

Energy Tax Savers

EPAct 179D Presentation



Energy Tax Savers, Inc.

The EPAct 179D Experts

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- Everyone should check that they have Audio
- Bottom Left hand corner one of the options says “Test Speaker and Microphone”
- Or “Audio Settings” and just switch to “Phone Call”
- Email me at jacob.goldman@energytaxsavers.com if having technical difficulty

Energy Policy Act of 2005 (EPAct 179D)

- Benefits available for projects completed between 1/1/06 thru 12/31/20
- Incentivized areas (\$1.80/sq ft maximum):
 - Different levels available (Up to \$0.60 for lighting, \$1.20, \$1.80)
 - Deduction level depends on building energy efficiency
- Available for New Construction and Existing Buildings
- Also available for tenant owned lease-hold improvements
- Benefit available for Primary Designers on Government Projects

Energy Tax Savers, Inc

Completed EPAct Project Map: U.S.



Project Cash Flow-Lump Sum

	0	1	2	3	4	5
Costs	\$(1,000)					
Benefits		\$400	\$400	\$400	\$400	\$400
Net cash flow	\$(1,000)	\$400	\$400	\$400	\$400	\$400
NPV Calc	\$(1,000)	\$385	\$370	\$356	\$342	\$329
	\$(1,000)	\$(615)	\$(246)	\$110	\$452	\$781

Payback	2.5	
NPV*	\$780.73	=NPV(Rate,Values)+\$(1,000)
ROI	29%	=IRR(Values)

*Discount Rate

4%

POLL QUESTION

Project Cash Flow-Loan

	0	1	2	3	4	5
Costs ^{*#}		\$(244)	\$(244)	\$(244)	\$(244)	\$(244)
Benefits		\$400	\$400	\$400	\$400	\$400
Net cash flow		\$156	\$156	\$156	\$156	\$156
NPV Calc		\$150	\$144	\$139	\$133	\$128
		\$150	\$294	\$433	\$567	\$695

Payback	0	
NPV [^]	\$694.97	=NPV(Rate,Values)
ROI	N/A	=IRR(Values)

*Interest Rate 7%

#Amount Financed \$1,000

^Discount Rate 4%

Project Cash Flow - Operating Lease

	0	1	2	3	4	5
Costs ^{*#}		\$(185)	\$(185)	\$(185)	\$(185)	\$(485)
Benefits		\$400	\$400	\$400	\$400	\$400
Net cash flow		\$215	\$215	\$215	\$215	\$(85)
NPV Calc		\$207	\$199	\$191	\$184	\$(70)
		\$207	\$406	\$598	\$782	\$712

Payback	0	
NPV [^]	\$712.09	=NPV(Rate,Values)
ROI	N/A	=IRR(Values)

*Interest Rate 10%

#Amount Financed \$700

Residual \$300

^Discount Rate 4%

Tax Deduction vs Tax Credit

- Value of Tax Deduction
 - Tax Deduction x Tax Rate = First Year Tax Savings
 - \$100,000 x 30% = \$30,000
- Value of a Tax Credit
 - \$100,000 = \$100,000
- EPAct 179D is a Tax Deduction
 - In Lieu of Depreciation (Time Value of Money)

EPAct Economics for Commercial Buildings

Mechanics

- Deductions *based on improvements over ASHRAE 90.1 2007*
- Deduction *limited to lesser of what you qualify for or project cost*

Commercial building projects:

- Converts cost of 39 year depreciable property to immediate deduction

Example: project cost \$195,000, and EPAct deduction of \$150,000

- Normally: deduct \$5,000 (1/39th of \$195K) a year for 39 years
- With EPAct: can immediately deduct \$150,000 in year 1, and the remaining \$45,000 over 39 years

<u>Depreciation</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Without EPAct	5,000	5,000	5,000	5,000	5,000	5,000
With EPAct	151,154	1,154	1,154	1,154	1,154	1,154

What's it Worth?

Sample Square Footage	Lighting		HVAC	Building Envelope	Total
	Minimum Deduction	Maximum Deduction	Maximum Deduction	Maximum Deduction	
50,000	\$ 15,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 90,000
100,000	\$ 30,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 180,000
250,000	\$ 75,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 450,000
500,000	\$ 150,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 900,000
750,000	\$ 225,000	\$ 450,000	\$ 450,000	\$ 450,000	\$ 1,350,000
1,000,000	\$ 300,000	\$ 600,000	\$ 600,000	\$ 600,000	\$ 1,800,000

*Note – with government buildings, the benefit goes to the primary designer

Primary Designers of Govt. Buildings EPAct Deduction

- Architects/Engineers/Lighting Designers etc.
- DOE goal to incentivize green design in government building sector
 - Benefits passed through to the primary designer of:
 - Federal
 - offices, military bases, court houses, post office, labs etc.
 - State
 - offices, transportation facilities, state universities, court houses etc.
 - County, city, town, village etc
 - offices, schools, town halls, police, fire, libraries etc.

