A Dealer Guide to ENERGY STAR®
Putting Energy into Profits

I. ABOUT THIS GUIDE

Reducing dealership overhead costs, including energy costs, is an important way to improve profits. In addition to added profitability, energy efficiency improvements demonstrate a dealer's concern for the environment.

Automobile dealerships are certainly an energy-intensive industry, with facilities consuming about 110 kBTU per square foot, compared to prime office space at 93 kBTU. That amount can add up to thousands of dollars in water and energy costs for the typical dealership per year. All dealerships have the potential to reduce energy costs by at least 20 percent, with more advanced energy efficiency and energy management approaches saving even more. These approaches can mean substantial savings for many dealerships.

If efficiency measures to effect only a 10 percent reduction in energy consumption by dealership facilities were implemented industry-wide, the results could be staggering.

More than $193 million in utility costs and more than 1 million tons of carbon dioxide can be saved as a result of 10 percent energy reduction. NADA represents approximately 20,000 new car and truck dealers holding nearly 43,000 separate franchises. Each of these dealerships has many options for saving energy, and that 20 percent savings could translate into meaningful dollars for every one of them.

The primary objective of this guide is to help automobile dealers and their managers learn about opportunities to save energy and reduce utility costs. Saving energy also reduces emissions of greenhouse gases that may contribute to climate change. This guide is intended to highlight energy savings opportunities for dealerships to implement or discuss with energy-related service and product providers. It is not a substitute for the participation of architects, designers, construction firms, facility managers, and other experts in the design process. This guide recognizes the important role franchisors can play in specifications and in some aspects of dealer facility design. Regardless of the role of your franchisor, there are opportunities in this guide for all dealerships.

The table on the next page lists some of the most significant opportunities that are applicable to most facilities. Dealerships should consider the following "Sure Energy Savers."

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II. SURE ENERGY SAVERS

Automobile Dealership Sure Savers			
	ENERGY STAR® Qualified Products Available	New Construction or Major Renovation	Simple Upgrade to Existing Facilities
Insulation		√	
Electrical receptacle seals		√	√
High-efficiency heating and cooling equipment	Yes	√	√
Cool roofing	Yes	√	
Multiple pane, low-e windows with inert gas fill	Yes	√	√
Engage in heating and cooling equipment maintenance contracts and seasonal tune-ups		√	√
T8 fluorescent lamps and electronic ballasts and investigate the potential for T5 lamps for all low-bay applications		√	√
Metal halide or even more efficient T5HO lamps for exterior, security, and high-bay lighting		√	√
Compact fluorescent fixtures in place of all recessed can fixtures		√	√
Photocell sunrise/sunset controls on exterior light		√	√
Efficient exit signs	Yes	√	√
Occupancy sensors for all storage, conference, and restrooms		√	√
NEMA premium motors and variable speed drives		√	√
Automatic door closers on all exterior bays and pedestrian doors		√	
Compact fluorescent light bulbs	Yes	√	√
Efficient office equipment, electronics, and appliances	Yes	√	√
Low-flow faucets in all lavatories		√	√

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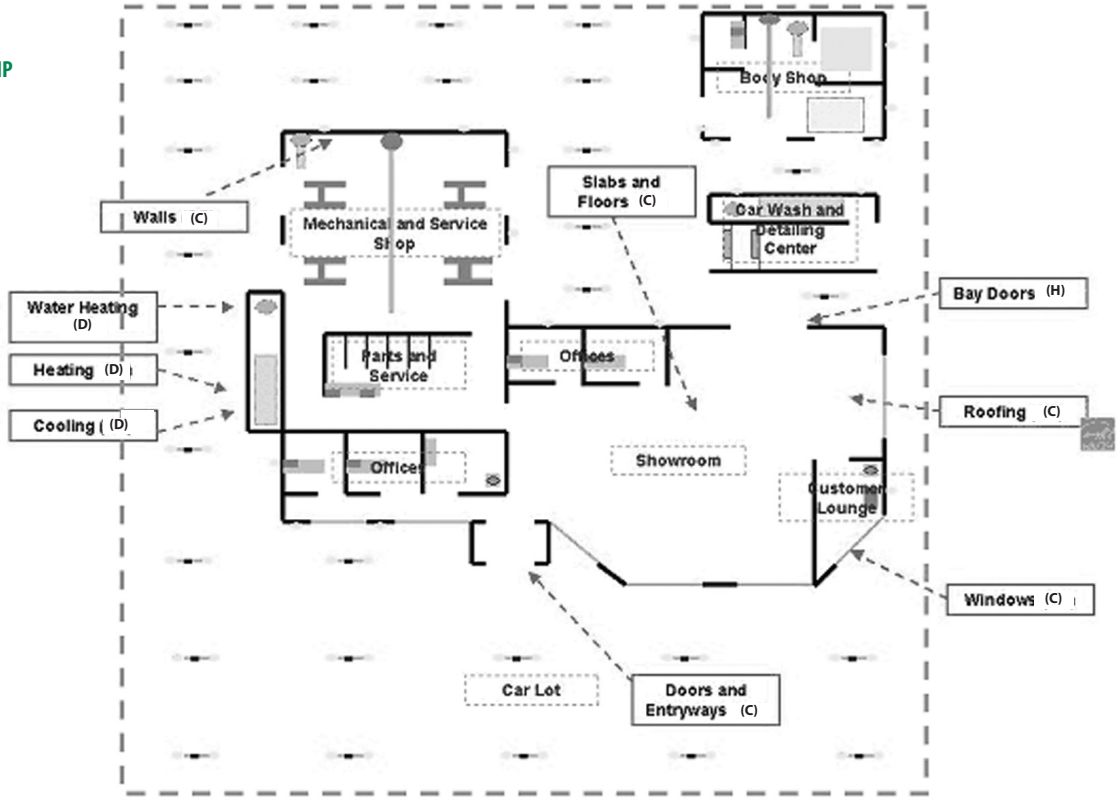
III. MAPS: ENERGY EFFICIENCY OPPORTUNITIES

The following graphics identify dealership energy efficiency opportunities. The equipment and facility features highlighted are coded to the Section V subheading (A, B, C, etc.) that details information on each opportunity.

