

## HVAC Reimagined

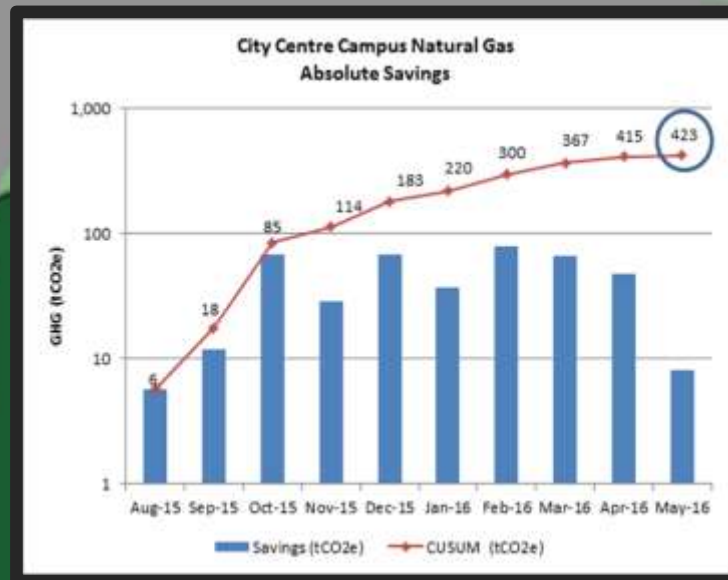
# The City of Coquitlam's City Centre Civic Campus Thermenex System

**Jeff Weston, P.Eng.**  
President | Thermenex

**Kevan Cornes**  
Manager Facility Operations  
City of Coquitlam | Strategic Initiatives



GHG Savings | Target 40% | Year to date 54%







### *Removed*

3-30 ton specific heat  
reclaim chillers

415 tons of air cooled  
chillers (3)

**TOTAL 505 tons**

### *Added*

Thermal Gradient  
Header

Piping between  
buildings

400 tons of holistic heat  
reclaim chillers

Shared Fluid Cooler

**TOTAL 400 tons**

# First Principle Thinking

“...you boil things down to the most fundamental truths you can and you reason up from there.”

