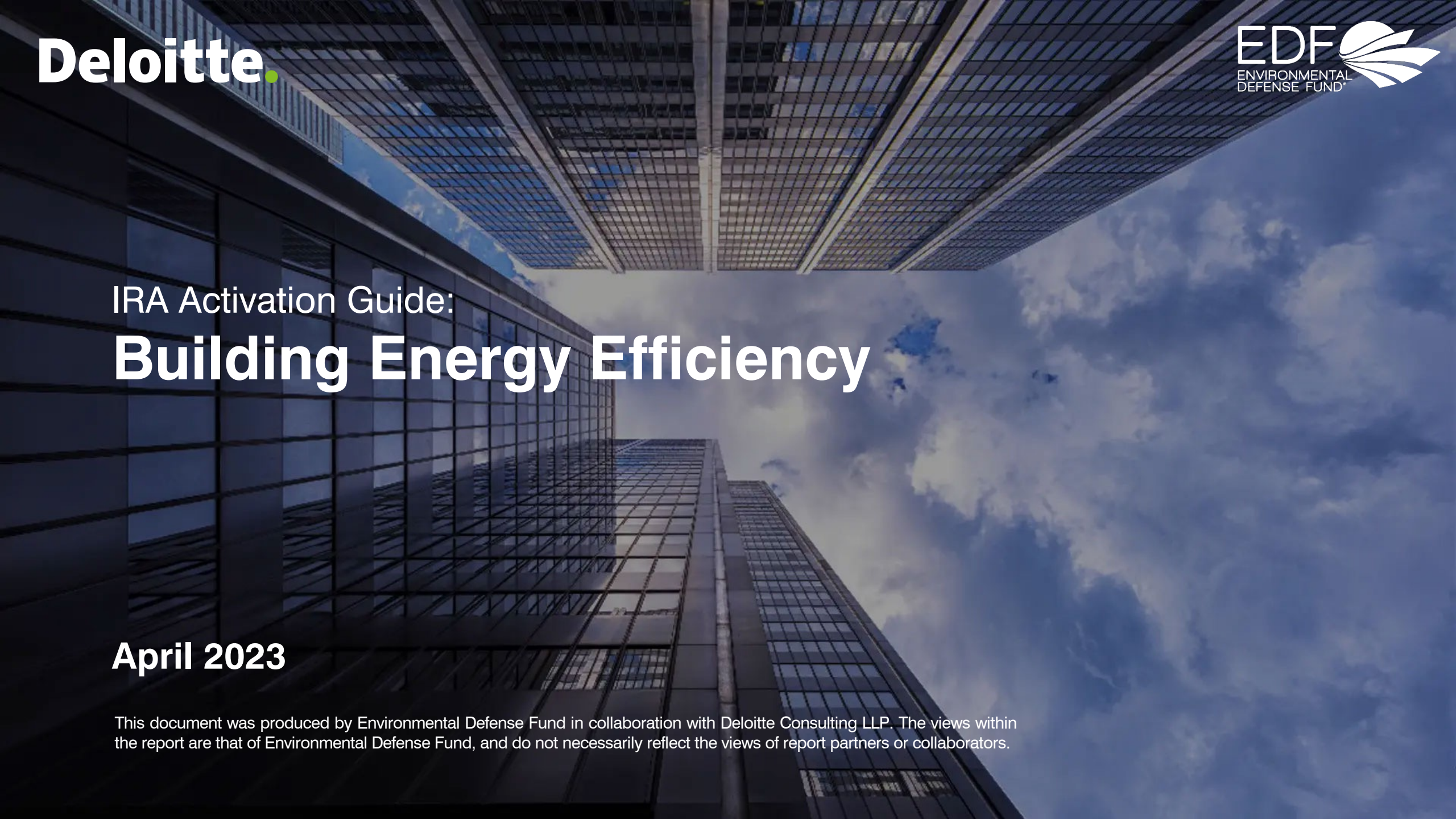

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EDF ENVIRONMENTAL DEFENSE FUND

IRA Activation Guide:

Building Energy Efficiency

April 2023

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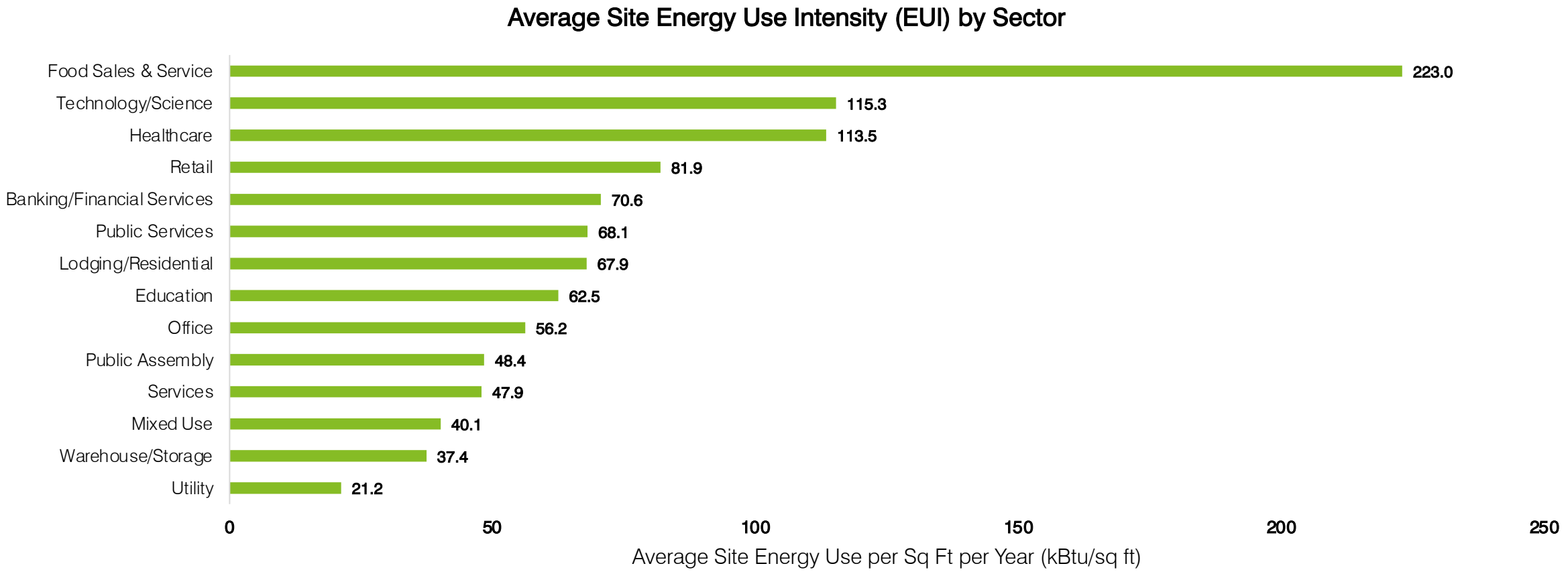
Companies with high energy footprints are most likely to benefit from the IRA's credits and deductions for energy saving building technologies



Companies in these industries tend to have high building energy intensities, but any company that owns or has a long-term lease for a commercial building has an opportunity to benefit from the IRA

Sources: Deloitte Analysis, Energy Star

§179D and §48/48E are the key provisions to know for commercial building energy efficiency, offering up to $5/sq ft deduction for energy reductions of 25%+ and up to 30% for heat pumps

	§179D: Energy Efficient Commercial Buildings Deduction	§48/§48E: Business Energy Investment Tax Credit (ITC)
PROVISION	Provides a tax deduction for energy efficiency improvements to commercial buildings, such as interior lighting; heating, cooling, ventilation, and hot water; and building envelope	Provides a tax credit of up to 30% of the upfront cost of a "qualifying energy property" such as a solar, wind electricity generation and standalone battery storage projects
KEY TAKEAWAYS	• Lowers the qualification threshold from 50% energy efficiency improvement to 25% • Increases deduction amount from $1.80/sq ft to sliding scale of $2.50-$5.00 based on % reduction in energy use, provided prevailing wage and apprenticeship requirements are met • If prevailing wage and apprenticeship requirements are not met, deduction amount is a sliding scale of $0.50-$1.00/sq ft • Makes deduction permanent and removes lifetime limit • Now eligible for designers of all tax-exempt facilities • Likely to be more commonly taken as a deduction due to phase out of bonus depreciation from 2023-2026	• Covers a variety of renewable energy technologies such as geothermal heat pump projects for commercial buildings • Employs a two-tier structure with a base rate of 6% and a bonus rate of 30% for either (1) meeting prevailing wage and apprenticeship requirements, or (2) producing a maximum output of <1 megawatt of electrical or thermal energy • Offers an additional 10% for using domestic steel, iron, and manufactured products, and another 10% for technologies installed in "energy communities" • Can be stacked on top of §179D deductions

