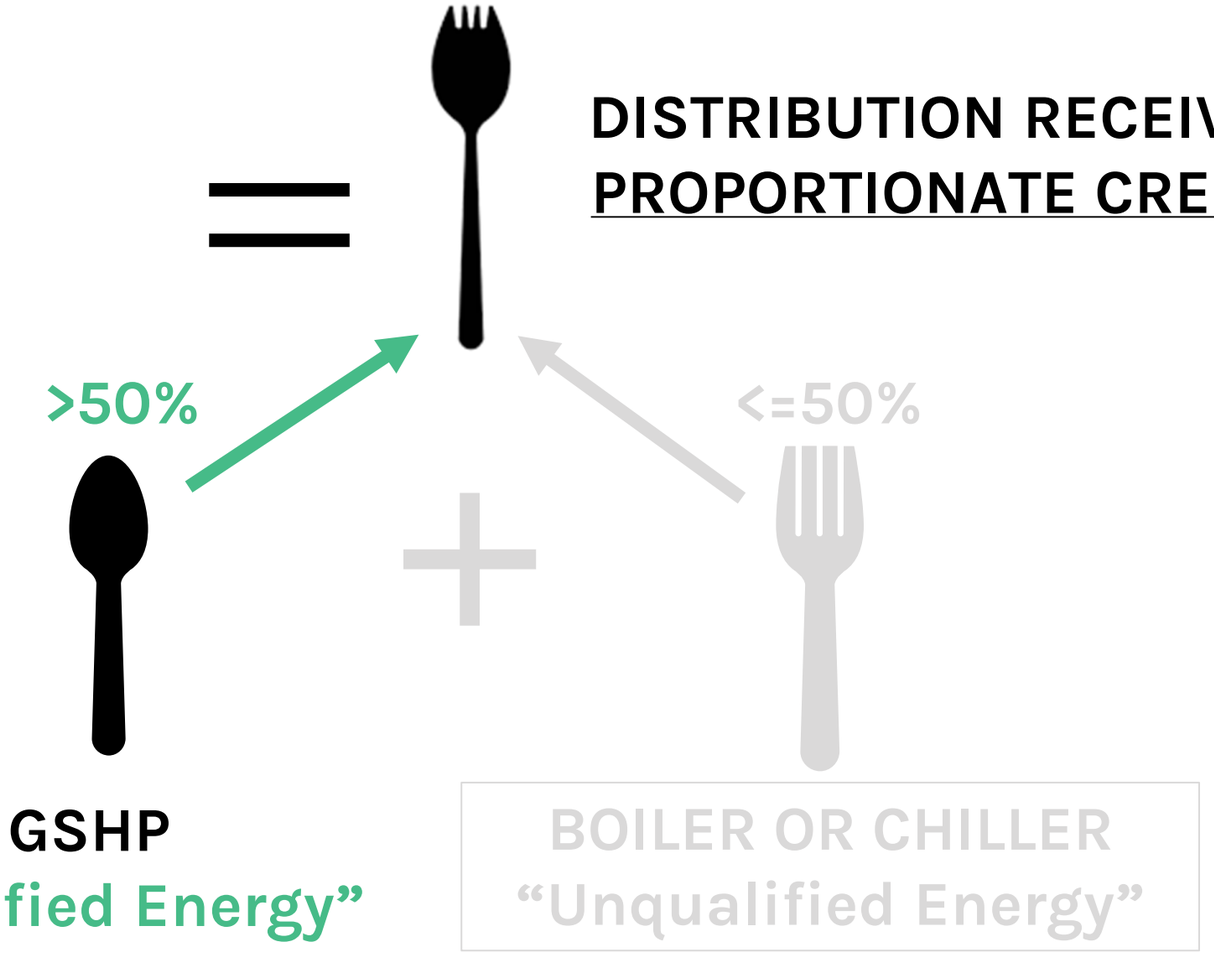
**3-50% Credit**

= Energy Credit * $\frac{Qualified\ Energy}{Total\ Energy}$

= Energy Credit * 50-100%

## Geo Energy Property

**6-50% Credit**




**DISTRIBUTION RECEIVES PROPORTIONATE CREDIT**

# ENERGY PROPERTY: GEOTHERMAL HEAT PUMP PROPERTY

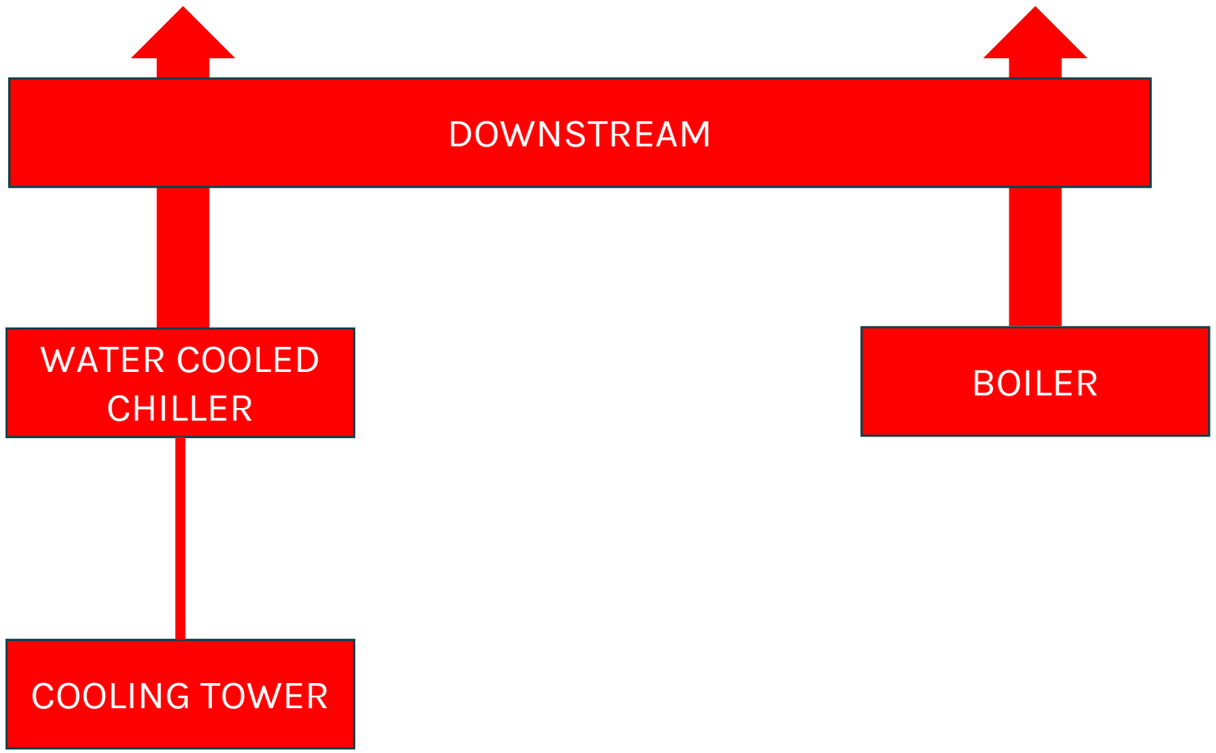
- **Section 48 Definition of Geothermal Heat Pump Property (GHP)**
  - "GHP property is equipment that uses the ground, ground water, or other underground fluids as a thermal energy source to heat a structure or as a thermal energy sink to cool a structure"
  - "Energy distribution equipment may be considered GHP property"
- **Interpretation**
  - **<u>Includes</u>**
