Energy Tax Savers, Inc.

EPAct Update

Energy Tax Savers
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Energy Policy Act of 2005 (EPAct)

- Incentivized areas:
  - Lighting
  - HVAC
  - Building envelope
- Available for New Construction and Existing Buildings
- Available for Tenant owned lease-hold improvements

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Who's Using EPAct?

First Movers	Reasons
Retailers	• Energy is a major operating cost • Centralized facilities' management
Distribution Centers	• Major growth market • High economic return
Hotels	• Meet ASHRAE 2004 = Full EPAct • Bi-level not required in guest rooms
Parking Garages	• Large facilities drive large EPAct benefits
Industrial Facilities	• Large facilities drive large EPAct benefits • Existing lighting is being phased out by law
Office Buildings	• More states enact ASHRAE 2004 or higher building energy codes

What's it Worth?

Sample Square Footage	Lighting Minimum Deduction	Lighting Maximum Deduction	HVAC Maximum Deduction	Building Envelope Maximum Deduction	Total
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

How Do You Qualify?

- Mechanics
  - Deductions based on improvements over ASHRAE 90.1 2001
  - Energy efficient improvements must be depreciable assets
    - Converts 39 year depreciation to current deduction
  - Available for installations completed 1/1/2006 through 12/31/2013
  - Deduction amounts:
    - Lesser of total cost or:
      - $1.80/sq.ft. Whole Building
      - $0.60/sq.ft. Individual Systems
        a. Lighting
        b. HVAC
        c. Building Envelope

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers)
HVAC (Heating, Ventilation & Air Conditioning)

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8 Ways to Capture Tax Deduction

- Whole Building ($1.80/ft^2)
  - 50% Energy Cost Reduction below standard
- Permanent Rules partial deduction ($0.60/ft^2)

	Building Envelope	Lighting	HVAC
Alternative 1	$16_{2/3}$ %	$16_{2/3}$ %	$16_{2/3}$ %
Alternative 2	10%	20%	20%

- Interim Lighting Rules ($0.30/ft^2-$0.60/ft^2)
  - 25% to 40% prescribed Light Power Density (LPD) reduction below standard

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Where are the Benefits

- Lighting, Lighting, Lighting
- Lighting Controls
- Specific Types of HVAC
  - Geothermal
  - Thermal Storage
  - Central Chiller plants with small buildings(<150,000sq.ft.) in Campus
  - VAV on buildings <75,000 sq.ft.
- LEED Buildings

Interim Lighting Rules

- Meet W/ft^2 targets
- Add'l Requirements
  - Bilevel Switching
  - Meet ASHRAE 90.1 Requirements
  - Meet IESNA minimum light levels

	2001 Standard LPD, W/ft^2	25% Improvement	40% Improvement
Office	1.3	0.975	0.78
Manufacturing	2.2	1.65	1.32
Retail	1.9	1.425	1.14
Warehouse	1.2	50% required, 0.60	

% 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

LPD (Light Power Density)

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Benefiting from ASHRAE 2004 & 2003 IECC

	2001 Std. (W/ft2)	25% Over 2001	40% Over 2001	2004 Std. (W/ft2)	2004 % over 2001	
Automotive Facility	1.5	1.125	0.9	0.9	40%	X
Convention Center	1.4	1.05	0.84	1.2	14%	
Court House	1.4	1.05	0.84	1.2	14%	
Bar Lounge/Leisure	1.5	1.125	0.9	1.3	13%	
Cafeteria/Fast Food	1.8	1.35	1.08	1.4	22%	
Family Dining	1.9	1.425	1.14	1.6	16%	
Exercise Center	1.4	1.05	0.84	1	29%	X
Gymnasium	1.7	1.275	1.02	1.1	35%	X
Health Care Clinic	1.6	1.2	0.96	1	38%	X
Hospital	1.6	1.2	0.96	1.2	25%	X
Hotel	1.7	1.275	1.02	1	41%	X
Library	1.5	1.125	0.9	1.3	13%	
Manufacturing	2.2	1.65	1.32	1.3	41%	X
Motel	2	1.5	1.2	1	50%	X

	2001 Std. (W/ft2)	25% Over 2001	40% Over 2001	2004 Std. (W/ft2)	2004 % over 2001	
Movie Theater	1.6	1.2	0.96	1.2	25%	X
Museum	1.6	1.2	0.96	1.1	31%	X
Office	1.3	0.975	0.78	1	23%	
Parking Garage	0.3	0.225	0.18	0.3	0%	
Theater	1.5	1.125	0.9	1.6	-7%	
Police/Fire Station	1.3	0.975	0.78	1	23%	
Post Office	1.6	1.2	0.96	1.1	31%	X
Retail	1.9	1.425	1.14	1.5	21%	
School/University	1.5	1.125	0.9	1.2	20%	
Sports Arena	1.5	1.125	0.9	1.1	27%	X
Town Hall	1.4	1.05	0.84	1.1	21%	
Transportation	1.2	0.9	0.72	1	17%	
Warehouse	1.2			0.8		
Workshop	1.7	1.275	1.02	1.4	18%	

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Energy Codes & Code Compliance

- 35 states are now at codes stricter than ASHRAE 2001
- Title 20 appliance standards and equivalent are eliminating the use of probe start metal halides (CA, OR, WA) others pending
- We see many designs that miss EPAct and miss Building Codes
- Download COMcheck at:

  http://www.energycodes.gov/comcheck/ez_download.stm

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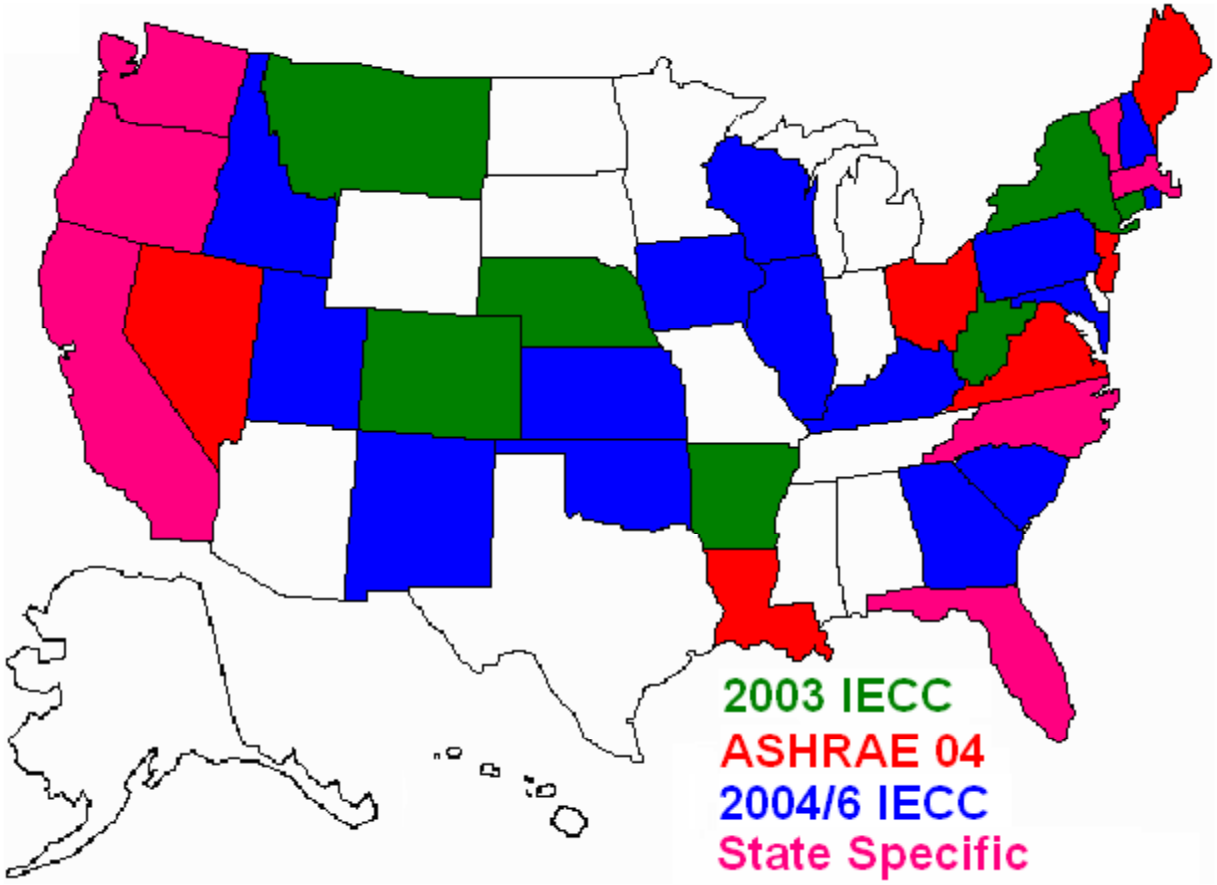
States with Stricter Lighting Standards than ASHRAE 90.1 2001



2003 IECC	
Arkansas	New York
Colorado	Montana
Connecticut	Nebraska
West Virginia	
2004/2006 IECC	
Illinois	New Hampshire
Rhode Island	Pennsylvania
Maryland	Kentucky
South Carolina	Georgia
Wisconsin	Kansas
Oklahoma	New Mexico
Utah	Idaho
Iowa	
ASHRAE 04	
Virginia	Louisiana
Maine	New Jersey
Ohio	Nevada
State Specific	
California	Oregon
Florida	Vermont
North Carolina	Washington
Massachusetts	

Lighting Retrofit Economics

- Energy Savings is usually the main driver
- In some states, Utilities offer Rebates for energy efficient lighting Installations
- Tax Savings is the newest opportunity
- Demand Response is another potential income stream
- Capitalizing on all the incentives can bring payback for projects to below 2 years and in some cases less than 1 year

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Common Lighting Retrofits

Industrial/Manufacturing/Warehouse

Metal Halide
458 Watts

T5 HiBay Fluorescent
234 Watts

Office & Retail

4 Lamp 4’ T12
Mag. Ballast
144→164 Watts

3 Lamp 4’ Super T-8
Elec. Ballast
72 Watts

Or

2 Lamp 4’ Super T-8
Elec. Ballast
67 Watts

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Commercial Building Immediate Deduction

- Permanent Rules
  - 16 ⅔% overall cost improvement below standard generated by each system (Lighting, HVAC, Building Envelope)
  - Energy models confirm savings
  - Daylighting systems particularly well suited
  - HVAC may qualify with as little as a 25% improvement over standard

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Understanding Energy Models

- IRS has approved ten types of modeling software
  - Trane Trace 700, Energy Plus, Carrier HAP, VisualDOE, EnergyGauge, DOE2.1E & 2.1E-JJH, Owens Corning Commercial Energy Calculator, Green Building Studio, EnerSim
  - other submissions are in process
- Important modern Energy management tool.
- Currently required for all HVAC and building envelope deductions and for whole building lighting alternative.
- In many jurisdictions, rebates are provided for all or substantial portions of modeling costs.

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What to do when HVAC & Building Envelope do not Qualify for EPAct

Repair & Replacement Expensing Opportunities

- HVAC Replacements
  - Numerous Companies are now systematically changing out worn HVAC package units
  - Consider using Q-PURE
    - Qualified Packaged Unit Replacement Expensing

- Roof Replacements
  - Consider using Q-RRED
    - Qualified Roof Replacement Expense Deduction

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Tax Opportunities For HVAC Equipment Replacement

- Q-PURE: Qualified Package Unit Replacement
- Q-CURE: Qualified Chiller Unit Replacement

- Only for existing buildings
- Best fact pattern is one for one change out

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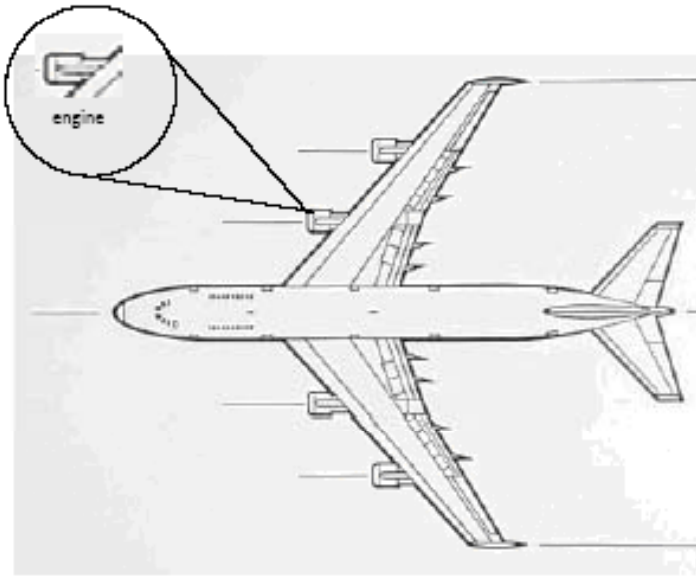
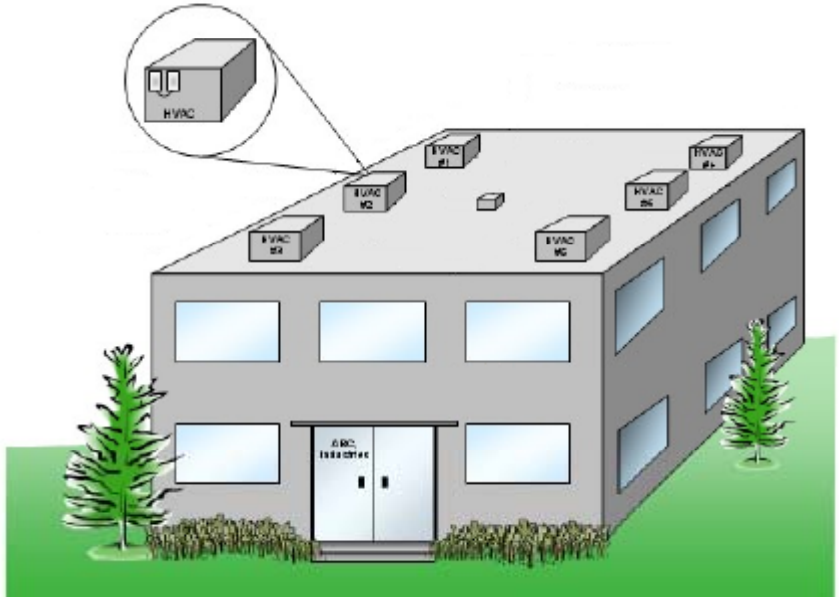
Federal Express Case