— Elon Musk



*Image Courtesy of Flickr.com*

HEATING is COOLING

# HEATING is COOLING



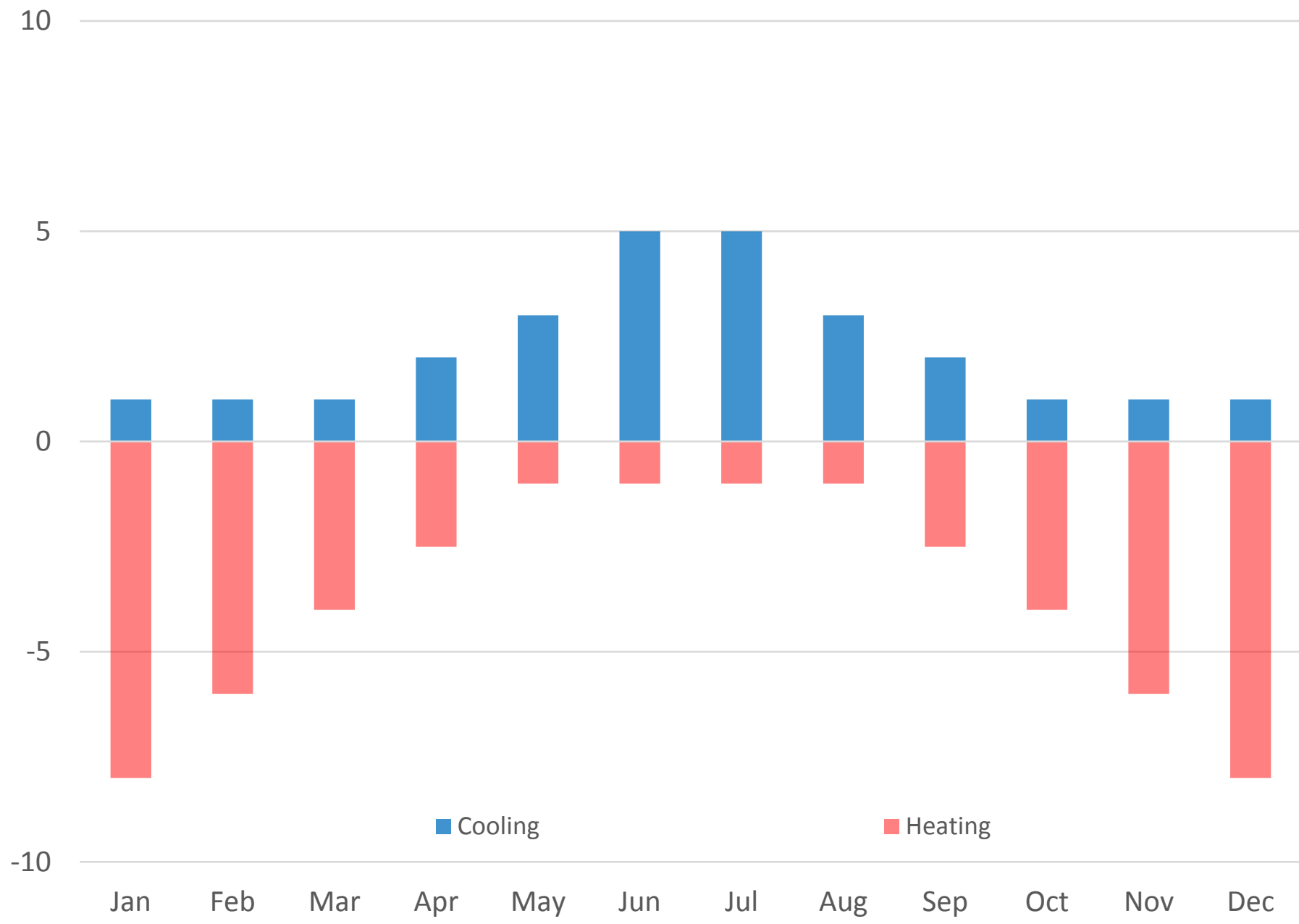


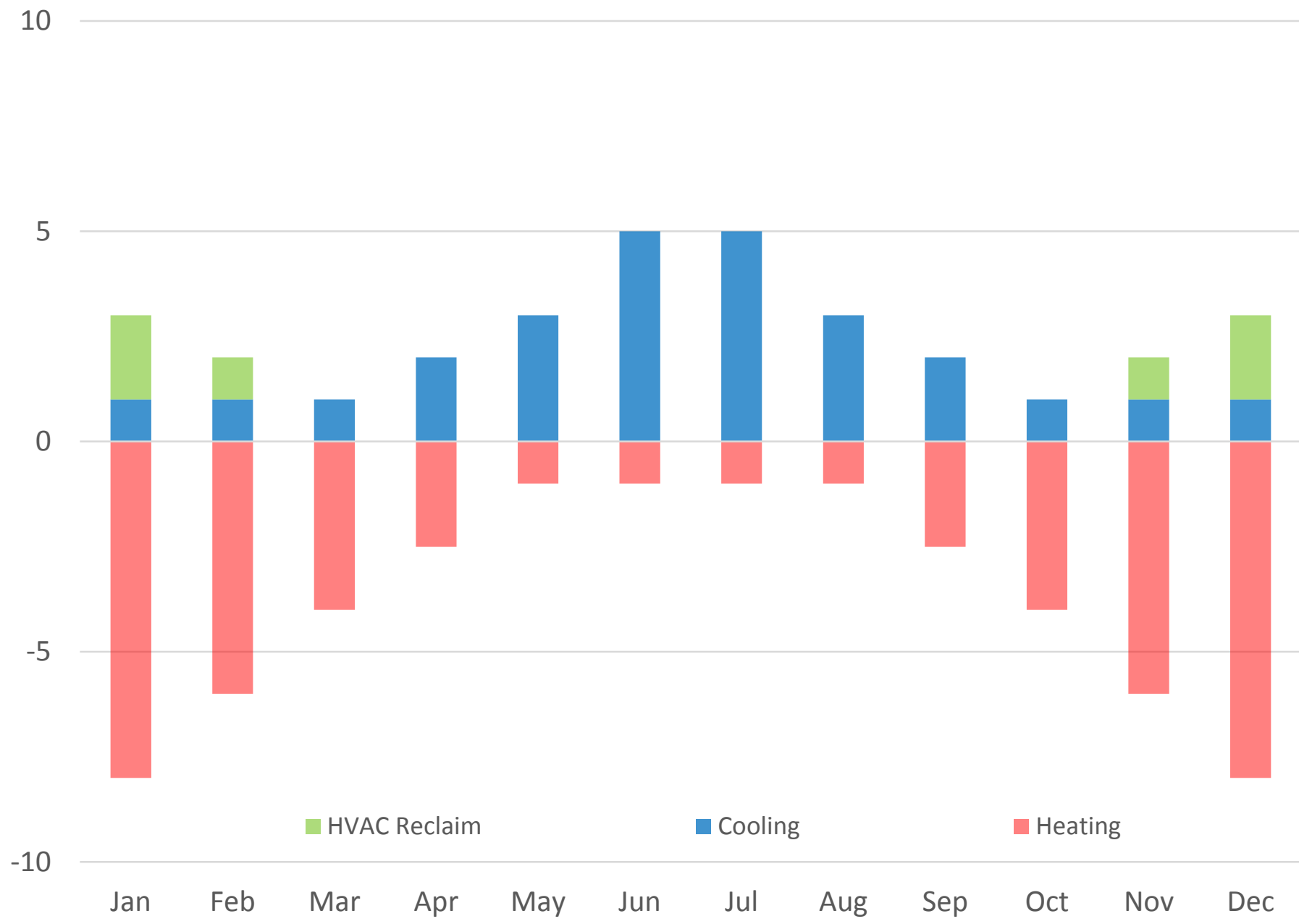


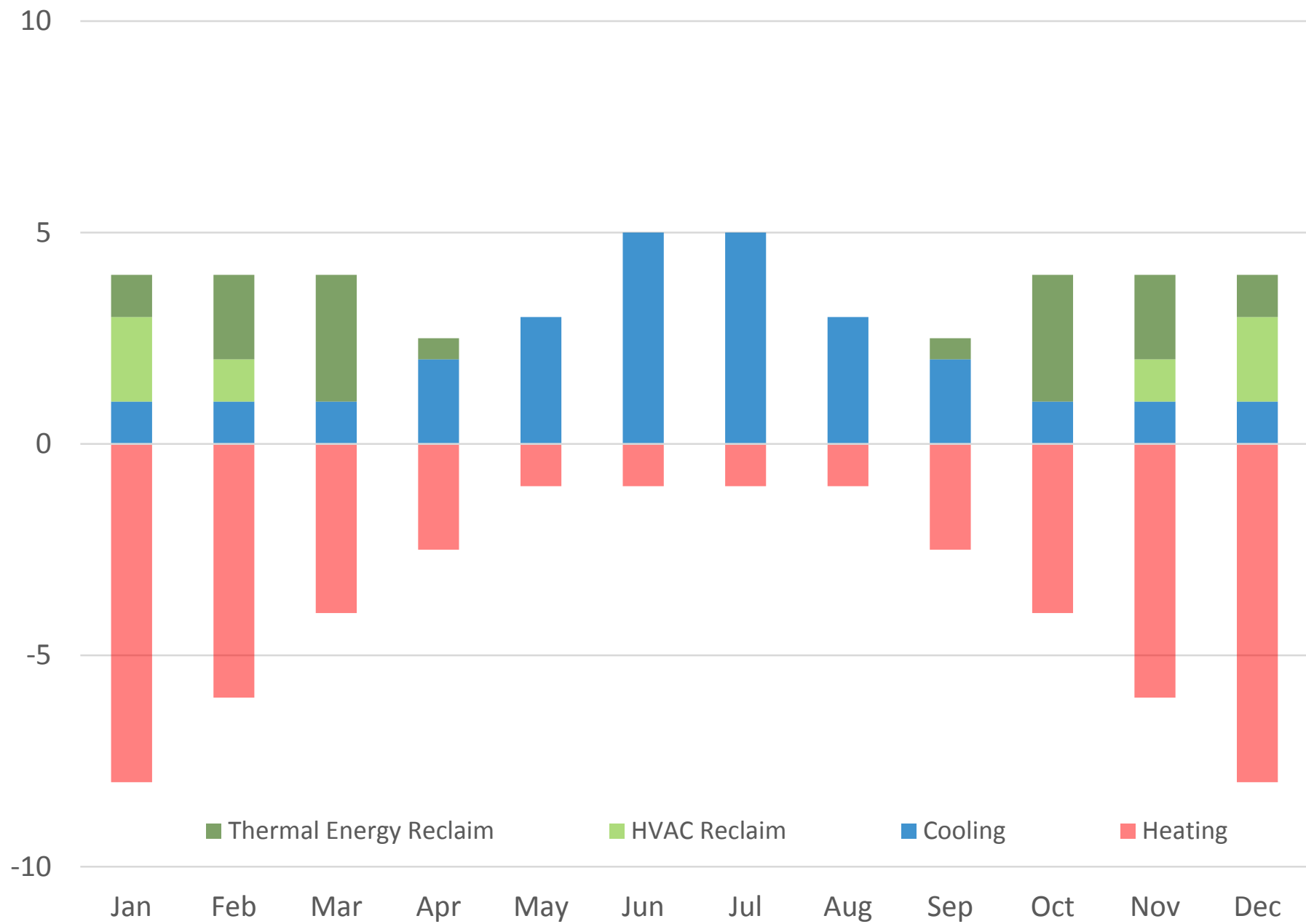


We heat by cooling burning stuff