Important IRS Notice Rev. Proc. 2011-14

- Taxpayers can use 3115 process to catch up on all missed EPM Act deductions
 - Excellent for investor groups to avoid amended individual returns
- Many property owners are combining **prior and current projects** for the \$1.80

How to Monetize the Benefit

- Two things need to occur for a company to achieve monetize an EPAct benefit
 1. A building project needs to occur that has significant spend in an EPAct year (2006-2020), such as:
 - Major lighting projects
 - Roof replacements
 - Window replacements
 - Major HVAC installation
 2. The building needs to meet the energy efficiency targets
 - ASHRAE 2007 standard for 2016-2020 projects
- ***Prior state of the building is irrelevant*

Methods to Qualify

- 1) Prescriptive Lighting Method (interim lighting rules)
 - Based on watts/sq.ft., bi-level, foot candles (max \$0.60/sq.ft.)
 - watts/ft² must be between 25-40+% better than ASHRAE 90.1.2001/2007
- 2) Modeling Method / Whole Building Method
 - Needed to get \$1.20/sq.ft. and \$1.80/sq.ft. deduction - engineering model (lighting, HVAC projects)
 - Overall building energy usage must be a certain percentage better than that of a reference building
 - Some buildings are lighting driven (warehouse/industrial)
 - Some buildings are HVAC driven (hotels, offices, schools)

****A building can qualify for the HVAC and/or envelope deductions even without an HVAC/envelope project being completed in an EAct year**

Ways to Capture Tax Deduction

- ⁽¹⁾Whole Building (\$1.80/ft²)
 - 50% Energy Cost Reduction below standard
- Permanent Rules partial deduction (\$0.60/ft²)

Building Envelope	Lighting	HVAC
⁽²⁾ 10%	⁽³⁾ 25%	⁽⁴⁾ 15%

- ⁽⁵⁾Interim Lighting Rules (\$0.30/ft²-\$0.60/ft²)
 - 25% to 40% prescribed Light Power Density (LPD) reduction below standard

Interim Lighting Rules

- Meet W/ft² targets
- Add'l Requirements
 - Bilevel Switching
 - Meet ASHRAE 90.1 Requirements
 - Meet IESNA minimum light levels

	2007 Standard LPD, W/ft ²	25% Improvement	40% Improvement
Office	1.0	0.750	0.60
Manufacturing	1.3	0.975	0.78
School	1.2	0.900	0.72
Hotel	1.0	0.750	0.60
Retail	1.5	1.125	0.90
Warehouse	0.8	50% required, 0.40	

% Improvement	25%	26%	27%	28%	29%	30%	31%	32%	33%	34%	35%	36%	37%	38%	39%	40%
Tax Deduction \$/sq.ft.	0.30	0.32	0.34	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60