    - Borefield
    - GSHP
    - Design Costs
    - Functionally interdependent elements: electrical, controls
  - **<u>May Include</u>**
    - **Distribution components (both air and hydronic)**
  - **<u>Does not include</u>**
    - Domestic hot water related equipment ("not a structure")

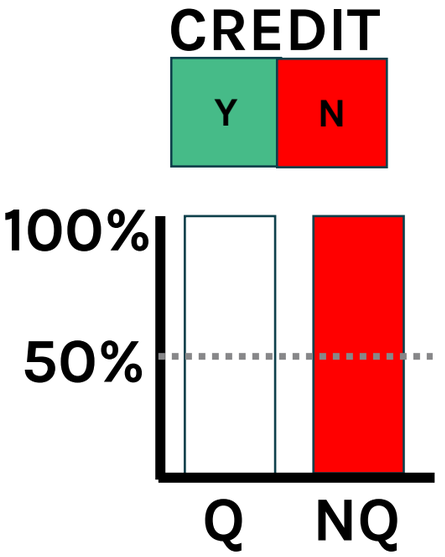
# EXAMPLES

# QUALIFIED ENERGY TAKEAWAYS

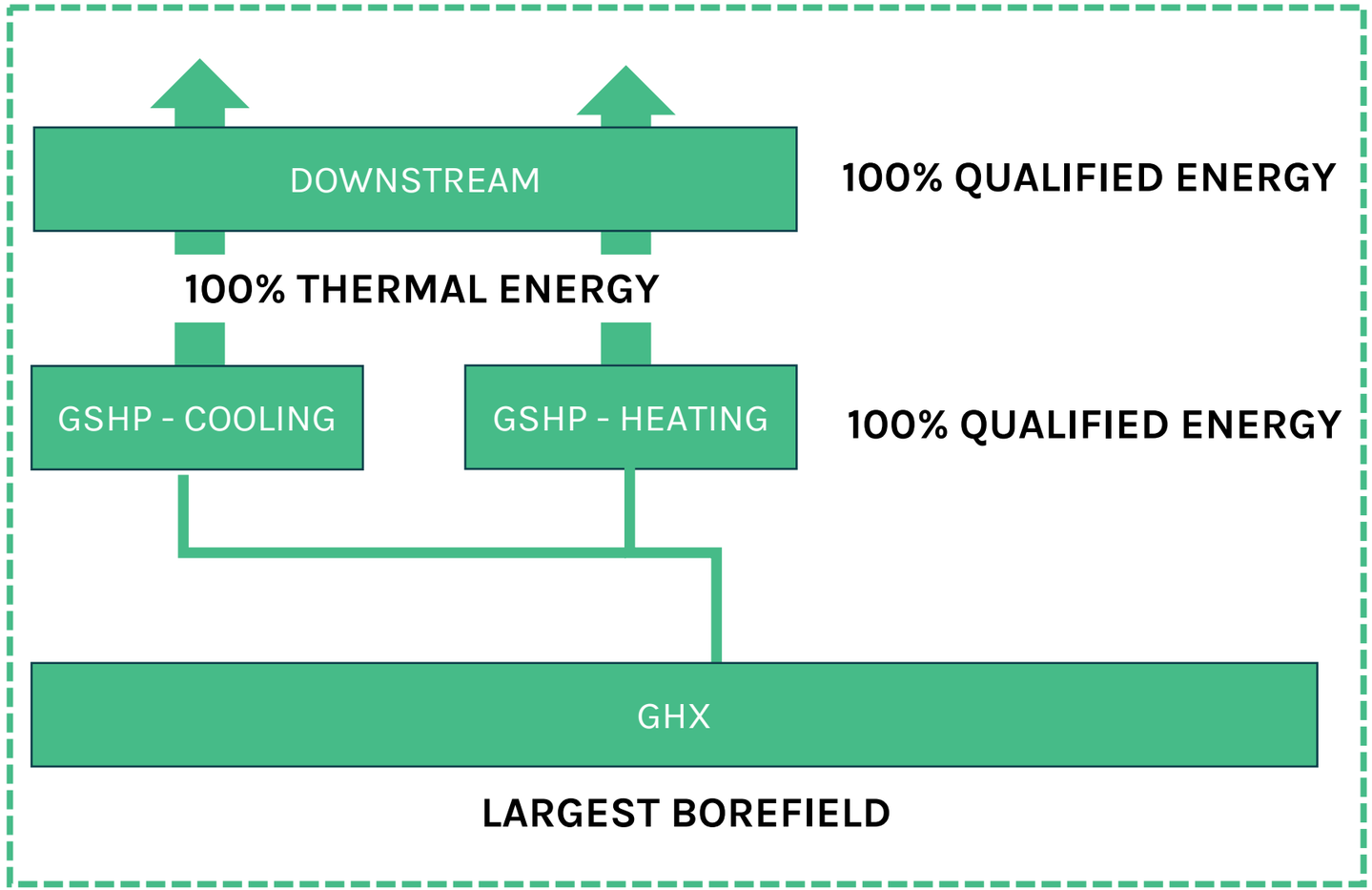
- **Qualified Energy**
  - Geothermal Heat Pump Property
- **Unqualified energy**
  - All Boilers
  - Chiller + Cooling Tower
  - Air Cooled Chiller
  - Air to Water Heat Pump
  - ***Water to Water Heat Pump Operating in Simultaneous Heating and Cooling Mode***