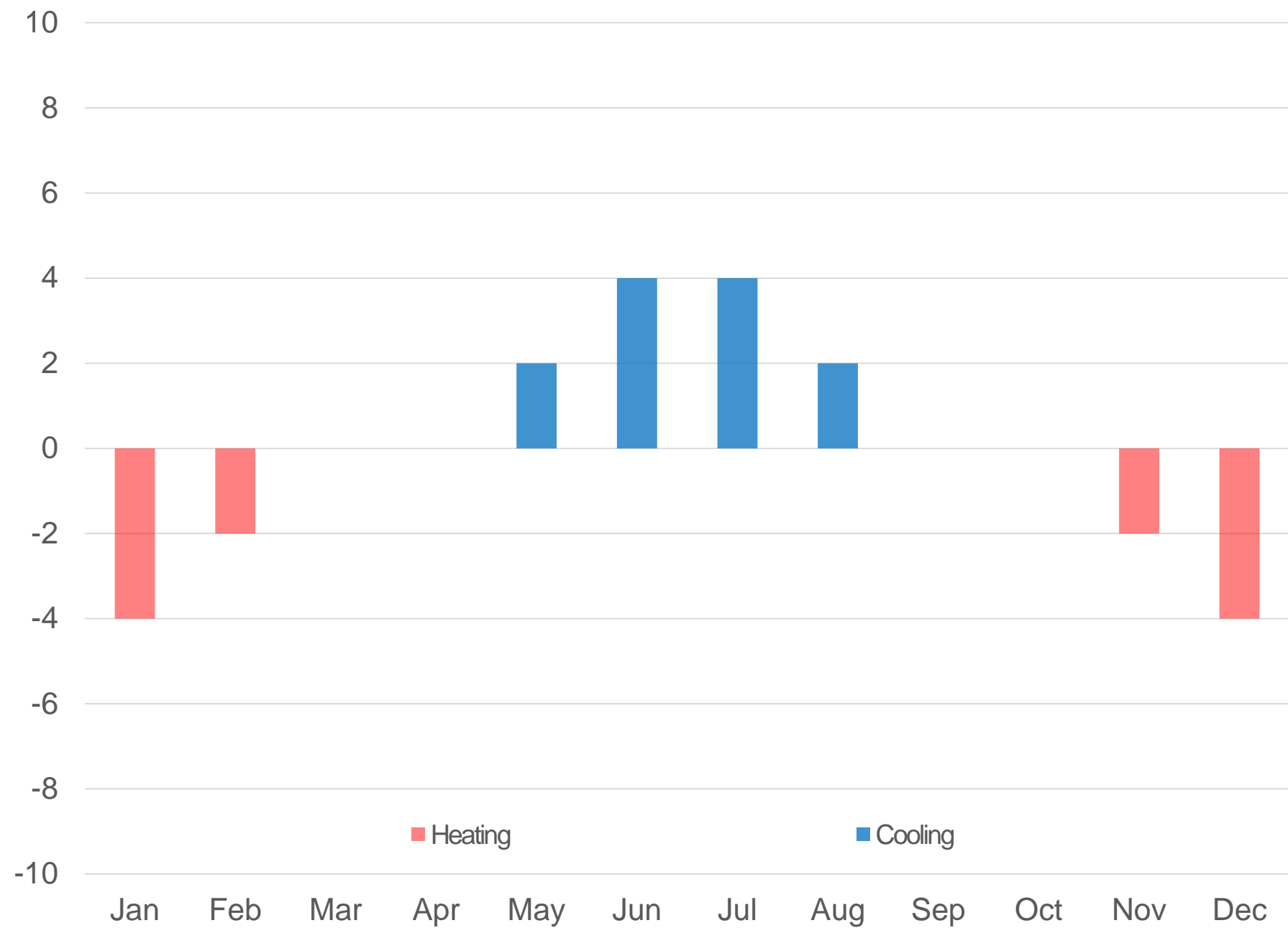












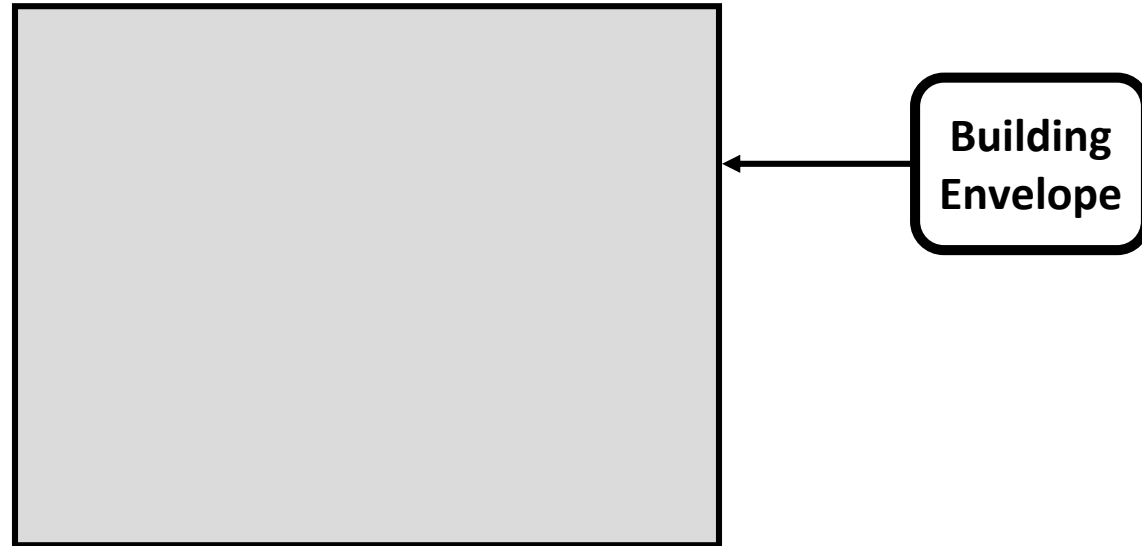


**Building  
Envelope**



***Buildings are dynamic  
energy logic puzzles***

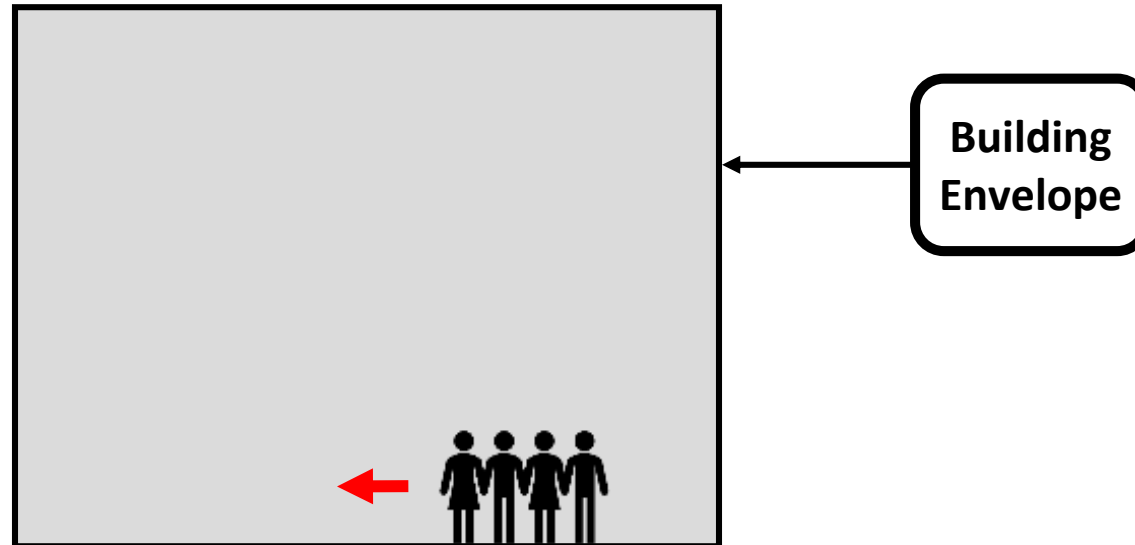
***Energy In = Energy Out  
(or the temperature in  
the building changes)***