EPAct 179D - Lighting Tax Deduction Wattages

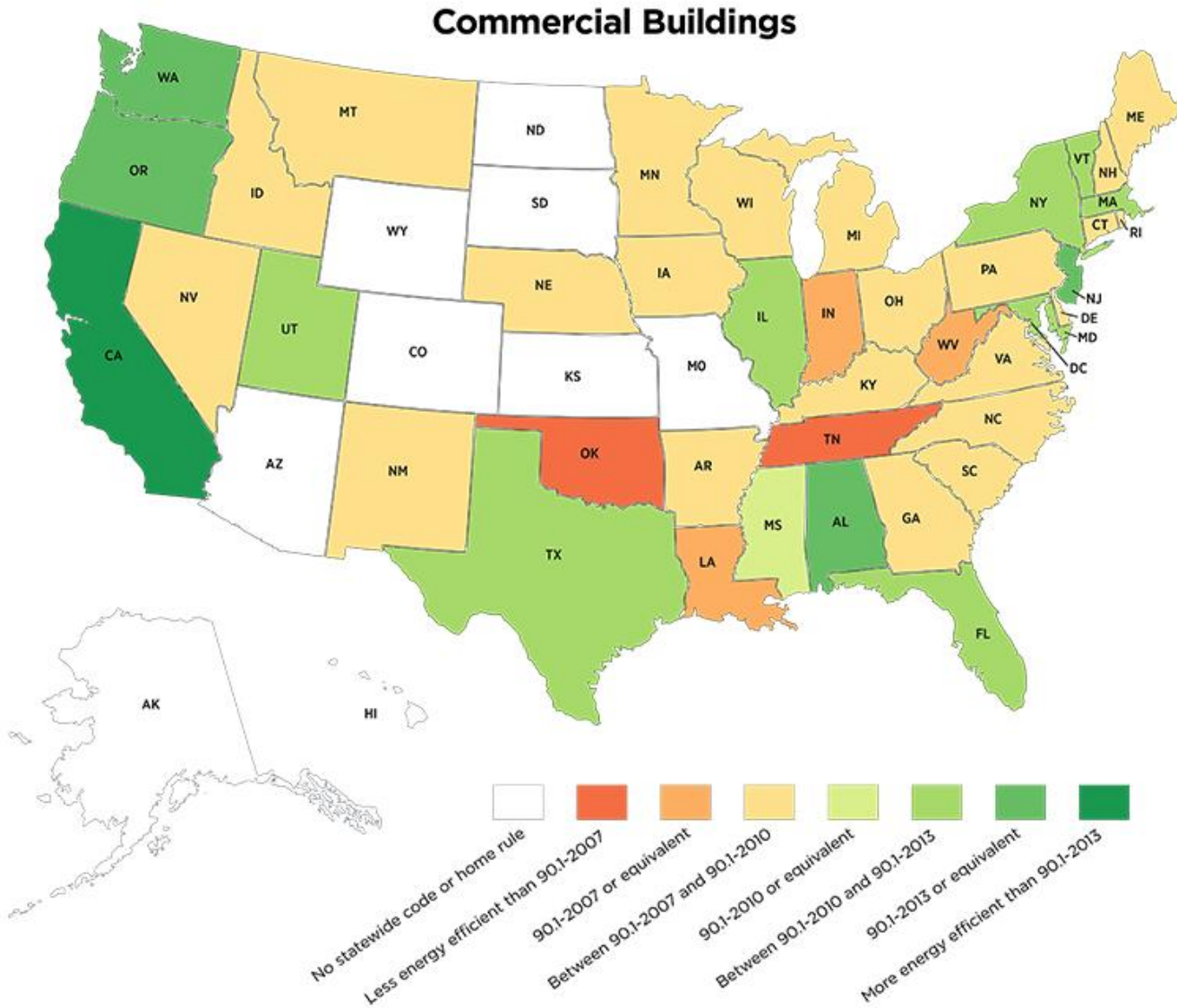
Standard for 2006-2015 Projects

Building Type	ASHRAE 2001	25% Improvement \$0.30/Sq Ft	40% Improvement \$0.60/Sq Ft
Automotive Facility	1.5	1.13	0.90
Convention Center	1.4	1.05	0.84
Court House	1.4	1.05	0.84
Bar Lounge/Leisure	1.5	1.13	0.90
Cafeteria/Fast Food	1.8	1.35	1.08
Family Dining	1.9	1.43	1.14
Dormitory	1.5	1.13	0.90
Exercise Center	1.4	1.05	0.84
Gymnasium	1.7	1.28	1.02
Health Care Clinic	1.6	1.20	0.96
Hospital	1.6	1.20	0.96
Hotel	1.7	1.28	1.02
Library	1.5	1.13	0.90
Manufacturing	2.2	1.65	1.32
Motel	2.0	1.50	1.20
Movie Theater	1.6	1.20	0.96
Multifamily	1.0	0.75	0.60
Museum	1.6	1.20	0.96
Office	1.3	0.98	0.78
Parking Garage	0.3	0.23	0.18
Theater	1.5	1.13	0.90
Police/Fire Station	1.3	0.98	0.78
Post Office	1.6	1.20	0.96
Retail	1.9	1.43	1.14
School/University	1.5	1.13	0.90
Sports Arena	1.5	1.13	0.90
Town Hall	1.4	1.05	0.84
Transportation	1.2	0.90	0.72
Warehouse	1.2	0.60 (50% Improvement Required)	
Workshop	1.7	1.28	1.02

Standard for 2016 Projects

ASHRAE 2007	25% Improvement \$0.30/Sq Ft	40% Improvement \$0.60/Sq Ft
0.9	0.68	0.54
1.2	0.90	0.72
1.2	0.90	0.72
1.3	0.98	0.78
1.4	1.05	0.84
1.6	1.20	0.96
1.0	0.75	0.60
1.0	0.75	0.60
1.1	0.83	0.66
1.0	0.75	0.60
1.2	0.90	0.72
1.0	0.75	0.60
1.3	0.98	0.78
1.3	0.98	0.78
1.0	0.75	0.60
1.2	0.90	0.72
0.7	0.53	0.42
1.1	0.83	0.66
1.0	0.75	0.60
0.3	0.23	0.18
1.6	1.20	0.96
1.0	0.75	0.60
1.1	0.83	0.66
1.5	1.13	0.90
1.2	0.90	0.72
1.1	0.83	0.66
1.1	0.83	0.66
1.0	0.75	0.60
0.8	0.40 (50% Improvement Required)	
1.4	1.05	0.84

