Dewberry

Need Funds for Campus Decarbonization Projects? Here to Help!

ICCCFO Fall Conference

October 3, 2024

Introductions

Jenni Betancourt
AIA, WELL AP, LEED AP BD+C, GGP, NCARB

Associate Principal,
Director of Sustainability

David Evers
PE, CEM, LEED AP

Vice President,
Business Unit Manager

2,500+
EMPLOYEES

60
LOCATIONS
nationwide

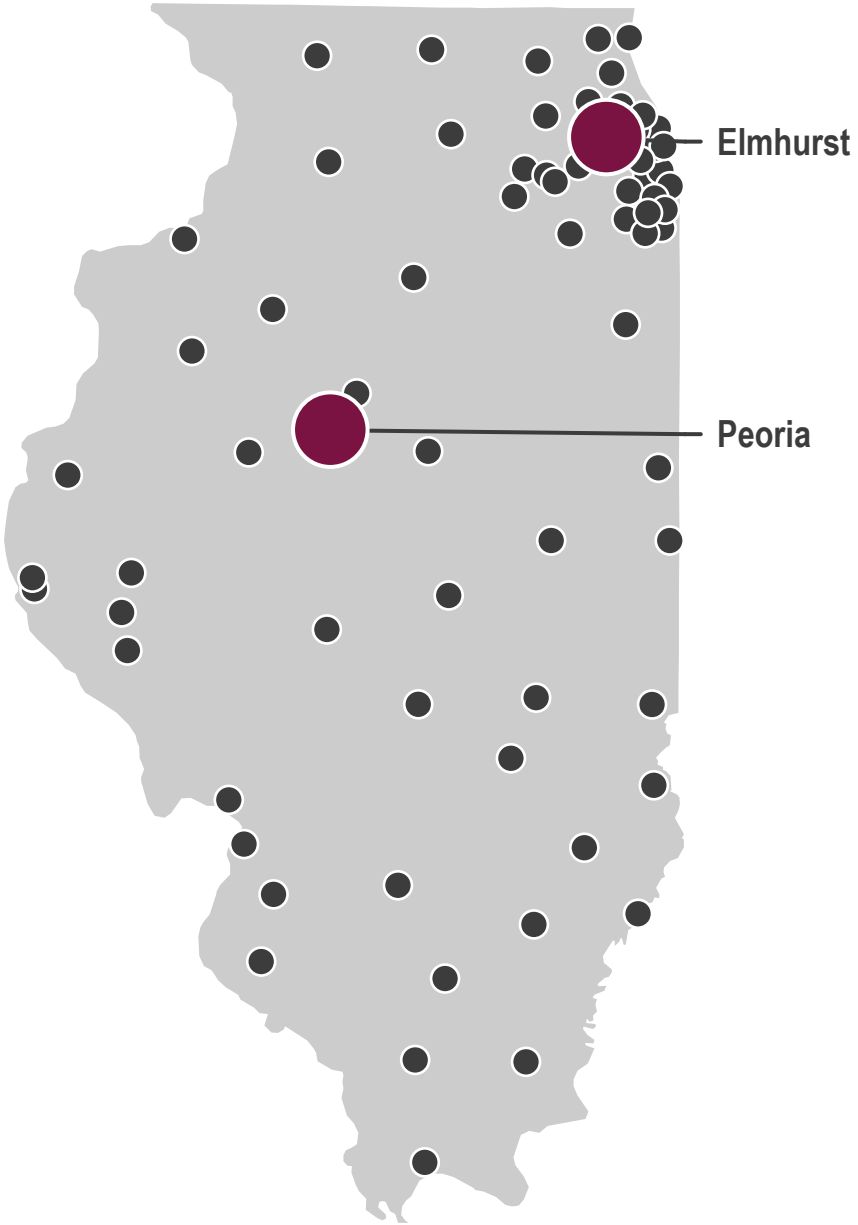
$711.45
MILLION
in 2023 revenue

65+
YEARS
helping clients build
and shape communities

Dewberry

Higher Education Experience

- **70+** community colleges in Illinois



Higher Education Experience

- **70+** community colleges in Illinois
- **25+** Higher Ed clients

Our clients with the most projects:

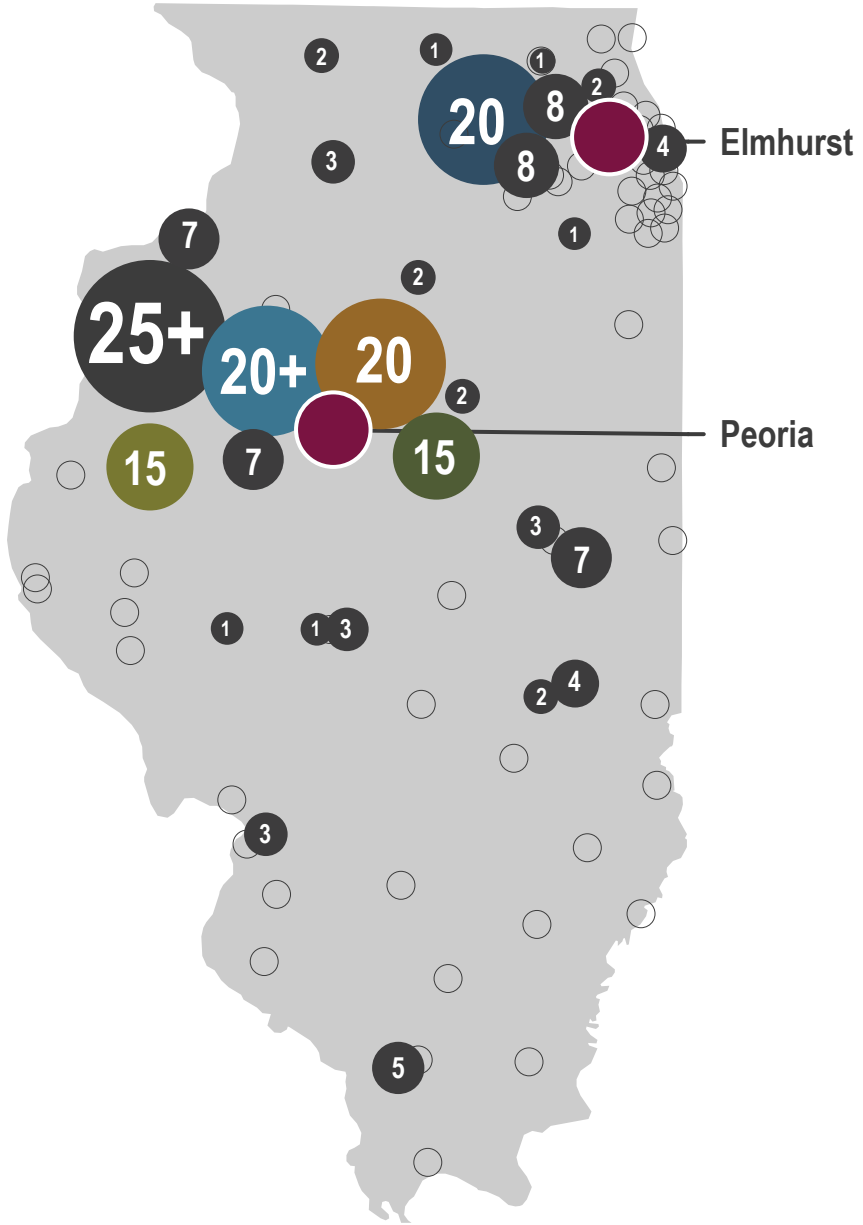
20 Elgin Community College

20+ Bradley University

20 Illinois Central College

15 Illinois State University

15 Western Illinois University



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Agenda

- What is Decarbonization and Why?
- Strategies to Achieve Decarbonization
- Funding Opportunities
- Case Study Examples
- Campus Approach to Decarbonization

What is Decarbonization?

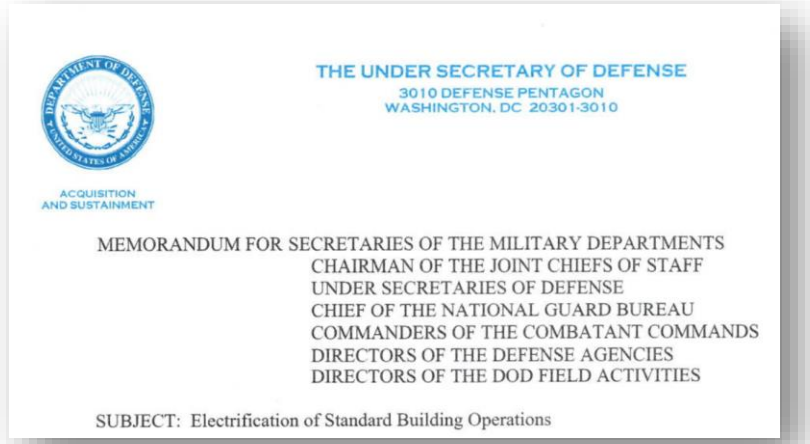
What is Decarbonization?

- Decarbonization refers to practices or policies that reduce GHG emissions (CO_2 equivalent)
- Practices:
  - ✓ Efficiency
  - ✓ Electrification
  - ✓ Clean Energy (Renewables, Energy Storage)

American Water Works Association
Dedicated to the World's Most Vital Resource

ASHRAE
Shaping Tomorrow's Built Environment Today

AIA



THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION AND SUSTAINMENT

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
CHIEF OF THE NATIONAL GUARD BUREAU
COMMANDERS OF THE COMBATANT COMMANDS
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Electrification of Standard Building Operations

INTERNATIONAL DISTRICT ENERGY ASSOCIATION

APPA Leadership in Educational Facilities

BOMA International

IFMA

What are the market conditions / drivers for Decarbonization?

- **Legislative Policy and Climate Goals – The desire is there**
  - Electrification mandates
  - Carbon commitments
- **Economics/Funding – The money is behind it**
  - Economics of the technologies (e.g. solar PV) have become attractive
  - Federal Funding at Historic Levels (e.g. IRA, BIL)
- **Codes and Standards – Regulatory compliance is mandating it**
  - IECC
  - Building Performance Standards, Benchmarking Ordinances

Decarbonization Design Strategies

- Energy Efficiency
- Building Electrification
- Renewable Energy
- Energy Storage
- Building-Grid Integration
- Refrigerant Management

But Why Electrify?

