



# Countryside Municipal Complex

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Environment Committee Meeting

June 20, 2023

COMMUNITY FACILITIES

# Countryside Municipal Complex

COUNTRYSIDE, IL

CLIENT

City of Countryside, IL

SERVICES

- Architecture
- Interior Design + FFE
- Engineering
- LEED Consulting
- NZE Design

CERTIFICATIONS

LEED® Gold  
ILFI ZE Certification





# The Site

## Wishing Well Hotel

- Opened in 1941
- Closed in 2006

## Flame Restaurant

- Opened in 1958
- Closed December 31, 2012





# The Site

Famous guests:

*Guy Lombardo*  
*Glen Miller Band*  
*Chicago*





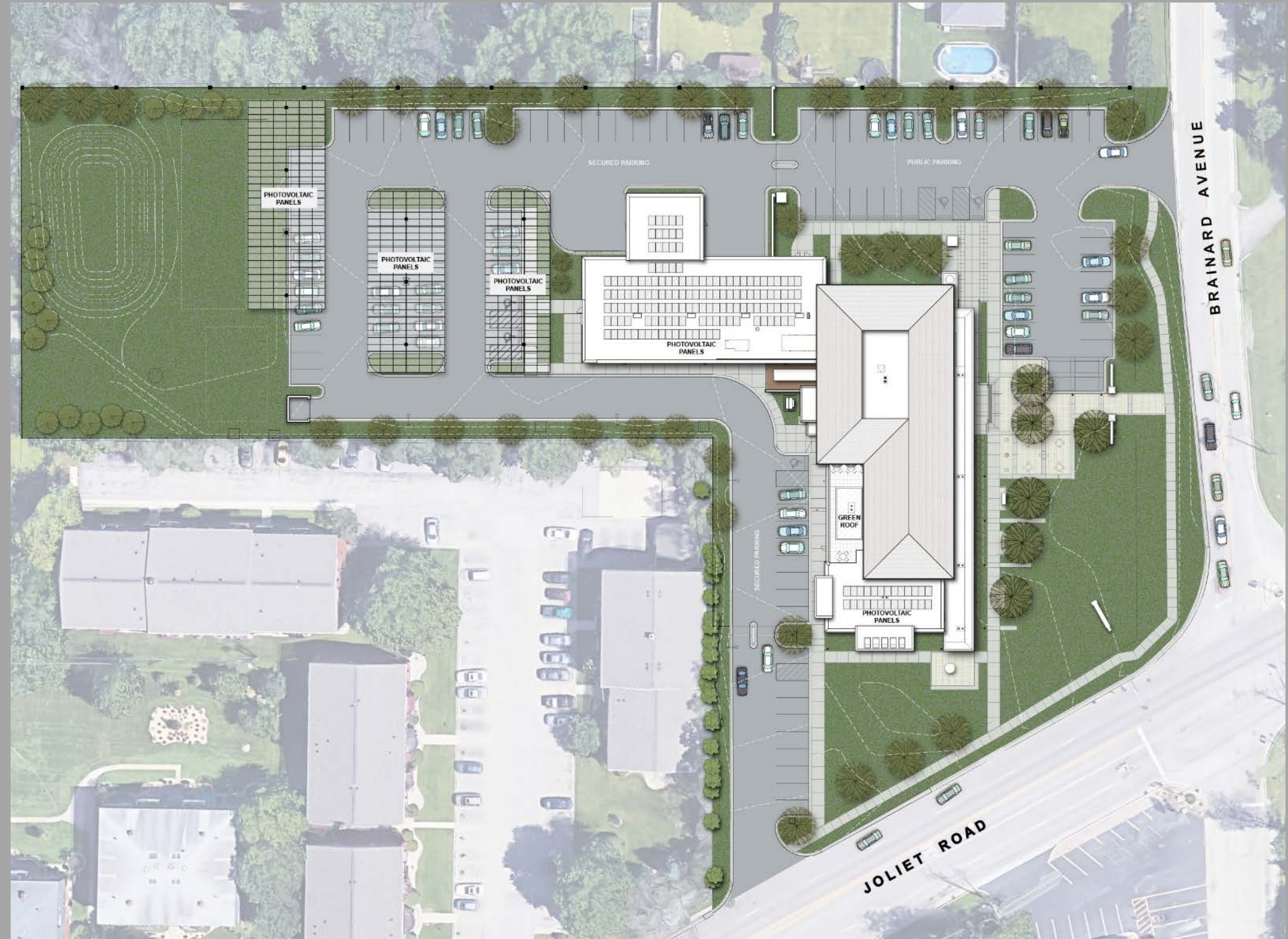
# The Site





# The Site

- Multiple entries / exits
- Public parking + secure staff and police parking
- Welcoming entry
- Protection through elevation and planters
- Collaboration with citizens



# From LEED... to Net Zero Energy Design

## HOW DID THE GOAL OF NET ZERO ENERGY COME ABOUT?

➤ LEEDv4 → ENERGY MODELING → OUR TEAM (WE'RE CLOSE!) → CLIENT (GO FOR IT!)