States with Stricter Lighting Standards than ASHRAE 90.1 2007



Source: energycodes.gov

Industrial Lighting Targets to Hit for \$1.20 & \$1.80/sq.ft. Incentives (Modeling Method)

Warehouse	2006-2015	2016-2020
\$1.80/sq.ft.	0.45 W/sq.ft.	0.30 W/sq.ft.
\$1.20/sq.ft.	0.75 W/sq.ft.	0.50 W/sq.ft.
Manufacturing	2006-2015	2016-2020
\$1.80/sq.ft.	0.82 W/sq.ft.	0.48 W/sq.ft.
\$1.20/sq.ft.	1.37 W/sq.ft.	0.81 W/sq.ft.

- Lighting alone can make a building qualify for the maximum \$1.80 deduction

Best Opportunities

- Buildings > 30,000 sq ft
 - Benefit often minimal in small buildings
- Warehouse/industrial buildings
 - Can qualify for the \$1.80 deduction with just lighting
- Parking garages
 - Easy to beat ASHRAE standard and large sq ft

Ways to Capture Tax Deduction

- ⁽¹⁾Whole Building (\$1.80/ft²)
 - 50% Energy Cost Reduction below standard
- Permanent Rules partial deduction (\$0.60/ft²)

Building Envelope	Lighting	HVAC
⁽²⁾ 10%	⁽³⁾ 25%	⁽⁴⁾ 15%

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Techniques for Achieving HVAC Tax Savings

1. More Efficient than Reference Equipment
 - Put in Highly efficient equipment and add
 - VFD's
 - Economizers
 - Demand Ventilation
 - Energy Recovery Ventilation
 - Etc.
2. Different Equipment than Reference Equipment
 - Chillers where Packaged Units are in the Reference Building
 - Central Plant
 - VRF
 - Geothermal
3. Take advantage of Time of Day Energy Pricing
 - Thermal Storage

What Tends to Qualify on the HVAC side?

1. Geothermal (Ground Source Heat Pumps)
2. High Efficiency Water Source Heat Pumps
3. Thermal Storage
4. High Efficiency VRF units in Rental Apartments/Dorms/Hotels
5. Centralized HVAC in Rental Apartments/Dorms/Hotels
6. Energy Recovery Ventilation
7. Demand Control Ventilation
8. VFD's on all major Motors and Compressors
9. Chillers in buildings < 150,000 sq ft
10. Direct fired heaters in non AC Industrial Spaces
11. Industrial Space >75,000sq ft with Constant Volume Package unit
12. VAV (variable air volume devices) in buildings <75,000 sq ft
13. Chilled Beam
14. McQuay Magnetic Bearing Chillers
15. Smardt Chillers
16. Arctic Cool Chillers
17. Gas fired chillers combined with electric chillers to peak shave
18. Coolorado in dry climates
19. Combined Heat and Power

Approved Software

DesignBuilder

Version 5.0.3.007

DeST

Version 2.0-190709

DOE-2.2

Version 48y

EnergyPlus

Version 9.1.0

Version 9.0.1

Version 8.8.0

Version 8.7.0

Version 8.6.0

Version 8.3.0

eQUEST

Version 3.65

Hourly Analysis Program (HAP)

Version 5.11

Version 5.10

Version 5.01

Version 5.00

IES <Virtual Environment>

Version 2019

Version 2018

Version 2017

Version 2016

OpenStudio with EnergyPlus

OpenStudio 2.7.0 with EnergyPlus Version 9.0.1

OpenStudio 2.3.0 with EnergyPlus Version 8.8.0

TAS

Version 9.5.0

Version 9.4.4

Version 9.4.3

Version 9.4.2

Version 9.4.1

Version 9.4

TRACE 3D Plus

Version 2.04.20

Version 1.25.286

TRACE 700

Version 6.3.4

Version 6.3.3

TRNSYS

TRNSYS 18.01.0001

TRNSYS 18.00.0019

179D Modeling Technique

Overall Guidance	NREL/TP-5500-66774 Sept 2016
Technique	ASHRAE 90.1 2007 Appendix G
Reference Data	ASHRAE 90.1 2007 addenda a, b, c, g, h, i, j, k, l, m, n, p, q, r, s, t, u, w, y, ad, and aw
Weather	ASHRAE 169-2013a
Ventilation	ASHRAE 62.1 2004
Load Data	Taxpayer's Bldg or Title 24 (In NREL document)
Exceptions	
Ventilation Rate	ASHRAE 62.1 2004 <u>not</u> Title 24
Occupancy	Title 24 <u>not</u> ASHRAE 62.1 2004
Lighting Load	ASHRAE 90.1 2007 <u>not</u> Title 24