Electrification – THE BIG PICTURE

GRID EMISSIONS

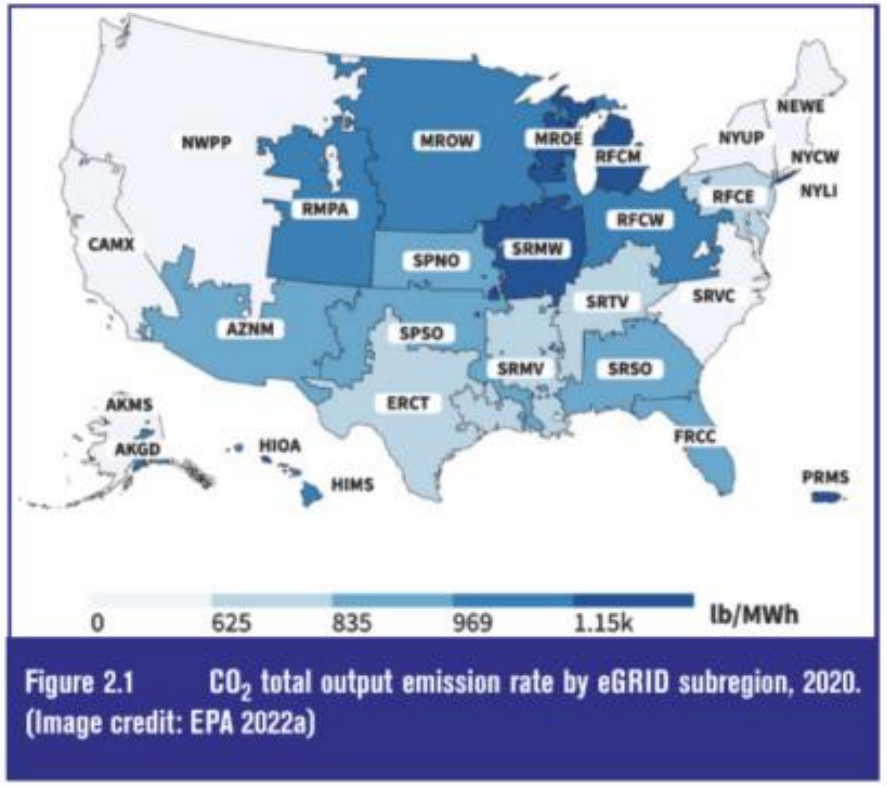


Figure 2.1 CO_2 total output emission rate by eGRID subregion, 2020. (Image credit: EPA 2022a)

Our Commitment

Did you know?

- PNM produces 55% carbon-free electricity today and we plan to make that 100% carbon-free energy
- Since 2007, our energy efficiency programs and reduced use at power plants have saved New Mexico more than 1.5 BILLION gallons of water. That's enough to fill 30 million bathtubs!
- Over the next 20 years, PNM will avoid an added 1 MILLION metric tons of carbon dioxide through its energy efficiency and load management programs.

Will the Grid Support Electrification?

FUTURE GRID




Renewables and Storage are likely transitional strategies.
Long-term solution could be Nuclear/Micronuclear.

Efficient Electrification
DESIGN STRATEGIES

- Heat Pumps
- Thermal Energy Storage
- Renewables

Source: Trane

Efficient Electrification

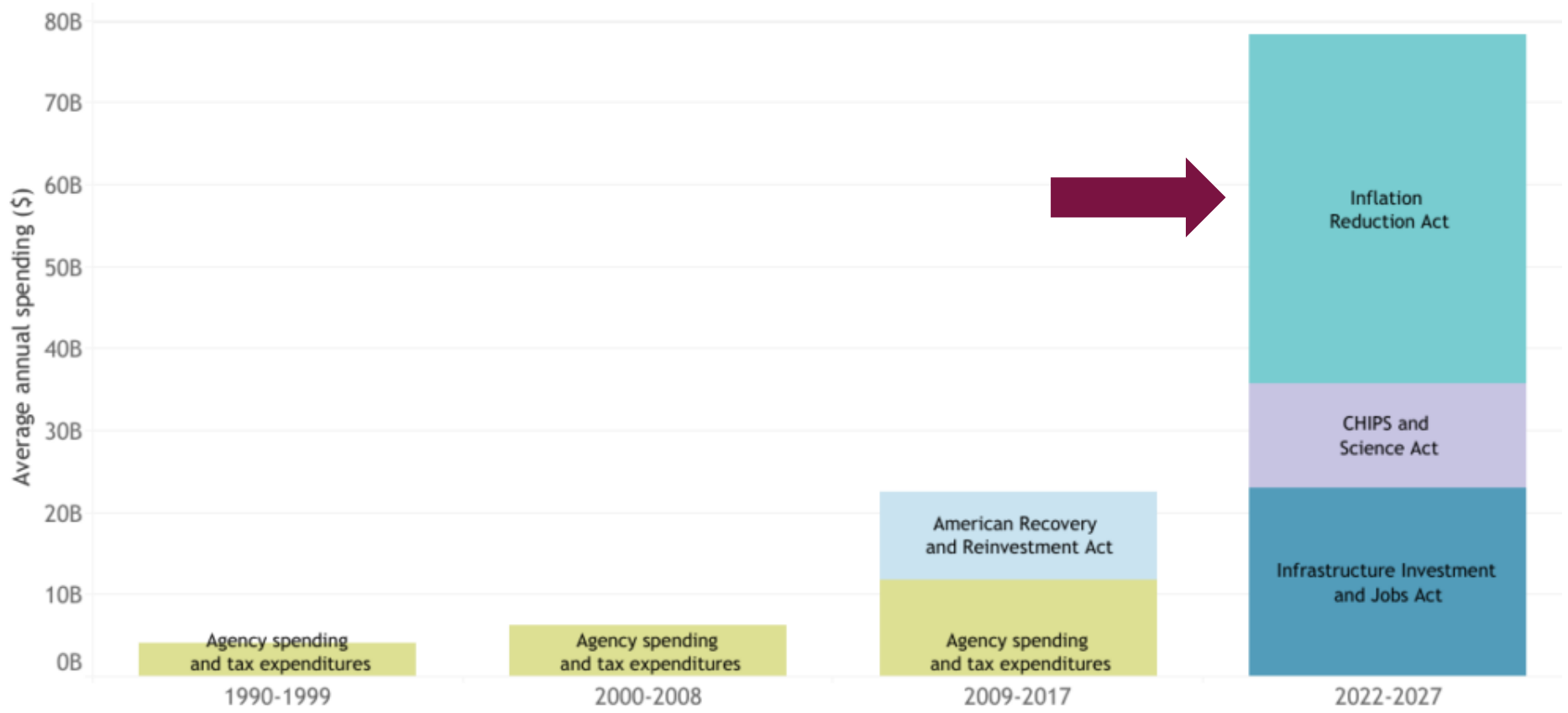
WHY HEAT PUMPS?