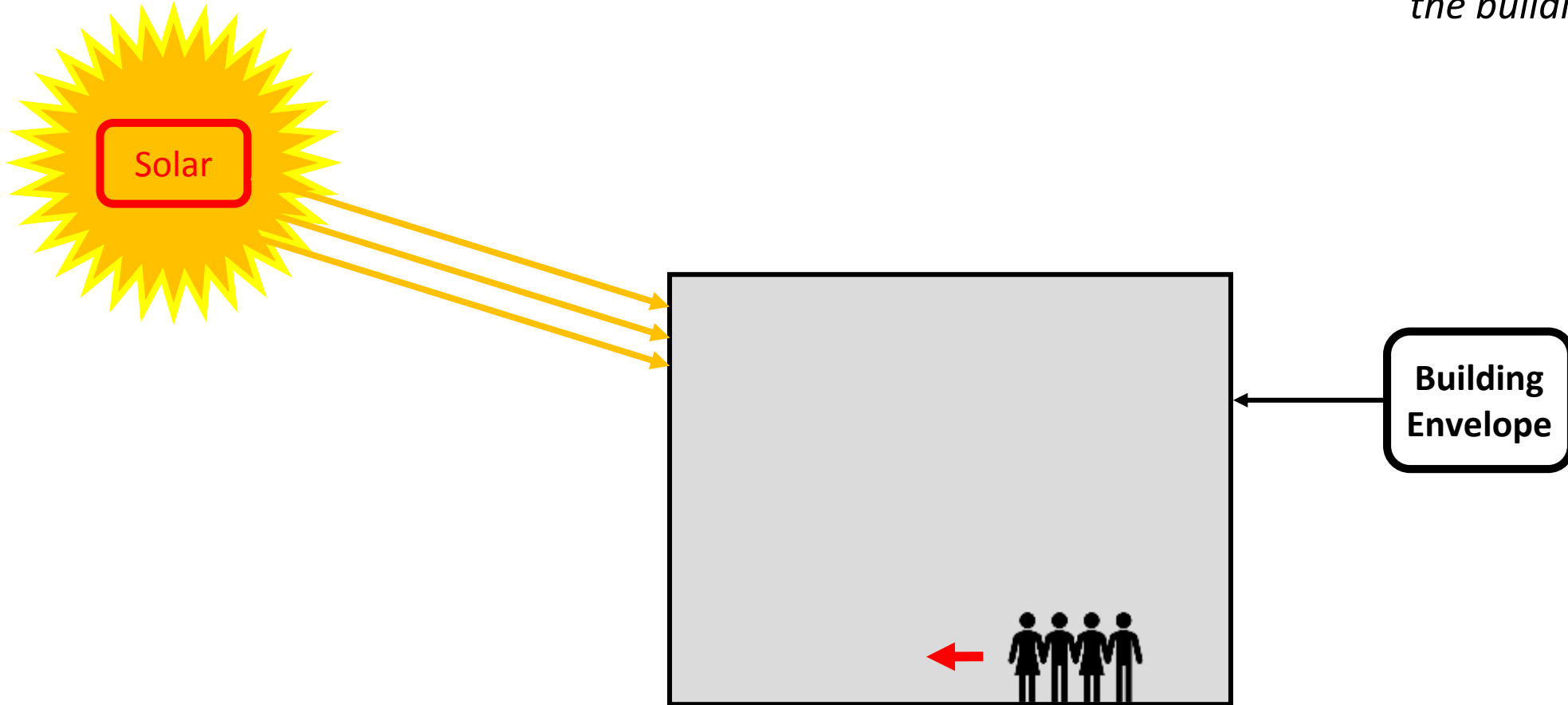
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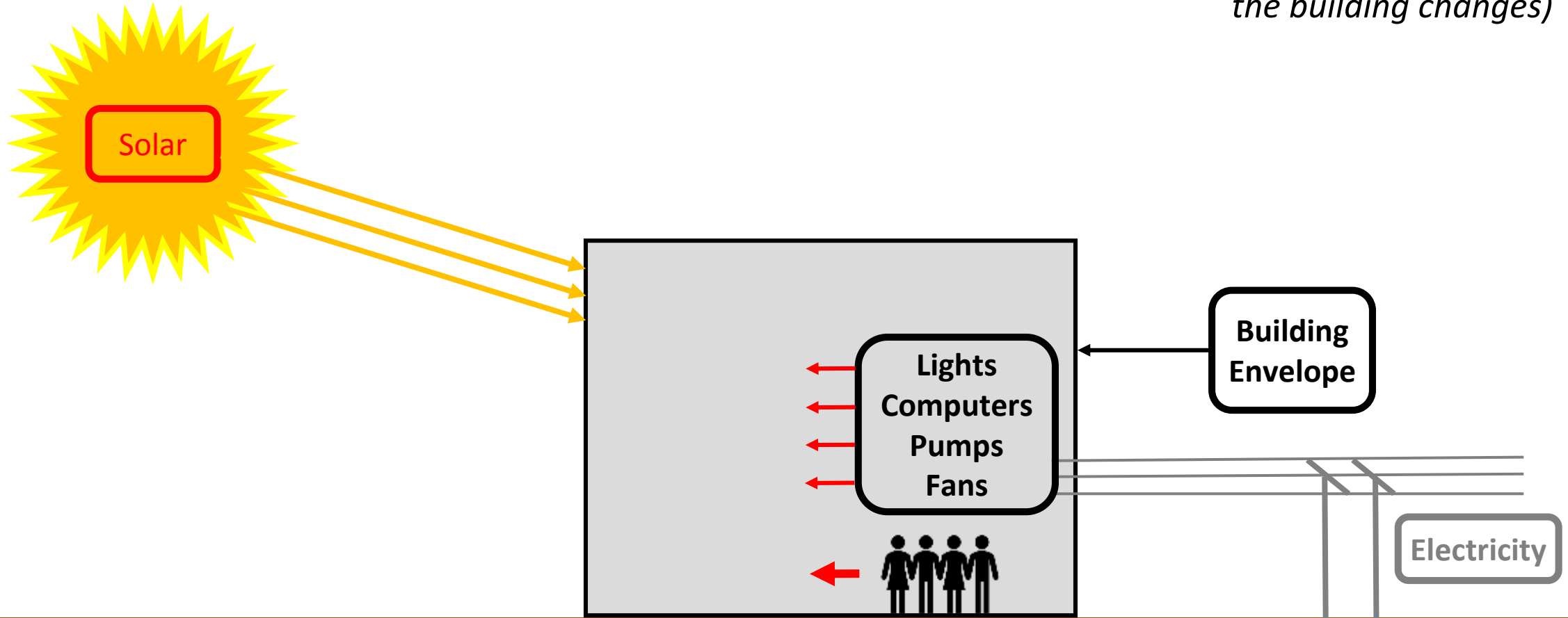
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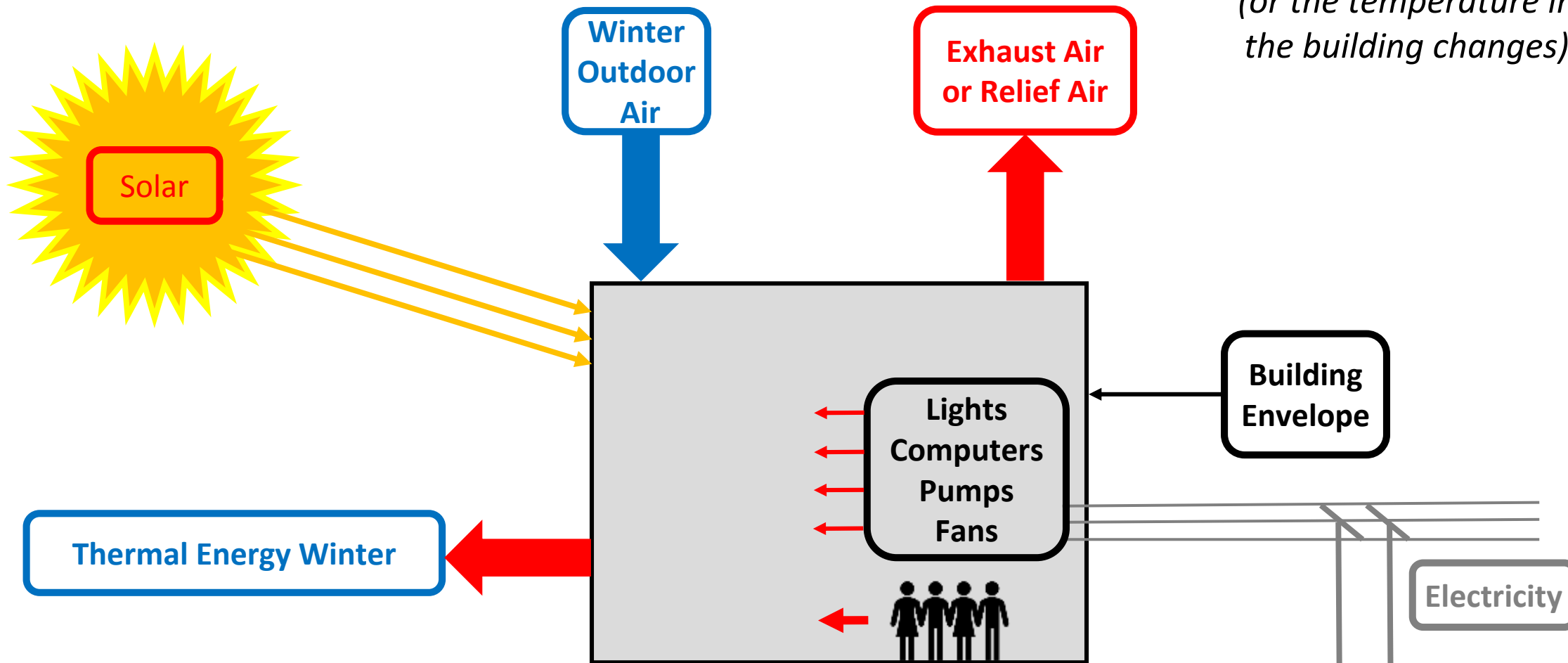