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Betterment & Adaptation Test

- Cannot be a betterment in a tax sense
  - i.e., changing package units to chiller does not qualify
- Building cannot be adapted to different use
  - i.e., converting industrial building to office will not qualify
  - i.e., if part of major overall building renovation will not qualify

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Package Unit Replacement (PUR) Programs

- Systematic Package Unit Replacement Programs are rapidly gaining acceptance
- Programs are offered by all of the leading HVAC manufacturers including:
  - Carrier
  - Lenox
  - McQuay
  - Trane
  - York

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Numerous Business Drivers for PUR Programs

- Energy Cost Savings
- Service Cost Savings
- Parts and Maintenance Cost Savings
- Volume Purchase Price savings for units and installations
- Higher utility rebate utilization
- Minimize facility operation interruption

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The Q-PURE Process

- Uses equipment data points and product specifications to document compliance with all tax statutes, court cases and IRS notices
- A comprehensive report is prepared for each installation
- Documentation is quantitative as presented in graphic form

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Q.P.U.R.E.

- **Q**ualified **P**ackaged **U**nit **R**eplacement **E**xpensing
  - Certain Prescribed Conditions allow for Expensing of HVAC
  - Immediate expensing is equivalent to a 20% discount
  - Accelerates Replacements based on Life Cycle Planning
  - Enables facilitates to move from old energy inefficient units to today's more efficient units
  - Covers every major brand of Packaged Units

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Q.P.U.R.E.

Required Data

- **Existing Packaged Unit**
  - Year of Initial Install
  - Tonnage
  - Manufacturer & Model #
- **Project**
  - Purchasing Entities Name & Contact Info
  - Cost of Packaged Unit & Install
  - Tax Year of Install
- **New Packaged Unit**
  - Manufacturer & Model #
  - Tonnage
  - Efficiency SEER/EER
- **Building**
  - Address
  - Leased or Owned
  - Estimated Value of Building or Leasehold

QPURE vs. Depreciation

QPURE	$ 45,000	
Federal Corporate Tax Rate	35%	
State Corporate Tax Rate	5%	Average Rate
QPURE Tax Savings	$ 17,213	
Discount Rate	8%	
		Delta
Present Value of an Immediate Q-PURE Tax Savings	$ 17,213	$ -
Present Value Depreciated over 39 years	$ 5,243	$ 11,970
Present Value Depreciated 15 years than replaced	$ 7,117	**$ 10,096**

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What Does Energy Tax Savers Deliver?

- Complimentary Design Analysis
- Complimentary Tax Benefit Assessment
- Comprehensive EPAct Tax Package

  - Energy Reduction Plan (ETSI Software)
  - Building Energy Model (ETSI Reviewed)
  - Tax Deduction Calculation (ETSI Software)
  - Owners Manual, highlighting energy savings
  - Design Certification (ETSI Document Creation and Review)
  - Post-Implementation Inspection (ETSI Document Creation and Review)
  - Audit Assistance

- Comprehensive QPURE Tax Package
  - All documentation required to allow for expense treatment

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Multi-location EPAct Management

- Inventory of Energy Equipment per location
  - Selling space and total store sq. ft.
  - Lighting Watts/sq.ft. for selling space & total store
  - HVAC count, model #, age and EER
  - Utility Info
    - $/sq.ft.
    - kwh/sq.ft. & therm/sq.ft., etc.
    - $/kwh & $/therm, etc.
- This inventory helps focus:
  - Retrofit budget
  - Lease re-negotiation
  - Standard Setting

Additional Tax Incentives

Solar

- Extended Through 12/31/2016
- 30% Tax Credit
- Available for Photovoltaic and Solar Thermal

Combined Heat & Power (CHP)

- Available Through 12/31/2016
- 10% Tax Credit

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SHOWCASE LIGHTING

Tax Deductions Brighten Return on Lighting Upgrades

BY CHARLES GOULDING, JACOB GOLDMAN AND SIDDHARTH SHETH

By all accounts, the Energy Policy Act of 2005 (EPAct) got off to a slow start. Along with many other provisions, the much-hyped law provides tax incentives to encourage more energy-efficient buildings. But there were delays in promulgating the Internal Revenue Service regulations to implement the law. And it's taken a while for facility executives to understand the complex legislation.

Today, however, a growing number of facility executives are coming to see how EPAct may offer significant financial benefits, especially for lighting systems.

Effective Jan. 1, 2006, EPAct provided new tax deductions for specific investments that improve the energy efficiency of either the entire building or one of three building systems: lighting, HVAC or the building envelope. To qualify for those deductions, a project — whether an entire building or one of the three subsystems — must cut energy use compared to the limits specified in ASHRAE 90.1-2001.

The amount of the deduction depends on how efficient the system is. The deductions are available for both new construction and improvements to existing buildings. The project must be placed in service between Jan. 1, 2006 and Dec. 31, 2008. Congress is currently weighing a measure to expand the tax deduction amounts and extend EPAct through the 2012 tax year and through 2014 for projects certified as of 2012.

To date, lighting systems have been by far the biggest beneficiaries of EPAct deductions. One important factor has been tremendous improvements in lighting product efficiency — many of today's lighting products meet the EPAct energy target. Combine those factors with the substantial economic benefits provided by EPAct, and there may well be a solid economic case for installation of high efficiency lighting.

What's more, the process of qualifying for lighting deductions is easier than for HVAC or the building envelope. For those two areas, energy modeling is required. For lighting, two methods are available for obtaining tax deductions. The simpler of the two is the prescriptive method, which is based on watts per square foot and does not require modeling. The second method is modeling to show a 16.67 per cent energy cost reduction compared to ASHRAE 90.1-2001. Modeling is the only way to obtain the benefits of watt per square foot power allowance adjustments for lighting controls.