## WHAT IS THE BENEFIT OF NET ZERO DESIGN TO THE OWNER?

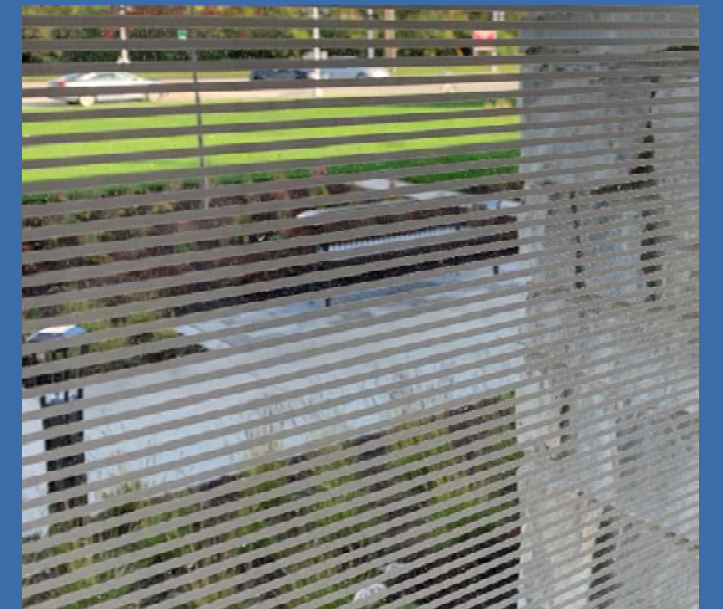
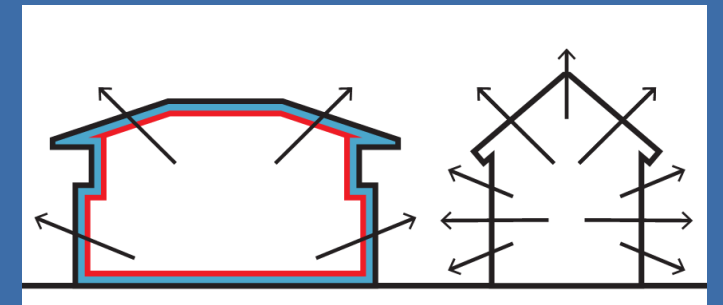
- ✓ HELPS ACHIEVE THEIR *NON-MONETARY* S.R.O.I. GOALS:
  - ✓ SPUR ECONOMIC DEVELOPMENT ALONG JOLIET ROAD (RT. 66)
  - ✓ 1<sup>ST</sup> MUNICIPALITY IN THE STATE OF IL TO HAVE A NET ZERO ENERGY DESIGNED FACILITY
    - ✓ LEADING BY EXAMPLE (IN THEIR COMMUNITY, IN CHICAGO, & AT THE STATE LEVEL)



# Passive Design Strategies – **reduce energy loss**

LEEDv4 – to NetZero Energy

1. Air-tight building design – Designed to  $0.2 \text{ cfm/ft}^2$  Air Infiltration Rate (vs.  $0.4 \text{ cfm/ft}^2$ )
2. Increase insulation values
  - a. R-40 = Roof
  - b. R-25 = Walls
    - i. Stopped here because energy modeling showed diminishing returns on the value of the thickness of insulation
3. Reduction of Solar Heat Gain
  - a. Large overhangs to shade fenestration
  - b. Ceramic frit pattern on glass to block approx. 50% of direct solar heat gain

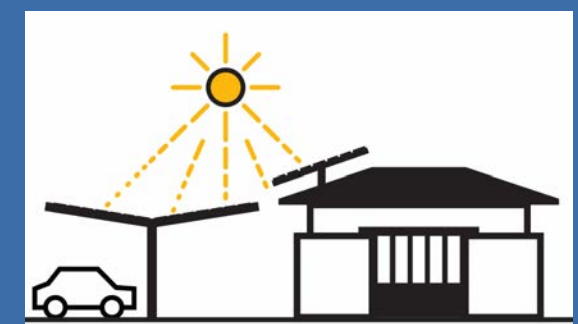
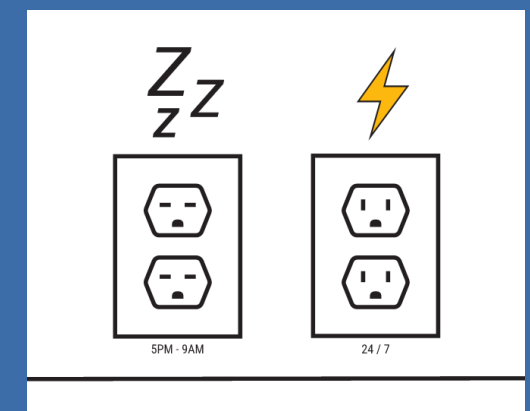
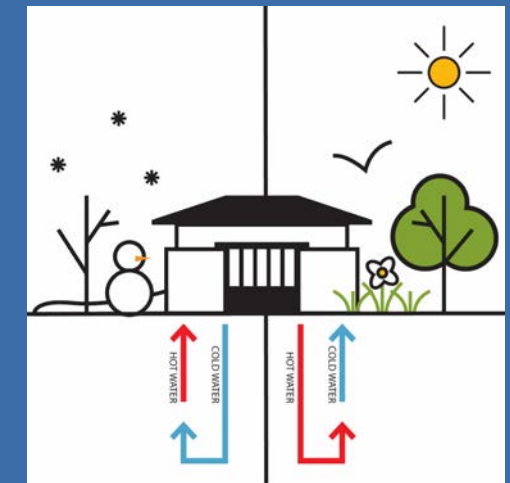




# Active Design Strategies – **reduce energy loads**

LEEDv4 – to NetZero Energy

1. Energy efficient design of the Mechanical systems
  - a. Geothermal ground loops used in conjunction with RTUs, Heat Pumps and VAV boxes
2. Power load savings
  - a. LED lighting
  - b. 208V (no transformers) instead of 480V
  - c. Receptacle controls
  - d. Daylighting controls
3. On-site renewable energy
  - a. Implementation of photovoltaic panels on the roofs and car ports