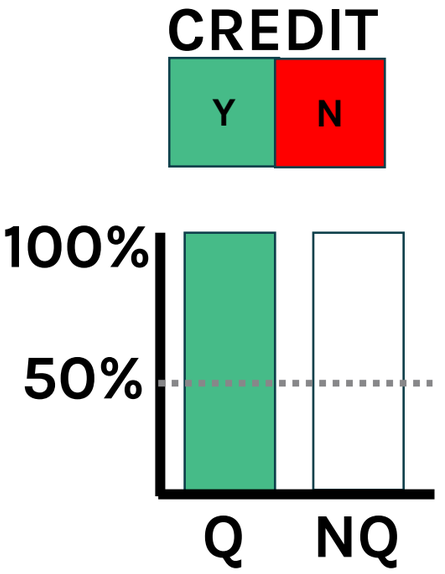
# PLANT 1 – CHILLER + BOILER



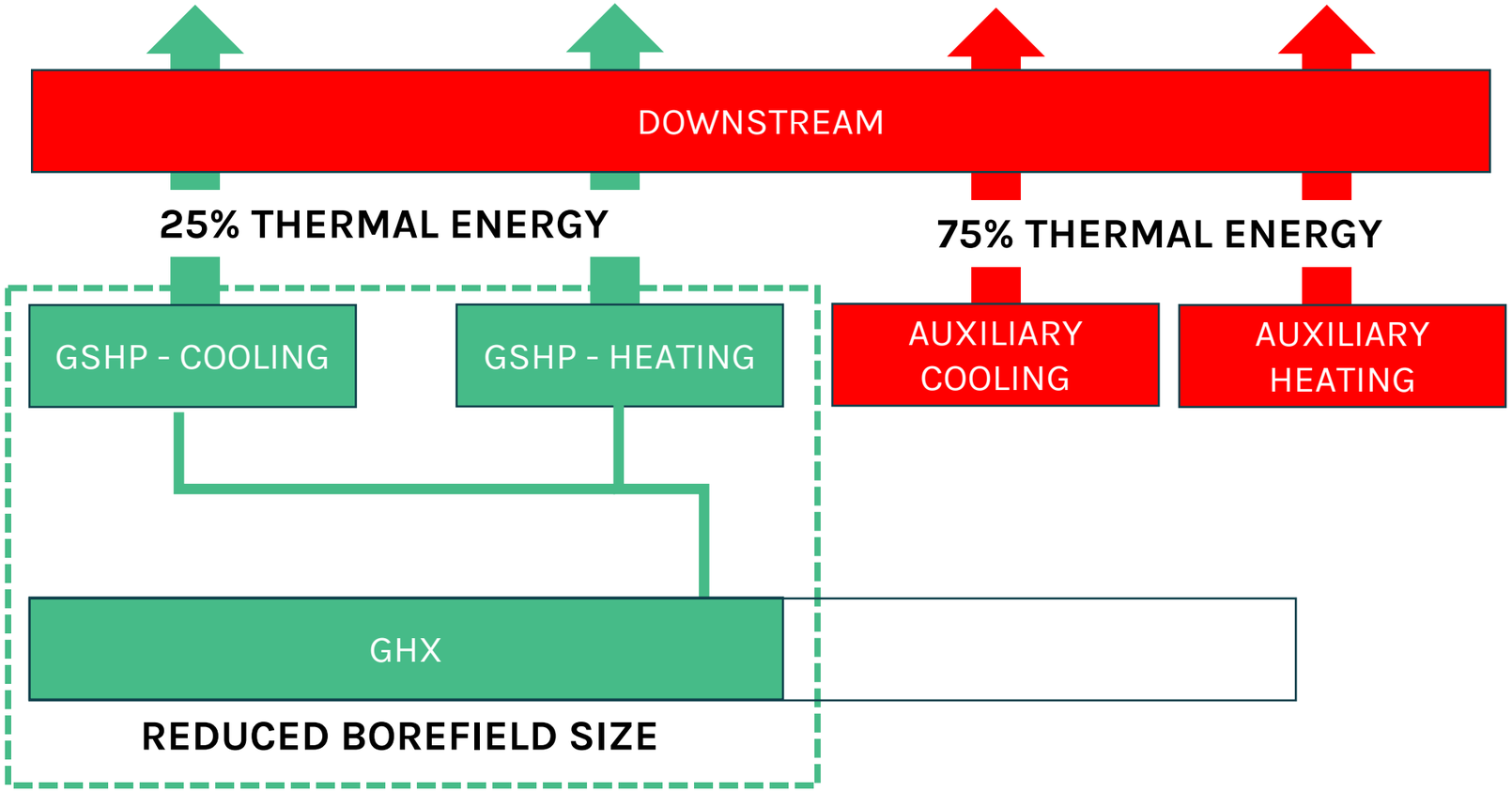



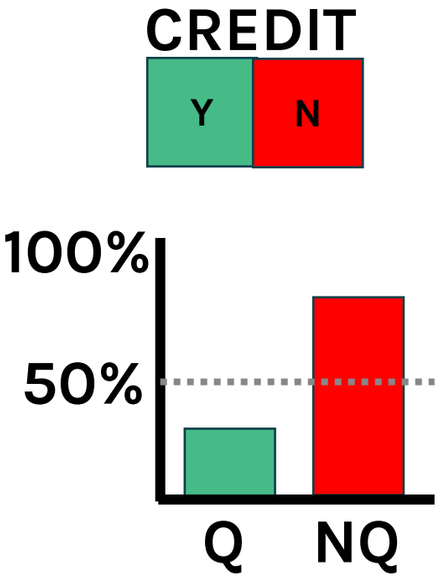
