IRS Releases Building Energy Efficiency Rules

*By Charles Goulding and Jacob Goldman**

Charles Goulding and Jacob Goldman discuss a commercial building's energy systems and how the Energy Tax Incentives Act of 2005 provides real opportunity for tax savings as well as environmental sustainability.

The Energy Tax Incentives Act of 2005[1] provides immediate tax deductions for qualifying investments that reduce energy costs for commercial buildings on a whole-building basis, for qualifying lighting,[2] for HVAC (Heating, Ventilating and Air Conditioning)[3] or for building envelope capital additions[4] pursuant to Code Sec. 179(c)(1)(D). The maximum $1.80 per square foot deduction requires a 50-percent energy cost reduction after comparing to a referenced 2001 building.[5]

The IRS published Notice 2006-52[6] on June 2, 2006, which provides guidance on how the commercial building energy tax incentives work. In general, the guidance is more favorable than many people had anticipated. The notice divides the 50-percent overall energy cost requirement into three 16.67-percent thresholds. The taxpayer, in obtaining the new deductions, must secure the new capital investment amount. This capital investment amount has to achieve a 16.67-percent performance increase by comparing performance based on 2001 ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers) standards for Lighting, HVAC and Building Envelope. Taxpayers must use an approved software model to verify the 16.67-percent energy cost improvement.

Charles Goulding, J.D., CPA, M.B.A., is the President of Energy Tax Savers, Inc.

Jacob Goldman, E.A., M.B.A., is a Tax Consultant with Energy Tax Savers, Inc.

Understanding Qualifying Property

Lighting investments are visibly apparent and generally familiar to tax professionals. HVAC investments, and in particular, building envelope investments, are either backroom systems or skeletal structure components that many tax professionals may not be completely familiar with. A brief description of the building components eligible for the new tax incentive follows

Lighting and Lighting Controls

Modern building lighting installations function as a system comprised of the basic lighting fixtures and lighting controls. Lighting controls use the time of day and sensors to detect occupants as decision points for shutting off lighting. More sophisticated controls can measure the amount of sunlight to manage energy use by reducing building lighting when natural light is available. Lighting controls are essentially the brains of a lighting system.

Until the Treasury issues the final regulations relative to the guidance in Notice 2006-52 , taxpayers can use the Interim Lighting Rules provided under Code Sec. 179(C)(1)(A)(ii). The Interim Lighting Rules are very flexible and, in energy, provide tax deductions for as little as 25-percent improvements in lighting performance. The Interim Lighting Rules are the only provisions that base the new deductions on product

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specifications rather than energy cost reductions.

HVAC

HVAC is recognized as the largest electrical category. The Department of Energy estimates that HVAC consumes 50-percent of all building energy.

H **Heating Systems.** Heating systems generally have the same core systems and are distinguished by fuel sources. Accordingly, furnaces are characterized by type such as oil, gas, propane or electrical.

V **Ventilation Systems.** Ventilation systems are very important for both energy management and air quality. Ventilation systems can use the natural outside environment for both heating and cooling purposes.

AC **Air Conditioners.** Air conditioners are major electricity users. Thus, installing improved air conditioning technology can substantially reduce electricity consumption. Notice 2006-52 repeatedly uses the word "cooling" in reference to air conditioners.

HVAC energy-saving techniques:

- **Variable Speed Drives.** HVAC systems require motors that consume energy. Motors are used in chillers, air handling units, cooling towers, boilers, pumps and fans. One widely used technology to reduce motor energy usage is to incorporate variable speed drives (VSD) or variable frequency drives (VFS) for all major motors. VSDs electronically reduce motor speed to correspond to need and electrical load.
- **HVAC Controls.** Like lighting, HVAC controls discern occupants and use the time of day to manage electrical energy use. Vendors of air conditioning control systems emphasize that their particular system is more cost effective to install Lighting Controls as a subset of HVAC controls when HVAC controls are already specified. Combined Lighting and HVAC controls and more advanced systems are called Building Management Systems (BMS). As a general matter, the more equipment and components connected to HVAC controls, the greater the potential energy savings.

