



# A GUIDE TO FEDERAL TAX INCENTIVES

For Commercial Geothermal Heat Pumps

Up to **30%** Tax Credit

Up to **10%** Bonus Tax Credit – Domestic Content

Up to **10%** Bonus Tax Credit – Energy Community

**Accelerated 5-Year Depreciation** Deduction

Up to **\$5.00 Per Square** Foot Tax Deduction



# FEDERAL ENERGY INVESTMENT TAX INCENTIVES<sup>1</sup>

Section 48(a) of the Internal Revenue Code has provided tremendous benefit to the commercial geothermal heat pump industry. The law classifies geothermal heat pumps as energy property allowing building owners to claim an investment tax credit (ITC) for spending on the property as well as eligibility for accelerated depreciation. The recently enacted Inflation Reduction Act includes several provisions extending and enhancing these federal incentives. This guide provides a general overview of these updated incentives.

Table 1 – Tax Credit Value (2022 to 2035)			
Credit Category	<1 MW Output	>1 MW Output	>1 MW + Prevailing Wage & Apprenticeship
Base	30%	6%	30%
Domestic Content Bonus	+10%	+2%	+10%
Energy Community Bonus	+10%	+2%	+10%

Phase Down: 26% / 6% 2033, 22% / 4.4% 2034

## THE TAX CREDIT

The tax credit is available in the two-tier structure shown in table 1 consisting of a base credit of 6% and a bonus rate of five times the base rate equating to 30%. To achieve the bonus rate projects will need to have a thermal output of less than 1 MW (~284 tons) or meet prevailing wage and apprenticeship requirements. The law also includes two additional bonus credits, the domestic content bonus credit, and the energy community bonus credit. Both of which provided an additional 10% credit or 2% if the project is >1MW and does not meet the prevailing wage and apprenticeship requirements.

The credits are a percentage of the system cost basis, have no limit to the credit amount, and can be carried back one year or into future years if the credit exceeds the liability. The basis is generally the direct cost of the property and installation as well as the indirect costs such as permitting, engineering, electrical, plumbing, etc. The credit can be used to offset both income taxes and alternative minimum taxes (AMT). Claiming the credit is done via [IRS Form 3468](#).

### Prevailing Wage & Apprenticeship Requirements

In general, the prevailing wage requirements require that all employees, contractors and subcontractors involved in the construction and alteration, or repair of a project must be paid the applicable prevailing wage, as determined by the Secretary of Labor. In general, the apprenticeship requirements require that an applicable percentage of labor hours (10-15% depending on the year in which construction of a project begins) must be performed by apprentices. For further details see [Treasury Notice 2022-26108](#).

### Domestic Content Bonus

To be eligible for the domestic content bonus, 100% of any steel or iron that is a component of the facility must be produced in the U.S. and the adjusted percentage of the total cost of manufactured products must be attributed to components that are mined produced or manufactured in the U.S. The adjusted percentage varies based on when the project begins construction (40% prior to 2025 and 55% after 2026).

The adjusted percentage is determined by dividing the domestic manufactured products and components cost by the total manufactured product cost for the project. Manufactured products are deemed as a U.S. Manufactured Product if all the manufacturing process take place in the U.S. and all the project components are of U.S. origin. A product in which all the manufacturing process take place within the U.S., but a portion of the components are not of U.S. origin is considered a Non-U.S. Manufactured Product. Although, the components of U.S. origin of these types of Non-U.S. Manufactured Products are still able to contribute to the domestic content for the project. For further details see [Treasury Notice 2023-38](#).

## Energy Community Bonus

To be eligible for the energy community bonus energy property must be installed in an “energy community” defined as one of the following:

- A brownfield site
- A city with a given population employed in or tax revenues derived from the extraction, processing, transport, or storage of coal or natural gas with unemployment rates above the national average
- Census tract or a census tract that is adjoining a census tract in which a coal mine has closed after 1999 or a coal-fired electric generating unit was retired after 2009.

For further information on the energy community bonus see [Treasury Notice 2023-29](#) and the [DOE Energy Community Mapping Tool](#).