# PLANT 2 – GSHP ONLY



# PLANT 3 – HYBRID – GSHP + AUXILIARY



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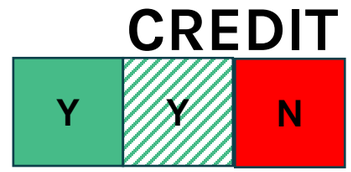
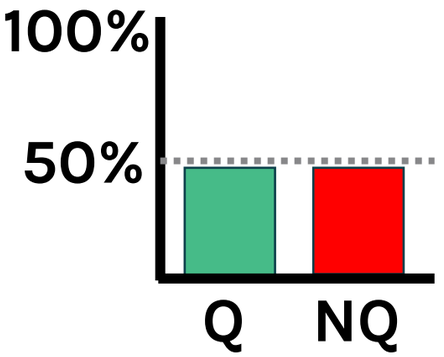
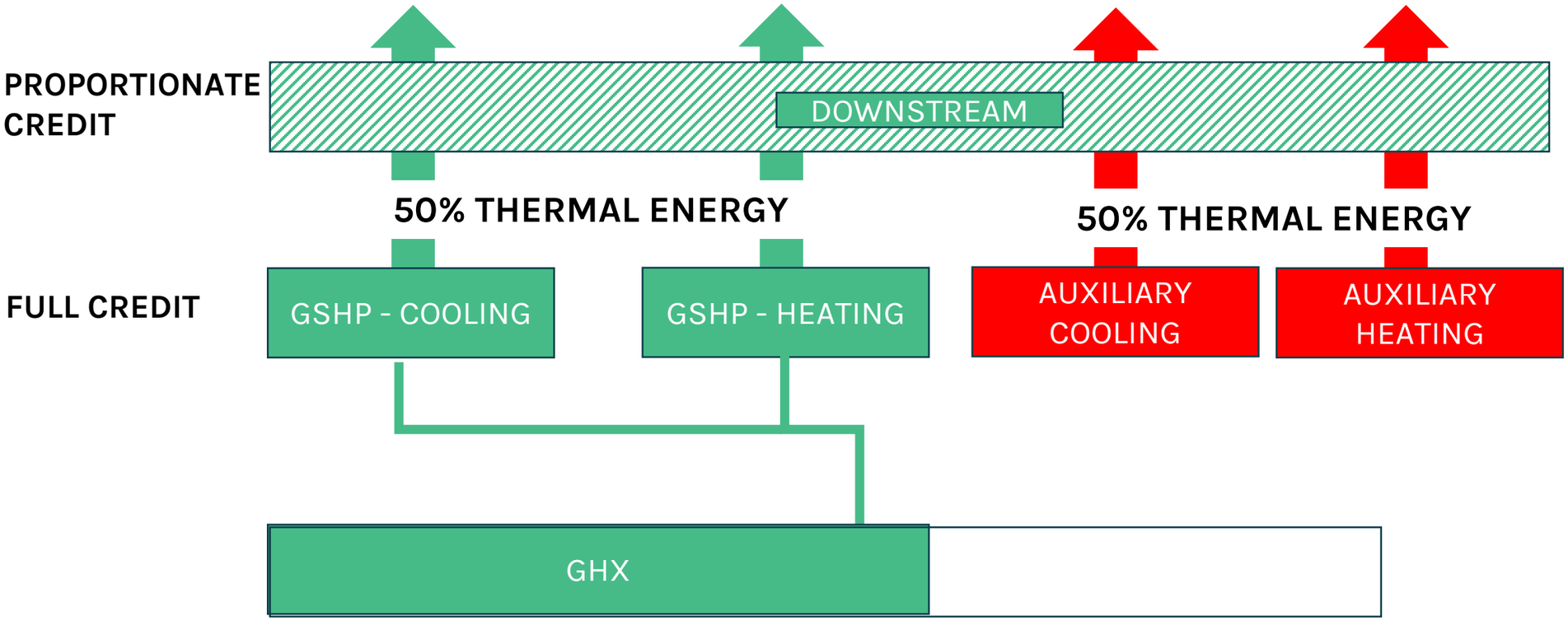
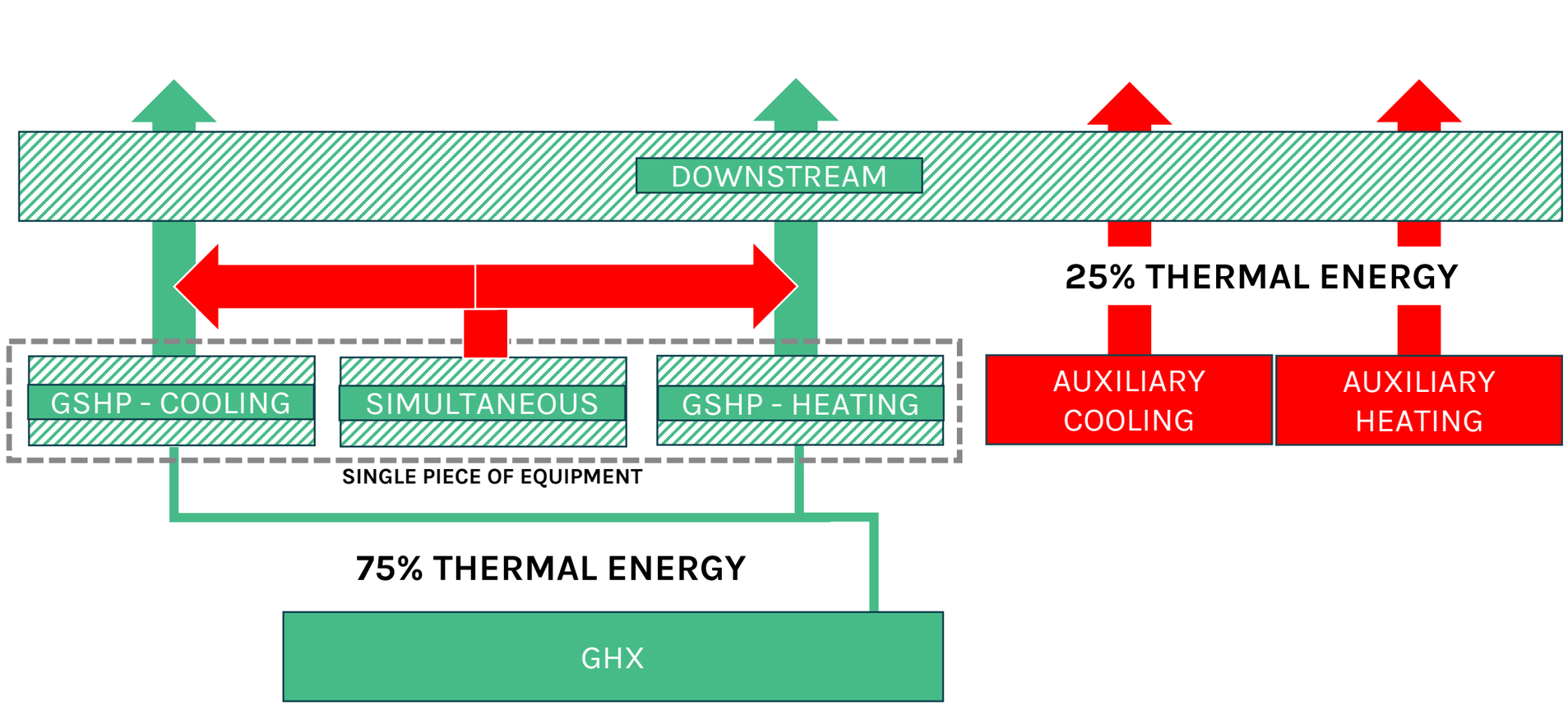
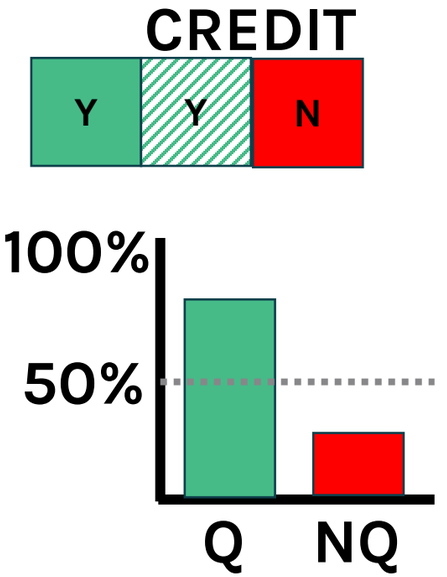