# Full-scale Mock Ups

**Mock Up 1**



Location: Second floor roof / wall soffit

**Mock Up 2**



Location: Bay window bump out and roof condition

**Mock Up 3**



Location: Main entrance and roof

**Mock Up 4**



Location: Police wing on northwest end

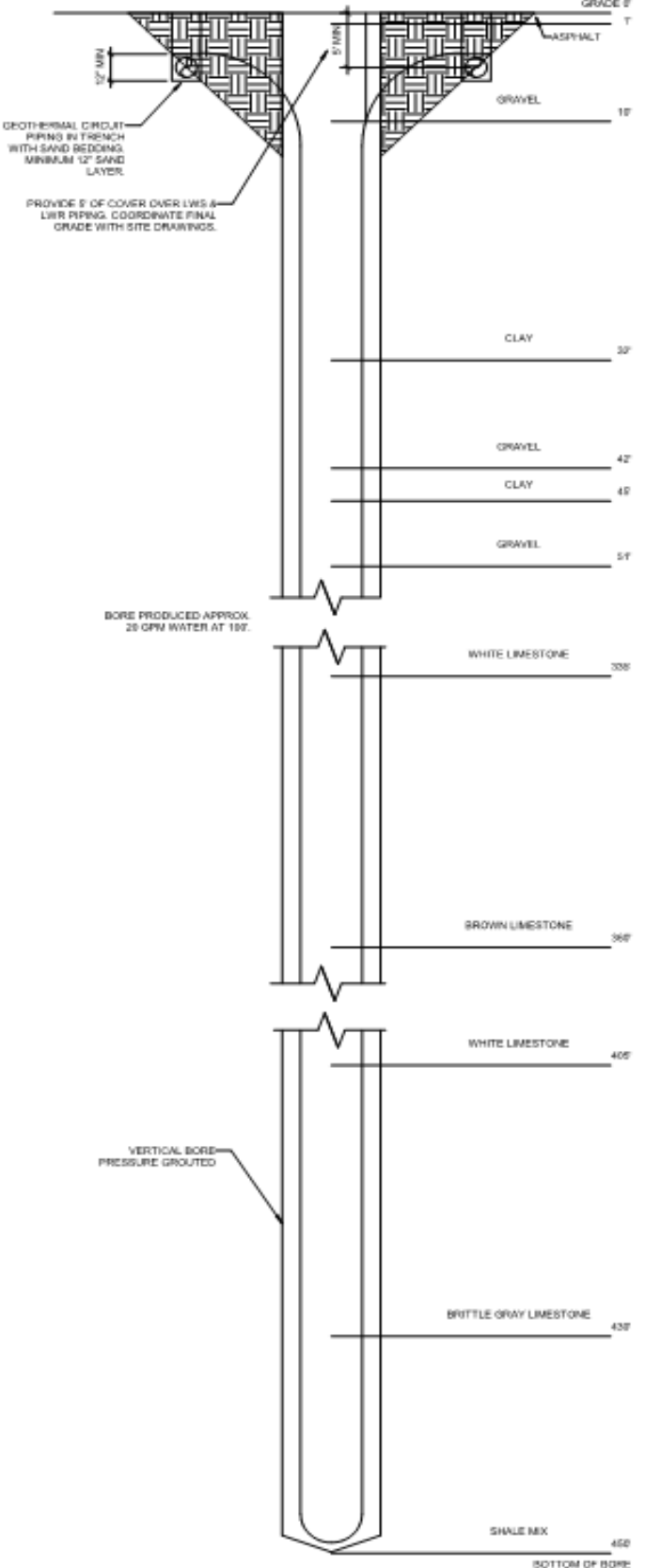
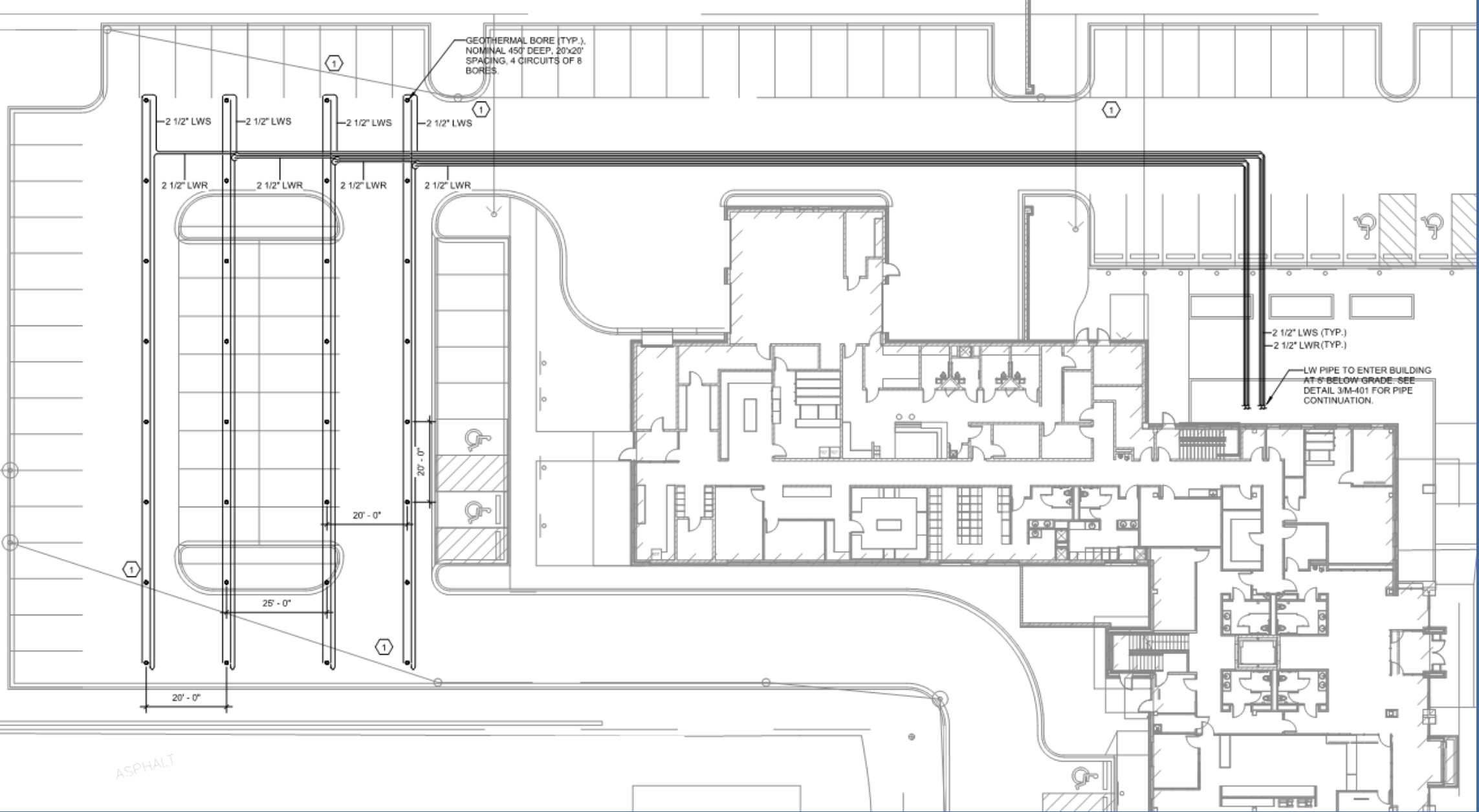