For links to supplier Web sites go to **WWW.FACILITIESNET.COM/BOM**

The Opportunity

EPAct tax deductions for lighting start at 30 cents per square foot for a 25 percent reduction in light power density compared to ASHRAE 90.1-2001 requirements. The deduction can be as great as 60 cents per square foot for a 40

VENTURE LIGHTING INTERNATIONAL

Uni-Form MP 575 pulse-start metal halide lamp and ballast system replaces 1,000-watt MH lamps. Product produces 60,000 initial lumens and twice the mean lumens of a standard 400-watt metal halide lamp. Arc tube shape improves thermal characteristics and light output. Tipless design eliminates cold spots for more uniform light output and longer lamp life. **CIRCLE #250**

ADVANCE TRANSFORMER

Mark 10 Powerline electronic dimming ballast for use with 24-watt T5 high output and 24-watt long twin tube fluorescent lamps has low-profile design. Ballast requires no additional control wiring and is compatible with controls from many manufacturers. **CIRCLE #260**

UNIVERSAL LIGHTING TECHNOLOGIES

Ballastar light-level switching ballast for T8 lamps provides light level control by switching from full light to 50 percent power using standard wall switches or relays. Ballast is designed to operate either one or two F32T8, F25T8, or F17T8 lamps. Product can be connected to any voltage from 120 to 277 volts.

CIRCLE #262

COOPER LIGHTING

The Fail-Safe LED series of architectural vandal-resistant luminaires features seven face plate choices in six base colors plus custom capabilities for signage and wayfinding. LED modules use 11 Lumileds 3W white LEDs offering 50,000 standard life hours at 70 percent lumen maintenance. The one-piece injection molded lens is designed to obscure lamp image while maintaining efficiency. UL 1598 listed for wet locations. **CIRCLE #253**

ORION ENERGY

The Compact Modular T8 Series high-bay lighting fixtures are available in 2-, 4-, 6-, and 8-lamp configurations. Quick-change ballast pack and modular design enable upgrades or advanced controls to be added. Aluminum "I" frame dissipates heat more quickly than steel, lowering temperature surrounding the ballast. **CIRCLE #273**

percent reduction.

To illustrate the economic benefit, a 100,000-square-foot building that qualifies for the maximum incentive will generate a $60,000 Federal income tax deduction and, in most states, a corresponding $60,000 state income tax deduction.

To qualify for these deductions, a facility has to meet not only the specified EPAct light power density requirements for that type of space, but also comply with some additional mandates. Under the current legislation, in effect until 2008, these additional requirements include bi-level switching and minimum IESNA light levels. Bi-level switching means having at least two levels of light other than off in all spaces. A space is defined as an area surrounded by floor-to-ceiling walls. A dimmer, for example, meets the requirements because it provides multiple levels of light. Two or more switches controlling different fixtures in a space would also meet this bi-level requirement. Occupancy sensors do not, on their own, meet this bi-level requirement because they do not provide two levels of light.

To get a deduction for a lighting EPAct project, facility executives need to know the square footage of the spaces subject to the project, the watts per square foot for all rooms — including new and retained wired lighting — and how the bi-level switching requirement has been met. Documentation for the lighting tax deduction includes a watts-per-square-foot spreadsheet for all wired lighting, a written energy plan, a certification and an inspection document.

Maximizing Benefits

Many lighting projects just miss qualifying for EPAct tax incentives because the lighting systems designer wasn't aware how close the design was to meeting EPAct requirements. There are cases where design needs will trump EPAct qualification but those occasions should represent conscious decisions. In many situations, merely changing one item in

Justifying Energy Projects

EFFICIENCY

Facility executives have a range of economic drivers for lighting projects. Five economic areas can be explored to increase the percentage of lighting and other energy efficiency projects that are approved.

- **ENERGY SAVINGS.** Many of today's lighting and HVAC products can reduce current energy consumption in the range of 25 to 50 percent compared to older products, in some cases products installed as little as five years ago.
- **REBATES.** Many states and local jurisdictions offer substantial rebates for energy improvements. Rebates are particularly lucrative in certain states in the Northeast and in California, where energy supply is limited and costs are high. Some rebates are called prescriptive, meaning that a particular product category gets a prescribed rebate, such as $80 per lighting fixture or $1,000 per air conditioning unit. Some rebates are kilowatt based, meaning that the more a project reduces electricity use, the greater the rebate. Facility executives can now access national electronic rebate databases and, for a fee, have all of the rebate paperwork completed in virtually every jurisdiction where a company has facilities.
- **EPACT DEDUCTIONS.** For projects that meet EPAct requirements, significant tax deductions are available.
- **DEMAND-RESPONSE PROGRAMS.** Many states offer demand-response and demand-management programs where companies can get substantial economic payments for using lighting controls and HVAC controls to reduce electricity use when called upon during demand events or to earn additional revenues for making lighting and HVAC investments that permanently reduce electrical demand.
- **MAINTENANCE COST REDUCTION.** Building maintenance is a high-cost, labor-intensive process, particularly if there are a lot of products with short lives that require regular replacement. Some new energy-efficient products have longer lives, which reduces replacement costs.

— Goulding, Goldman, Sheth

ALANOD ALUMINUM

Miro-Micro Matt for fluorescent high-bay applications has 93 percent total reflectivity and produces up to 20 percent more light than the same luminaire with a white painted reflector. Product is abrasion-resistant, inorganic to avoid yellowing or darkening, anti-static and dust resistant. **CIRCLE #254**

LEVITON

Z-MAX lighting-control relay systems include stand-alone and network-ready models. Service life is 10,000,000 switching cycles. Astronomical clock allows system's location to be programmed to time-of-day settings or a time offset from sunrise or sunset. Relays offer keypad programming with bright LCD panels and on-screen instructions. **CIRCLE #255**

LUMISYS

Maxiom Series controls high voltage lighting circuits via a two-wire RS-485 network, occupancy sensors, light level sensors, momentary override switches, and other input devices. LX5 technology features native BACnet and a range of other protocols. Panels have on-board DDN (Digital Device Network) communication to Digi-Touch addressable switches. UL listed. **CIRCLE #256**

FULL SPECTRUM SOLUTIONS

The EverLast line of fixtures features electrodeless fluorescent technology that has a rated life of up to 100,000 hours and is resistant to EMC interference. The company has seventeen different combinations of lamp wattages in three different styles and offers dimmable options on many models. **CIRCLE #257**

HOLOPHANE

ROAM photocontrols communicate via a wireless transceiver, creating a self-configuring, self-healing wireless network that exchanges data between photocontrols on an event-driven basis. The system monitors itself, reporting outages as they occur. Photocontrol is backward-compatible with light fixtures that have a locking-type receptacle. **CIRCLE #258**

LAMINA

The SoL MR16 LED is designed as a direct, ready-to-plug-in retrofit for 20-watt MR-16 halogen and comparable CFL lamps. This design produces as much light as the 20-watt halogen bulb, but consumes less than 8 watts. Color temperatures of 3,050 K and 4,700 K. **CIRCLE #267**

INTERNATIONAL ENGINEERING PRODUCTS AND CONSULTING CORP.