# PLANT 4 – HYBRID – SIMULTANEOUS GSHP + AUXILIARY



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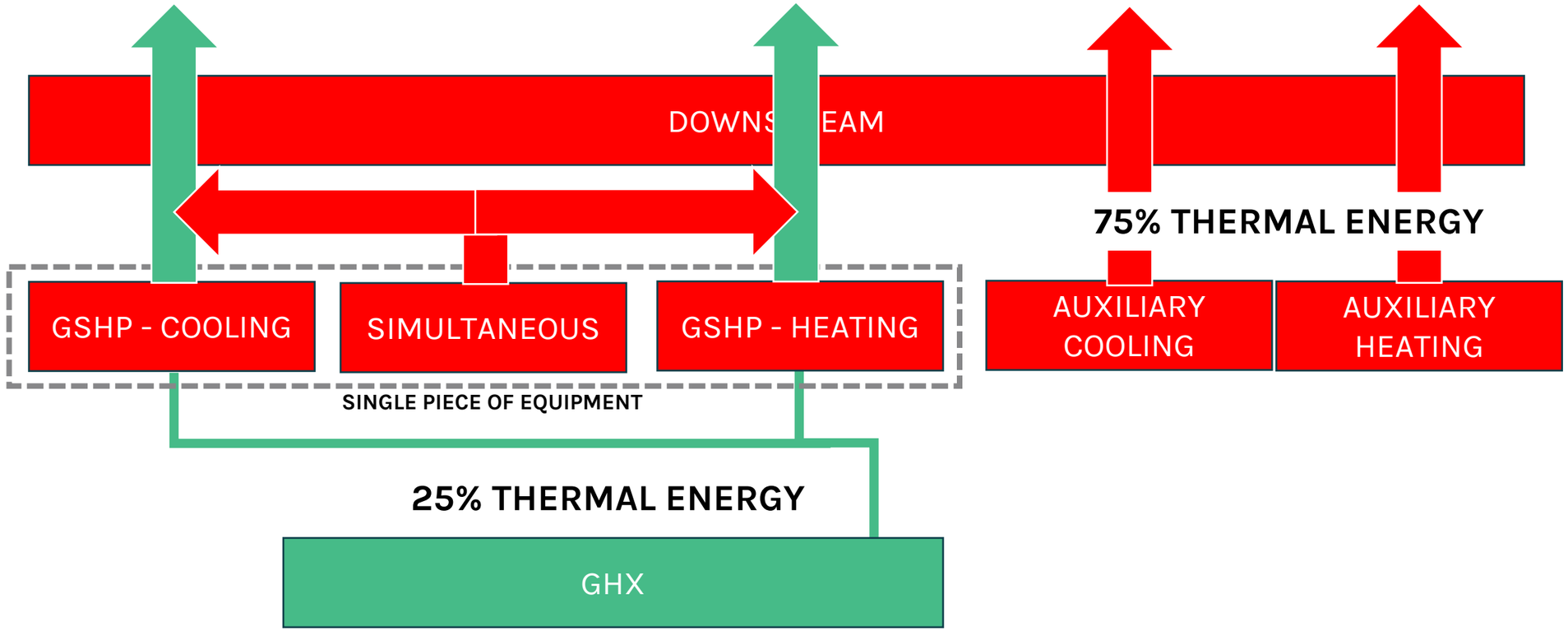
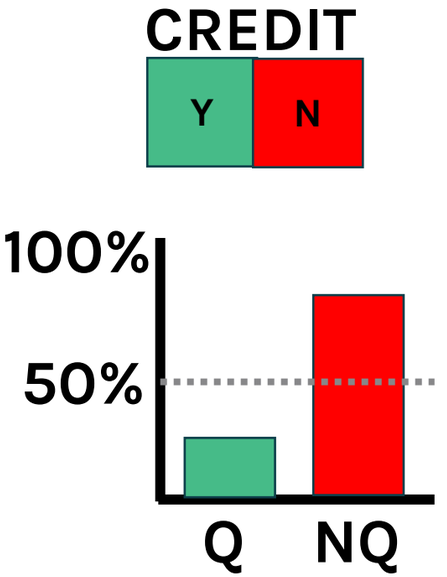