A. Overall Dealership



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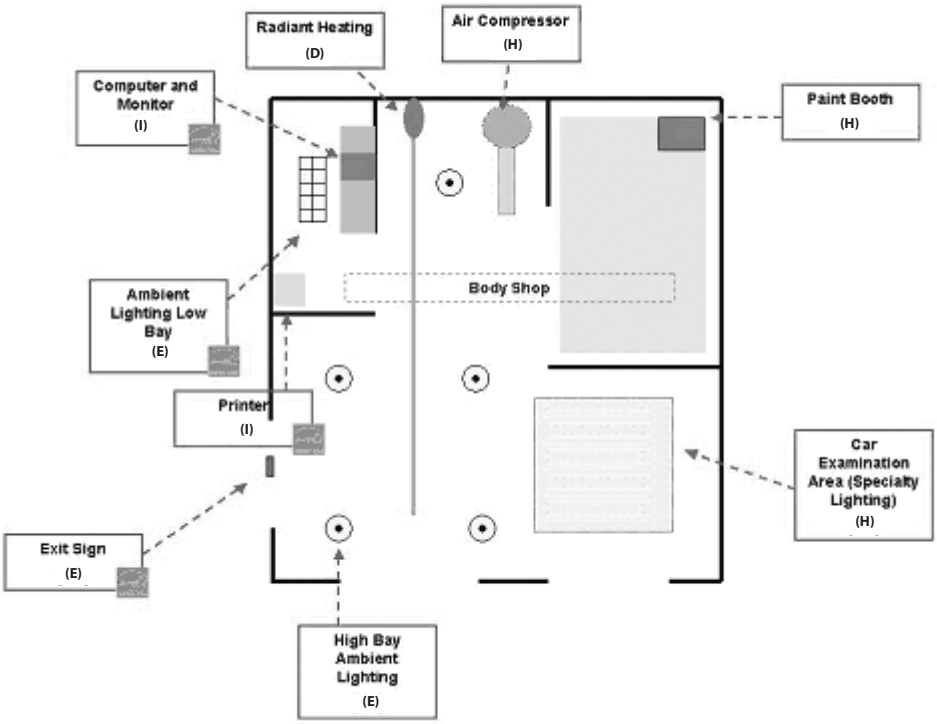
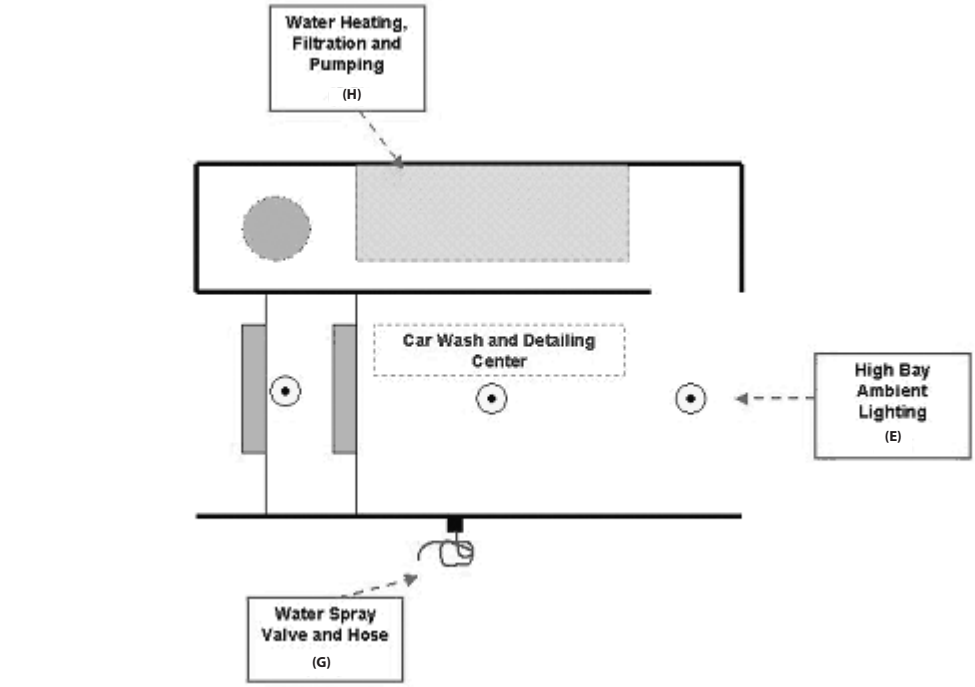
B. Body Shop



C. Car Wash and Detailing Center



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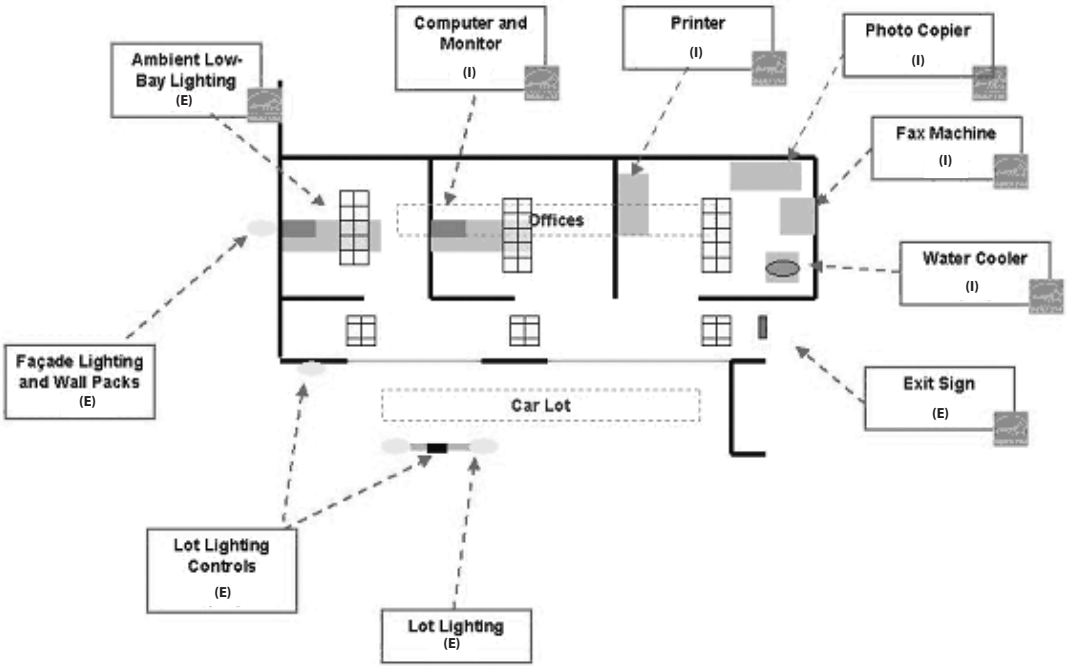
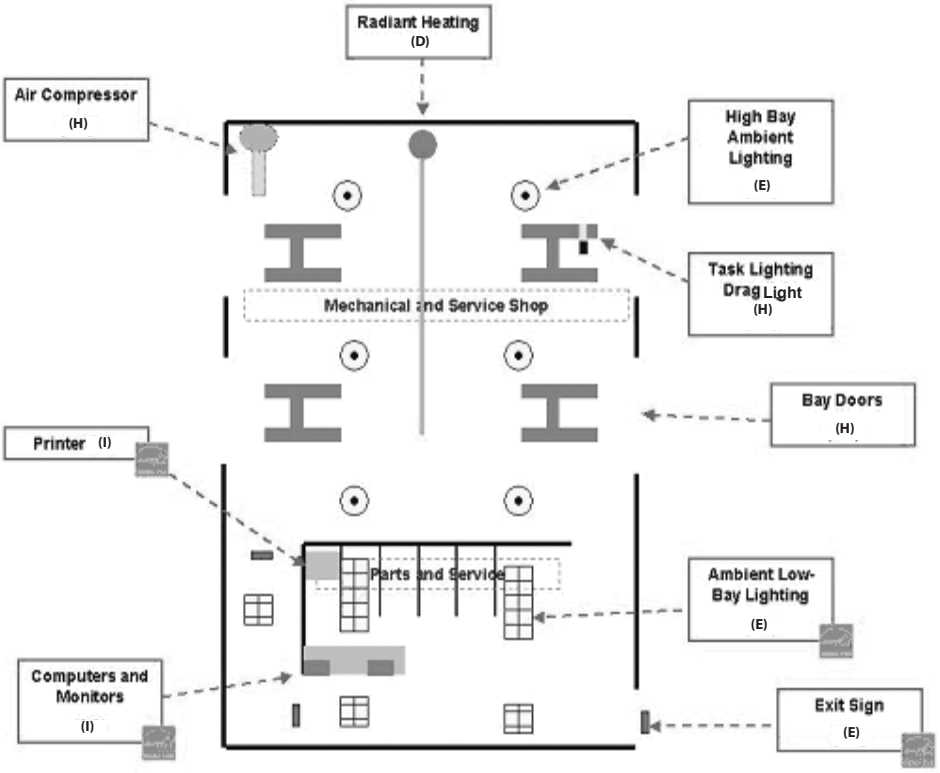
D. Lot and Offices



E. Mechanical and Service Shop and Parts and Service



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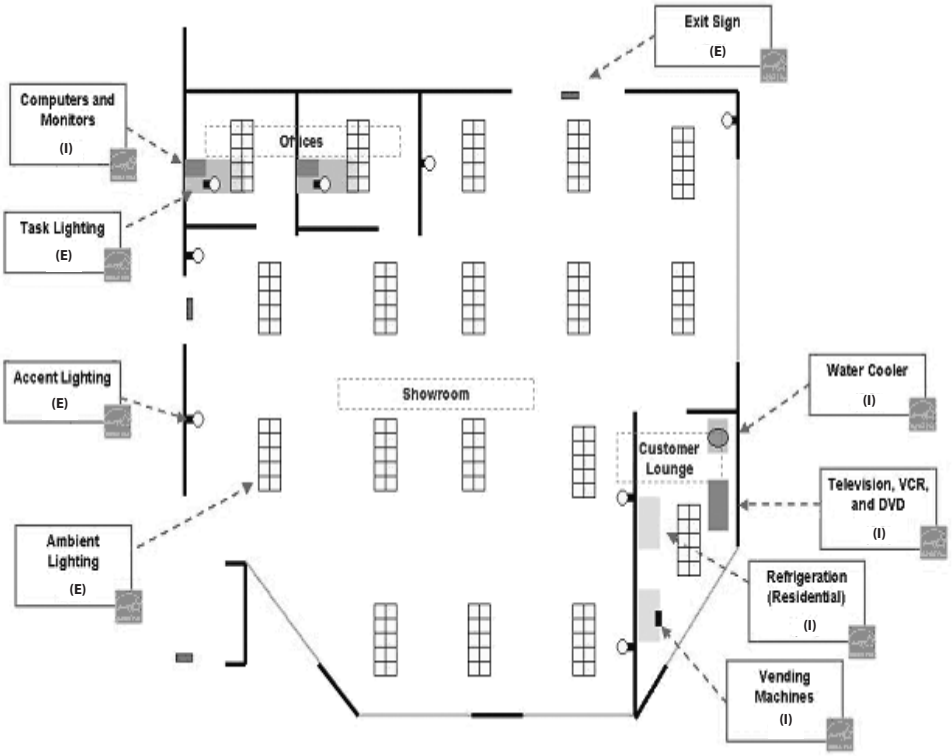
F. Showroom and Customer Lounge