Building Envelope

Building envelope describes all of the perimeter surfaces of a building that touch the outside, including roofs, slab, walls, windows and doors. Roofs, slabs and walls use insulation to maintain heating and cooling loads. Increasingly, more sun-intense jurisdictions are requiring so called "cool roofs" that reflect, rather than absorb, sun and heat. Windows use glazing and solar shades to maintain heating and cooling loads. Doors can also use glazing; walls can incorporate vapor barrier and moisture systems that enable a building to use energy efficiently. Skylights, particularly with large retail buildings, distribution centers and warehouses, can substantially reduce the need for conventional lighting and the related electrical use. And, under California's building energy codes, certain large footprint buildings are required to have skylights.

Exhibit 1

Integration of Core Building Components			
Equipment and Component Description	**Lighting**	**HVAC**	**Building Envelope**
Lighting			
lighting controls	Yes—Core category	Yes—reduces load	
daylighting controls	Yes—Core category	Yes—reduces load	
HVAC		Yes—Core categories	
Building Envelope			
roof		Yes—seals leaks & reduces load	Yes—Core category
cool		Yes—seals leaks & reduces load	Yes—Core category
roofs		Yes—seals leaks & reduces load	Yes—Core category
walls		Yes—seals leaks & reduces load	Yes—Core category
floors		Yes—seals leaks & reduces load	Yes—Core category
slabs		Yes—seals leaks & reduces load	Yes—Core category
doors		Yes—seals leaks & reduces load	Yes—Core category
windows	Yes—daylighting	Yes—seals leaks & reduces load	Yes—Core category
skylights	Yes—daylighting	Yes—seals leaks & reduces load	Yes—Core category

The Whole Building–Integrated Energy Management

The Energy Tax Planning Act (EPAct) provides that whole buildings that achieve 50-percent energy cost reductions compared to that of ASHRAE 2001 qualify for the maximum $1.80 per square foot deduction. With the whole building approach, the goal is to maximize the integrated design of all systems and components to minimize energy use. In particular, a

highly insulated air leak–free building envelope can maximize the efficiency of HVAC systems. Energy-oriented window systems enhance HVAC improvements, and when lighting and skylights and Windows are functionally integrated, the result is commonly called a "daylighting system." Exhibit 1 presents a diagram illustrating how the three core building components integrate to save energy.

Energy Tax Planning

The optimal approach to energy tax planning is to correlate the building energy tax plan to the organization's overall building energy plan. Just as all buildings are unique, every enterprise's approach to building energy planning is going to be unique. For large building portfolios, the enterprise building energy strategy generally reflects the building owner's overall facts, circumstances and long-term objectives. Some of the items that impact building energy strategy include the following:

- **Building Age.** As a general rule, most of the older buildings were built to meet lower building code energy standards and are less efficient than newer buildings.
- **Financial Resources.** At the threshold, energy improvements are expensive. Sophisticated building owners use a myriad of investment incentives, electricity rebates and tax incentives, coupled with the underlying energy cost reduction, to improve substantially the economic payback related to energy improvement investments.
- **Geography.** Different regions of the United States

Exhibit 2

The Road to ZEB Existing Buildings Energy Tax Plan		
Current Initiatives 2006–2007	**Potential Tax Benefit**	**Code Section**
Upgrade existing conventional systems		
Lighting and lighting controls with daylighting	$0.60 per square foot deduction	Code Sec. 179(c)(1)(C)(i)
HVAC and HVAC controls with natural ventilation	$0.60 per square foot deduction	Code Sec. 179(c)(1)(C)(ii)
Building envelope including cool roofs, insulation and energy star windows	$0.60 per square foot deduction	Code Sec. 179(c)(1)(C)(iii)
Introduce Solar PV	30% credit	Code Sec. 48(a)(2)(A) as amended by EPAct

Post–2007 to 2013 Cycle Initiatives	**Potential Tax Benefit***	**Code Section**
Introduce new products and integrate some new solar		
Lighting Light emitting diodes	$0.60 per square foot deduction	Requires extension of existing tax provisions
Hybrid Lighting (a hybrid of solar and conventional lighting)	30% credit	
HVAC Decentralized HVAC	$0.60 per square foot	
Solar Thermal	30% credit	
Building Envelope Advanced materials	$0.60 per square foot	
PV Solar windows and solar walls	30% credit	