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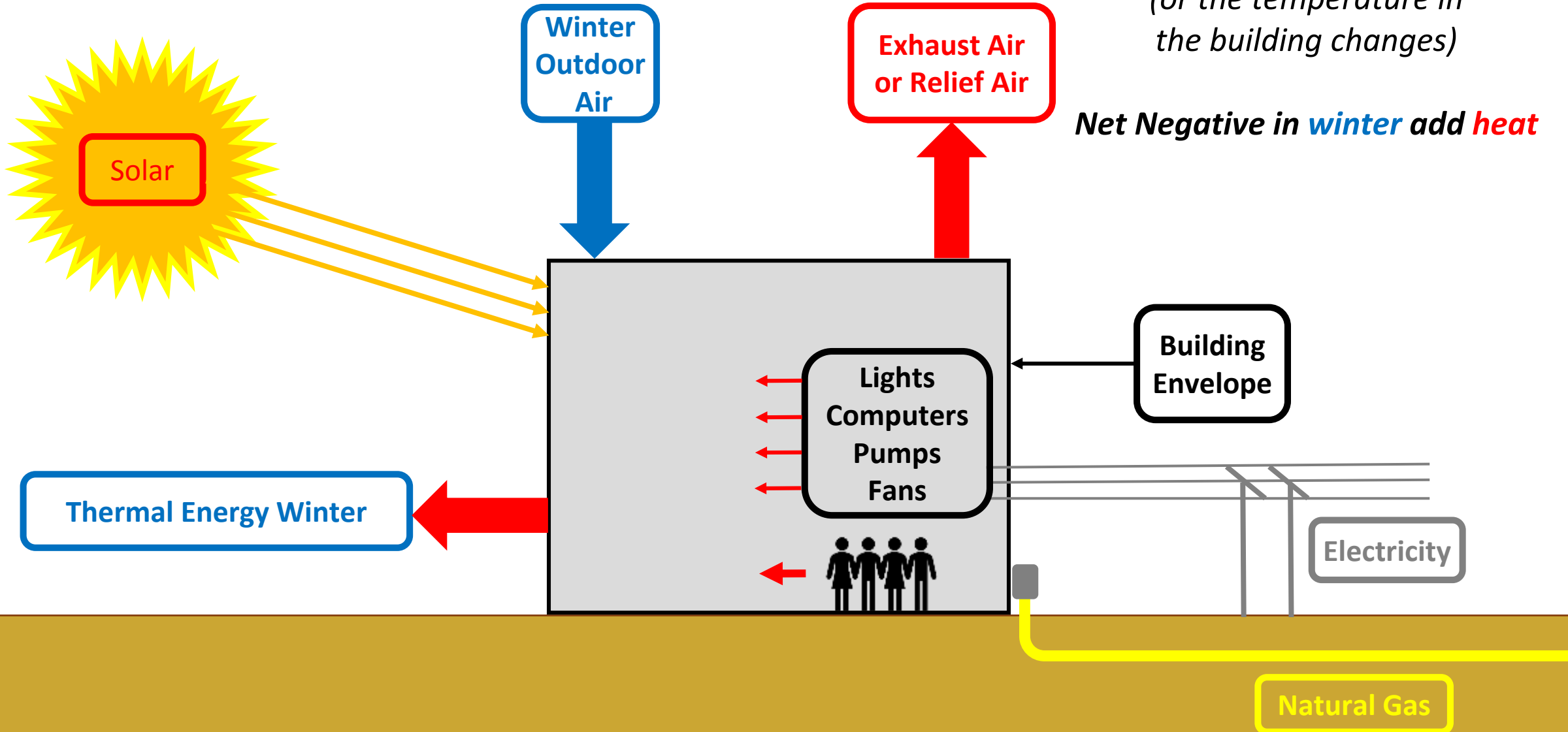
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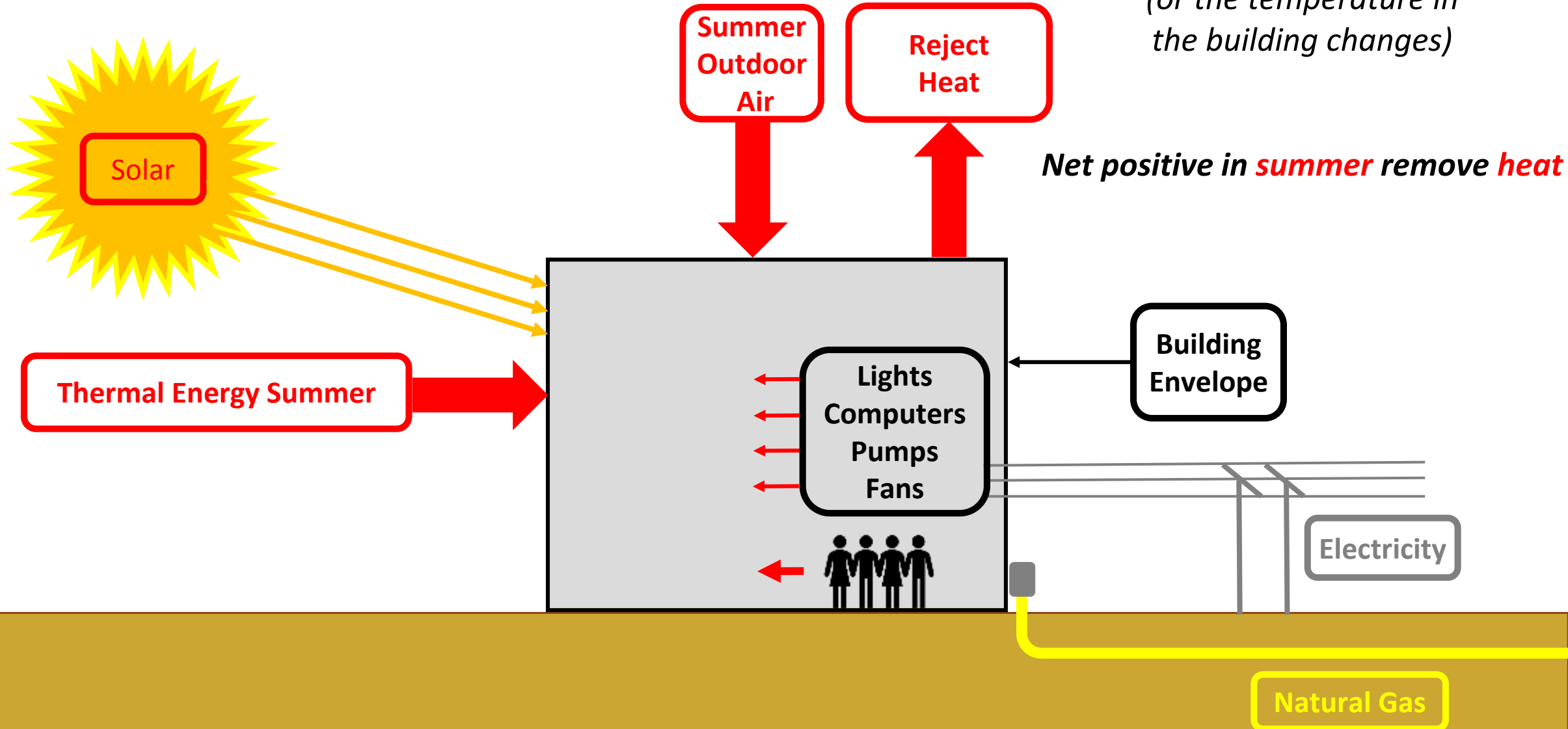
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*Net Negative in **winter** add **heat***