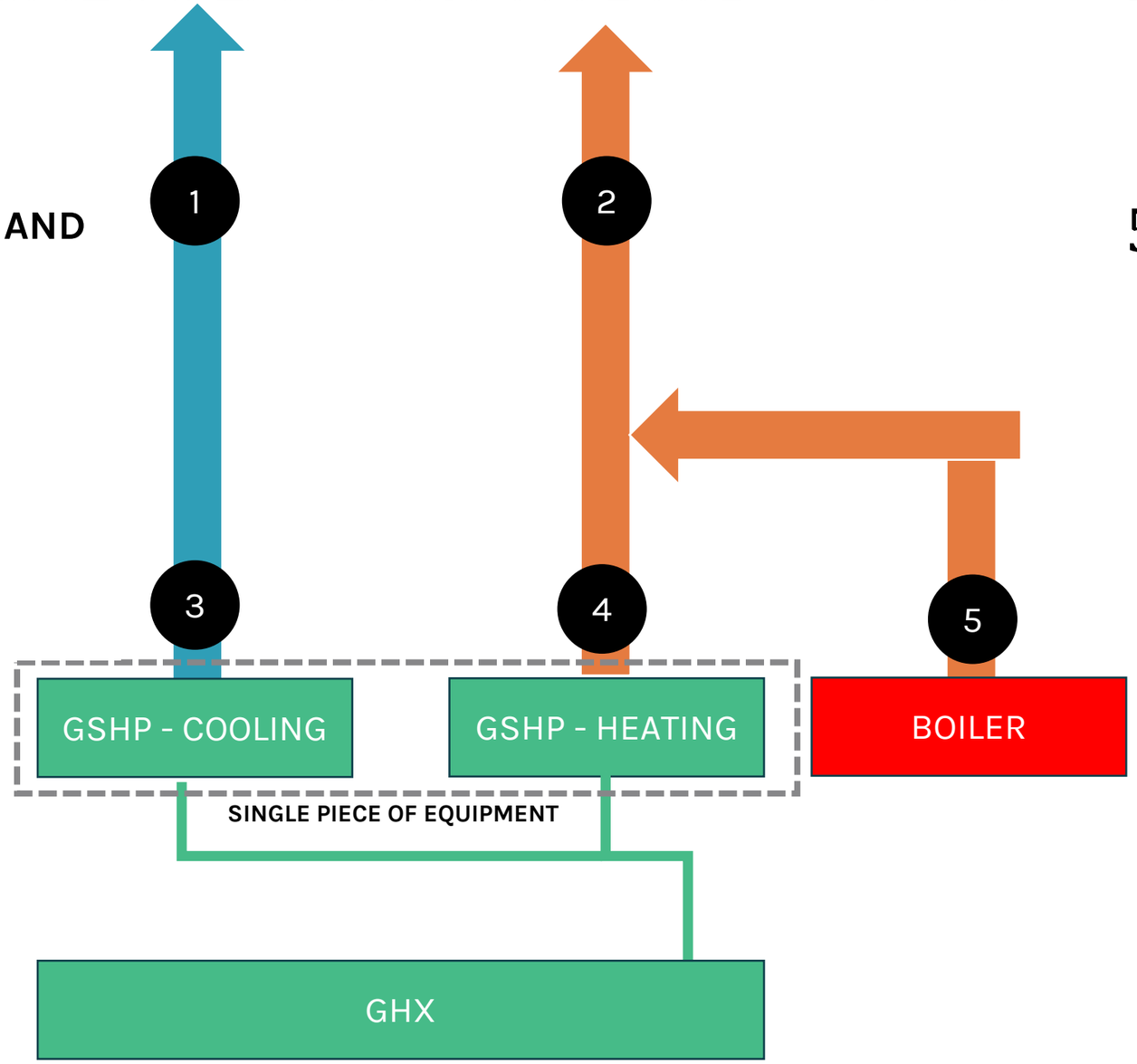
# DUAL USE CALCULATION

- **Input**
  - Annual building heating and cooling
- **Calculation**
  - Plant Energy Analysis
- **Outputs**
  - Credit percentage