IV. Franchisor Specifications

Automobile dealers are often subject to a franchisor's aesthetic and technical facility requirements, which may be designed to ensure a uniform and instantly identifiable look and feel. Some franchisor facility requirements and designs carefully consider energy efficiency. Other franchisor requirements and designs focus on the initial costs of construction, but not on long-term facility operating costs. During facility renovations or new facility construction involving franchisor requirements or design input, consider the following:

- Discuss energy efficiency concerns with the franchisor's designers, architects, and/or construction firm, especially where they involve the look of a facility (e.g., building structural characteristics, lighting). Stress that energy efficiency is a priority.

- Evaluate energy efficiency improvements involving areas that are not regulated or standardized by the franchisor. These may include shop areas, roofing that is not visible, and heating and cooling systems.

- Contact NADA or your state or local dealership association for the latest information on maximizing dealership energy efficiency.

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V. ENERGY EFFICIENCY TECHNOLOGIES AND APPROACHES

A. Energy Management

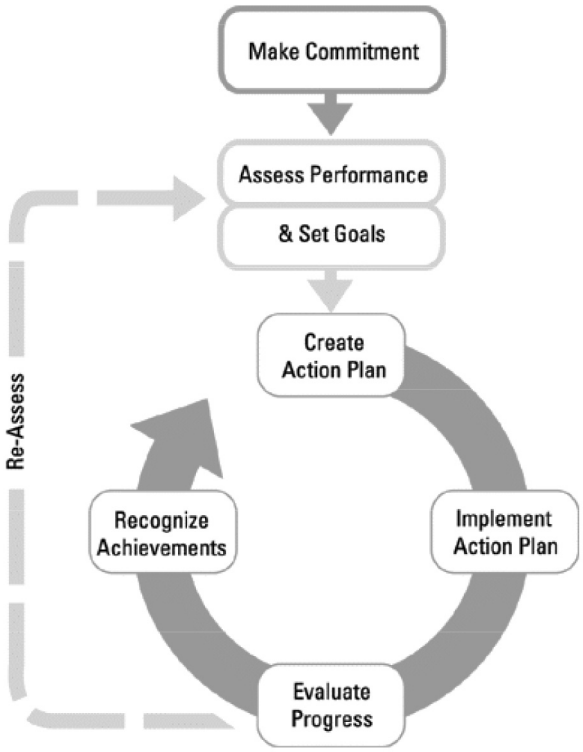
Energy management, like any other aspect of running a dealership, is good business. Yet many dealerships do little to manage their energy beyond accounting for the costs as line items in a yearly budget. Dealers and their facility managers need to know and understand the following:

- How much energy is used?
- What are the costs of energy, including seasonal variations and peak charges?
- What are available options for purchasing electricity and natural gas at lower rates?
- What are the potential future costs of energy?

Knowing the facts, you can exploit ways to save energy and costs. Strategies include:

- Improvements and technologies offering returns on investment.
- Awareness of energy consumption trends and forecasts.
- Managing the risk of future price changes.
- Seeking rate classification changes and aggregating facilities to boost purchasing power.

ENERGY STAR Guidelines for ENERGY Management



Learn More on the Web

Visit the ENERGY STAR Guidelines for Energy Management Webpage at http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index.

In many states, dealerships may be able to aggregate their facilities or join with other dealerships to purchase energy at lower rates, thus achieving much lower energy costs. Contact your state energy office for more information, and carefully evaluate options to ensure appropriate service and cost-effectiveness. Importantly, energy management is a continuous process where actions are taken and results are continually reassessed.

B. Demand Reduction and Demand Response

Dealerships conduct most of their activities during normal "business hours" which coincide with the times when the demand on the electric utility grid is at its highest. During these periods, utilities may impose demand charges on electric bills. Demand charges are fees imposed by the utility based on a facility's highest electrical demand, or peak kilowatt (kW).

Many utilities actively seek ways to reduce demand and increase their reliability without adding new power plants or new electric lines, Where permitted, electric utilities may continue to increase demand charges. Alternatively, they may price electricity used at different times differently relative to market conditions. For example, during low-demand periods,

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electricity will be priced very economically, whereas electricity offered during high-demand periods will be much more expensive. These pricing programs reward customers with low or off-peak demand with low electricity costs, while encouraging high-demand customers to lower or shift their peak demand.

Overall, demand charges can contribute significantly to operational costs, especially in areas prone to electrical capacity shortages. Fortunately there are opportunities for dealerships to lower their demand for electricity, including:

- Energy efficiency upgrades that permanently reduce electrical loads.
- Scheduling equipment usage, such as setting cooling units to pre-cool and take advantage of a building's thermal mass during peak billing periods.
- Building automation and direct digital controllers with energy management features that automatically adjust equipment operation to flatten peak demand.
- Thermal storage (ice) to offset cooling in areas of extreme peak electricity charges.

Opportunities to reduce demand are detailed in the lighting, heating and cooling, motors, building automation system, and dealership-specific equipment sections of this guide.

Local electric utilities may offer programs specifically aimed at reducing the electrical demand of small and mid-sized businesses. These programs may include incentives, equipment, or management practices that could help reduce a dealership's demand and save money. To learn more about these programs, see the incentive section of this guide and contact your electric utility.

Project Suggestion

When considering energy efficiency upgrades, emphasize those upgrades that will result in permanent demand reductions during periods where electricity is at its highes. Lighting and cooling are prime examples.

C. Building Shells

A loose building—one that lacks insulation to limit heat loss/gain, excessively and uncontrollably exchanges air, and draws in moisture—will inevitably cost more to operate, have poor indoor air-quality, and cost more to improve later. The best time to take advantage of building shell improvements is during construction or a major renovation, when upgrades to roofing materials, insulation, windows, and other elements involve only a small incremental cost. Existing facilities, however, can also benefit from building shell improvements and the returns on investment can be substantial. The sections below highlight selected building shell elements and suggest opportunities for improving energy efficiency.

Visit the Web to learn about the most recent model building energy codes, such as ASHRAE 90.1 and the IECC:

American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE):
http://www.ashrae.org/

International Code Council:
http://www.iccsafe.org/

Building Codes Resource Center:
http://resourcecenter.pnl.gov/cocoon/morf/ResourceCenter

U.S. Department of Energy's Building Energy Codes Program:
http://www.energycodes.gov/

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1. Roofing

Roofing presents a major opportunity for improving energy efficiency. Heat rising in a facility may conduct through the roof, contributing to heating costs. In addition, most dark roofs absorb heat, adding unnecessarily to cooling costs. Fortunately, these costs can be minimized through insulation and cool roofing.

Roof Insulation

The roof or underlying structure is the first place to consider when deciding to increase insulation levels. Increasing insulation (R-value) will reduce energy costs over time. For existing facilities, consider upgrading to the level of roof insulation specified by model energy codes if the structural characteristics of the facility will allow this to be done economically. Even modest amounts of insulation can be added through coatings applied to the roofing structure on the inside, over the roofing material, or in the eaves. During roof replacement, consider placing insulating material under the new roof, and specifying roofing with a higher R-value. Discuss these options with your service and product provider.