*Buildings are dynamic  
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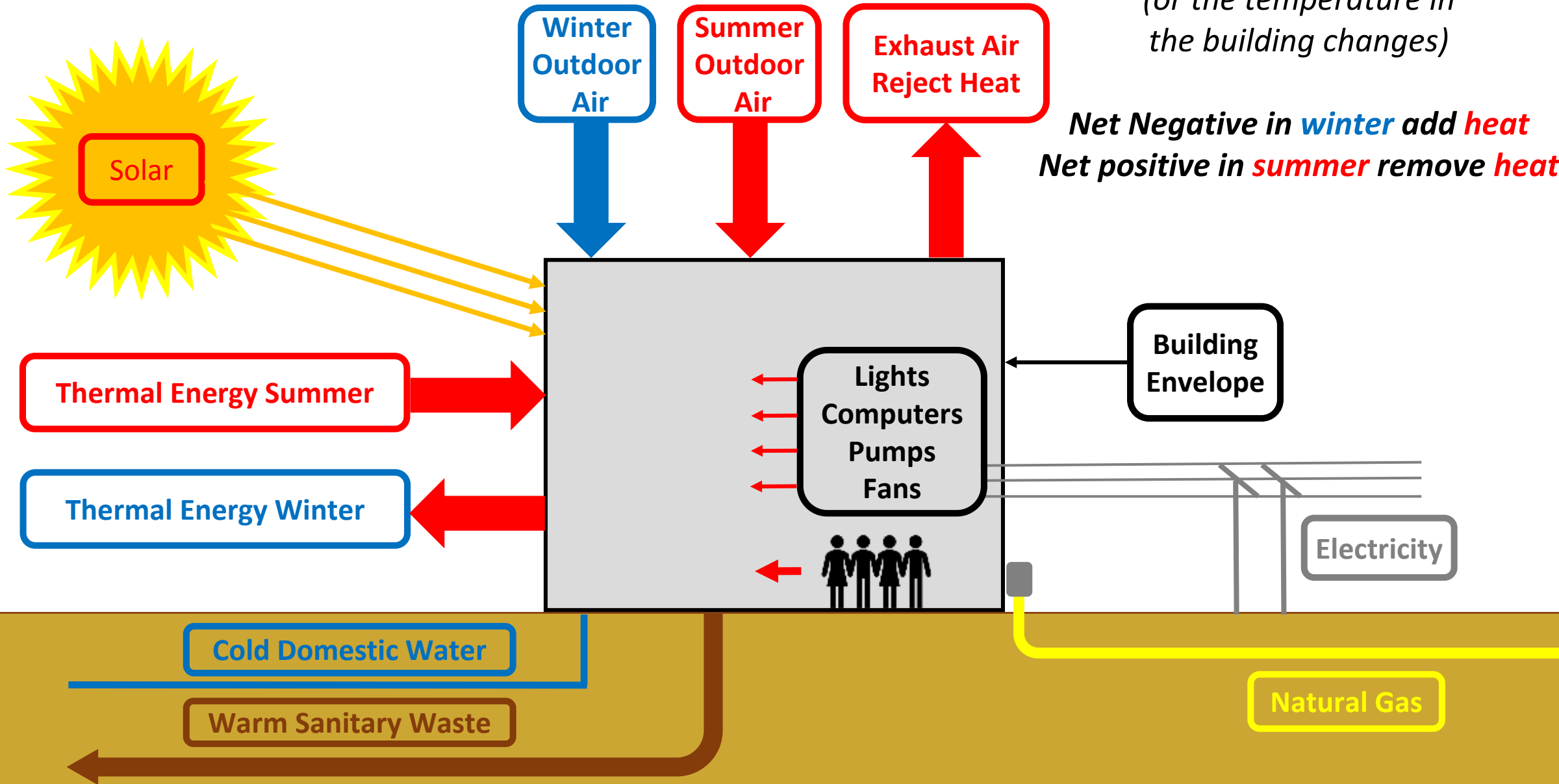
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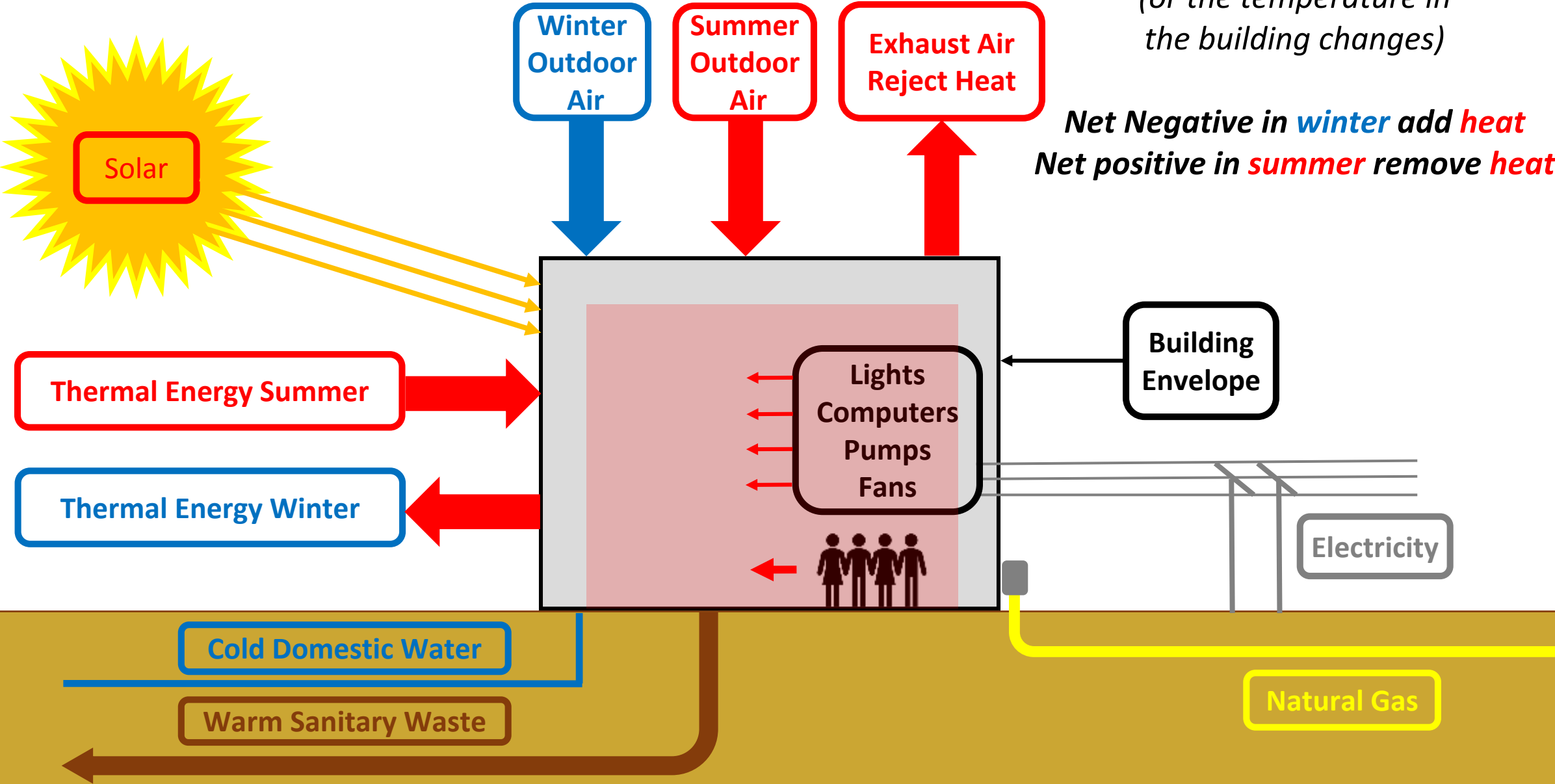
*Energy In = Energy Out  
(or the temperature in  
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*Net Negative in **winter** add **heat**  
Net positive in **summer** remove **heat***