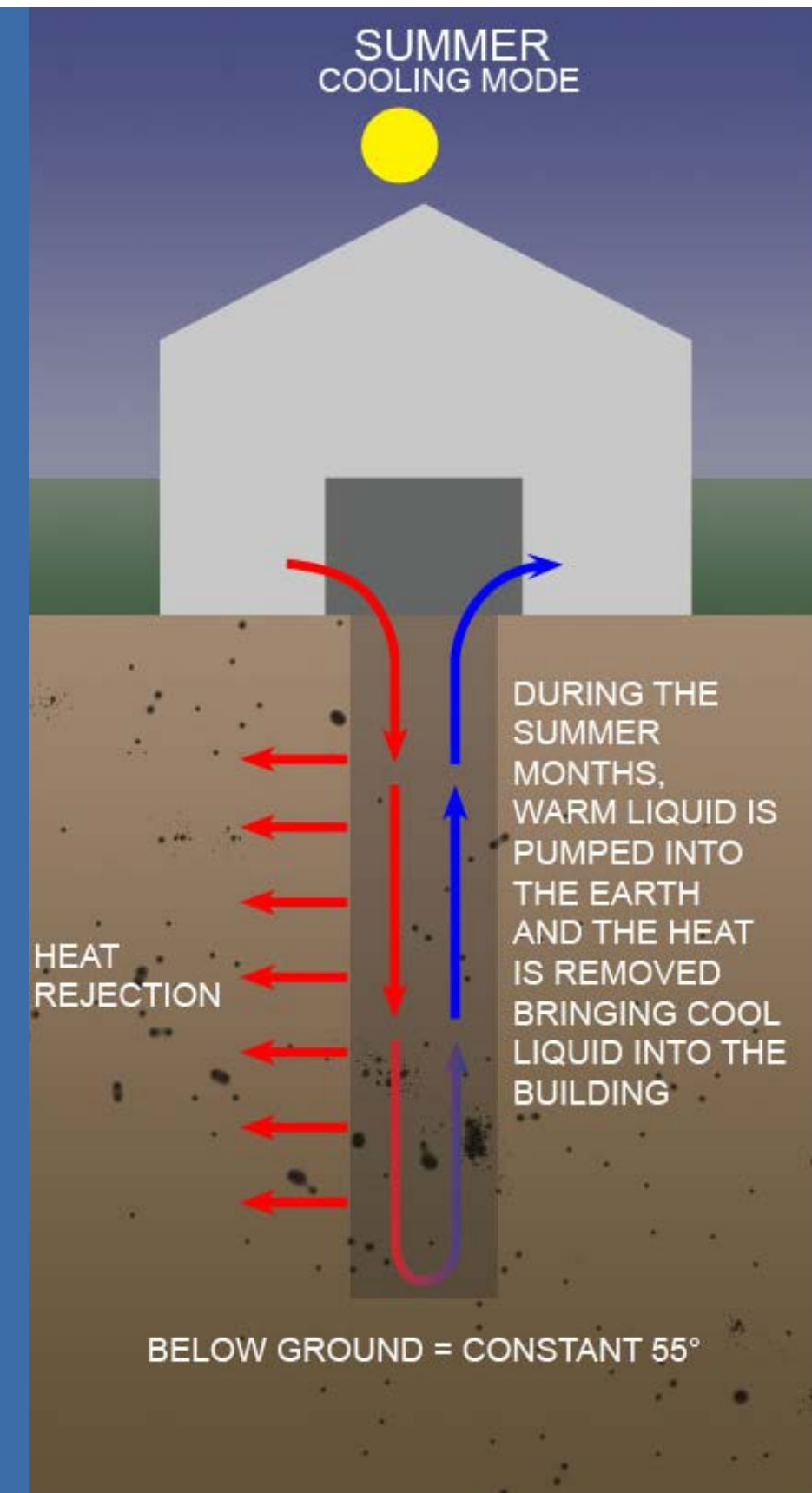
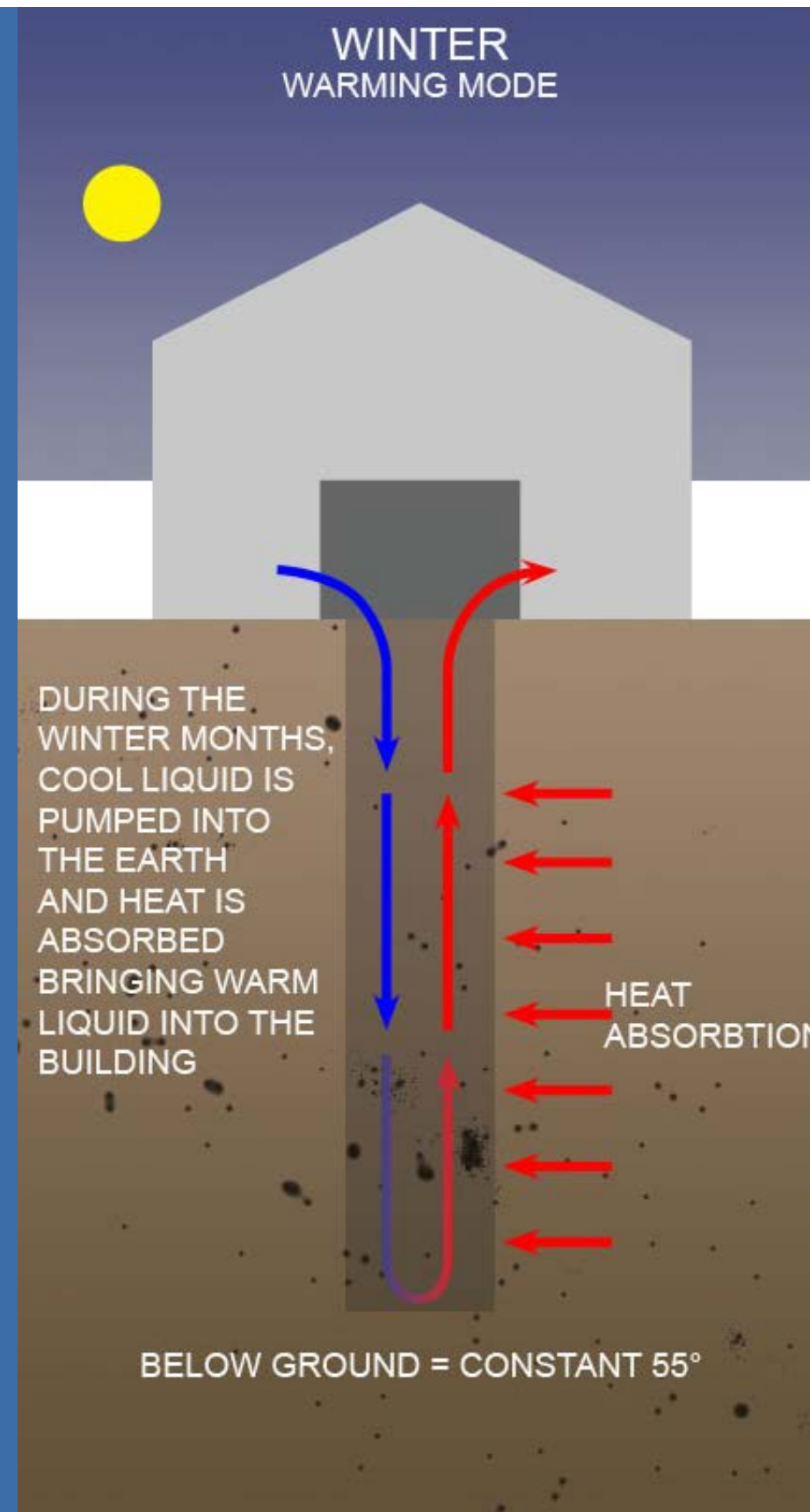
# Geothermal Wells