Gas Heat	• 1 BTU input = 0.9 BTU of heat output 90% efficiency
Electric Heat	• 1 BTU input = 1 BTU of heat output 100% efficiency
Heat Pumps	• 1 BTU input = 3 BTU of heat transferred Coefficient of Performance (COP) = 3.0

Funding Opportunities

Drivers
FEDERAL FUNDING

Historical Federal Investment in Clean Energy Technologies



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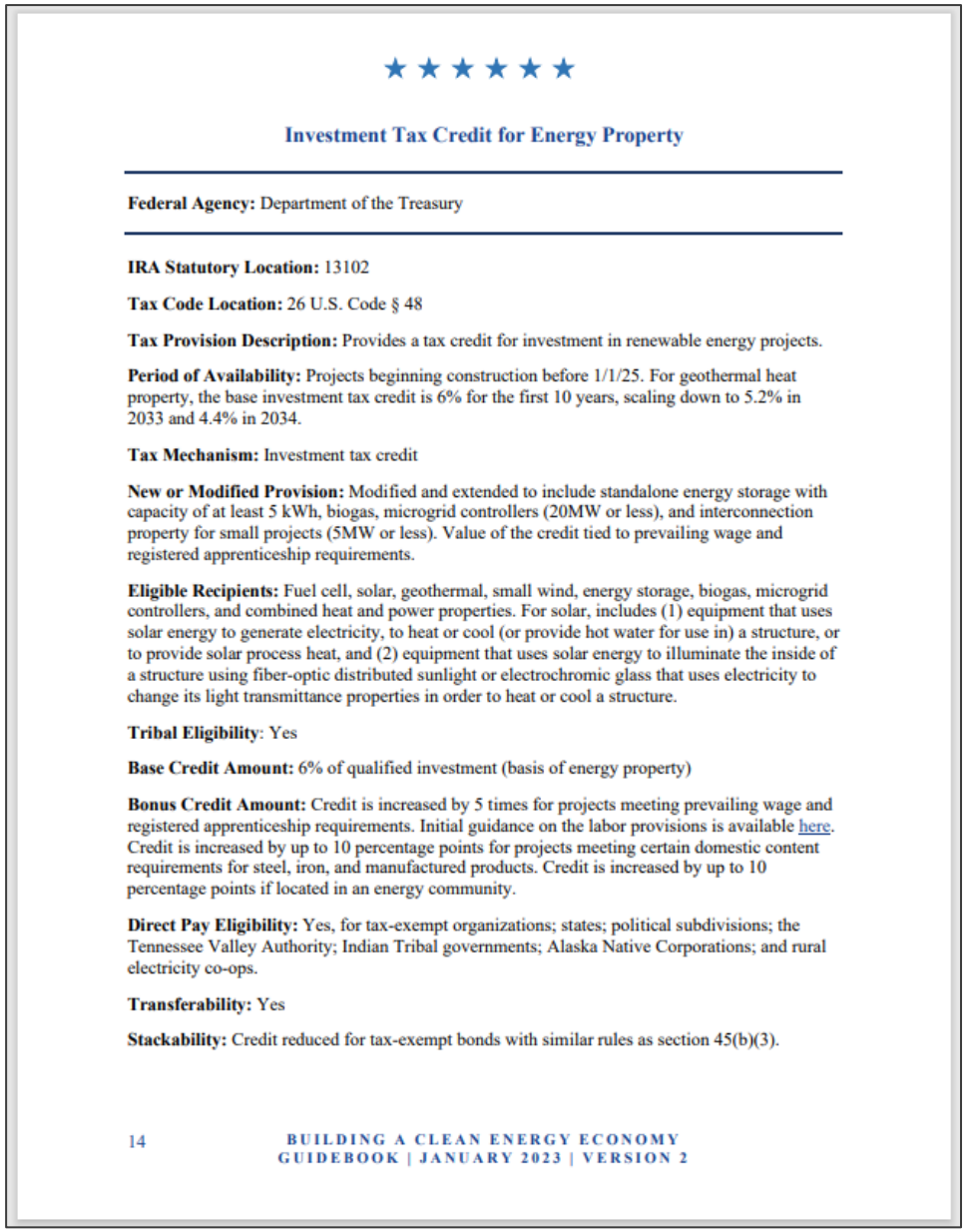
IRS § 48
ENERGY INVESTMENT TAX CREDIT

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



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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).

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Investment Tax Credit

IRS FORMULA

UPDATED INVESTMENT TAX CREDIT	
Base Rate	**6%**
Increased Credit Amount*	**5X multiplier**
Meets Domestic Content Requirements**	**10%**
Meets Energy Communities Requirements ***	**10%**
Total Potential Credit Value	**Up to 50% with Bonuses**

Meet Prevailing Wage and Apprenticeship Training Requirements

Made in USA (Buy American Act)

Either:

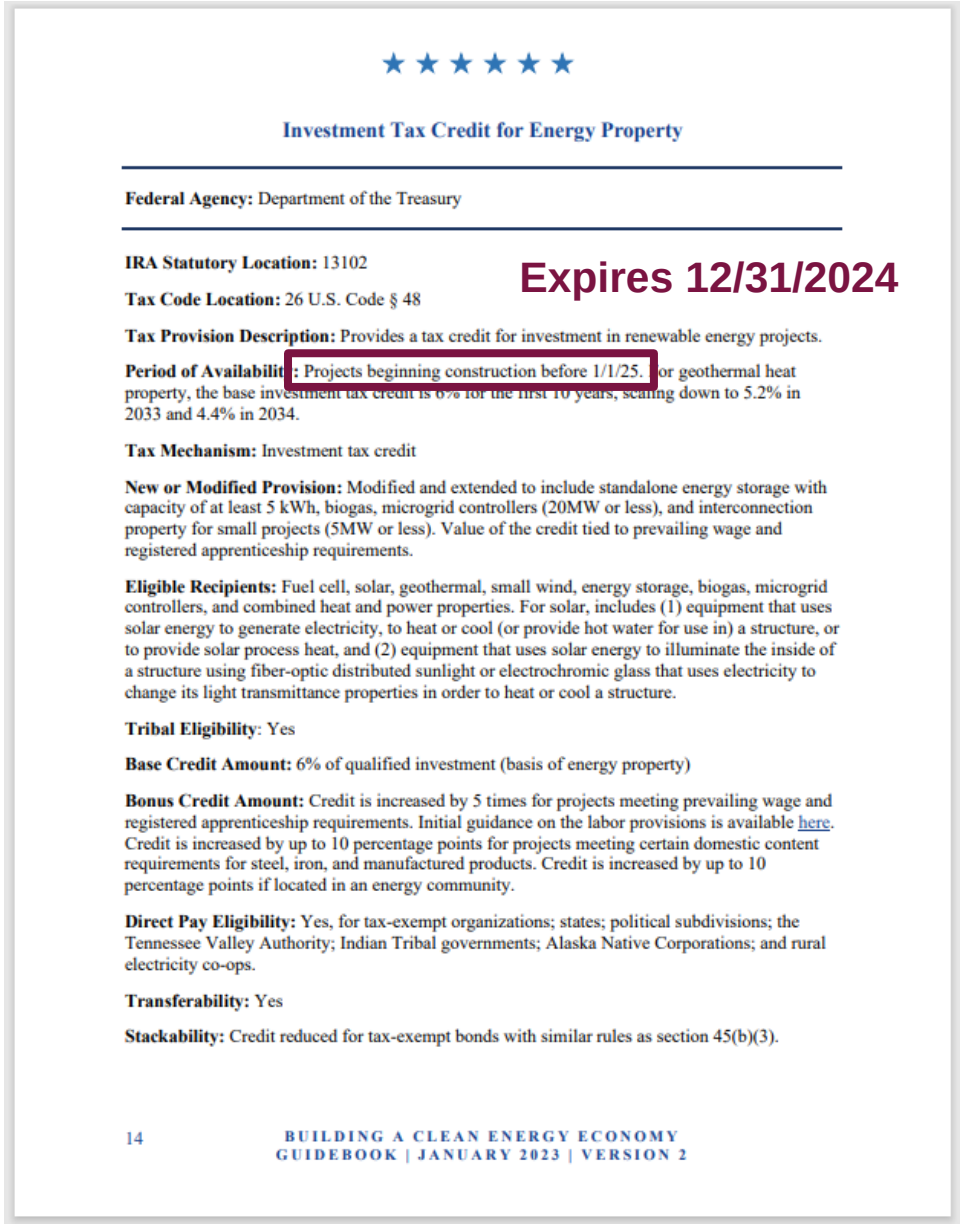
- Brownfield Site
- Above-average unemployment and either employment or tax revenue from coal, oil or natural gas, OR
- Census tracts containing mines or coal-fired generating units that have retired

Replacement for Expiring ITC

IRS § 48

PRE-2025

- Technology-specific: fuel cell, solar, geothermal, small wind, energy storage, biogas, microgrid controllers, combined heat and power
- Geothermal phasedown begins 2033
- Availability of credits for some technologies expires 12/31/2024



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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).