Note that adding insulation is a case of diminishing returns. For example, doubling the R-value will not result in twice the savings. For new commercial facilities, the most cost-effective amount of insulation, taking into account its cost and energy savings potential for a given climate, is specified by the International Energy Conservation Code (IECC) or ASHRAE 90.1. Often these model energy codes are more stringent than the minimum energy code used in your local area. For maximum energy savings, always request that work be done in compliance with the most stringent code. Additional insulation beyond that specified by a model energy code may not make good economic sense.

Cool Roofing

Commercial roofs are notoriously hot, as anyone who has been on one on a hot summer day can attest. This heat can conduct through the roofing material into the building, contributing significantly to air-conditioning costs. Cool roofing materials can alleviate much of this problem. Cool roofs are usually light in color, and are designed to reflect sunlight and shed heat gain through a property known as emissivity. By reducing solar gain, the roof surface temperature is reduced by up to 100 degrees Fahrenheit, significantly lowering air-conditioning loads. Consider cool roofing during new construction and when an existing roof is being replaced, particularly in warm and sunny climates. Cool roofing products are available in most roofing types and involve a small cost premium when compared to conventional roofing. As an upgrade for existing facilities, cool roofing is often one of the best energy cost reduction investments one can make but should be carefully evaluated. Consult your service and product provider for assistance evaluating a facility's climate, size, orientation, and roof slope to determine if the energy savings are significant enough to merit upgrade costs.

Did You Know?

Cool roofing has the potential to save a 1980s-built, 100,000 square-foot dealership between $2,000 and $11,000 in energy costs ***annually?***

To learn more about cool roofing, visit The ENERGY STAR Qualified Product website:
http://www.energystar.gov/index.cfm?fuseaction=find_a_product

and The Lawrence Berkeley Cool Roofing Material Database website:
http://eetd.lbl.gov/coolroof.

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2. Walls

Reducing Air and Moisture Infiltration

All walls permit some level of air and moisture infiltration that may contribute significantly to heating and cooling loads and indoor air-quality concerns. For all new construction, minimize infiltration by using such barriers as cloths, membranes, and coatings. Concrete walls are especially susceptible to moisture infiltration. For existing buildings, retrofits usually are only cost-effective during renovation or re-facing when walls are bare and accessible. Consult your architect, construction company, service and product provider, or heating and cooling professional for more information.

In addition to adding barriers, fill all gaps between the structural components of conditioned space using such products as fiberglass batting, spray foam or caulking. A number of small holes and leaks can quickly add up to the equivalent of leaving a door open.

Wall Insulation

Increasing the R-value in wall cavities or concrete forms will reduce energy costs. For new facilities, consult model energy codes to determine the most cost-effective amount of insulation. For existing facilities, consider upgrading to the level of wall insulation specified by these energy codes if the structural characteristics of the facility allow it. Even modest amounts of insulation added using coatings applied to existing walls offer benefits. Discuss with a service or product provider the best energy saving options for the facility.

3. Slabs and Basements

Reducing Moisture in Slabs and Basements

The concrete commonly used in commercial slabs and basements conducts moisture, contributing to cooling loads and poor indoor air-quality. When constructing a new facility, use membranes and vapor retarders to reduce or nearly eliminate moisture infiltration. These barriers may also be used to prevent the infiltration of hazardous air contaminants. Retrofitting barriers to slabs and basements typically is impractical.

Slab and Basement Insulation

Increasing the R-value in basement structure cavities, concrete forms, and the interface between foundations and buildings will reduce energy costs. As with roofing and walls, consult model energy codes to determine the most cost-effective amount of insulation to use. Also for existing facilities, consider upgrading to the level of wall insulation specified by these energy codes if the structural characteristics of the facility allow it. Even modest amounts of insulation added through coatings applied to foundation blocks and under floors will help. Consult with a service and product provider to determine the most appropriate energy savings options.

4. Windows

Dealerships typically have a considerable amount of window area. Careful window selection will ensure that windows have the optical properties necessary to allow customers to see vehicles, that they provide for a friendly, day-lit atmosphere, and that they limit summer heat gain and winter heat loss. Fortunately, you can choose from many energy-efficient options that will achieve these goals. For new construction or window replacement, consult and adhere to model energy codes. Energy-efficient features should be standard for new windows.

A window's frame has an enormous impact on its efficiency. Efficient window designs use a thermal break, consisting of an insulating material to prevent heat loss in the winter and gain in the summer. Frames made of solid metal without a thermal break, such as aluminum, can lead to considerable heat transfer.

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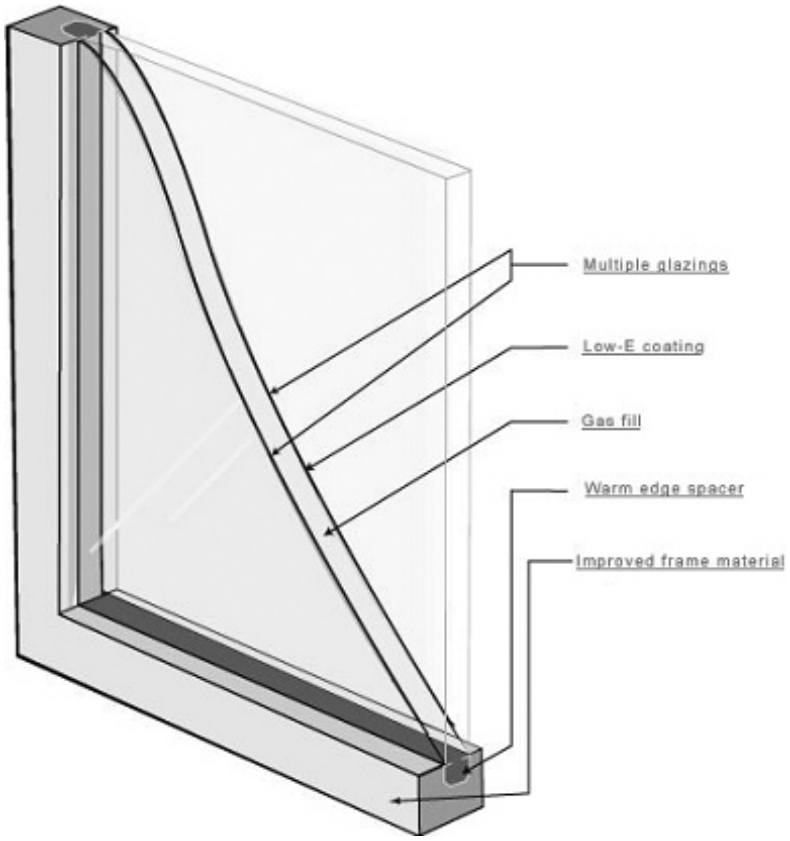
Panes

Multiple panes or glazing improve efficiency by adding a dead air-space that reduces heat conduction. Inert gas fill between panes results in a window with a better R-value than one filled with air.



Low-E

Almost all new commercial windows have low-emittance or "Low-E" coatings. Low-E coatings keep heat inside in the winter and outside in summer and should be specified by climate to ensure the most cost-effective balance of solar gain and heat loss. For product visibility reasons, consider a mild tint or clear Low-E glass.

Tints

Tints applied to window glazing are often just additives to provide privacy and reflect solar gain. Although tints may not be desirable for showrooms, they work well for offices, shops, and other dealership areas. The degree of tint added to windows should reflect the need for privacy and the benefit of reduced solar gain. Discuss tinting in detail with your architect or glazing service and product provider.

Upgrading Existing Windows

For upgrades and retrofits where existing windows will not be replaced, aftermarket coatings and tints may be a good option, particularly in more extreme climates. Shop carefully, however, as the real-world effectiveness of coatings can vary widely. When in doubt, request product qualifications, laboratory test data and/or references to other projects where the coating was used when determining potential energy savings.

To learn more about energy-efficient windows, visit:

The ENERGY STAR Qualified Products website at
http://www.energystar.gov/index.cfm?fuseaction=find_a_product and

The Efficient Windows Collaborative webpage

http://www.efficientwindows.org.