Note: Companies can also take advantage of the §30C tax credit for alternative fuel fueling property by installing clean vehicle charging in their buildings. See IRA Fleet Electrification Activation Guide for more details.
Unless otherwise specified, all references to "Section" in this presentation are to the Internal Revenue Code of 1986, as amended (IRC).
Sources: Deloitte Analysis, Geo Exchange

The §179D tax deduction applies to three categories of energy efficiency improvements for buildings that each contain a suite of potential technologies for companies to install

Interior Lighting

Light Bulbs
- High-Efficiency LED
- High-Efficiency OLED

Lighting Controls
- Occupancy Sensors
- Timers
- Smart Lighting
- Dimming Controls

Lighting Alternatives
- Incorporation of Natural Light (e.g., skylights)

Heating, Cooling, Ventilation & Hot Water Systems

Heating
- Heat Pumps (Air-Source and Geothermal)
- Heat Recovery & Thermal Storage
- Smart Thermostats
- Variable-Speed and High-Efficiency Motors

Cooling
- High-Efficiency Chillers
- High Efficiency Air Conditioning

Ventilation
- Ventilation Fans
- Air Barriers/Duct Sealing

Hot Water Systems
- Electric Water Heaters
- Heat Pump Water Heaters
- Solar Water Heaters
- High-Efficiency Gas Storage Water Heaters
- Smart Water Heaters

Building Envelope

Roof
- Roof Insulation
- Green and Cool Roofs
- Outdoor Surface Reflectance

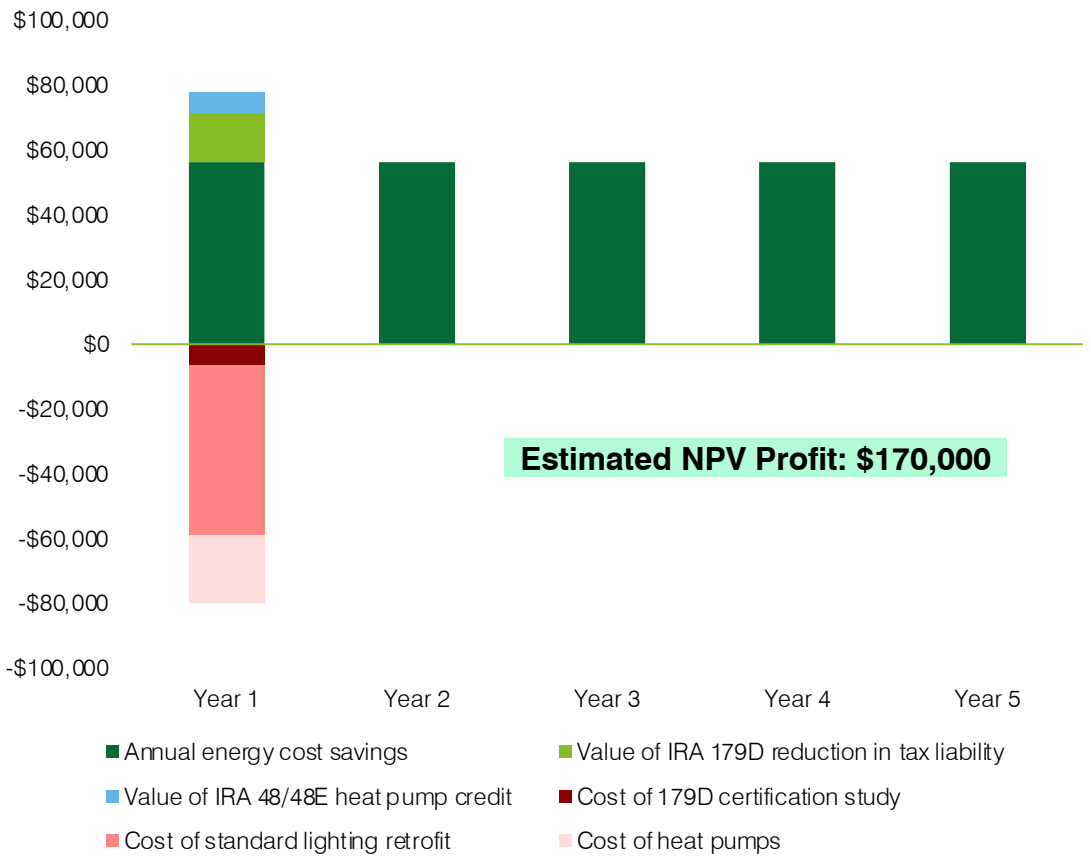
Wall
- Wall Insulation
- Green Facades
- Reduced Air Infiltration