Items Needed to Analyze for EPA Act

- Ideal submission: electrical, mechanical, architectural and plumbing drawings
- If plans unavailable:
 - Lighting survey
 - Indication of bi-level switching in office/conference areas
 - Project square footage
 - HVAC unit survey

Sample Lighting Data

Room	Sq.Ft.	Fixture	Count	Watts/ Fixture	New?	Bi-Level	Average Foot Candles
Office 201	400	LED 2X4 (2)18W	4	36	New	Yes	39
		LED 2X4 (1)18W	2	18	Retained		
Office 202	100	LED 2X4 (4)18W	2	72	New	Yes	42
Office 203	140	LED 2X4 (2)18W	2	36	New	No	42
Office 204	100	LED 2X4 (2)18W	2	36	New	Yes	41
2 nd Floor Men's Room	130	LED 2X4 (2)18W	3	36	New	No	14
2 nd Floor Lady's Room	175	LED 2X4 (2)18W	4	36	New	No	13

Sample HVAC Data

Unit Type	Model #	Zone/Area Served	Additional Info
Water Cooled Chiller-1	Daikin AGZ-190DH	Office	VFDs included
Water Cooled Chiller-2	Daikin WDC-050E2216	Office	VFDs included
AHU-1	Daikin CAH025GDDC	Office	VAVs included
AHU-2	Daikin CAH040DDM	Office	Energy Recovery, CO2 Sensors
MAU-1	Greenheck MSX-118-H32	Kitchen – Bldg A	None
Unit Heater 1	Rittling RH-33	Warehouse	None
Unit Heater 2	Rittling RH-18	Production	None

ETSI Process

1. Receive project data and perform complimentary review
 - Review time generally within a week
2. Once engaged, perform energy modeling and prepare tax report
 - Takes around 2-4 weeks, depending on complexity
3. Deliver report and all accompanying documents to client
 - Client receives report with all IRS required data on EPass

About ETSI

- First EAct service provider (founded 2005)
- Completed more EAct projects than any other firm (15,000+)
- Diverse background of firm professionals
 - Attorney, CPA, MBA, LEED AP, PE
- Over 150 published articles in various publications
 - *Corporate Business Taxation Monthly*, *Building Operating Management*, *IMARK Magazine*, *Retrofit Magazine*, *Parking Professional*



Credit for Increasing Research Activities

(AKA 'R&D Tax Credit')

(Should be Known as Credit for Qualified Expenses that meet IRS and Case Law Guidelines)

“Designed to encourage businesses to increase the amount they spend on research and experimental activities”

-Internal Revenue Service



R&D Credit Overview

- Enacted in 1981
- Available for all for-profit entity types
- Can be used to offset income taxes, payroll taxes, or AMT
- No annual or lifetime cap on credit amount
- Credit typically ranges from 4 -7% of eligible expenses
- Can typically claim credit for prior three tax years
- If in loss situation, can carry credit back/forward (1, 20)

R&D Tax Credit

Examples of Technology Sectors



- ▶ Apparel Design & Manufacturing
- ▶ Architectural Design/Construction
- ▶ Artificial Intelligence
- ▶ Big Data Analytics
- ▶ Cosmetics
- ▶ Environmental Remediation
- ▶ Food Science/Manufacturing
- ▶ FinTech
- ▶ Health Sciences & Pharmaceuticals
- ▶ Horticulture
- ▶ Industrial Manufacturing
- ▶ Logistics & Packaging
- ▶ Machine Tools
- ▶ Printing (3D, Digital, Laser, Offset)
- ▶ Robotics Implementation
- ▶ Software & IT Development

R&D Credit - 4 Part Test



- 1) New or Improved Business Component
 - Product
 - Process
 - Software (Internal or External)
 - Technique
 - Formula, or
 - Invention
- 2) Technological in Nature
- 3) Elimination of Uncertainty
- 4) Process of Experimentation

Eligible Expenses

- Employee Wages

- Many firms nonetheless have scientists, engineers or designers on staff
- **"Technical Problem Solving"**



- Supplies
- Contractor/Consultant Payments

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<http://www.energytaxsavers.com/>

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