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5. Doors and Entryways

Door Designs and Seals

Every time exterior doors are opened or closed, conditioned air may escape or unconditioned air may be drawn in. Heating and cooling units must then compensate for the unconditioned air. Doors may open and close often as customers enter and employees come in from lots and service areas. This high traffic presents excellent energy savings opportunities, including:

- **Improved Door Designs:** Include additional insulation or multiple panes of glass.
- **Good Seals**: Doors that do not seal tightly will not keep the weather out. For newly installed doors, make sure the door structure lines up with the frame and seals. For existing doors, check the door and add seals where missing, cracked or hardened. Often in older doors, the bottom of the door has little or no sealing; install door sweeps in these cases.
- **Automatic Closers:** These prevent doors from being left open. Automatic door closers have been standard in commercial buildings for decades, but the performance of older installations may have degraded. If the automatic door opener/closer is hydraulic, check the cylinder yearly to ensure that it closes the door quickly. Periodically check electronic units that use step pads, ultrasonic, or infrared sensors for proper operation.

New doors should adhere to the most recent model energy codes.

Vestibules

Many commercial buildings feature vestibules, which are small areas separated by two sets of doors. Vestibules use a small air space to improve occupant comfort and reduce drafts by separating the outside from the inside of the building. They also save energy. For new construction or major renovations, vestibules are a good idea and should be considered for existing buildings as part of major renovation of the facade.

D. Heating, Cooling, and Ventilation

Proper heating, ventilating, and air-conditioning (HVAC) are key to maintaining a comfortable, healthy, and productive environment for all dealership employees and customers. Collectively, these systems account for nearly 40 percent of the electricity used in commercial buildings. Substantial cost savings and improved heating and cooling performance can be achieved by implementing energy efficiency measures.

1. Load Reduction

Consider implementing strategies that will reduce the dealership's heating and cooling loads. Reducing a facility's load allows existing systems to operate less frequently and newer systems to be downsized, lowering both operating and capital costs. See the building shell and lighting sections of this guide for more information.

2. Heating and Cooling Systems

Heating is one of the largest energy expenses for many dealerships. Cooling systems are very energy-intensive. The cooling systems are also almost always fueled by electricity and tend to operate during periods subject to expensive peak and time-of-use charges. Given the large size and high traffic of their facilities, dealers should focus on the performance of their heating and cooling systems.

For new facilities, work with architectural, construction, and HVAC service and product providers to specify units that are energy-efficient and economical. Consider upgrading systems in existing facilities. Heating and cooling systems have advanced significantly in design and efficiency in the last decade. For example, today's air conditioners use 30 to 50 percent less energy to produce the same amount of cooling as 1970s systems. Replacing air conditioners just 10 years old may save 20 to 40 percent on cooling costs. For HVAC systems more than a few years old, consider contacting a heating and cooling service and product provider with demonstrated experience in energy-efficient installations to determine the potential savings associated with upgrading equipment.

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Heating systems are generally rated by their Annual Fuel Use Efficiency (AFUE)—the higher the value, the more efficient the unit. Cooling units are rated by their seasonal energy efficiency ratio (SEER) or their energy efficiency ratio (EER). As with AFUE, the higher the value, the more efficient the unit. Heat pumps may include a SEER for cooling, but the efficiency of the heating function is determined by the coefficient of performance (COP). Heat pumps with greater COPs have better heating performance. Use these values to evaluate potential heating and cooling equipment options.

Heating and Cooling System Tips

- Where possible, reduce heating and cooling loads—by making building shell and lighting system improvements, for example—before selecting new equipment.

- NEVER SUPERSIZE! Installing over-sized equipment unnecessarily increases up front capital costs and the costs of operation. Request that your architect or HVAC professional conduct an Air-Conditioning Contractors of America's Manual N Commercial Load Calculation to ensure proper sizing.

- When selecting a new cooling system, have your HVAC professional compare standard-efficiency and high-efficiency units, including their lifecycle costs.

- In humid climates, consult your HVAC professional about supplemental dehumidification. Reducing the humidity of a facility increases occupant comfort and reduces costs by allowing thermostat set points to be raised a few degrees with no loss in comfort.

- Consider specifying economizers. Often available at a low incremental cost on new units, economizers draw in fresh air when the temperature outside is lower than inside, offsetting cooling costs.

Did You Know?

Improperly designed and sized heating and cooling distribution systems use up to 40 percent more energy?

Learn More on the Web

ENERGY STAR Qualified Products "Heating and Cooling Smartly"
http://www.energystar.gov/index.cfm?c=heat_cool.pr_hvac

Air Conditioning Contractors of America
http://www.acca.org/

Flex Your Power "Heating, Ventilation and Air-Conditioning (HVAC) Systems"
http://www.fypower.org/com/tools/products_results.html?id=100124

- Where applicable, specify National Electrical Manufacturers Association (NEMA) premium motors on HVAC equipment, and consider specifying variable speed drives (VSD) on condenser and evaporator fans. More efficient motors use less energy and variable speed drives save energy by reducing motor speed when full output is not needed.

- For facilities with heat-generating processes or equipment consider heat recovery to capture waste heat and use it to offset facility space or water heating costs. For example, consider heat recovery from air-compressors.

- Consider energy recovery ventilators or enthalpy wheels. These ventilators recirculate heat that would ordinarily be vented from facilities during the winter, and can add supplemental dehumidification in the summer.

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Waste Oil Fired Heating Units

Dealerships generate a substantial amount of waste oil and other lubricants. This waste stream can reduce heating costs by offsetting or eliminating the electricity, natural gas, or fuel oil used to heat dealerships. In addition to reducing energy costs, managing used oil on-site eliminates potential off-site liability costs. Thus, using oil for heating may be an attractive possibility, but it should be considered carefully.

Learn more

Visit the Used Oil Management Association at http://www.uoma.com./index.html
and

U.S. EPA Used Oil Management Program at http://www.epa.gov/epaoswer/hazwaste/usedoil.

Under federal law, dealership space heaters may be used only to burn dealerships' own waste oil and that from do-it-yourselfers, must have a maximum capacity of not more than 500,000 BTUs/hour, and must be vented outside the facility. Check for applicable state and local laws. Larger units may be used to burn used oil on-site but are subject to stricter regulations.

Like any other oil furnace, used-oil heaters vary in efficiency. Use correct size specifications for units you consider and select high-efficiency units where possible. A dealer may have oil to burn, but that is not an excuse for low efficiency. Used-oil heating systems may also need oil tank heating or compressed air to function, which may increase the cost of installing and operating the system. When pricing used-oil space heaters, consider the potential need to purchase and install additional used-oil storage.

Radiant Heaters

Radiant heaters warm objects and people directly, making them extremely efficient for large open areas such as mechanical and body shops. Electric radiant heating systems produce warmth from exposed elements or lamps. Gas units can be direct-fired with the radiant element serving as a fire-tube and vent. Radiant heating elements are often easy to install and flexible for many applications.

Water Heaters

Always select energy-efficient water heaters. Typically, gas water heaters are more cost-effective. Electric and gas water heaters are rated by energy factors (EF); the greater the EF, the more efficient the unit. Heat pump water heaters concentrate heat in the atmosphere, achieving greater efficiencies than electric water heaters and, in some cases, lower operating costs than gas water heaters. (Heat pumps concentrate existing heat from the air; therefore, as shown in the table, they can have EFs greater than 1.) Also consider tankless or demand water heaters. These are available in gas and electric models, and save energy by eliminating tank heater storage losses.

Water Heater Energy Efficiency

Water Heater Type	Available Energy Efficient EF
Electric	0.90 to 0.93
Gas Condensing	0.80 to 0.86
Gas	0.60 to 0.65
Heat Pump (Electric)	1.2 to 2.0
Electric Tankless	0.95
Gas Tankless	0.90

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Control Strategies

Control strategies that help eliminate unnecessary use can greatly improve the efficiency of heating and cooling systems. Common control strategies include programmable thermostats, multiple zones, and demand sensors. These strategies can be specified on new systems and retrofitted to existing ones.

Learn More on the Web

For more on programmable thermostats, visit ENERGY STAR Qualified Products at http://www.energystar.gov/index.cfm?fuseaction=find_a_product.

- ***ENERGY STAR Qualified Programmable Thermostats***: These simple, easy to install thermostats allow convenient night/weekend setback to reduce energy costs. Models vary in price depending on the desired features and usually include manual overrides to ensure comfort for late night and early morning workers.