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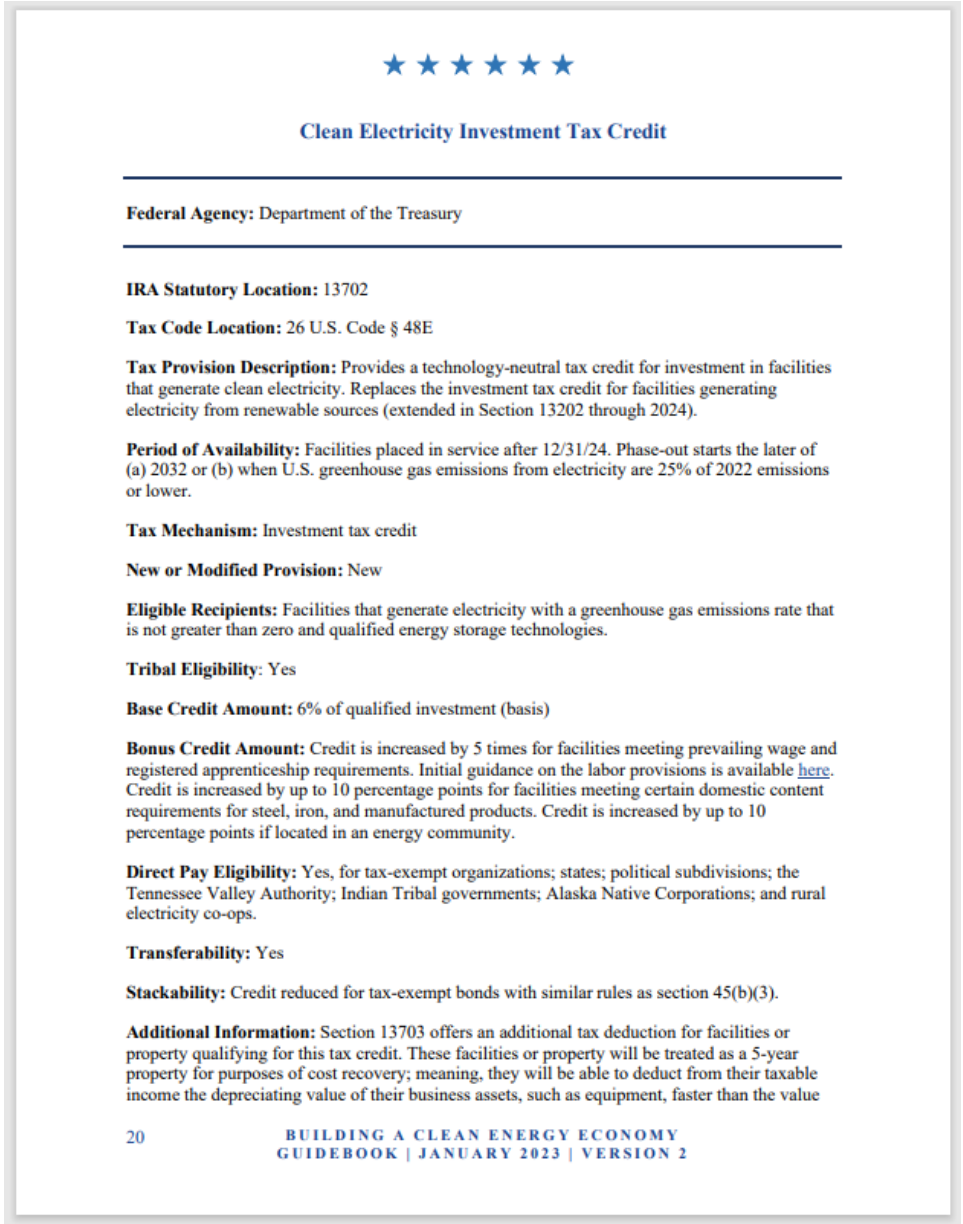
IRS § 48
CLEAN ELECTRICITY ITC

- Technology-neutral tax credit for investment in facilities that generate clean (net zero GHG emissions) electricity and qualified energy storage technologies
- Available until the later of:
  - 2032, or
  - 3-year phaseout once U.S. GHG emissions from electricity are reduced 25%
- NPRM posted 6/3/2024



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Clean Electricity Investment Tax Credit

Federal Agency: Department of the Treasury

IRA Statutory Location: 13702

Tax Code Location: 26 U.S. Code § 48E

Tax Provision Description: Provides a technology-neutral tax credit for investment in facilities that generate clean electricity. Replaces the investment tax credit for facilities generating electricity from renewable sources (extended in Section 13202 through 2024).

Period of Availability: Facilities placed in service after 12/31/24. Phase-out starts the later of (a) 2032 or (b) when U.S. greenhouse gas emissions from electricity are 25% of 2022 emissions or lower.

Tax Mechanism: Investment tax credit

New or Modified Provision: New

Eligible Recipients: Facilities that generate electricity with a greenhouse gas emissions rate that is not greater than zero and qualified energy storage technologies.

Tribal Eligibility: Yes

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

Bonus Credit Amount: Credit is increased by 5 times for facilities 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 facilities 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).

Additional Information: Section 13703 offers an additional tax deduction for facilities or property qualifying for this tax credit. These facilities or property will be treated as a 5-year property for purposes of cost recovery; meaning, they will be able to deduct from their taxable income the depreciating value of their business assets, such as equipment, faster than the value

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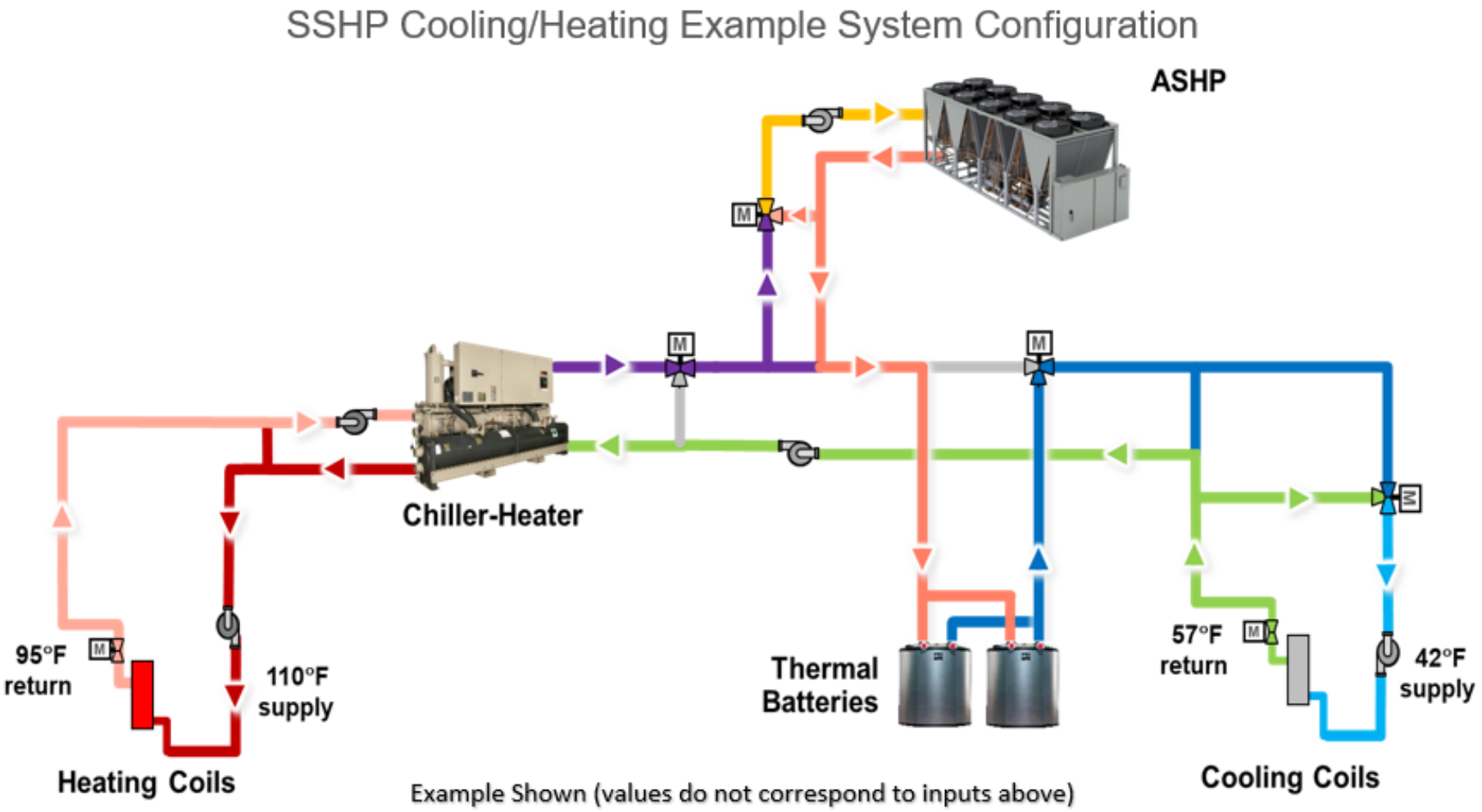
Project Examples