Windows
- Window Retrofits
- Storm Windows
- Dynamic Glass/Glazing
- Advanced Window Coatings
- High Performance Windows

Note: Not an exhaustive list of technologies
Sources: Deloitte Analysis, US DOE, USAID, Energy.gov, UC Berkeley, US Green Building Council

The Business Case: Most commercial building energy efficiency upgrades pay for themselves in less than a year and can generate ongoing cost savings

Estimated Annual Profit for Sample Commercial Building Energy Efficiency Installation



Sample Business Case

Energy & Operating Cost Savings	+	IRA Deduction & Credit Value	-	Upfront Technology & Cert. Costs	=	Total Profit of Energy Efficiency Upgrades
($56K x 5 Years)	+	$22K	-	$80K	=	**$170K 5-year NPV Profit**

Business case will vary based on building size, technologies installed, location (due to varying energy costs), energy use, tax liability, state/local incentives, cost of capital, and other factors.

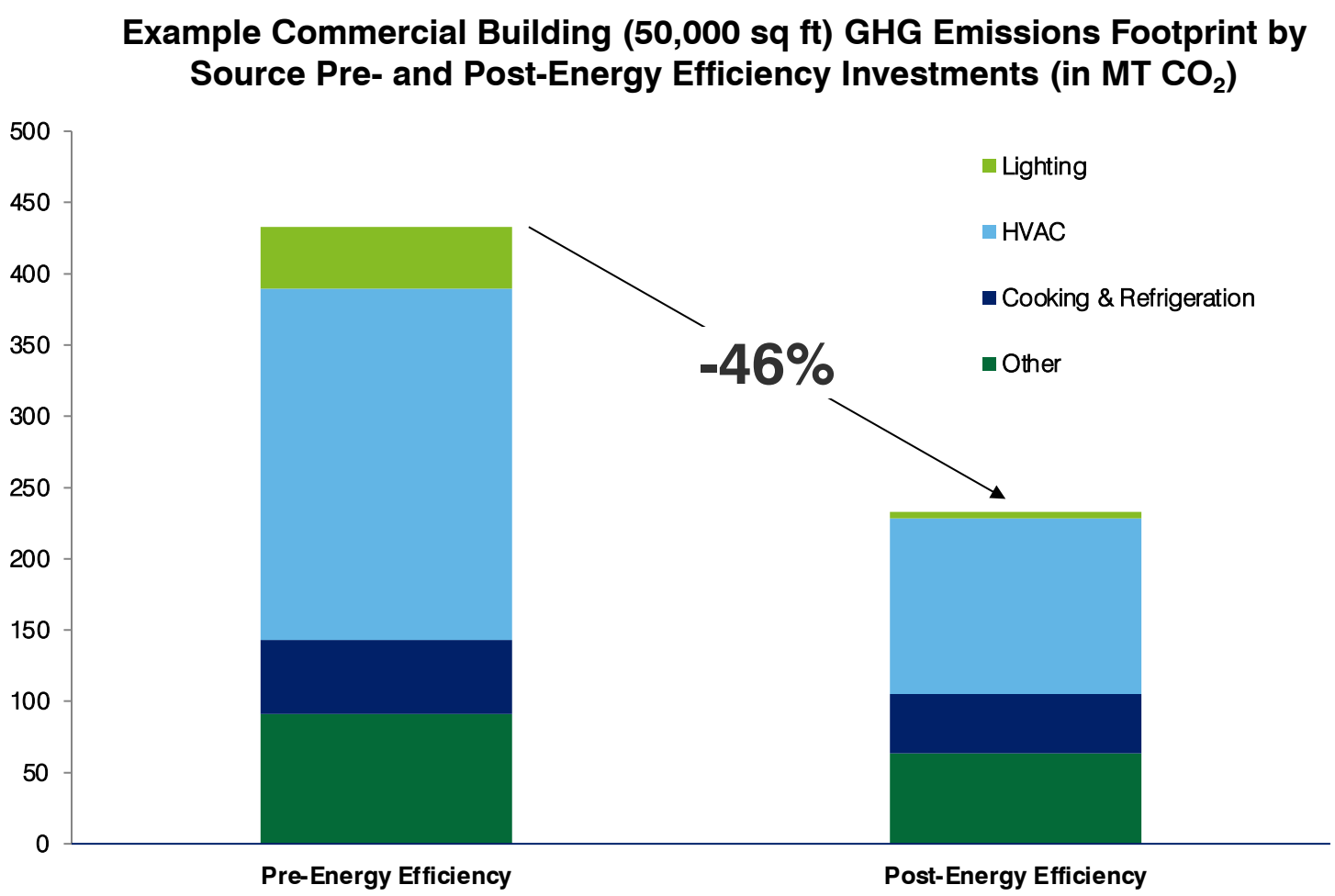
A company that uses IRA credits and deductions to install heat pumps, ventilation fans, and LED lightbulbs in a 50,000 sq ft building could generate an estimated $170K NPV profit over 5 years.