- ***Set Points Lockout:*** Use programmable thermostat or energy management systems that lockout set points to prevent unauthorized employee tampering. Alternatively, use thermostat locks to restrict employee access.Determine set points after assessing temperatures that are comfortable for the majority of staff and customers. Also, certain employees such as off-shift workers may need to be able to override set points.

- ***Multiple Zones:*** By dividing dealership facilities into multiple heating and cooling zones, HVAC systems can operate more efficiently, eliminating inaccuracies from a central sensor point. In addition, occupants in different facility areas can adjust temperatures to meet their needs.

- ***Demand or CO_2 Sensors:*** Older heating and cooling systems draw in fresh air by assumed occupancy, but modern systems regulate facility air quality by measuring the amount of CO_2 present, drawing in fresh air only as needed. The result is greater energy efficiency and excellent indoor air quality.

Maintenance

Heating and cooling systems need maintenance to operate efficiently. Here are some tips:

- Engage a qualified HVAC firm in a maintenance contract with seasonal tune-ups. During these tune-ups, a technician should check combustion efficiency, refrigerant level, and belt tension, as necessary.

- Clean or replace air filters regularly, as recommended by the system manufacturer. Accumulated dirt and dust make fans work harder.

- Clean evaporator and condenser coils on heat pumps, air-conditioners, and chillers.

- Dirty coils inhibit heat transfer; clean ones save energy.

- Inspect ducts and piping for leakage or damaged insulation. Leaky ductwork is one of the biggest contributors to cooling/heat loss in buildings. Apply duct sealer, tape, and insulation as needed.

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E. Lighting

Vehicle appearance is important to customers, so present merchandise under the best lighting conditions. Lighting is critical in shop areas for safe, high-quality working conditions.

For most businesses, lighting accounts for 18 to 55 percent of electricity consumption. With dealerships falling on the high end of this scale, lighting efficiency should be a new construction priority and a high-return upgrade for existing facilities. Achieve efficient, quality lighting systems with the following formula for lighting energy efficiency and quality:

Design + Technology + Maintenance = Performance and Energy Savings

Lighting Energy Efficiency Upgrade Savings Potential[1]

# Fixtures Before Upgrade	# Fixtures After Upgrade[2]	Application	Original Specification	Upgrade	Annual Energy Savings (kWh)	Annual Cost Savings	Annual Emissions Prevention (Tons CO_2)
150	100	Low Ceiling Interior Lighting (Offices, Showrooms)	T12 with Magnetic Ballast	T8 with Electronic Ballast	47,000	$3,700	36
30	20	High Ceiling Interior Lighting (Shops, Showroom)	Probe Start Metal Halide Magnetic Ballast	Pulse Start Metal Halide with Electronic Ballast	67,100	$5,300	50
50	50	Interior Lighting (Showroom)	Halogen	Compact Fluorescent Electronic Ballast	10,900	$870	8
20	20	Exit Signs	Incandescent	Light Emitting Diode	5,255	$420	4
20	20	Building Facade Lighting (Wall Wash)	Probe Start Metal Halide with Magnetic Ballast	Pulse Start Metal Halide with Electronic Ballast	78,000	$6,200	60
50	50	Lot Lighting	Probe Start Metal Halide with Magnetic Ballast	Pulse Start Metal Halide with Electronic Ballast	95,000	$7,600	73
				Total	303,255	$24,090	231

1. Based on assumed wattage and usage patterns for specified lighting technologies, the annual savings potential of any upgrade will vary considerably with the number of fixtures, and the original vs. upgraded equipment used. Consult a lighting service or product supplier for specific recommendations. Cost savings shown are based on an $0.08 per kWh average utility rate. Actual savings will vary relative to factors such as base electricity rates, demand charges, and dealership operational characteristics.

2. Assumes that some fixtures can be eliminated due to improved lighting design and installation.

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Given the many quality, energy-efficient lighting technologies available on the market, select the most effective options for your facilities.

Saving Money with Lighting Improvements

Lighting system upgrades can provide an excellent return on investment while improving quality. The table at left (page 16) illustrates the savings potential of lighting system improvements involving lamps, ballasts, fixtures, and delamping. This section discusses key lighting efficiency opportunities that may be applicable to your dealership.

Lighting Design

High-quality lighting design involves coordinating technology, fixtures, placement, and room characteristics (e.g., finishes). Select a lighting designer well versed in energy efficiency issues. Given the range of lighting options available, a good lighting design can be both aesthetically pleasing and efficient.

Project Suggestions

When selecting a lighting consultant/designer, consider one certified by the National Council on Qualified Lighting Professionals (LC), Association of Energy Engineers (Certified Lighting Efficiency Professional—CLEP), or American Lighting Associations (CLC). For new construction and major retrofits, consider professionally developed computer models of your lighting system.

Learn more about lighting design on the Web at http://www.iesna.org (Illuminating Engineer Society of North America) and http://www.designlights.org (The Design Lights™ Consortium).

Simple yet effective upgrades that can be made to existing systems, include:

- Substituting T8 fluorescent lamps and electronic ballasts for T12 lamps and magnetic ballasts.
- Replacing incandescent lamps or systems with fluorescent lamps or systems.
- Installing controls such as photocells and occupancy sensors.
- Installing metal halide or high-pressure sodium vapor lamps in place of mercury vapor lamps.

For new facilities, consult the franchisor, architect, construction firm, or lighting professional regarding efficient lighting design options. For existing facilities, franchisor designers and architects may need to be consulted on any such changes.

1. Lighting Technologies

A critical component of any lighting project is the lighting technology you choose. Selecting energy-efficient lighting technologies can lower utility bills. Be sure to consult model energy codes when selecting new lighting technologies.

To assist in designing your lighting system, the ENERGY STAR Small Business Network has developed a Lighting Technology Specifier's Guide (next page), which classifies common dealership lighting applications and technologies by their relative efficiency.

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Lighting Technology Specifier's Guide*									
Application	Typical Automotive Dealership Application	Technology							
		Incandescent	Halogen	HID	Compact Fluorescent	T12 Fluorescent (Linear)	T8 Fluorescent (Linear)	T5 Fluorescent (Linear)	LED
Ambient Lighting Low Ceiling	Offices, Conference Rooms, Parts and Service	●	●	⊙	⊙	⊙	◆	◆	N/A
Ambient Lighting High Ceiling	Showroom, Body and Mechanical Shops	●	●	□	□	⊙	□	◆	N/A
Exterior Lighting	Lot	●	●	□	⊙	⊙	◆	◆	N/A
Accent Lighting	Showroom	●	○	⊙	◆	⊙	◆	◆	◆
Task Lighting	Offices, Body and Mechanical Shops	●	○	⊙	◆	⊙	◆	◆	◆
Exit Sign Lighting	All areas	●	N/A	N/A	⊙	N/A	N/A	N/A	◆
Specialty Lighting	See Dealership-Specific Equipment	●	○	⊙	◆	⊙	◆	◆	◆
* Table for informational purposes only. Always consult your lighting professional before specifying a technology for your facility.									
KEY (in each application): Low Efficiency = ● Medium- Low Efficiency = ○ Medium Efficiency = ⊙ Medium-High Efficiency = □ High Efficiency = ◆									

Low-Ceiling Ambient Lighting

Low-ceiling ambient lighting is used to illuminate commercial spaces, such as offices, conference rooms and service centers with ceilings that are typically 8 to 12 feet high but may be up to 20 feet high, The three lighting technologies commonly used in low-ceiling ambient lighting applications include incandescent, halogen, and fluorescent.

- Improve the efficiency and quality of the lighting systems in low-ceiling areas by replacing T12 fluorescent lamp and magnetic ballast lighting systems with T8, T5, and power compact along with electronic ballast lighting systems.

- Install screw-in ENERGY STAR qualified reflector CFLs (R-CFL) in all recessed can fixtures. (In some such fixtures, CFLs will fail prematurely due to heat build-up. For unventilated recessed can fixtures in insulated ceilings, consider lamps tested by Pacific Northwest National Laboratory for superior heat resistance and performance. See http://www.pnl.gov/rlamps.) For even better performance, replace incandescent can fixtures with dedicated CFL can fixtures.