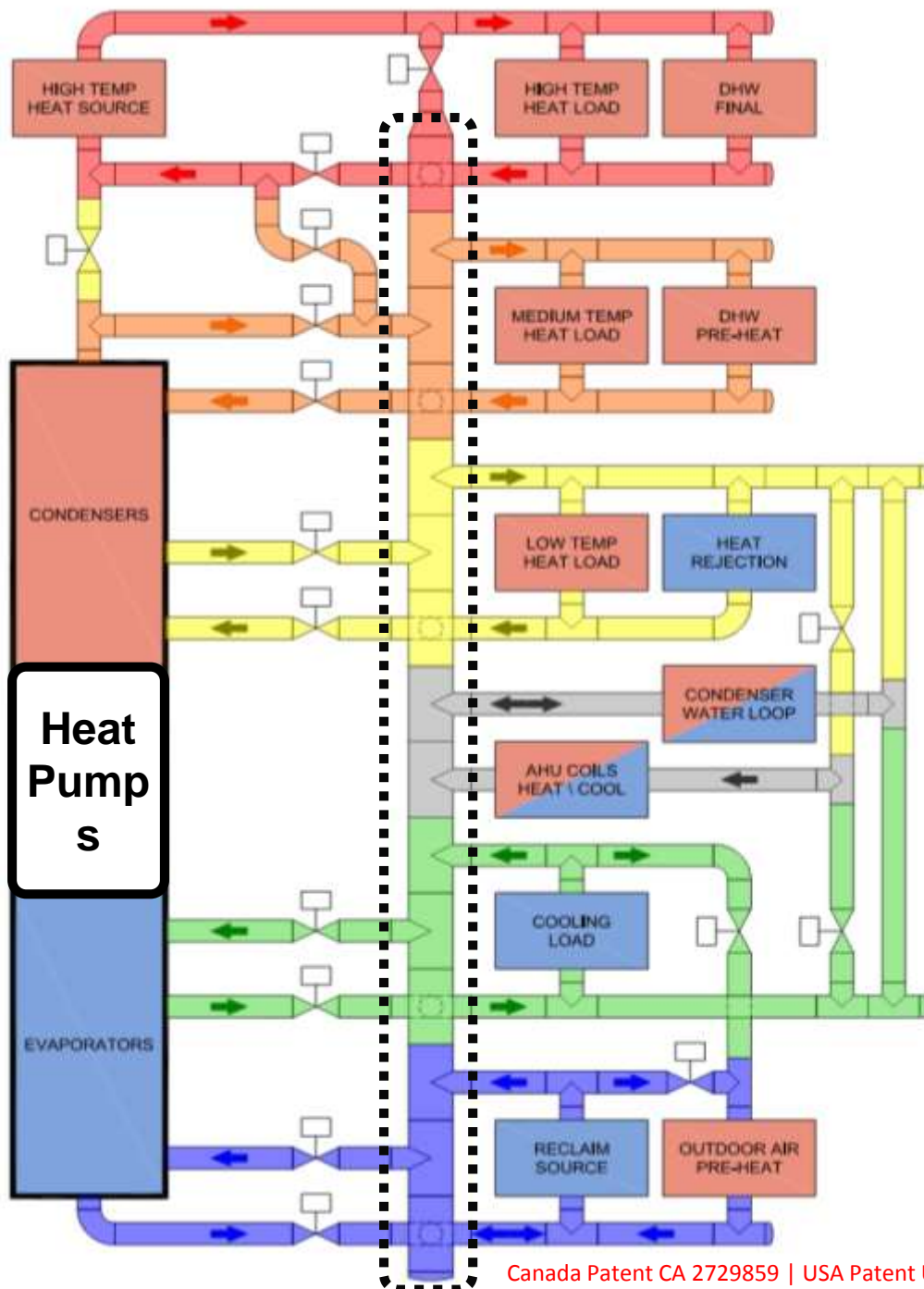
The interior of a large building is a heat factory