ASSUMPTIONS

- 50,000 sq ft building
- 22.5 kWh/sq ft building energy footprint
- $0.125/kWh building energy costs
- $1.05/sq ft cost of standard lighting retrofit
- $20,900 cost of heat pumps for 16,000 sq ft building
- No retail cost premium for ventilation fans
- $0.13/sq ft cost for 179D certification study
- 21% effective tax rate
- 40% reduction in energy costs due to energy efficiency upgrades
- $4.00/sq ft §179D deduction value (based on 40% improvement and meeting prevailing wage and apprenticeship requirements)
- 10% reduction in building operating costs due to energy efficiency upgrades
- 30% credit for heat pump costs from §48/48E
- 8% discount rate for NPV calculation

Sources: Deloitte Analysis, EIA, Buildings IOT, EIA, Constellation, EPA, Remodeling Calculator, Energy Star, US GSA

The Climate Case: Installing energy efficient technologies could help reduce commercial building energy emissions by an estimated 46%, or 200 MT CO_2 annually for a typical building



Assumptions

Example Building Specifications

- 50,000 sq ft building
- 22.5 kWh/sq ft building energy usage
- 0.855 lbs CO2/kWh emissions factor

Energy Efficiency Improvements by Source Type

- Lighting efficiency improvement potential estimated to be 90% by converting to LED lightbulbs
- HVAC efficiency improvement potential estimated to be 50% by converting to heat pumps, high efficiency ventilation fans, and solar water heaters
- Cooking and refrigeration efficiency improvement potential estimated to be 20% by converting to more efficient refrigerators and commercial ovens
- Other efficiency improvement potential estimated to be 30% by converting to high efficiency enterprise servers and electronic devices
- Does not include insulation, which can provide significant additional gains in energy efficiency

Scope & Disclaimers

- Does not consider embedded carbon from construction in the CO_2 footprint, which can have a significant impact on overall building lifetime emissions
- Exact emissions reduction potential will depend on grid decarbonization, specific technologies installed, and existing technologies, among other factors

Sources: Deloitte Analysis, EIA 1, EIA 2, EIA 3, Buildings IOT, Better Buildings, US DOE, Energy Star

§179D: The commercial buildings energy efficiency tax deduction provides up to $5/sq ft deduction for energy efficiency improvements of 25% or more

DEDUCTION OVERVIEW

- **Provision Description:** Provides a tax deduction for energy efficiency improvements to commercial buildings (new or retrofit)
- **Period of Availability:** Permanent; new rules begin in 2023
- **Incentive Type:** Business tax deduction
- **New or Modified Provision:** Modified and extended (revised efficiency thresholds and deduction amounts, extended timeline)