Lighting control uses solid state electronics with on-site, remote and aggregate Web-based controls for HID lighting. The VB400 contains an electronic ballast and features microprocessors to regulate current flow for metal halide, high-pressure sodium and pulse start lamps. **CIRCLE #259**

FOSTER TRANSFORMERS

LED power supply features short circuit and overload protection and can be

dimmed with a standard dimmer. The power supply is encapsulated in epoxy and housed in a 304 stainless steel enclosure. Power supply can withstand a direct short in excess of 15 days, with no external fusing required. Product accepts multiple input voltages with output configurable for 12 VDC or 24 VDC up to 60 W. **CIRCLE #251**

JUNO LIGHTING GROUP

Elate specification-grade luminaires offer open and lensed downlights, wall wash and adjustables with CFL, induction, HID, incandescent and low-voltage sources. The line also features pull-down and multiple lamp-aiming adjustables for display lighting. **CIRCLE #268**

LITHONIA

The I-BEAM fluorescent high bay lighting system features T5HO cool running technology that is UL/C-UL listed to operate in environments up to 65 degrees C. I-BEAM delivers up to 50 percent in energy savings over 400 watt metal halide lamps, according to the company, and maintains designed light levels over the life of the system. **CIRCLE #269**

OSRAM SYLVANIA

The DURA-One A19 electrodeless compact fluorescent lamp features a rated life of up to 15,000 hours. Offers instant brightness, a starting temperature of –20 degrees

F and unlimited switching cycles. Compared to a 75-watt incandescent A19, the product provides energy cost savings of up to $82 over the life of the lamp, according to the company. **CIRCLE #274**

NEXLIGHT

The WRT4244 dimmer controls fluorescent ballasts that accept a 0-10 volt DC control voltage. The unit is used in conjunction with the WR6161-84 20 amp relay to provide on/off control. Dimmer controls up to 50 ballasts. Dimming groups can be made that contain up to 60 dimmers. **CIRCLE #271**

SQUARE D

Occupancy sensors employing passive infrared (PIR) and ultrasonic technologies are available for wall switches and ceiling-mount applications. PIR wall switch replacement sensors are both 120/277 VAC and cover a 180-degree area with a 300-square foot range. Ceiling sensors offer 360-degree coverage and have a coverage area of up to 2,000 square feet. **CIRCLE #261**

GE

VIO white LED converts violet wavelength to white light, producing less than a 100 degree Kelvin color shift over a 50,000-hour rated life. Product is offered in 3,500K and 4,100K color temperatures. High-power, 4-watt LEDs feature 70-percent lumen maintenance and chip-on-board package that improves thermal management. RoHS compliant. **CIRCLE #252**

ROBERTSON WORLDWIDE

Electra series high temperature ballasts meet ENERGY STAR 4.0 requirements

and have a 90 degree C maximum case temperature. Ballasts available with side leads, bottom leads or bottom leads with studs for one 7- through 42-watt and two 13- through 26-watt CFLs. **CIRCLE #275**

SENSOR SWITCH

nLight lighting offers system-level-control while enabling zones of nLight devices to self-commission and function independently. System provides local control via LCD Gateways, as well as remote, global control through SensorView Web-based software. **CIRCLE #276**

LUTRON

EcoSystem allows workers to control one or more fixtures from their desks using a personal computer. Quantum software control package monitors individual lighting fixtures and power usage, operating hours, monitor lamp and ballast performance. The system allows users to make changes to as many as 100 EcoSystem networks at the same time. **CIRCLE #270**

a design — such as high wattage display cases — or changing out a few more fixtures than originally anticipated makes the difference between no tax deduction and a large tax deduction.

On a national facility project for a large retirement organization, for example, a slight design change increased the EPAct tax deductions from $2,000 per facility to $40,000 per facility.

The first step to obtaining EPAct deductions is hiring a lighting designer who is familiar with EPAct requirements or is willing to learn them. If a facility executive hires an architect or lighting designer who has no familiarity with EPAct, it may well be worth allowing some additional time to learn the standards. It would also be important to ask the designer to explain the rationale for designs involving large building spaces that don't qualify for EPAct tax deductions.

Good design incorporates many different — and sometimes conflicting — considerations. However, it's clear that energy-efficient design is now being given more weight than in the past. There has also been a quantum leap in the energy efficiency of lighting products, which makes it possible to achieve both good lighting quality and energy efficiency. Facility executives should look for a designer who is familiar with today's products and is not merely recycling outdated, inefficient design solutions.

It is also important to keep accurate records of which properties have qualified for EPAct tax deductions and for how much per square foot. For example, a building that in 2007 qualifies for deduction of 37 cents per square foot will have the opportunity to achieve a second deduction of 38 cents per square foot if a proposal to increase the deduction from the current 60 cents to 75 cents becomes law.

Getting a "Free Ride"

Organizations that installed energy-efficient lighting before Jan. 1, 2006 — that is, before the beginning of the EPAct qualifying period — have the potential to get what is known as a "free ride" under the law. That's true if the organization has already achieved the EPAct light power density targets. The reason: Lighting projects undertaken after Jan.

1, 2006, for buildings that have already hit the light power density targets are automatically entitled to a tax deduction. Essentially this means that if a facility already meets the EPAct watts-per-square-foot target, virtually all lighting upgrades will qualify for tax deduction.

Free riding is typically used to obtain automatic tax deductions for lighting controls projects, including occupancy controls, dimming and daylighting systems as well as the lighting portion of building management systems.

More and more facility executives are beginning to understand free riding. At one department store chain, a lighting controls project involving 20 facilities qualified for a "free ride" tax deduction. The chain had invested in energy efficient lighting before EPAct was passed and already met the EPAct watts-per-square-foot requirement before the lighting controls were installed. Most of the projects involved automatic shutoff systems — time clocks or occupancy sensors. Ten stores qualified for the full 60 cents per square foot deduction.

Tax Tips

Beginning in late 2005, the U.S. lighting industry did a magnificent job of introducing EPAct on industry Web sites and in trade brochures. But practical problems made it difficult for facility executives to take advantage of the deductions. Applying EPAct requires interdisciplinary skills involving engineering, energy management and tax concepts that aren't normally part of the basic skill set of any single professional. The mainstream tax profession community is often not conversant with lighting electrical wattage, HVAC energy efficiency and building envelope fenestration concepts. Likewise, the facilities community generally isn't familiar with tax deductions and normally doesn't use income tax benefits as part of the project capital authorization process.

Initially, the lighting industry described the basic EPAct concepts and then recommended that facility executives seek tax advice. Increasingly, the lighting industry is engaging specialized tax consulting firms that have the required skill set necessary to identify, analyze and capture the EPAct benefits.

Today, companies are beginning to obtain substantial tax savings ranging from a few thousand dollars for small projects to tens of millions of dollars for large national property holders.