High-Ceiling Ambient Lighting

Ceilings over 20 feet are common in showrooms, warehouses, and shop areas. Lighting technologies used in these areas need to be more intense than those in low-ceiling applications. High-output fluorescent systems (HO) and high intensity discharge (HID) systems are installed in most dealerships. Older HID lighting systems typically use mercury vapor lamps and are very inefficient compared to more modern HID systems. Dealerships with mercury vapor lamps should consider upgrading.

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Improve the efficiency of high-ceiling lighting by:

- Installing metal halide or high-pressure sodium HPS HID lighting systems. In many dealership applications, except warehousing, metal halide lamps are preferred due to their high-quality crisp white to slightly blue light.

- Where cost-effective, specifying electronic ballasts for HID lighting systems.

- For even greater efficiency, and improved light quality, considering T8, T5, T8HO and T5HO systems designed specifically for high-ceiling applications.

- Considering new HO compact fluorescent lamps (CFLs), from 55 to over 100 watts, for existing HID sockets (be sure the ballasts of HID fixtures are disconnected before installing CFLs) or new installations. This technology is relatively new and has demonstrated good energy savings over HID technologies but should be discussed with a lighting professional before implementation.

Exterior Lighting

Dealership exterior lighting is used to illuminate both facilities and inventory. Given the quantity of exterior lighting in most dealerships, the potential for cost savings can be great. To improve the efficiency of exterior lighting:

- Install metal halide or HPS HID systems for lots and facade lighting. Generally, metal halide systems are preferred over HPS because they render colors well, improving the appearance of inventory.

- Specify pulse-start systems instead of probe start HID systems.

- Where cost-effective, specify electronic ballasts for HID systems.

- For illuminated canopies and signs, specify T8, T5, T8HO or T5HO fluorescent systems with electronic ballasts. Also consider LED signage.

- Consider T5, T8, T8HO and T5HO fluorescent systems and electronic ballasts instead of HID systems for lot lighting, as they are more efficient than HID systems.

Accent Lighting

Accent lighting used to illuminate specific architectural features or products, common in dealerships, can be found in wall-washers, sconces, and track lighting. Accent lighting may use inefficient incandescent lighting. For improved accent lighting efficiency:

- Replace incandescent and halogen lamps with CFLs, where possible.

- When selecting new accent lighting, specify CFL and electronic ballast illuminated fixtures, many of which are ENERGY STAR qualified.

- HID designs less than 150 watts, though more efficient than incandescent or halogen designs, should be used sparingly or in applications where CFLs will not suffice.

- Consider LED fixtures as they are very efficient and low maintenance.

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Task Lighting (for other than shop areas)

Task lighting illuminates specific workspaces such as desks. Traditional desk lamps use incandescent or halogen bulbs. Consider more efficient CFL and LED task lighting.

Exit Signs

Replacing exit signs can increase facility energy efficiency and safety. Incandescent exit signs operate at about 40 watts per sign, whereas fluorescents operate at between 12 and 20 watts each, with ENERGY STAR qualified units using five watts or less. Many ENERGY STAR qualified exit signs use energy efficient LED technology. Often, exit signs can be retrofitted with LED technology. For more on energy-efficient exit signs, visit the ENERGY STAR Qualified Products website at http://www.energystar.gov/index.cfm?fuseaction=find_a_product. Find ENERGY STAR Small Business Network's LED Exit Sign Fact Sheet in PDF at this address: http://www.energystar.gov/ia/business/small_business/led_exitsigns_techsheet.pdf.

Did You Know?

The most efficient lights are lights not used.
Control technologies can save money and add convenience to a lighting system.

2. Fixtures

Specifying energy-efficient lighting technologies, such as T8 or T5 fluorescent lamps and electronic ballasts, is critical to improving facility energy efficiency. However, the best lighting involves a system that depends on the quality of fixtures in combination with lamps, ballasts and placement. Fixtures come in a wide variety of applications. Fixture selection should be guided by:

- Technology efficiency
- Ceiling height
- Spacing
- Amount of glare
- Distribution of light
- Task plane height
- Desired light level
- Appearance

For the best efficiency and performance, consult a lighting professional or designer when selecting fixtures.

3. Lighting Controls

Controls are key to lighting system energy efficiency and convenience. Lighting control strategies to improve energy efficiency include:

- *Bi-level Switching:* These control lighting systems in groups of fixtures or lamps. For example, bi-level switching can allow half the lights in a room to be turned off when full illumination is not required. Bi-level switching is common in offices, conference rooms, and classrooms.

- *Dimmers:* By controlling the amount of light, these systems save energy. They are available for fluorescent and incandescent systems. Daylight dimmers are special sensors that allow room lights to be dimmed based on the amount of free and natural daylight available. Dimmers are commonly used in conference rooms and offices.

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• *Occupancy Sensors:* These detect the motion of room occupants, turning off lights in unoccupied areas and turning them back on when movement is detected. Occupancy sensors are commonly used in restrooms, conference rooms, offices, and storage rooms.

• *Daylight Sensors (Photocells):* Common exterior system inefficiency is "day burn," or leaving lights on during the day. Installing daylight sensors that turn lights on and off automatically eliminates this inefficiency. For many dealerships, using sensors on the large number of exterior lights presents a sizable savings potential.

Energy Savings Potential with Occupancy Sensors

Application	Energy Savings
Offices (private)	25–50%
Offices (open spaces)	20–25%
Restrooms	30–75%
Corridors	30–40%
Storage areas	45–65%
Meeting rooms	45–65%
Conference rooms	45–65%
Warehouses	50–75%

Note: Figures listed represent energy savings potential under optimum circumstances. Figures are based on manufacturer estimates. Actual savings may vary. Source: California Energy Commission/U.S. Department of Energy/Electric Power Research Institute.

4. Day Lighting

Save money by harvesting the free light of the sun! Simply open window blinds and dim or turn off lights, or integrate day lighting strategies throughout the facility. Common daylighting strategies include:

• *Blinds:* Allow individual control of daylight.

• *Sky lights, sun tubes and other fixtures:* Channel daylight into a facility.

• *Daylight dimming systems:* Automatically dim lighting systems relative to the amount of daylight harvested.

Did You Know?

Research indicates that day lighting not only saves money, but also improves employee productivity and product sales. To learn more, visit the Daylighting Collaborative at http://www.daylighting.org and Energy Design Resources "Design Guidelines: Daylighting Guidelines" at http://www.energydesignresources.com/resource/163.

F. Building Automation Systems

Building automation systems using direct digital technology are becoming increasingly common in new facilities. These advanced systems allow facility functions to be monitored and controlled from central devices, consoles, Internet browsers, or even cell phones. By combining thermostats, lighting controls, occupancy sensors, and other building functions together into a network, they can be managed effectively. Systems consist of control units that receive information from sensors and send control signals to actuators regulating building functions. Examples of building automation system functions include:

• Automatically setting back temperatures in a facility when unoccupied (similar to, but more advanced than, a programmable thermostat).

• Automatically regulating lighting systems based on activity and occupancy.

• Scheduling the operation of major facility energy consuming systems to avoid demand charges.

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- Providing information on facility energy consumption, including integrating electricity and natural gas meter data into easy to interpret graphics and reports.

- Sending alarm signals to alert facility managers of potential equipment problems.

By combining these control features, building automation systems can improve energy efficiency. They can also integrate such facility features as security and fire suppression. Though energy savings alone may not justify the cost of building automation systems, consider the added convenience and security, particularly for new facilities.

G. Electric Motors

In the U.S, electric motors are by far the single most significant end use of electricity. More efficient motors use less energy and can lower peak demand. Electric motors are also used in:

- HVAC systems
- Compressed air systems
- Lathes and drill presses
- Automotive lifts
- Bay Doors
- Pressure wash systems
- Automotive vacuums

For some of these applications, more efficient motors can be installed and/or advanced controllers can be used. Two of the most common motor upgrades include:

- *National Electronic Manufacturers Association (NEMA) Premium Motors* (Applications 1HP and up): NEMA premium motors have efficiencies greater than 77 percent and are available for many applications. Select NEMA premium motors where applicable.

- *Variable Speed or Frequency Drives (VSD):* When combined with appropriate control units, these allow motors' operation to be tuned to actual demand, resulting in considerable savings where constant speeds aren't required. Prime applications include air or water flows.