# EXAMPLE CALCULATION: HYBRID – GSHP + BOILER

**TOTAL ENERGY = BUILDING HEATING AND COOLING LOADS**

**PLANT EQUIPMENT THERMAL OUTPUT**



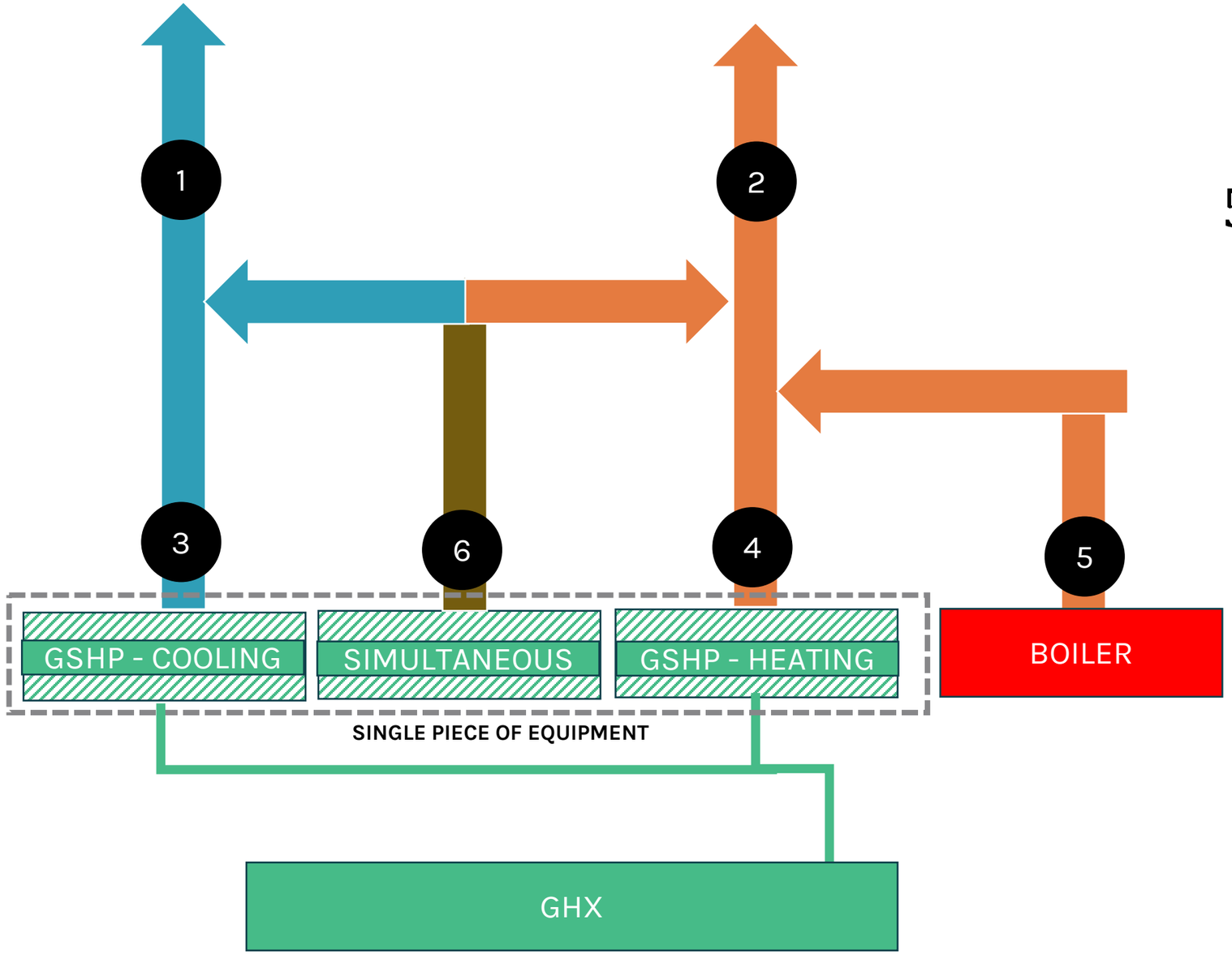

$$50\% < \frac{Qualified\ Energy}{Total\ Energy}$$

$$\mathbf{50\%} < \frac{\mathbf{3+4}}{\mathbf{1+2}}$$

**SAME AS…**

$$50\% < \frac{3+4}{3+4+5}$$

# EXAMPLE CALCULATION: HYBRID – SIMULTANOUS GSHP + BOILER



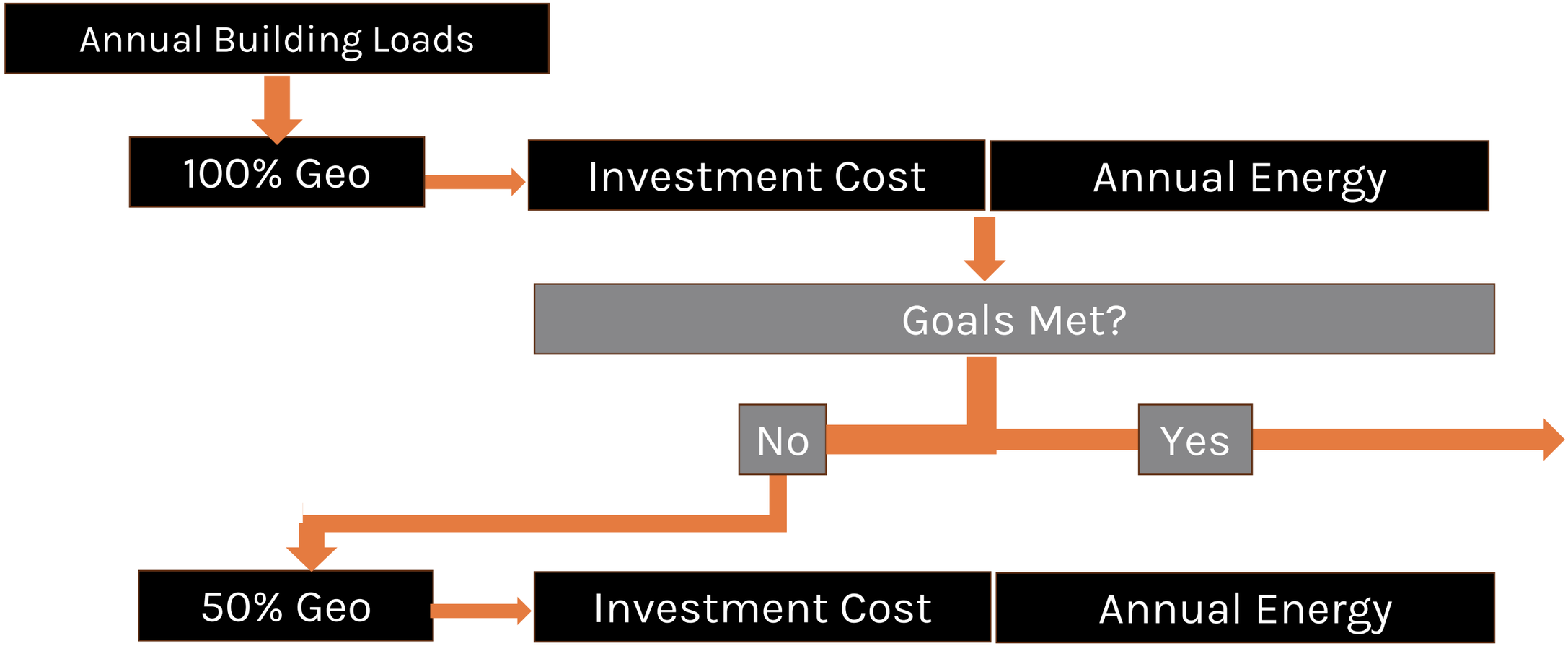

$$50\% < \frac{Qualified\ Energy}{Total\ Energy}$$

$$\mathbf{50\%} < \frac{\mathbf{3+4}}{\mathbf{1+2}}$$

**SAME AS…**

$$50\% < \frac{3+4}{3+4+5+6}$$

# DUAL USE EVALUATION PROCESS



# ACKNOWLEDGEMENTS

# Energy Tax Savers, Inc.

Recorded Webinar
https://www.youtube.com/watch?v=BQJqiq6NylI

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# END

# How Incentives Impact Design Choices

**Speakers:** Jeff Love / *Sustainable Comfort, Inc.*
Adam Shelly / *Ecosystem*
Victor Braciszewski / *SmithGroup*