To date, the most common lighting EPAct projects involve distribution centers, industrial facilities and retail spaces. But EPAct deductions have also been gained for lighting projects in office buildings, supermarket chains, restaurants, assisted living facilities, hotels and other types of buildings.

There is a great deal of synergy between EPAct and the U.S. Green Building

WATT STOPPER

DW-200 wall switch occupancy sensors combine passive infrared and ultrasonic technologies. Sensors contain two relays for controlling two independent lighting loads or circuits. Products have high sensitivity and dense coverage and include selectable walk-through, test and presentation modes. **CIRCLE #263**

PHILIPS LIGHTING

Luxeon Rebel power LEDs are engineered for operation between 350 mA and 1000 mA, and can exceed 70 lumens per watt at 350 mA. Product can deliver more than 160 lumens at higher drive currents. Product has a 3mm by 4.5mm footprint. Ceramic-based package is designed

to withstand high heat with a maximum junction temperature of 150 degrees C. Available in warm, neutral and cool-white with correlated color temperatures (CCTs) of 3,000K, 4,100K and 6,500K respectively. **CIRCLE #264**

NOVITAS

SuperSwitch 2 occupancy switches adjust sensitivity and time delay automatically and immediately in response to occupant behavior, eliminating the need to "learn" behavior patterns over time. Switch fits into a designer-style wallplate. With manual on mode, lights are not switched on until touchplate is pressed. **CIRCLE #265**

ACCULITE

Exeter E3 Series luminaires feature an extended range of decorative trims and lenses for commercial and retail environments. Based on the company's glass, acrylic and aluminum optical assemblies. **CIRCLE #266**

NORTH AMERICAN ENERGY GROUP

LED wall packs are designed for security, accent and perimeter lighting applications. Packs are rated at 100,000 hours of operation, feature 80 percent energy savings over HID, and require virtually no maintenance. Available in 150w or 250w equivalent and in 120/277v. **CIRCLE #272**

Council's Leadership in Energy and Environmental Design (LEED) green building rating system. LEED requires computer modeling to document target levels of energy efficiency; EPAct also requires computer modeling for HVAC, building envelope, whole-building and some lighting deductions. More importantly, LEED generally requires adherence to ASHRAE 90.1-2004 energy-efficiency requirements, meaning that LEED projects will generally either qualify for EPAct tax deduction or come very close. What's more, 90.1-2004 is the basis for code in some states.

For example, office buildings qualify for EPAct at the .975 watts per square foot level and ASHRAE 90.1-2004 sets a maximum of 1 watt per square foot for office buildings. So a building planned to meet 90.1-2004 only needs to reduce lighting energy use by .025 watts per square foot to qualify for an EPAct deduction. Accordingly, leading office building developers are increasingly setting their office building lighting requirements at less than .975 watts per square foot so that they both meet the requirements of ASHRAE 90.1-2004 and qualify for EPAct. It seems likely that the LEED-qualified professionals will begin to realize that EPAct provides meaningful economic incentives to support their LEED initiatives.

The modeling required to qualify for a whole-building deduction under EPAct is very similar to LEED modeling. However, for separate systems modeling relating to lighting, HVAC and the building envelope, EPAct building modeling requires taking a different approach, one that most engineers are not familiar with. Facility executives should be sure that their engineers understand, in-depth, the computer modeling requirements of EPAct.

EPAct Lighting Success Stories

EPAct has made it possible for many warehouses, distribution centers and industrial property owners to realize substantial tax deductions. For example, the Genlyte supply division facility in Union, N.J., replaced older metal halide lighting with energy-efficient fluorescent lighting. In the assembly/parts facility, 240 metal halide fixtures with a rating of 455 watts per fixture were changed over to four-lamp T5 fixtures with a rating of 236 watts per fixture. In the warehouse, approximately 40 metal halide fixtures were replaced with more energy-efficient six-lamp T5 fixtures as well.

With these changes, lighting energy use for the assembly/parts facility fell from 1.33 to .84 watts per square foot. For the warehouse, lighting energy use

dropped from .56 to .48 watts per square foot. The result was a 35 percent reduction in lighting energy cost and an EPAct tax deduction exceeding $100,500.

The building industry is increasingly recognizing the substantial value of EPAct-related lighting upgrades for both energy savings and tax deductions. For the first time, national property owners have a national lighting standard energy target that provides national economic benefits. If the EPAct extension bill is enacted, as expected, virtually every US commercial and government building will have the opportunity to benefit from this legislation. BOM

Charles Goulding, an attorney and certified public accountant, is president of Energy Tax Savers, Inc. Jacob Goldman is a tax consultant and Siddharth Sheth is an engineer with the firm. The firm has developed complimentary EPAct designer guides for major building categories including distribution centers, offices, pharmaceutical facilities, hotels and schools.

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The Tax Aspects of HVAC Package Unit Replacement Programs

By Charles Goulding, Jacob Goldman and Nicole DiMarino

Charles Goulding, Jacob Goldman and Nicole DiMarino describe several tax benefits and additional costs saving advantages for property owners that implement HVAC package unit replacement programs. They also discuss related cost segregation opportunities and Code Sec. 199 considerations.

The majority of those ubiquitous metal boxes on the top of buildings everywhere are heating, ventilation and air conditioning (HVAC) systems, commonly called package units. Package units generally have a product life of 14 or so years. It is estimated, based on Air Conditioning and Refrigeration Institute (ARI) industry shipment data, that nine billion dollars worth of these units installed in the early 1990s will soon need replacing. Numerous leading manufacturers manufacture package units, including, but not limited to Carrier, Lennox, McQuay, Trane and York.

Up on the Roof

To help the company's tax department better understand package units, the energy manager at one major retailer recently asked the tax department to meet on the top of the roof at a facility near their corporate office. This exercise greatly assisted the tax department in understanding the nature and functionality of package units. This process also enabled the tax department to see how the package units were affixed to the building, in that they are curb mounted to the roof, aligned with roof aperture and connected to the building and other mechanical systems *via* electrical, piping and ductwork connections.

Package Unit Replacement Programs

Historically, many property owners waited until a deteriorating package unit completely broke down. Then these property owners would scramble to get any replacement unit that worked from a local HVAC dealer. This can be risky behavior that can result in the building temporarily being without heat and air conditioning.

The New Managed Approach

Increasingly, property owners are obtaining substantial economic benefits by entering into formalized package unit replacement (PUR) programs. PUR programs are a building management technique that offers numerous cost savings including:

- energy cost savings from increased efficiency,
- purchasing price efficiencies,
- more efficient product energy cost savings,
- repair part savings,
- service call maintenance savings,
- rebate realization and higher rebates,
- demand response savings, and
- federal and state tax savings.

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Energy Cost Savings and Purchasing Efficiencies

Package units have become increasingly more energy efficient over the last decade. Merely replacing an older unit with today's legally required minimum energy efficiency units will often result in energy cost savings exceeding 20 percent from the prior generation unit.