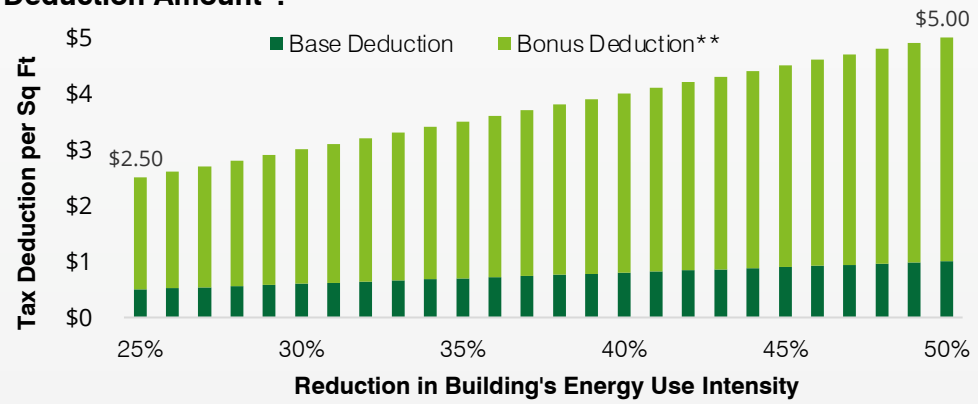
Nontransferable

No Direct Pay Eligibility

Stackable with other Credits

No Limit to Size of Total Deduction

Deduction Amount*:



*Deduction amount is not to exceed the cost of energy efficiency property; amount is adjusted annually for inflation

**Bonus deduction is awarded for meeting prevailing wage and apprenticeship requirements

ELIGIBILITY REQUIREMENTS

Available January 1, 2023, with no expiration date

Organization Types and Usage:

- Owners and long-term lessees of commercial buildings
- Designers of energy efficient building property (architects, engineers) for tax exempt owners
- Tax-exempt owners of commercial properties, pending Treasury guidance on deduction

Energy Efficiency Requirement: Minimum 25% improvement in building energy efficiency, relative to ASHRAE standards for new construction and prior energy use intensity for retrofits

Energy Efficiency Improvement Categories:

Interior Lighting

Heating, Cooling, Ventilation & Hot Water Systems

Building Envelope

HOW TO CLAIM THE DEDUCTION

- Engage a qualified third party (contractor or engineer licensed by the state where the building is located) to complete a 179D study by using IRS-approved energy software to model the energy performance of the buildings and improvements, compared to a reference building that meets ASHRAE 90.1 standards
- After installing energy efficiency upgrades, arrange for the same third party to complete a physical site visit to check energy efficiency improvements and sign Certification document
- Calculate potential 179D deduction based on energy efficiency improvements, compliance with prevailing wage and apprenticeship requirements, and cost of energy-efficiency commercial building property (EECBP) installations
- Submit IRS tax form 7205 to claim deduction (draft form accessible here)

Notes: Companies may choose to use Bonus Depreciation instead of the 179D deduction depending on project costs and their tax liability, but Bonus Depreciation is phasing out beginning in 2023 until reaching 0% in 2027.
Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRS, IRC.

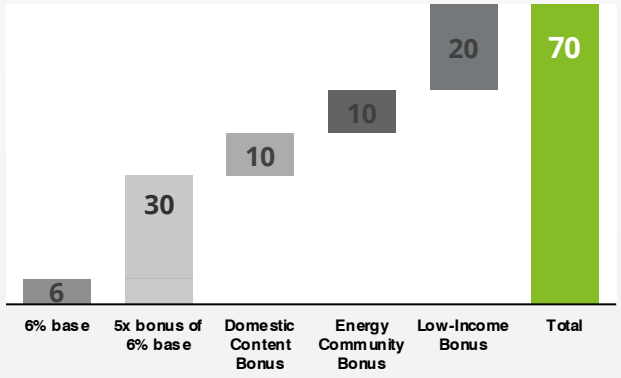
§48: The IRA increased and expanded the investment tax credit, which can be used for building-related combined heat and power systems, geothermal, and energy storage

CREDIT OVERVIEW

- **Provision Description:** Provides a tax credit for investment in renewable energy projects
- **Period of Availability:** Projects beginning construction before 1/1/25
- **Incentive Type:** 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 projects with 5MW or less

Transferable | Direct Pay (for tax-exempt) | Not Stackable with 45 PTC for same project | No Limit to # of Credits | General Business Credit Terms Apply

Credit Amount (in % of investment cost):



- **Prevailing Wage & Apprenticeship Bonus** qualifies projects for 5x bonus multiplier times the base
- **Domestic content bonus** provides additional 10 ppt
- **Energy community bonus** and **low-income bonus** provide an additional 10 ppt and 20 ppt credit, respectively

