Upgrading to Energy Efficient Building Controls
How to Monetize Vested EPAct Section 179D Tax Deductions

By Charles R. Goulding, Jacob Goldman, and Taylor Goulding

Many buildings have been upgraded to IRS Section 179D energy efficiency tax deduction levels without utilizing earned Section 179D tax deductions.

These property owners have a unique opportunity to purchase building controls, including lighting controls and HVAC controls, to further reduce building energy use while triggering large vested tax deductions.

Code Section 179D EPAct Tax Opportunities

Pursuant to Energy Policy Act (EPAct) Code Sec. 179D, as enacted by EPAct, commercial property owners or primary designers in government projects making qualifying energy-reducing investments in their new or existing locations can obtain immediate tax deductions of up to $1.80 per square foot.

If the building project does not qualify for the maximum $1.80-per-square-foot immediate tax deduction, there are tax deductions of up to $0.60 per square foot for each of the three major building subsystems: lighting, HVAC (heating, ventilating, and air conditioning) and the building envelope. The building envelope is every item on the building's exterior perimeter that touches the outside world including roof, walls, insulation, doors, windows and foundation.

Understanding Building Energy Controls

The term building energy controls includes, lighting controls systems, HVAC controls systems and multi measure building controls systems that may control both lighting and HVAC and other building system functions.

Lighting Controls

Lighting controls systems can reduce lighting energy costs by dimming light levels or by completely shutting lights on or off. Lights may be dimmed to create an atmosphere or mood, or to adjust to levels of natural light streaming into a room. Lighting systems that work with natural day light are called, "daylighting controls" and may also be integrated with window shading systems and windowsill light shelves that project

daylight into a room[1] are called respectively motion sensors, occupancy sensors and time of day controls. Lighting controls can reduce overall lighting use by 40% or more.

Some well known companies that exclusively focus on lighting controls include Lutron, Leviton and Sensor Switch.

Heating, Ventilation and Air-Conditioning (HVAC) Controls

HVAC is generally the largest building energy user in air-conditioned buildings. This means that HVAC controls can potentially save tremendous amounts of energy costs. HVAC systems can encompass numerous components and HVAC controls can control a few or many of the HVAC systems components. The more HVAC components an HVAC system controls, the more energy is saved. Similar to lighting, HVAC controls can be based on human occupancy and time-of-day. Human occupancy HVAC controls include temperature and air handling, including air changeover and carbon dioxide levels. HVAC controls can also control motor speeds for multiple motor controlled devices and heat exchangers. The added devices that control motor speeds and hence energy use are called variable frequency drives or variable frequency drives. Some of the well known HVAC controls companies include Siemens, Andover, Johnson Controls, and Honeywell.

Building Controls

More comprehensive building controls systems can control any or all of the controls described above plus elevators, alarm systems, fire sprinklers, security and other building system functions.

Policy Supporting EPAct Tax Deductions for Controls

The two main building equipment categories that use energy are lighting and HVAC. The best technique to minimize energy system use is a two step process. The first step is to install the most energy efficient underlying lighting and HVAC equipment at the Section 179D EPAct energy performance levels or better. The second step is to install lighting and HVAC controls systems that further enhances the energy efficiency of the already very energy efficient underlying equipment subject to control.

[1] Charles Goulding, Jacob Goldman, & Taylor Goulding. "The Tax Aspects of Daylight Harvesting" Corporate Business Taxation Monthly, June 2008.

Lighting Free Riding

Lighting free riding tax deductions can be obtained any time a lighting controls system is installed in building that:

1. Already meets the prescriptive EPAct lighting watts per square foot reductions required for a particular building category, and/or
2. Whenever a building energy model demonstrates a 16.67% lighting energy cost reduction compared to the ASHRAE 2001 building energy code standard.

In a September 2004 study entitled, *"Analysis of a Potential Free-Rider Eligibility for a Proposed Commercial Building Lighting Tax Deduction,"* the Department of Energy was hoping that building owners fully utilized the free riding tax deduction concept to save energy and obtain EPAct tax deductions from doing so[2]. The 2004 study included a list of building categories and the percentage that would be estimated to be eligible for partial or full tax deduction as follows[3]:

90.1-1999 Building Type	% Of buildings that meet LPD requirement for a full or partial tax deduction	Average % LPD below ASHRAE 90.1-2001 levels for eligible buildings	Sample Size
Hotel/Motel	33.3%	48.5%	6
Office	4.8%	44.7%	21
Retail	26.1%	41.4%	23
School/University	37.5%	32.6%	8
Warehouse	28.6%	64.6%	7

Note that this data would by definition understate the free-riding tax deduction opportunity since it was based on pre 2004 data, before the enactment of EPAct and before the recent widespread introduction of large volumes of energy efficient lighting.

HVAC Free-Riding

There are a large number of buildings eligible for HVAC controls free-riding that can easily be identified by installed HVAC technology. To be positioned for HVAC free-riding, an existing building must be at or near a 16.67% HVAC cost improvement compared to ASHRAE 2001 standards. We say at or near since the installation of the controls system itself will improve the energy cost reduction percentage. Sellers and installers of HVAC controls should consider targeting buildings that already meet the 16.67% energy cost reduction level.

[2] Winiarski, D. W., E. E. Richman, and R. Biyani. *Analysis of a Potential Free-Rider Eligibility for a Proposed Commercial Building Lighting Tax Deduction*. Rep. Pacific Northwest National Laboratory - National Technical Information Service, Sept. 2004. Web. <http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14593.pdf>.

[3] Winiarski, D. W., E. E. Richman, and R. Biyani. *Analysis of a Potential Free-Rider Eligibility for a Proposed Commercial Building Lighting Tax Deduction*. Rep. Pacific Northwest National Laboratory - National Technical Information Service, Sept. 2004. Web. <http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14593.pdf>.

The following HVAC technologies generally meet the 16.67% energy cost requirement and accordingly should provide for free ride HVAC controls tax deduction.

- Geothermal (ground source heat pumps)
- Thermal storage
- Energy recovery ventilation
- Demand control ventilation
- Chillers in buildings less than 150,000 square feet
- Cambridge heaters in non air-conditioned industrial spaces and warehouses
- VAV (variable air volume) devices in buildings less than 75,000 square feet
- Chilled Beam

Conclusion

Building property owners that already have lighting or HVAC systems at the required EPAct Section 179D tax deduction levels have a unique opportunity to install controls systems, substantially further reduce energy consumption, and obtain large EPAct tax deductions from doing so. To summarize, first you reduce your energy use, then you control the efficient system and then you obtain the EPAct tax deduction that you now have doubly earned.

Charles R. Goulding, Attorney/CPA is the President of Energy Tax Savers Inc., The EPAct 179D Experts, an interdisciplinary tax and engineering firm that specializes in the energy-efficient aspects of buildings.

Jacob Goldman, LEED A.P., is an Engineer and Tax Consultant with Energy Tax Savers, Inc., The EPAct 179D Experts.

Taylor Goulding is a Tax Analyst with Energy Tax Savers, Inc., The EPAct 179D Experts.

Contact the experts at Energy Tax Savers today at www.energytaxsavers.com or by email at info@energytaxsavers.com.