Everyone in the installed package unit supply chain, including manufacturers, dealers and installers, can offer more favorable per unit pricing related to obtaining all of particular company's business for a fixed period of time, resulting from volume pricing and the ability to systematically schedule manufacturing, production, delivery and installation.

Numerous utilities offer substantial rebates for purchasing more energy efficient package units, and often the rebates for high efficiency units are set at the highest percentage, or fixed level. Frequently, property owners who wait until the last minute do not even qualify for these valuable utility rebates since many rebate programs require pre-approvals.

Additional Energy Cost Savings from Advanced Ordering

One of the biggest saving opportunities from PUR programs is the ability to prearrange delivery of much more energy efficient units. Based on traditional product demand, package unit HVAC dealers tend to stock the minimum energy efficient units and back order the more energy efficient units. Accordingly, waiting until an existing unit is inoperable usually forecloses the ability to purchase the more energy efficient units that require six to 12 weeks advance ordering.

Once the age of package units begins to exceed normal product life, they typically begin to require replacement of relatively expensive component parts, in particular, expensive compressors.

Old package units require constant maintenance and higher fees are incurred for repetitive service calls. HVAC service companies know how to tweak and patch old units so they continue operating for limited time intervals. Although this can be a lucrative business for the service provider, it is really not a productive use of an experienced HVAC mechanic's work time.

Rebate Capture and Higher Rebates

Numerous utilities offer substantial rebates for purchasing more energy efficient package units, and often the rebates for high efficiency units are set at the highest percentage, or fixed level. Frequently, property owners who wait until the last minute do not even qualify for these valuable utility rebates since many rebate programs require pre-approvals, which administratively cannot be accomplished on an immediate basis. Moreover, many utility programs logically offer higher rebates for purchasing higher energy efficient units, but, as indicated above, those units are generally not available with a last minute equipment purchase.

In addition to utility rebates, in states with demand response programs there is often an additional economic benefit for payments available from the permanent electric grid demand reduction related to purchasing the new, more energy efficient package units. HVAC units are one of the biggest building equipment electricity users.

Tax Savings

Normally package units are capitalized and depreciated for tax purposes as buildings over 39 years. This is actually a very onerous tax depreciation life period for equipment that clearly is not going to last 39 years and, in most, cases has a useful economic life that is less than 20 years and less than 50 percent of the tax prescribed useful life.

Package units purchased pursuant to PUR programs can potentially qualify for qualified package unit replacement expense (Q-PURE) tax deductions depending on facts and circumstances, when properly documented. For Federal tax purposes, the tax aspects of repair and replacement of building equipment is largely governed by a long line of leading court cases including *Plainfield-Union Water Co.*[1] This frequently cited case established the so-called *Plainfield-Union* test regarding wear and tear measurement points.

FedEx Corp.[2] concluded that an aircraft, and not the aircraft engine, was the appropriate unit of property. By analogy, this "appropriate unit" approach should apply to HVAC systems. These court cases and recent IRS guidance, including proposed regulations under Code Sec. 263 that were released in March 2008 and corrected in April 2008,[3] set out a series of bright line tests applicable to determining whether replaced building equipment is entitled to an immediate tax deduction.

Cost Segregation Interface

As a general rule, when installed in new buildings, package units are considered building property subject to 39 year depreciation. In certain special situations replacement package units may be installed with added task HVAC that is eligible for shorter depreciation, typically seven years under the cost segregation rules. Examples of task HVAC may be data center HVAC, HVAC for manufacturing processes, specialized ventilation systems and heat recovery systems where process heat may be used to service the building. With larger HVAC equipment installations, taxpayers should consider both repair expense opportunities and cost segregation opportunities. If the HVAC replacement/task HVAC combination arises to a betterment, disqualifying repair treatment, the default may be to cost segregation as the exclusive tax opportunity.

Package Unit Tax Repair Expense Analysis

Four "Unit of Property" Tests

One of the most important criteria for determining whether a building product is considered a repair replacement item is the so-called "four unit of property" tests.

There are four subparts to "the unit of property" tests:

- The first test asks how the taxpayer and industry treats the component part in relation to the larger unit of property for regulatory, market, management and accounting purposes.
- The second test asks if the economic useful life is co-extensive with the economic useful life of the larger unit of property.
- The third test concerns whether or not the larger unit of property and the smaller unit can function without each other.
- Lastly, test four asks whether the component part is or can be maintained while affixed to the larger unit of property.

Recently released Proposed Reg. §1.263(a)-3(d) requires capitalization if:

- the new investment results in a "betterment,"
- the new improvement restores the unit of property, or
- the new investment adapts a unit of property to a new or different use.

Worn Standard

It is important to provide worn documentation, meaning the replaced property must have completed its useful life. The facilities and tax departments should begin this analysis by first identifying all package units considered worn by applying a bright-line useful life standard. Geography impacts HVAC package unit life and certain seaside regions of the country require HVAC coastal units that have a shorter economic life.

Betterment Test

The facilities and tax departments should agree on a bright-line betterment criteria. Based on tax precepts, the replacement unit cannot be considered a betterment. The selected betterment standards should reflect current package unit regulatory and technology standards. Although the recently released proposed regulations withdraw the so-called value test, the betterment test does involve a materiality threshold. Accordingly, the new unit cannot result in a material increase in overall building value. The age or performance characteristics of HVAC systems generally have little or no impact on total realistic value.

Restoration

The new unit cannot serve to restore a unit of property, meaning it cannot prolong the useful life of the building. The general consensus is that installing a new package unit is not going to extend the useful life of a building.

Addition to New or Different Use

The replacement unit cannot result in a material change in building function, including a building extension. Accordingly, installing a unit that enables the building itself to serve an entirely different purpose would be problematic for tax repair expensing. The new unit cannot result in an increase in the capacity, productivity, efficiency, strength or quality of the unit of property or its output.

Code Sec. 199 Interface

The Code Sec. 199 deduction for qualified production activity income involves various complex tax issues related to construction projects. A discussion of those issues is outside the scope of this article.[4] Construction activities include activities performed in connection with a project to erect or substantially renovate real property. The 2008 proposed regulations under Code Sec. 263 require capitalization of amounts paid to replace a major component or substantial structural part of a unit of property.

Accordingly, sellers of roof top package units that also engage in installation may need to reconcile their own use of Code Sec. 199 with the customer's use of the repair expense provisions, which may conflict with each other.

Conclusion

The practical problem for building owners and facility managers is that they may not know how to apply and document compliance with the various repair and replacement tax expense tests. The advantage with implementing a new PUR program is that the property owner can simultaneously justify engaging a tax advisor knowledgeable about the Q-PURE repair expense tax rules and their application to PUR practices. The taxpayer's documentation should demonstrate compliance with all of the repair versus capitalization standards. Waiting until the last minute to complete an obligatory task is normally never sensible and with package unit replacements may be financially indefensible. With nine billion dollars in prospective package unit replacements, building operators can benefit from substantial cost savings by planning in advance, and should carefully consider the potential tax opportunities as well.