# HVAC Reimagined

**(9 Logic Differences available in a handout)**

# Thermal Gradient Header



Heating

Cooling

Heat Reclaim

Heat Rejection

ONE PIPE

## Aquatic Centre

### SYSTEM A Boilers

SYSTEM B  
MTEC CH1

**SYSTEM C**  
City Hall Transfer (Heating)

### SYSTEM D

### SYSTEM E

### SYSTEM F

### SYSTEM G

**SYSTEM G**  
City Hall Transfer (Cooling)

SYSTEM H  
AHU3 Heating

SYSTEM I  
AHU4 Heating

### SYSTEM J

### SYSTEM K

## Floor Plan

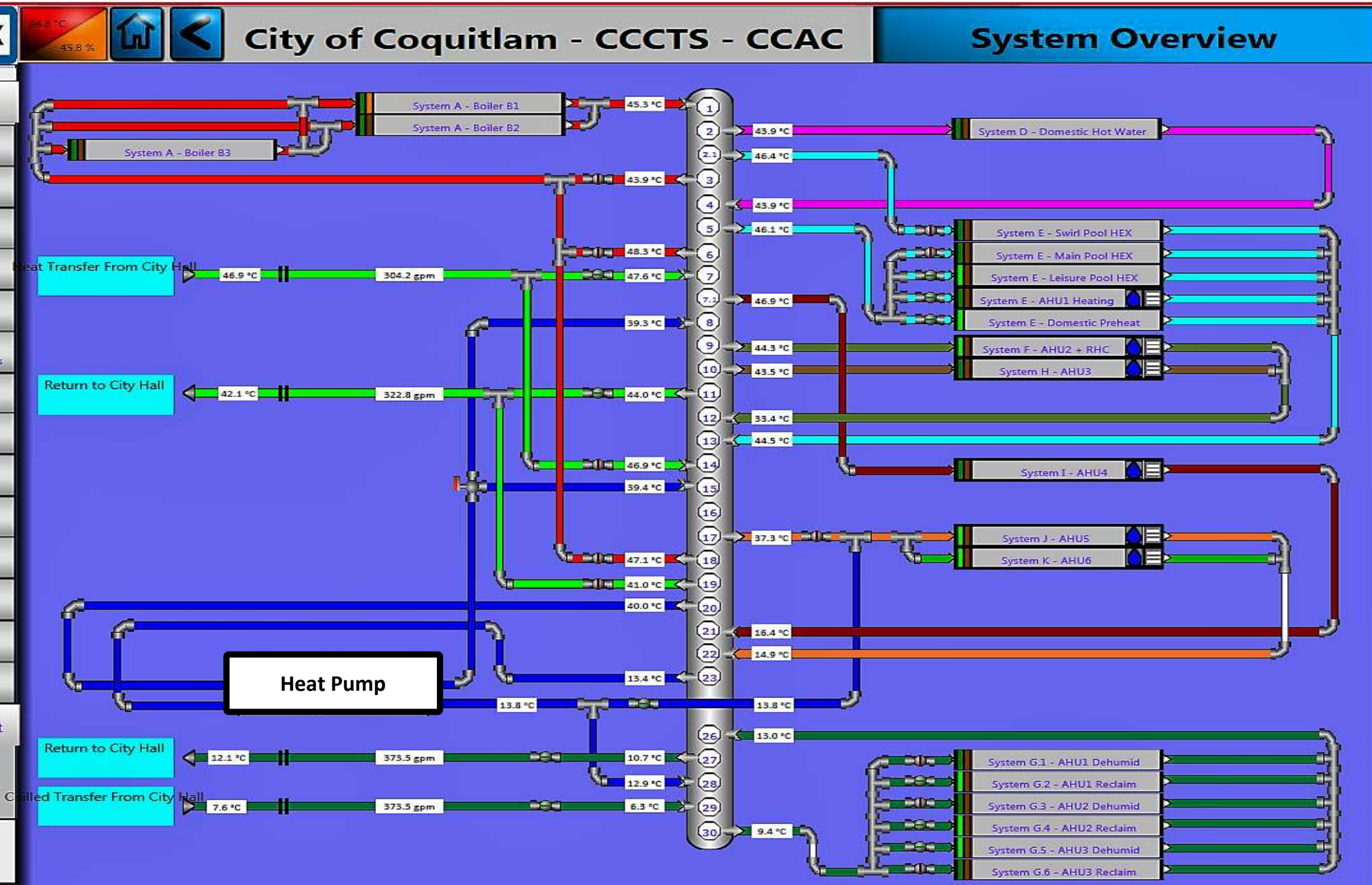
## Schedules

City Hall Primary Plant

Thermenex Support

For technical support please call

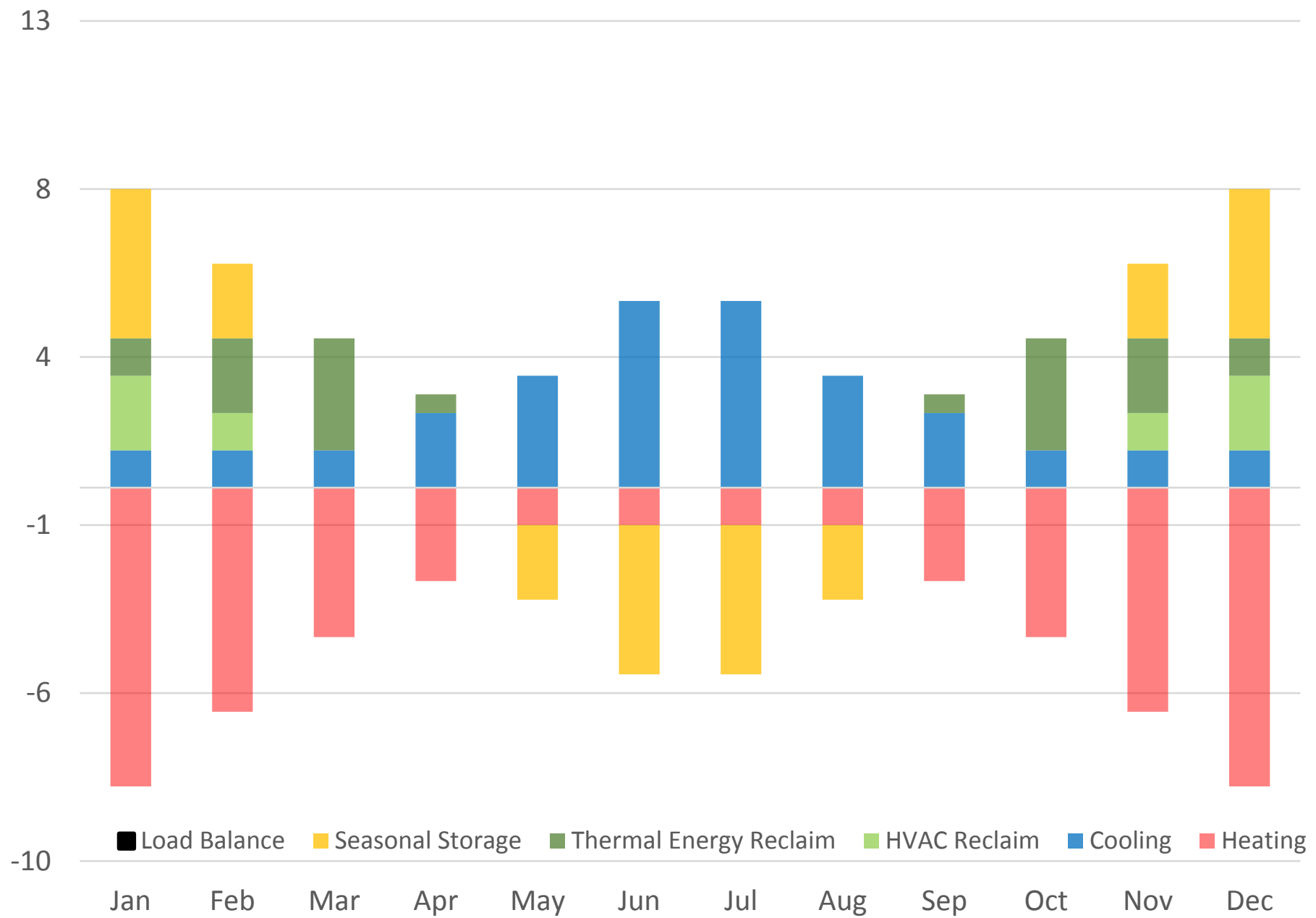
+1-604-524-0463





‘The buildings at the City of Coquitlam’s Civic Centre were particularly challenging to find energy and GHG savings because they are already so far ahead of their peers.’

Brad White, P.Eng.  
SES Consulting  
June 2018





# Coquitlam Leads The Way To A New Future