## ELIGIBILITY

The tax credit does not require a specific type or class of geothermal heat pump just simply that the heat pump is using the ground as a source or sink to heat or cool a building. This means the tax credit can be applicable to systems utilizing large central water to water heat pumps/chillers or small distributed indoor packaged water to water and water to air heat pumps. In summary eligibility requirements include:

- **Location:** The building must be located in the United States
- **Timeline:** Construction commences prior to Jan. 1st, 2035
- **Equipment:** Uses the ground/ground water as a heat source to heat a building or heat sink to cool a building
- **Entity:** Original use begins with the taxpayer (tax exempt entities eligible via direct pay)

## Hybrid Geothermal Systems – “Dual Use Equipment”

Often geothermal systems are hybrid type systems consisting of additional supplemental energy sources. In these types of systems, the equipment involved in carrying both forms of energy is classified as dual use equipment. This will likely be the heat pumps and equipment downstream of the heat pumps such as ductwork. To remain eligible for the credit, dual use equipment must obtain at least 75% of the annual energy input into the system from the geothermal deposits. This does not mean that 75% of the installed design capacity needs to be geothermal. Additional energy sources used solely for backup/emergency means does not qualify the system as dual use. This interpretation is based on the definition of energy property found in [I.R.C. 26 USC § 1.48-9 Definition of energy property](#).

## ELECTIVE PAY OPTION (DIRECT PAY)

Allows for direct payment rather than a credit against income tax to non-taxable entities. Applicable entities include:

- Any Tax-Exempt Organization (Schools, Charities, etc.)
- State and Local Governments and Political Subdivisions
- The Tennessee Valley Authority (TVA)
- Indian Tribal Governments
- Alaskan Native Corporations

These entities that qualify for the credit claim the credit by filing an annual tax return via [form 990-T](#).

## CREDIT TRANSFER (TRANSFERABILITY)

The transferability provisions provide means for entities that are subject to income taxes and who have earned the credit the option to sell the credit for cash to another unrelated taxpayer. All or a portion of the tax credit including the domestic content credit if eligible can be transferred. Note bonus credits cannot be transferred separately from the base credits.

## ENERGY PROPERTY ACCELERATED DEPRECIATION<sup>2</sup>

Under the Modified Accelerated Cost Recovery System of Sec. 168(e)(3)(B)(vi) of the Revenue Code, commercial geothermal heat pump systems are classified as a 5-year property meaning the cost basis of the property is eligible for depreciation on an accelerated MARCS basis. The cost basis must be reduced by one half of the energy tax credit. Energy property is also eligible for 100% first year special depreciation although this was introduced with the Tax Cuts and Jobs Act of 2017 and is set to phase down to 20% each year beginning in 2023 to 0% in 2027.

# 179D COMMERCIAL BUILDINGS ENERGY EFFICIENCY TAX DEDUCTION<sup>3</sup>

The 179D commercial buildings energy efficiency tax deduction is an additional incentive that can be claimed in combination with the energy investment tax credits. The 179D deduction has been in effect since January of 2006 and was made a permanent program as part of the Consolidated Appropriations Act of 2021. Most recently the Inflation Reduction Act revised the 179D deduction allowing for increased incentives for energy efficient commercial buildings.

## THE TAX DEDUCTION

The amount of the deduction is on a building square foot basis as shown in table 2. Qualifying properties must demonstrate a reduction in annual energy and power cost of 25% or greater compared to the most recent Standard 90.1 published by ASHRAE and not later than the date that is 4 years before the date the property is placed in service. The deduction amount increases for each percentage point above 25% up to 50%. Similar to the energy investment tax credit properties are eligible for an increased deduction amount if they meet prevailing wage and apprenticeship requirements.

Table 2: 179D Tax Deduction Beginning 2023			
Credit Category	Savings Requirement	Does Not Meet Wage & Appr. Req.	Meets Wage & Appr. Req.
Fully Qualifying Property	25%	\$0.50/ft <sup>2</sup> to \$1.00/ft <sup>2</sup> +\$0.02 per % increase	\$2.50/ft <sup>2</sup> to \$5.00/ft <sup>2</sup> +\$0.10 per % increase

## ELIGIBILITY

The deduction is primarily taken by the building owners. The Inflation Reduction Act has also made the deduction available to all tax-exempt entities as well (government property, schools, hospitals, churches, etc.). The deduction for these tax-exempt entities is passed on to those primarily responsible for the design (engineers, architects, contractors, etc.). Buildings are eligible to claim the credit every three years (four in some cases) for multiple energy efficiency upgrades.