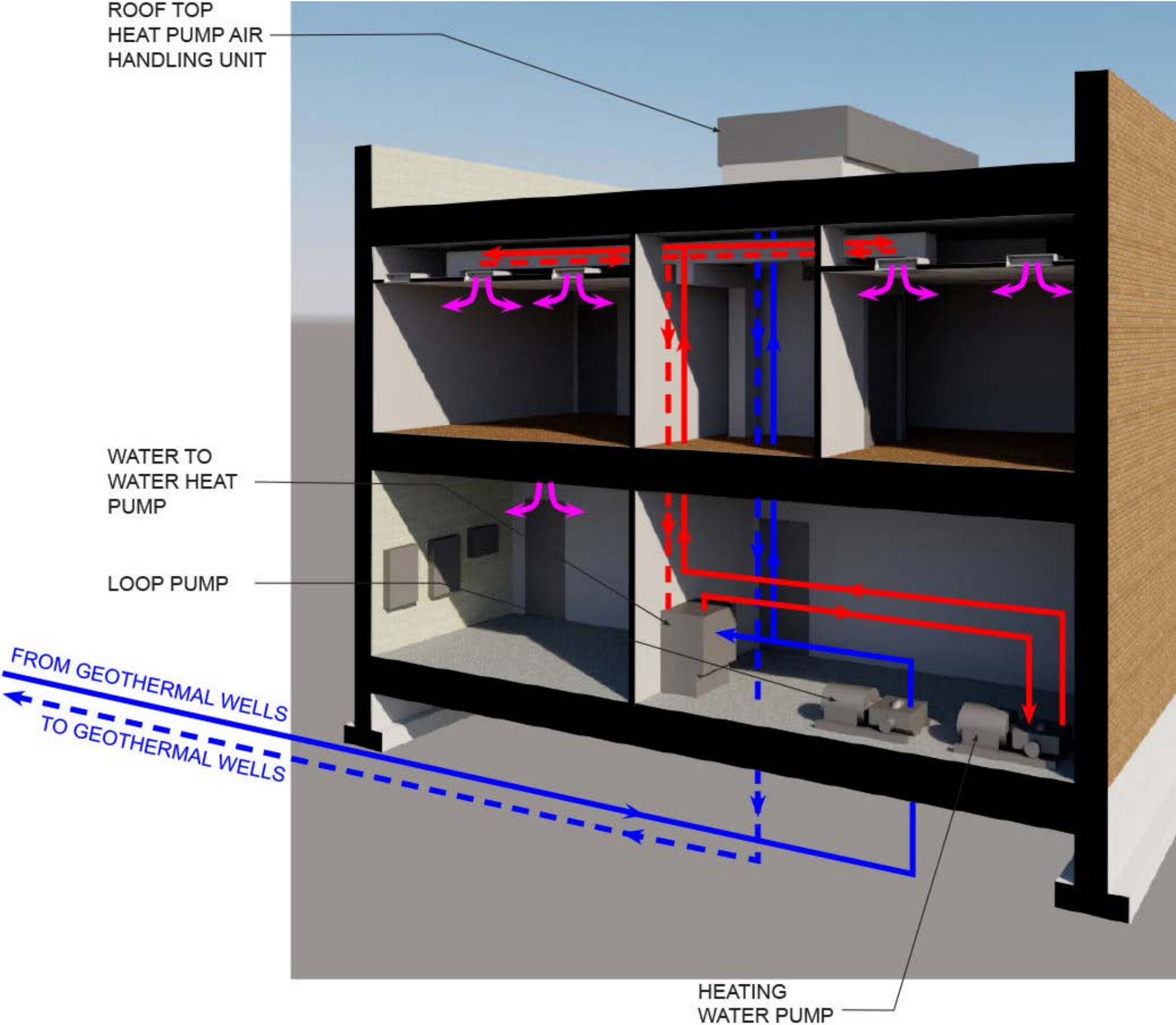
# Geothermal System

- THINK OF THE EARTH AS A BATTERY
- STORING HEAT FOR THE WINTER
- STORING COOLING FOR THE SUMMER





# Geothermal System





# PVs

- ✓ 638 photovoltaic panels
- ✓ Generation: 275.2 MWh of power annually
- ✓ Provides some weather protection for squad and personal vehicles





# Photovoltaic Panels





# Energy Performance

01/04/22

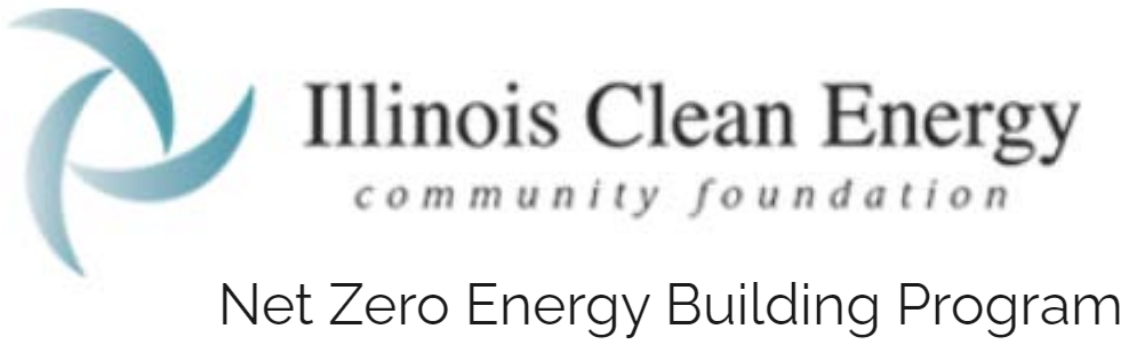
**Instructions:**

Fill out the green and white cells as they pertain to the project. Customize production and demand sources as needed.