2013 to 2020 (ZEB)	**Potential Tax Benefit***	**Code Section**
Integrate substantial amounts of alternative energy equipment, and in particular, solar		
Lighting Direct current solar (sunlight) for lighting	30% credit	Requires extension of existing tax provisions
Combine lighting and HVAC solar systems | integrating solar PV and solar thermal	30% credit	
Installation of a broad sense of alternative energy items including solar geothermal wind	10%–30% credit	
*These potential tax benefits will only be available if the current EPAct legislation is extended. The road to ZEB concept is a hypothetical plan developed by Energy Tax Savers, Inc.		

present different energy cost exposures and opportunities. For example, in the North, heating comprises a substantial portion of energy costs. In the Northeast, there tends to be a higher proportion of older and, hence, less energy-efficient buildings. However, there are always exceptions, including multiple buildings built recently in New York and Boston that are designed to achieve very high efficiency levels.

- In the southern region of the country, air-conditioning results in the disproportionate amount of energy costs. However, many southern and western buildings in the United States are relatively new and energy efficient, which acts to mitigate some of the higher cooling costs.
- **Utilities.** The underlying costs of energy, particularly electrical energy, can vary widely depending on the local utility rate environment. Some states utilities do not have enough local generation capacity and are obligated to pay market prices to obtain electricity from third parties. Other utilities may have adequate power facilities but may be hamstrung by prior contractual arrangements made in the newly deregulated electricity market place.
- **Competition.** Building owners with tenants are more motivated to make investments reducing operating costs including energy costs in soft real estate market.
- **Environmental Sustainability.** More people are increasingly concerned with energy management as one of the components of environmental sustainability concerns particularly in the effort to reduce emissions.

Building Energy Code Standards

Building energy code standards vary widely in the United States. Some 22 states use ASHRAE 2004 standards, requiring energy efficiency. Most of the remaining states use prior standards such as ASHRAE 2001, ASHRAE 1999 or even older codes that incorporate less demanding energy standards.

California uses building code provisions called, Title 24, which particularly emphasize energy efficiency.

ASHRAE 2004 has specific standards requiring Lighting and HVAC to be more energy efficient. More efficient lighting is specified for a wide variety of building categories including offices, warehouses, manufacturing facilities and schools. Recognizing the high energy costs relative to air conditioning, ASHRAE 2004 now requires off hours HVAC to shut down controls for 15,000 BTU units and above. That 2004 standard is a substantial drop from the previous standard, which required shut-down for 65,000 BTU units and above.

The EPAct tax incentives only require energy performance standards exceeding ASHRAE 2001, taxpayers with new energy-reducing projects in the 22 states already at the ASHRAE 2004 code level and California are much more likely to qualify for the new tax deductions

Strategic Energy Tax Planning

The long-term reach goal promulgated by the U.S. Department of Energy is to achieve ZEB. "ZEB" stands for Zero Energy Based buildings where the net of the energy generated at the building and used by the building from the electric grid is zero. Buildings generate energy from building systems that create energy. Energy can arise from conventional systems such as co-generation and a variety of generators all from alternative sources, such as solar, wind or geothermal.

Building owners on the road to ZEB are going to proceed along a path that works best for them. The EPAct tax provisions reward taxpayers for improving conventional systems while simultaneously encouraging the conversion to alternative energy sources. A hypothetical ZEB strategy and the related tax opportunities based on today's technology expectations is presented in Exhibit 2.

Conclusion

Tax advisors that understand a building owner's long-term energy strategy have the opportunity to provide important advice for supporting that strategy. With today's high energy prices, reducing energy can substantially reduce building operating costs. The new EPAct Commercial Building tax deductions provide additional cost savings.

Endnotes

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1 Energy Tax Incentives Act of 2005 (P.L. 109-58).

2 Code Sec. 179(c)(1)(C)(i).

3 Code Sec. 179(c)(1)(C)(ii).