A qualified 3rd party is required to use IRS approved energy modeling software to demonstrate the efficiency improvements. Qualified building simulation software includes:

QUALIFIED BUILDING SIMULATION SOFTWARE												
• Design Builder	• EnergyGauge	• Carrier's Hourly Analysis Program (HAP)	• TAS	• DeST	• Energy Plus	• IES Virtual Environment	• TRACE 3D Plus	• DOE-2.2	• eQUEST	• Open Studio w/ Energy Plus	• TRACE 700	• TRNSYS

## EXAMPLE - NEW CONSTRUCTION

A business spends \$2,000,000 to install a geothermal heat pump system in a brand-new building which they move into in the 1st quarter of 2024.

**Assumed Corporate Tax Rate (State + Federal):** 30%

**Building Size:** 150,000 sq. ft.

**179D Deduction:** \$5.00/sq. ft.

**Assumed Discount Rate:** 6%

	Year						
	0	1	2	3	4	5	6
GSHP Cost Basis							
	\$2,000,000						
30% Tax Credit		\$600,000					
10% Bonus Tax Credit		\$200,000					
Depreciation Deduction Benefit	\$168,000	\$124,800	\$ 74,880	\$52,848	\$52,848	\$6,624	
179D Deduction Benefit	\$225,000						
Total Tax Incentive	\$1,193,000	\$124,800	\$74,880	\$52,848	\$52,848	\$6,624	
<b>Net Present Value (NPV)</b>	<b><span style="color: green;">\$(614,565)</span></b>						
<b>Gross Tax Incentive Sum</b>	<b><span style="color: green;">\$1,505,000 (75% of original cost)</span></b>						

The NPV in this example demonstrates a true cost of \$614,565 in year 0 when accounting for the original cost, tax incentives, and the time value of money. Both the depreciation and 179D deduction benefits show the actual tax credit from the deduction after applying the assumed corporate tax rate.

## EXAMPLE - RETROFIT

A business that has owned their building for five years installed a \$400,000 geothermal heat pump system, removing boilers and putting in a ground loop. The system becomes operational in the 4th quarter of 2023.

**Assumed Corporate Tax Rate (State + Federal):** 30%

**Building Size:** 60,000 sq. ft.

**179D Deduction:** \$5.00/sq. ft.

**Assumed Discount Rate:** 6%

	Year						
	0	1	2	3	4	5	6
GSHP Cost Basis							
	\$400,000						
30% Tax Credit		\$120,000					
10% Bonus Tax Credit		\$40,000					
Depreciation Deduction Benefit	\$4,800	\$36,480	\$ 21,888	\$13,133	\$10,502	\$9,197	
179D Deduction Benefit	\$90,000						
Total Tax Incentive	\$254,800	\$36,480	\$21,888	\$13,133	\$10,502	\$9,197	
<b>Net Present Value (NPV)</b>	<b><span style="color: green;">\$(84,044)</span></b>						
<b>Gross Tax Incentive Sum</b>	<b><span style="color: green;">\$346,000 (87% of original cost)</span></b>						

The NPV in this example demonstrates a true cost of \$84,044 in year 0 when accounting for the original cost, tax incentives, and the time value of money. Both the depreciation and 179D deduction benefits show the actual tax credit from the deduction after applying the assumed corporate tax rate.



**Carrier Aquazone™ Water Source Heat Pumps**  
Available in sizes ranging from  $\frac{1}{2}$  ton to 30 tons



**Dedicated Outdoor Air Units**



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#### MORE INFORMATION

Database of U.S. State Incentives for Renewables & Efficiency  
Including Additional Local Incentives <https://www.dsireusa.org/>

Internal Revenue Code (IRC)  
<https://www.law.cornell.edu/uscode/text/26>

Latest Tax Forms and Instructions  
[www.irs.gov](http://www.irs.gov)

#### SOURCES

1. I.R.C. 26 USC § 48
2. I.R.C. 26 USC § 168
3. I.R.C. 26 USC § 179D



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