Energy													Project Name: <b>Countryside City Hall and Police Department</b>	
Net Positive Energy Production and Demand Table														
Performance Period	Performance Month	1	2	3	4	5	6	7	8	9	10	11	12	Total
	Monthly period (should match raw billing or meter data)	03/01/21-03/31/21	04/01/21-04/30/21	05/01/21-05/31/21	06/01/21-06/30/21	07/01/21-07/31/21	08/01/21-08/31/21	09/01/21-09/30/21	10/01/21-10/31/21	11/01/21-11/30/21	12/01/21-12/31/21	01/01/22-01/31/23	02/01/22-02/28/22	
Energy Performance	Electricity received from grid, kwh	1848	0	0	0	0	0	0	441	12094	20897	35450	21400	92130
	Electricity provided to grid, kwh	0	9837	16219	19374	18186	17438	13777	0	0	0	0	0	94830
	<b>Net usage or generation (negative # = net positive)</b>	<b>1848</b>	<b>- 9837</b>	<b>- 16219</b>	<b>- 19374</b>	<b>- 18186</b>	<b>- 17438</b>	<b>- 13777</b>	<b>441</b>	<b>12094</b>	<b>20897</b>	<b>35450</b>	<b>21400</b>	<b>-2700</b>



# Certifications





# Electrification – THE BIG PICTURE

## FUTURE GRID



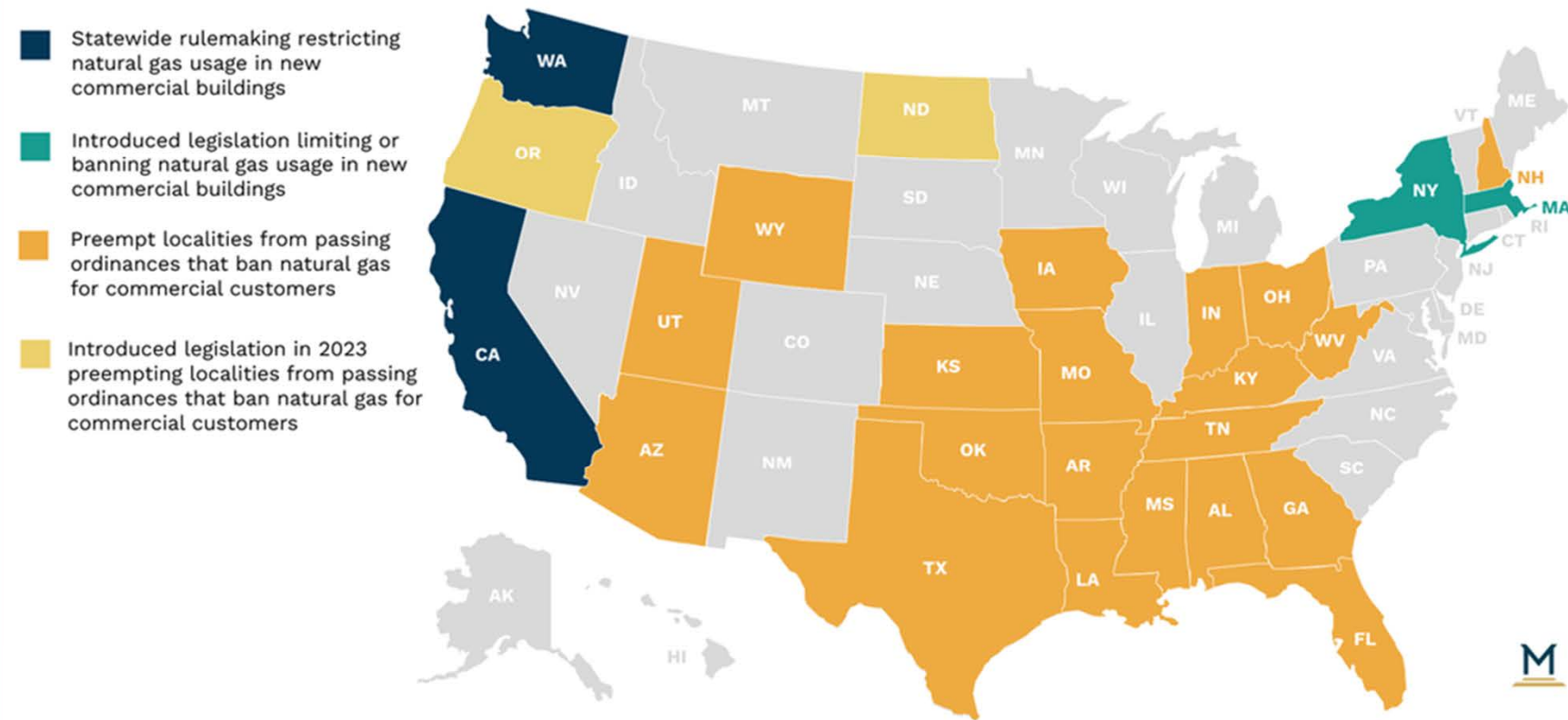


# Electrification

## DRIVERS

- **Legislative Policy**
- Codes and Standards
- Federal Funding
- ESG Initiatives
- Progressivism
- Economics
- Technology