ELIGIBILITY REQUIREMENTS

Available for construction start dates between January 1, 2023, and December 31, 2024

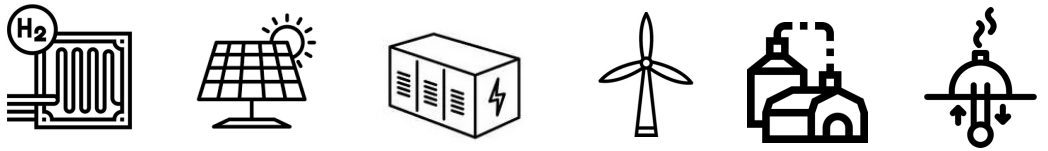
Organization Types and Usage:

- Businesses that own or develop renewable energy projects
- Tax-exempt entities that fall under subtitle F of the IRC, Indian Tribal governments, rural electricity co-ops among others that own or develop renewable energy projects

Project Types:

- Fuel cell, solar, geothermal, small wind, standalone energy storage, biogas, microgrid controllers, and combined heat and power properties. It includes solar powered heating and cooling as well as equipment that uses solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight or electrochromic glass

Example project types (non-exhaustive):



Fuel Cell | Solar | Energy Storage | Wind | Biogas | Geothermal

HOW TO CLAIM THE CREDIT

- Fill out and file IRS Form 3468 or IRS Form 3800 to claim the ITC
- Review the initial IRS guidance on prevailing wage and apprenticeship requirements and the Environmental Justice Solar and Wind Capacity Limitation to assess opportunities for credit adders
- Review additional information regarding the ITC which can be found online using the Database of State Incentives for Renewables & Efficiency (DSIRE)

Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRC.

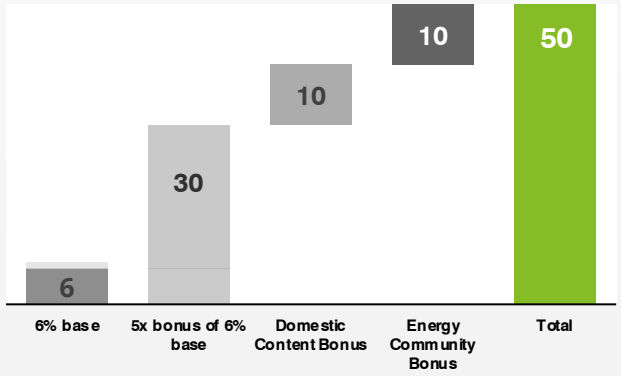
§48E: The new ITC for clean electricity generation and storage that comes into effect in 2025 can also be used for building-related energy efficiency installations

CREDIT OVERVIEW

- **Provision Description:** Provides a technology-neutral tax credit for investment in facilities that generate clean electricity. Replaces the ITC for facilities generating electricity from renewable sources
- **Period of Availability:** Facilities placed in service after 12/31/24. Phase-out starts the later of a) 2032 or b) when U.S. GHG emissions from electricity are 25% of 2022 emissions or lower
- **Incentive Type:** Investment tax credit
- **New or Modified Provision:** New

Transferable | Direct Pay (for tax-exempt) | Not Stackable with 45 PTC for Same Project | No Limit to # of Credits | General Business Credit Terms Apply

Credit Amount (in % of investment cost):



- **Prevailing Wage & Apprenticeship Bonus** qualifies projects for 5x bonus multiplier times the base
- **Domestic content bonus** provides additional 10 ppt
- **Energy community bonus** provide an additional 10 ppt credit

ELIGIBILITY REQUIREMENTS

Available for facilities placed in service between January 1, 2025, and likely 2032 and beyond

Organization Types and Usage:

- Businesses that own or develop renewable energy projects
- Tax-exempt entities that fall under subtitle F of the IRC, Indian Tribal governments, rural electricity co-ops among others that own or develop renewable energy projects

Project Types:

- Facilities that generate electricity with a GHG emissions rate that is no greater than zero and qualified energy storage technologies

Construction Start Date & Phase-Out:

- Construction start date dictates eligibility for ITC. However, ITC is claimed in the tax year that the facility is placed in service (IRS Guidance on construction start date)
- The credit will be phased out as the U.S. meets its GHG emissions reduction targets. (Facilities can claim 100% of credit in the first year after reaching the target, 75% in Year 2, 50% in Year 3, and 0% in Year 4)

HOW TO CLAIM THE CREDIT

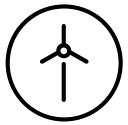
- Fill out and file IRS Form 3468 or IRS Form 3800 to claim the ITC
- Review the initial IRS guidance on prevailing wage and apprenticeship requirements to assess opportunities for credit adders
- Review additional information regarding the ITC which can be found online using the Database of State Incentives for Renewables & Efficiency (DSIRE)

Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRC.