New Mexico Behavioral Health Institute

- New 123,000 SF Facility in Las Vegas, NM
- $109M Construction Cost
- Secure Detention and Treatment Facility

Heat Pumps with Ice Storage



Potential Tax Credit

CASE STUDY – NEW MEXICO BEHAVIORAL HEALTH INSTITUTE

123,000 SF New Building

$122M Construction Cost

- HVAC @ $112/SF = $13.8M
  - With **Thermal Energy Storage**, 50% of HVAC cost (hydronic portion) is considered Thermal Energy Storage Property = $6.9M
- Credit value @ 50% = **$3,470,000**
  (25% of total HVAC cost)

UPDATED INVESTMENT TAX CREDIT	
Base Rate	**6%**
Increased Credit Amount*	**5X multiplier**
Meets Domestic Content Requirements**	**10%**
Meets Energy Communities Requirements ***	**10%**
Total Potential Credit Value	**Up to 50% with Bonuses**

Countryside Municipal Complex

Countryside Municipal Complex

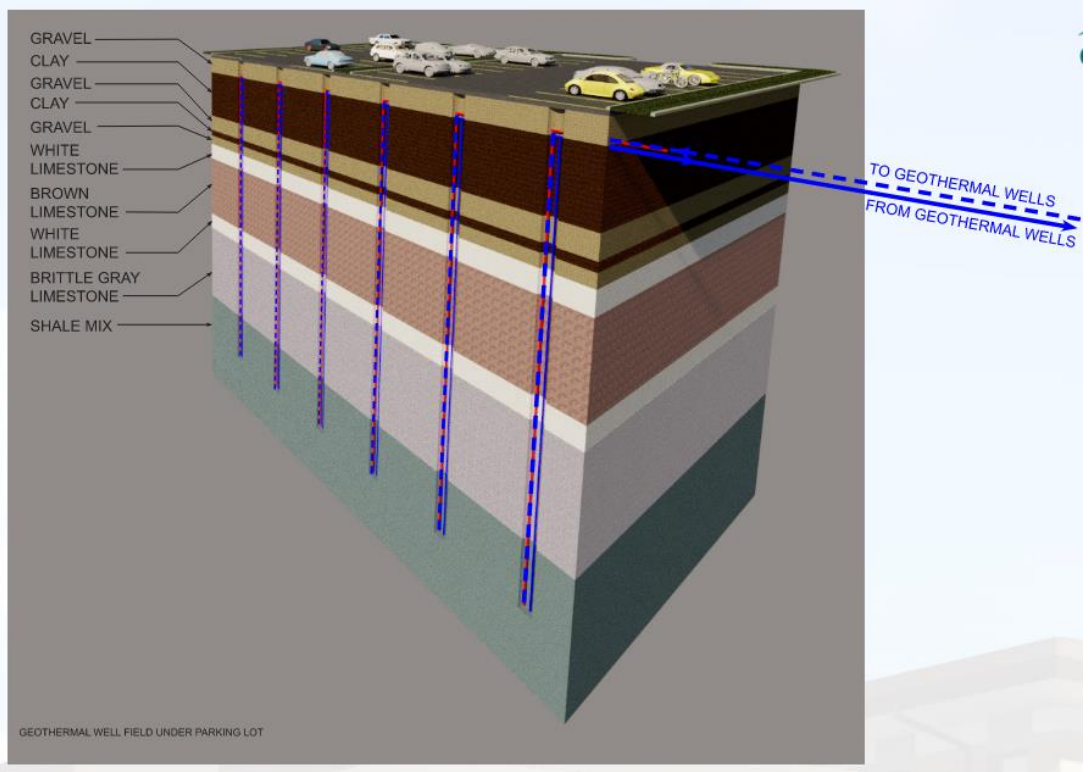
Building Envelope

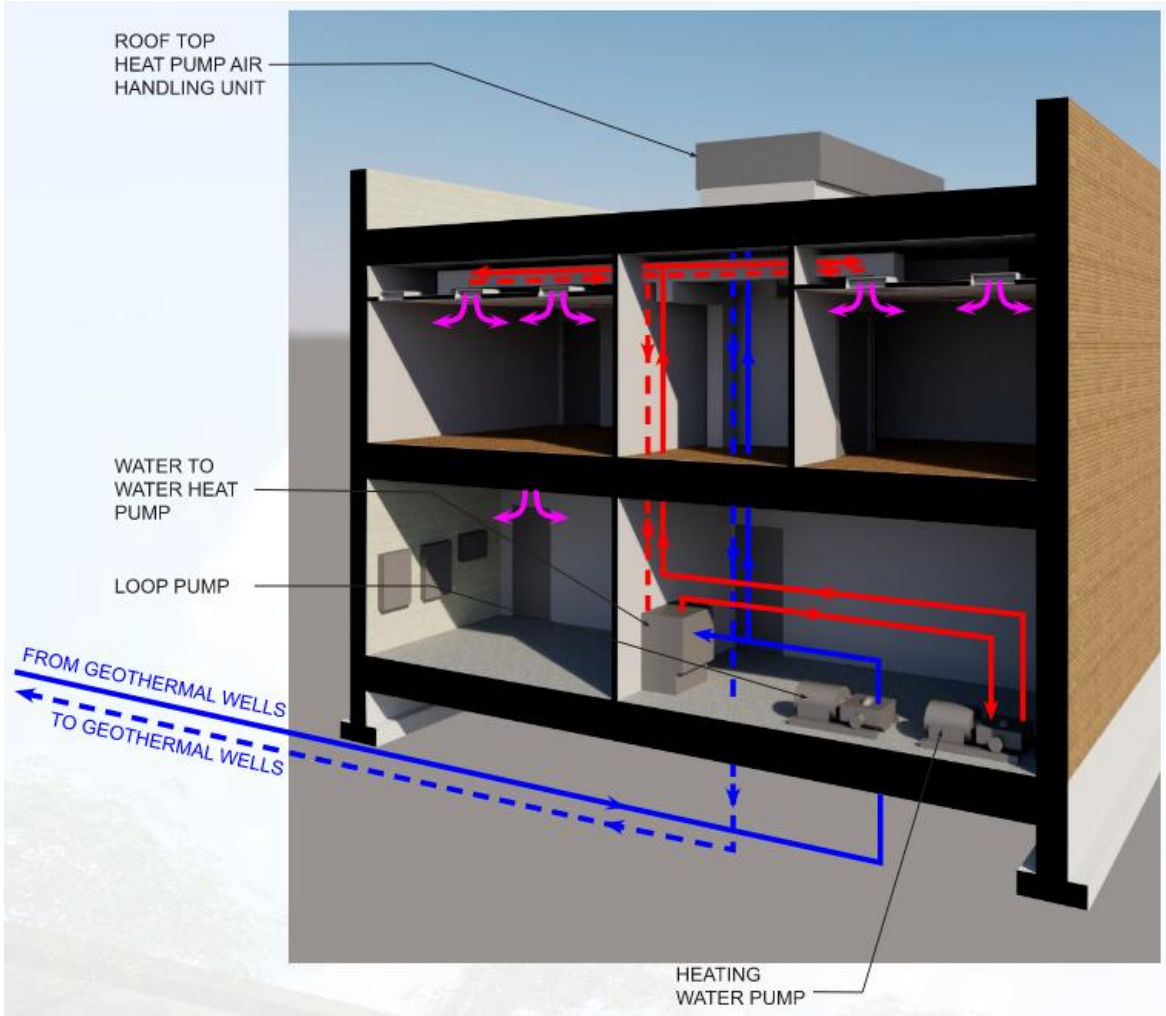
Geothermal HVAC

Solar PV

Countryside Municipal Complex

- Geothermal HVAC





Potential Tax Credit

CASE STUDY – NEW BUILDING W/GEOTHERMAL HVAC

100,000 SF New Building

$80M Construction Cost

Eligible Energy Property:

- Geothermal HVAC @ $100/SF = $10M
- 50% of Electrical Cost = $5M
- Energy Property Design Fee = $1M

TOTAL Energy Investment = $16M