### Natural Gas Bans Impacting Commercial Buildings



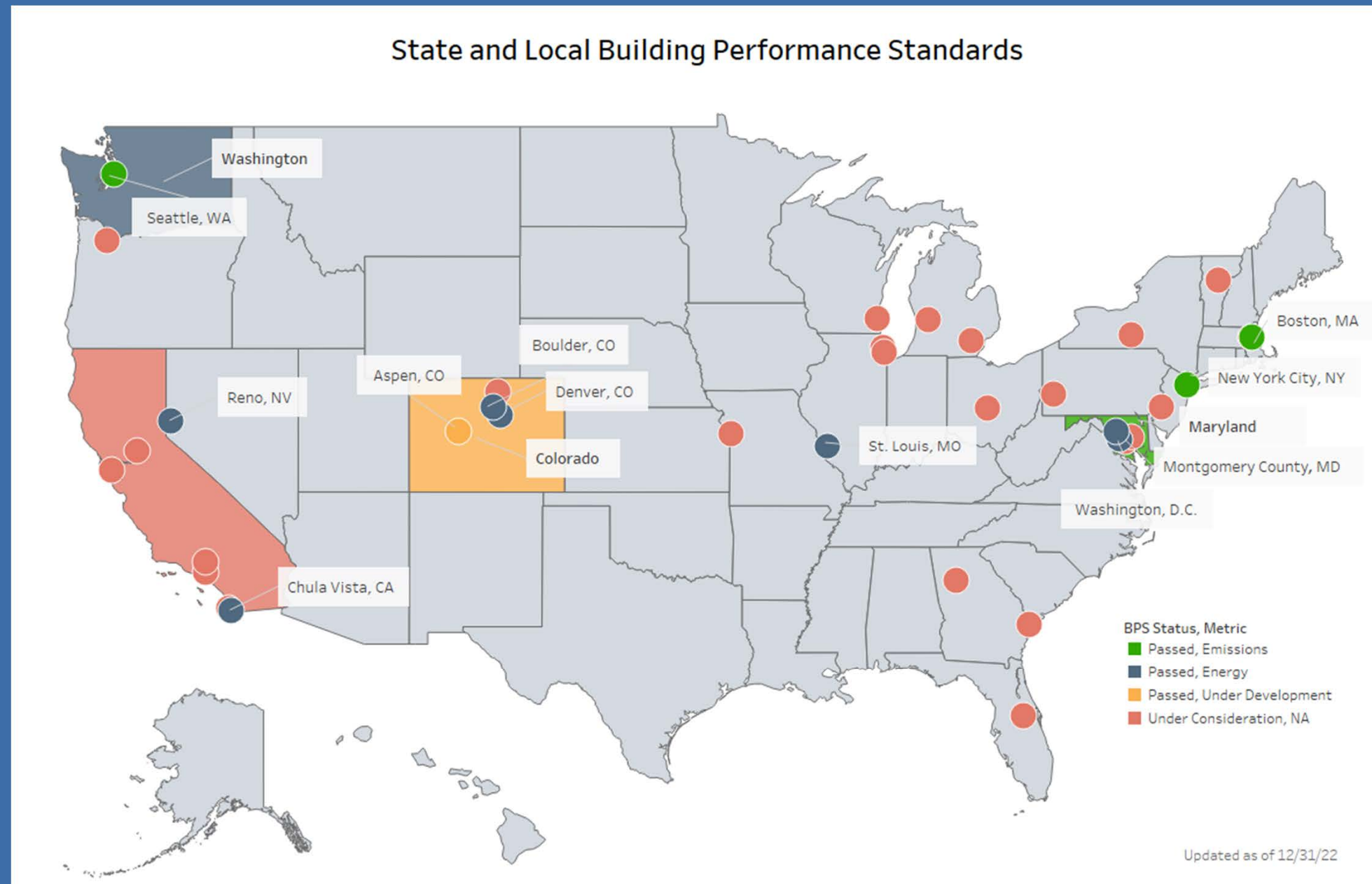
Source: MultiState. Data as of January 24, 2023



# Electrification

## DRIVERS

- Legislative Policy
- **Codes and Standards**
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Source: <https://public.tableau.com/app/profile/doebecp/viz/BuildingPerformanceStandards/BuildingPerformanceStandards>