Endnotes

1 *Plainfield-Union Water Co.,* 39 TC 333, Dec. 25,740 (1962).

2 *FedEx Corp.,* DC Tenn., 2003-2 USTC ¶ 50,697, 291 FSupp2d 699. *Aff'd* CA-6 (unpublished opintion), 2005-1 USTC ¶ 50,186.

3 Guidance Regarding Deduction and Capitalization of Expenditures Related to Tangible Personal Property, 73 FR. 12,838 (Mar. 10, 2008), 73 FR. 19,451 (Apr. 9, 2008) (to be codified at 26 CFR pt. 1).

4 *See* Robert Feinschreiber and Margaret Kent, *Vagaries of the Section 199 Construction Incentive,* J. Int'l Tax'n, July 2007, at 30, *available at ProductionIncentive.com.*

Forbes.com

Energy & Genius

The Green Tax Gusher

Ashlea Ebeling 11.24.08, 12:00 AM ET

Want to install a $60,000 solar energy system in your home? Uncle Sam will pay 30%. Really.

You thought tax cuts were going to just the bottom 95% of taxpayers? Take another look. Millionaires are eligible for the latest round of breaks, the ones enacted by Congress on Oct. 3.

In 2006 Neil Chayet, the longtime host of cbs Radio's daily *Looking at the Law* segment, and his wife, Martha, a Republican fundraiser and former state finance official, paid $1.2 million for a Salem, Mass. mansion built in 1811 for U.S. Supreme Court Justice Joseph Story. The 9,000-square-foot building is a money pit. The Chayets have put $88,000 into energy-saving windows and $100,000 into a heat pump that feeds off warmth in the ground. They are getting some help from taxpayers, however.

The Chayets will claim a $2,000 credit for the heat pump, thanks to billions in green tax pork for businesses and individuals that Congress added to the $700 billion bank bailout. "It started as a labor of love and ended as a labor of love with a credit," says Neil Chayet, who personally lobbied Congress for the breaks. The new law contains tax goodies for everything from home windmills and corn stoves to plug-in hybrid cars and deluxe bicycles. Some are retroactive to the start of 2008--meaning you can claim them, as the Chayets are doing, for work already done. "People just fall into it. They wake up and have a credit," marvels Philip Tingle, an energy tax lawyer in Miami, Fla.

Solar > For 2008 you can claim one tax credit of up to $2,000 for up to 30% of the cost of a photovoltaic system to generate electricity and another credit of up to $2,000 for 30% of the cost of a system to heat hot water for showers and radiators (not for hot tubs or pools). This is a credit, not a deduction, so it reduces your tax liability dollar for dollar.

Stop! Don't install a photovoltaic system yet. In 2009 the $2,000 cap on that credit (but not the cap on the credit for thermal systems) comes off. No matter how much you spend, you can get 30% back from Uncle Sam. For a typical $60,000 installation, you'll get $18,000 knocked off your tax bill. If you don't owe that much you can carry forward any unused credit and use it in later years. Charles Goulding, a Syosset, N.Y. energy tax lawyer, reports that homeowners who have already started work are asking contractors not to finish until next year, to get the bigger break. "It's going to cause solar to boom in this country," he predicts. But first, perversely, it's causing a delay.

Note: In some cases the federal credits apply only to your net system cost after state incentives--now offered by 18 states. (For a state-by-state listing of green incentives, go to www.dsireusa.org.) Between the state and federal giveaways, installing a solar system might be a win financially (for you personally, if not for the taxpayer). To figure out how much energy a photovoltaic system will generate in your locale, check out the National Renewable Energy Laboratory's PVWatts online calculator.

Can't find a contractor? No need to rush; Congress authorized both of the solar credits through 2016, and a Democratic Congress is unlikely to take green credits away, even from rich folks. Even better, you can use the credits to reduce your alternative minimum tax bill as well as your regular tax.

Wind and geothermal > There's a new $4,000 credit for up to 30% of the cost of installing a home windmill system to generate electricity. (The credit is available even if you're selling the wind energy back to a utility.) For geothermal systems like the one the Chayets installed there's a new $2,000 credit. Daniel Ellis, president of ClimateMaster, a manufacturer of heat pumps, says the typical geothermal installation runs about $18,000. So the $2,000 break, he says, "isn't going to be a deal-changer for most people, but it's a sweetener." Like the solar credits, these credits are available for work done between Jan. 1, 2008 and Dec. 31, 2016.

The National Renewable Energy Laboratory has an In My Backyard tool that estimates the electricity you can produce with a windmill at www.nrel.gov/eis/imby. For geothermal the best tool comes from Natural Resources Canada, downloadable at www.retscreen.net.

Home improvements > The new law resurrects for 2009 a $500-per-tax-filer lifetime tax credit for energy-efficient home improvements. This credit was in effect in 2006 and 2007 but isn't available for work performed in 2008. (Couples who file separately can claim only $250 each.)

It's not hard to use up your $500 lifetime allotment. You can get up to a $500 credit (equal to 10% of materials costs) for insulation or exterior doors; up to a $200 credit (equal to 10% of installation and materials costs) for windows; up to $150 for an energy-efficient furnace or boiler burning gas, propane or oil; and up to $300 for a new central air system or water heater meeting certain specs. New for 2009 is the $300 credit for a corn stove, that being something to heat your home. (Why is this country using food to heat homes? Same reason it uses food to run cars.) To see if the equipment you're buying qualifies, go to www.ase.org/taxcredits.

Transportation > The new law creates a credit of up to $7,500 for the first 250,000 buyers of plug-in electric vehicles, beginning in 2009. So far the Chevy Volt, scheduled to come on the market in 2010 with an estimated $40,000 sticker price, is the only vehicle that seems to qualify. Meanwhile, the old hybrid-car tax credit of up to $3,150 is still available for certain models but not the most popular ones. That break, passed in 2005, applied in full to only the first 60,000 hybrids from each manufacturer; Toyota has run out of credits, and Honda is likely to do so by year's end. (Warning: You can't use a hybrid credit to reduce your AMT.)

Congress even found a place in the bailout for a bicycle tax benefit--an idea that Representative Earl Blumenauer (D--Ore.), who bikes to work, has been peddling for years. Beginning in 2009 employers who provide transit benefits (either pretax salary reduction plans or prepaid vouchers) for bus, train, van pooling or parking can provide up to $20 a month in tax-free bicycling benefits. (Bike commuters can't double-dip and get transit or parking vouchers, too.)

Congress has left it to the irs to fix the details, but expenses that could be reimbursed from a pretax or employer-paid bicycle benefit are likely to include the costs of buying, fixing or storing a bike. No word yet on Spandex.