Tax Credit value @ 50% = **$8,000,000**

(4X incremental HVAC cost)

UPDATED INVESTMENT TAX CREDIT	
Base Rate	**6%**
Increased Credit Amount*	**5X multiplier**
Meets Domestic Content Requirements**	**10%**
Meets Energy Communities Requirements ***	**10%**
Total Potential Credit Value	**Up to 50% with Bonuses**

Business Case for Decarbonization

- **100,000 SF Academic Building**

Option 1 – Conventional HVAC

$8.0M	HVAC Cost
$11.2M	Energy Cost (30 years)
$19.2M	**Total Cost**

Option 2 – Geothermal HVAC and Solar PV

$13.0M	HVAC & PV Cost
$0	Energy Cost (30 years)
($9.5M)	Federal Tax Credit
$3.5M	**Total Cost**

And Zero Emissions

Campus Approach to Decarbonization

What has Dewberry done in the Decarb space?

- ✓ Sustainability (LEED, WELL, etc.)
- ✓ Net Zero Energy Design
- ✓ Climate Action Plans
- ✓ GHG Inventories
- ✓ Energy Benchmarking and Assessment
- ✓ Asset Management
- ✓ Energy and Carbon Master Planning
- ✓ EV Charging
- ✓ Energy Retrofits
- ✓ Thermal Solutions
  - Electrified Heating Design/Retrofit
  - Geothermal
  - Thermal Energy Storage
- ✓ Electrification/Microgrid
  - Clean Energy Generation, Storage and Grid Interconnection

Where to Begin with Decarbonization?

- Planning and Implementation Process

Asset Management Approach

Q&A