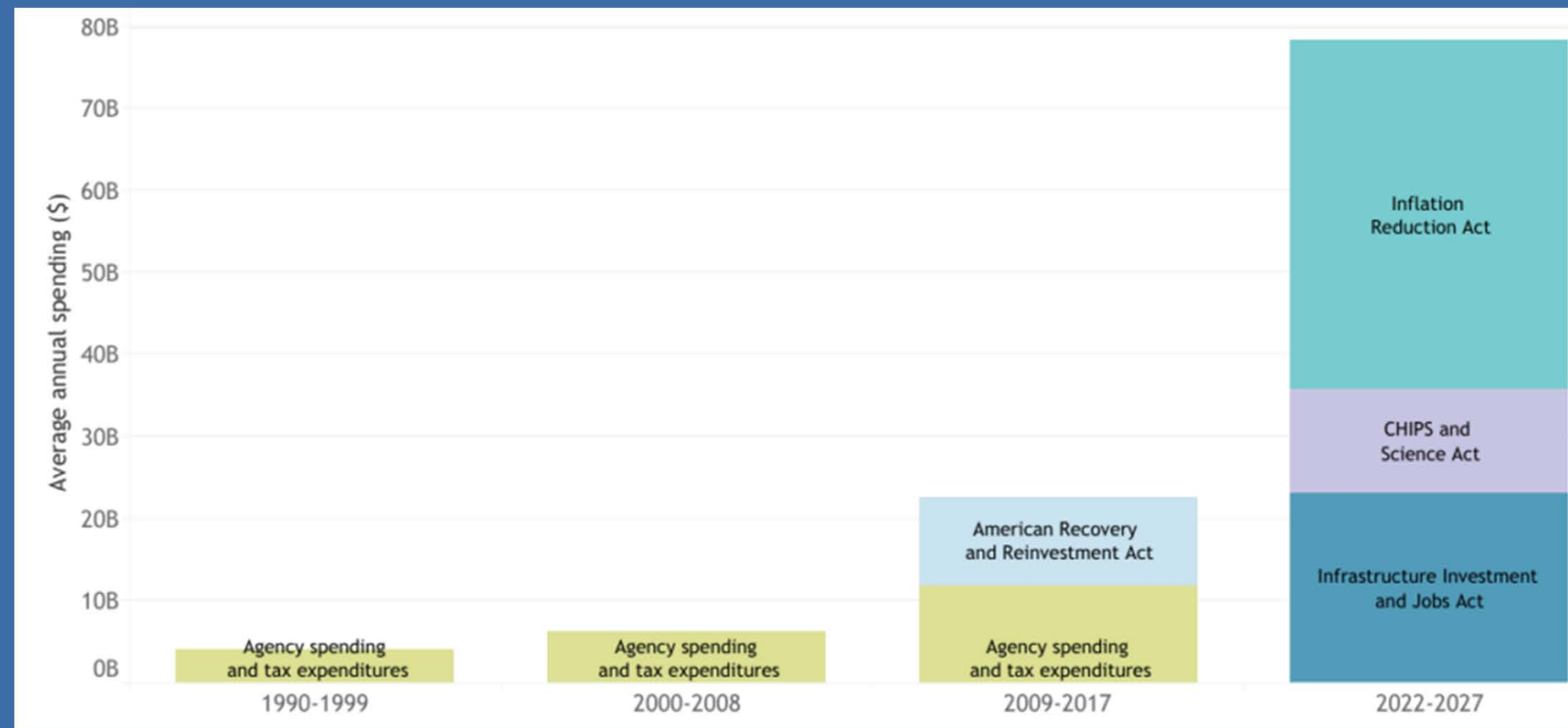


# Electrification

## DRIVERS

- Legislative Policy
- Codes and Standards
- **Federal Funding**
- ESG initiatives
- Progressivism
- Economics
- Technology

### Historical Federal Investment in Clean Energy Technologies



Source: <https://rmi.org/climate-innovation-investment-and-industrial-policy/>

# Funding Opportunities

## UPDATES TO SECTION 48 ENERGY INVESTMENT TAX CREDIT

- Historically used for solar, microturbines, geothermal, CHP
- Expanded to include thermal energy storage property
- Electrochromic glass and Microgrid controllers
- Direct pay option for non-taxable entities
- Increased credit value of up to 50% of the cost for energy property projects



### Investment Tax Credit for Energy Property

**Federal Agency:** Department of the Treasury

**IRA Statutory Location:** 13102

**Tax Code Location:** 26 U.S. Code § 48

**Tax Provision Description:** Provides a tax credit for investment in renewable energy projects.

**Period of Availability:** Projects beginning construction before 1/1/25. For geothermal heat property, the base investment tax credit is 6% for the first 10 years, scaling down to 5.2% in 2033 and 4.4% in 2034.

**Tax Mechanism:** Investment tax credit

**New or Modified Provision:** Modified and extended to include standalone energy storage with capacity of at least 5 kWh, biogas, microgrid controllers (20MW or less), and interconnection property for small projects (5MW or less). Value of the credit tied to prevailing wage and registered apprenticeship requirements.

**Eligible Recipients:** Fuel cell, solar, geothermal, small wind, energy storage, biogas, microgrid controllers, and combined heat and power properties. For solar, includes (1) equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat, and (2) equipment that uses solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight or electrochromic glass that uses electricity to change its light transmittance properties in order to heat or cool a structure.

**Tribal Eligibility:** Yes

**Base Credit Amount:** 6% of qualified investment (basis of energy property)

**Bonus Credit Amount:** Credit is increased by 5 times for projects meeting prevailing wage and registered apprenticeship requirements. Initial guidance on the labor provisions is available [here](#). Credit is increased by up to 10 percentage points for projects meeting certain domestic content requirements for steel, iron, and manufactured products. Credit is increased by up to 10 percentage points if located in an energy community.

**Direct Pay Eligibility:** Yes, for tax-exempt organizations; states; political subdivisions; the Tennessee Valley Authority; Indian Tribal governments; Alaska Native Corporations; and rural electricity co-ops.

**Transferability:** Yes

**Stackability:** Credit reduced for tax-exempt bonds with similar rules as section 45(b)(3).



# Funding Opportunities

## OBTAINING TAX CREDIT

<b>Form 3468</b>	<b>Investment Credit</b>	OMB No. 1545-0155
Department of the Treasury Internal Revenue Service	Attach to your tax return. Go to <a href="http://www.irs.gov/Form3468">www.irs.gov/Form3468</a> for instructions and the latest information.	<b>2022</b> Attachment Sequence No. 174
Name(s) shown on return		Identifying number

**Part I Information Regarding the Election To Treat the Lessee as the Purchaser of Investment Credit Property**  
If you are claiming the investment credit as a lessee based on a section 48(d) (as in effect on November 4, 1990) election, provide the following information. If you acquired more than one property as a lessee, attach a statement showing the information below.

1 Name of lessor: \_\_\_\_\_  
 2 Address of lessor: \_\_\_\_\_  
 3 Description of property: \_\_\_\_\_  
 4 Amount for which you were treated as having acquired the property . . . . . \$ \_\_\_\_\_

**Part II Qualifying Advanced Coal Project Credit, Qualifying Gasification Project Credit, Qualifying Advanced Energy Project Credit, and Advanced Manufacturing Investment Credit**

<b>12 Energy credit:</b>		
a Basis of property using geothermal energy placed in service during the tax year. See instructions . . . . .	\$ _____ × 30% (0.30)	<b>12a</b> _____
b Basis of property using solar illumination or solar energy placed in service during the tax year that is attributable to periods after _____		
<b>Geothermal heat pump systems</b> (see instructions):		
cc Basis of property placed in service during the tax year. See instructions. For property placed in service after 2022, multiply by 30% instead of 10% . . . . .	\$ _____ × 10% (0.10)	<b>12cc</b> _____
<b>Qualified investment credit facility property</b> (see instructions):		
dd Basis of property placed in service during the tax year . . . . .	\$ _____ × 30% (0.30)	<b>12dd</b> _____
ee Reserved for future use . . . . .		<b>12ee</b> _____
ff Reserved for future use . . . . .		<b>12ff</b> _____
gg Reserved for future use . . . . .		<b>12gg</b> _____
hh Other energy credits and special adjustments (see instructions) . . . . .		<b>12hh</b> _____
<b>13</b> Enter the applicable unused investment credit from cooperatives (see instructions) . . . . .		<b>13</b> _____
<b>14</b> Combine lines 11e, 11f, 11g, 12a, 12b, 12c, 12g, 12j, 12m, 12s, 12v, 12x, 12y, 12z, 12bb, 12cc, 12dd, 12hh, and 13. Report this amount on Form 3800, Part III, line 4a . . . . .		<b>14</b> _____

Form **3468** (2022)



**Thank you**

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Jonathan Tallman, AIA, NCARB

[jtallman@dewberry.com](mailto:jtallman@dewberry.com)