Every function has a role to play to take advantage of the IRA to support improvements in commercial building energy efficiency

Strategy

- Assess building energy efficiency against corporate strategy
- Identify priority buildings and technologies for energy efficiency upgrades



Sustainability

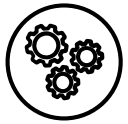
- Calculate projected abatement potential from building energy efficiency and compare against goals and strategy
- Assess against alternative abatement projects to calculate opportunity cost of investment

Finance

- Refresh business case to include IRA incentives
- Conduct ROI analysis for priority buildings and technologies to optimize spend
- Assess financial impacts of retrofit vs. new build and company-driven vs. energy-as-a-service provider-driven installations

Tax

- Assess eligibility for §179D and §48/48E and calculate projected value; compare §179D value against bonus depreciation value
- Monitor IRS website for forthcoming additional guidance on energy use intensity baseline measurement for retrofits, finalized IRS Form 7205 required for §179D, and IRS Form 3468 or IRS Form 3800 to claim the ITC (§48 & §48E)



Operations & Procurement

- Engage licensed third party to complete §179D study and provide Certification
- Identify specific energy efficiency technology vendors to purchase from

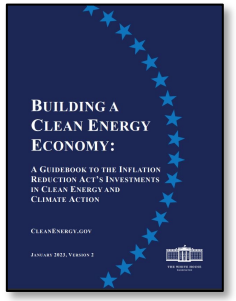
Government Affairs

- Identify additional federal, state and local incentive structures
- While the comment period for the deduction closed on October 31, 2022, it is possible to engage the IRS and Treasury on aspects of §179D implementation

Sources: Deloitte Analysis

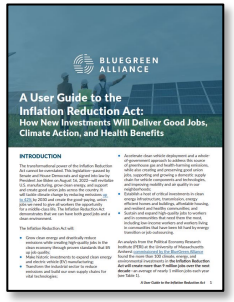
Several additional resources exist to help companies activate the IRA's building energy efficiency provisions

General IRA Resources



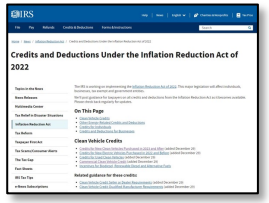
[WH IRA Guidebook]

Includes overview, description, and funding details for each IRA funded incentive



[BGA IRA User Guide]

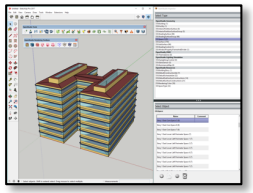
Provides overview of IRA incentives by sector and explains funding mechanisms



[IRS Credits and Deductions under the IRA]

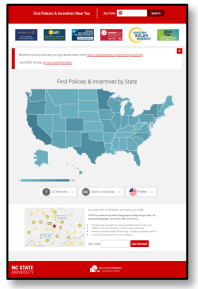
Compiles resources, forms and descriptions of IRA tax credits and deductions

Commercial Building Energy Efficiency Resources



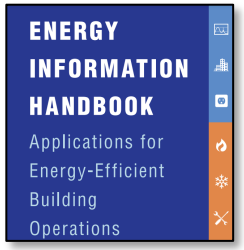
[EnergyPlus Whole Building Energy Simulation Program]

Free model for energy consumption in buildings, funded by the DOE



[Database of State Incentives for Renewables & Efficiency]

Computes avoided emissions from solar and wind project by MW size and state



[DOE/Berkeley Handbook for Building Energy Measurement]

Outlines roadmaps for business leaders to accelerate their sustainability journey

Victoria Mills
Managing Director
vmills@edf.org

Other useful resources:

- IRS Overview of 179D
- Draft IRS Form 7205 for 179D
- Whole Building Design Guide
- Energy Star Resources for Building Owners and Managers
- California Energy Commission Building Energy Efficiency Resources for Commercial Buildings

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