Learn More on the Web

For more on electric motor efficiency, visit The National Electrical Manufacturers Association at http://www.nema.org/energy/efficiency/premium and The Consortium for Energy Efficiency at http://www.ceel.org.

For systems such as HVAC, compressed air, and pressure washers, consult a service product provider to see if retrofits to existing equipment are possible and will save money. For new equipment, determine if NEMA premium motors or other high efficiency motors and VSDs are available.

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H. Dealership-Specific Equipment

Dealerships use a variety of specific equipment, particularly for shop operations, and activities such as vehicle washing and detailing.

1. Compressed Air Systems

Energy intensive pneumatic systems, critical to servicing automobiles, provide opportunities for saving energy costs.

Compressors

Select the most energy-efficient compressor given performance needs.

- *Reciprocating Compressors*: This design uses a piston to maintain pressure in a tank. It is prone to heat build-up in the compressor head and condensation build-up. Reciprocating compressors are available in a variety of capacities, require moderate maintenance, and are easy to rebuild.

- *Scroll Compressors:* Use a rotating scroll to compress air. They generally are more efficient than reciprocating designs at higher volumes and more frequent use, and deliver greater volume and good pressure.

Compressed Air Technology Specifier's Guide*

Volume of Air	Frequency of Use	Technology: Reciprocating Compressor	Technology: Scroll Compressor	Technology: Centrifugal Compressor
Low	Low	◆	⊙	●
	High	⊙	◆	●
Medium	Low	◆	◆	●
	High	⊙	◆	⊙
High	Low	⊙	◆	●
	High	⊙	◆	◆

* Table for informational purposes only. Consult a compressor professional before specifying a technology for your facility.

KEY (in application): Low Efficiency = ● Medium Efficiency = ⊙ High Efficiency = ◆

- *Centrifugal Compressors:* Typically used for large shops, they provide large quantities of air at relatively low pressures. They are low-maintenance, and can be energy-efficient when run at 80 percent or greater of peak capacity throughout the day. They are extremely inefficient at lower capacities.

Use the Compressor Air Technology Specifier's Guide (table above) to help determine which compressed air option to select. When selecting compressors or replacing worn motors, specify NEMA premium motors or other high efficiency motor designs.

For efficient compressor operation:

- Periodically check belts for wear and tension.
- Lubricate moving parts per manufacturer's maintenance recommendations.
- Frequently empty water separators.
- Change air-filters at manufacturer-recommended intervals.

Consult a compressor product and service provider to determine the most appropriate system size and energy efficiency for the facility.

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Compressor Intake Air

System performance depends on the temperature and humidity of the air drawn into the compressor assembly. To perform best, compressors require cold, dry air. To enhance performance and energy efficiency:

- Locate compressor air-intakes as far as practical from heat sources (e.g., boilers, transformers, compressor heads).
- In northern climates, locate air-intakes outside the building.
- Consider cooling intake air, but only after carefully evaluating the energy use to do so. Generally, active intake air-cooling is best for high-volume, high frequency systems.
- Be sure compressor designs incorporate air-drying and/or water separation.

Compressor Controls

Consider placing compressors on timers, or selecting compressors with timing features to ensure that they will not "kick on" when the shop is closed. Properly programmed timers allow compressed air systems to be fully pressurized before the shop opens, ensuring no loss of operational efficiency.

Air Distribution System

Efficient air distribution systems reduce the need for oversized compressors, keeping energy demands down. Proper air distribution system design will avoid pressure losses due to poor piping and leakage. To maximize compressed air system efficiency:

- Minimize bends and fittings. Where curves must be made, avoid abrupt angles and pipe the system using loops to minimize resistance and pressure drops.
- Suspend piping and outlet hoses from the ceiling, to help eliminate pressure drop from crimped hoses and improve operator convenience.
- Frequently check for leaks in the system at all air manifolds and end uses. Leaks unnecessarily use energy and lead to excessive compressor cycling.
- Check that fittings on the end of air-hoses close when tools are disconnected. Remove air-tools from the end of hoses when not in use; they are often the source of air leaks.

2. Paint Booths

Paint booths are energy-intensive. Automotive refinishing often involves HVLP guns that require large volumes of air and ventilation systems necessary to remove vapors and particulates and to supply conditioned air to booths. High lighting levels are essential and heat is often necessary to accelerate the curing of some finishes.

Today's paint booths are much more efficient than those available just five to 10 years ago, with manufacturers offering premium motors, improved air-flow and ducting, variable speed drives and controls, and T5 or T8 lighting. When selecting a new paint booth, ask suppliers if they incorporate these features and if they have data comparing the efficiency of their booths to other manufacturers'. For existing booths, consult booth suppliers and/or a qualified electrician to determine if energy-efficient features can be retrofitted and whether they would be cost-efficient.

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To maintain booth efficiency, follow manufacturer recommendations for changing filters, cleaning ducts, and cleaning the booth itself. Check compressed air fittings or manifolds leading into the booth for leakage and replacing as necessary.

3. Car Wash and Detailing Facilities

Many dealerships have on-site vehicle washing centers or bays. These range from simple pressure washers to automated car washes with rollers and dryers. They can be extremely energy- and water-intensive.

For new construction, consider the following:

- At a minimum, HID lighting such as metal halide lamps should be specified and, in many applications, T5, T5HO or T8 lamps will provide better energy efficiency.
- Where electricity is the only fuel available, consider heat pumps for water heating. By concentrating existing heat, heat pumps cost much less to operate than electric resistance heating and sometimes even gas heating units.
- Where gas is the primary water heating fuel, carefully evaluate boiler efficiencies, looking for a minimum 85 percent annual fuel use efficiency (AFUE).
- Maintain boilers regularly, checking for combustion efficiency and sediment.
- Specify NEMA premium motors and consider variable speed drives.
- Evaluate water reclamation systems as they can reduce water use by up to 60 percent.

For most existing car wash and detailing centers, it may not be cost-effective to replace such major components as boilers and drive motors unless the facility is more than 10 years old. However, there are still many energy efficiency improvement opportunities:

- Leaks, especially in high-pressure systems, waste a considerable amount of water and, if a hot water line, energy. Check fittings and water manifolds for leaks.
- Check sprayers and pressure washers for leaks, replacing as necessary.
- Consider installing timers and controls that shut down water heating and pumps when not in use.

4. Bay Doors

Bay doors may open and close dozens of times a day as motor vehicles enter and exit, increasing heating and cooling loads. In some facilities, these doors are left open unnecessarily for long periods of time. To reduce energy losses from bay doors:

- Check seals to minimize air infiltration. Replace missing cracked, or hardened seals.
- For new doors, specify interior and exterior thermal breaks and R-10 or greater.
- For new installations, specify automatic sensor-driven bay door actuators to ensure that doors close immediately after vehicles or persons enter or exit. Newer high-speed units safely close doors in a fraction of the time older units take.
- Educate employees on the energy efficiency value of keeping doors shut.

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5. Parts Storage Areas

Parts storage can occupy significant floor space that must be lit and possibly heated or cooled. Consider installing automated parts storage systems that use less space, possibly reducing energy (and labor) costs. Use energy-efficient lighting such as T5 or T8 lamps for low-ceiling applications, and T5 or HID lamps for high-ceiling areas.

6. Specialty Task Lighting in Shop Areas

Shop areas require a variety of specialty task lighting. These include mobile task lights, such as the work or "drag" lights used to illuminate vehicles during servicing. Older drag lights use incandescent lamps or halogen bulbs, both of which are energy-intensive and inefficient. CFL and LED illuminated drag and mobile lights now are available. The advantages of these energy-efficient drag lights include:

- *Reduced energy consumption:* Incandescent drag lights use 60 to 100 watts, fluorescent drag lights use 12 to 20 watts, and LED drag lights use five to eight watts.

- *Increased safety*: Incandescent and halogen drag lights can cause severe burns; fluorescent and LED drag lights will not.

- *Improved Durability:* Incandescent and halogen drag lights are prone to annoying filament and lamp breakage. Quality fluorescent work lights are much more durable as they do not have a fragile filament and are usually surrounded by impact-resistant plastic. LED lighting, which is solid state, is very resistant to impacts.

CFL drag lights are now comparable in price to incandescent models, and LED models command a small price premium.

In addition to drag and task lights, many body shops have an area used for quality control with lighting designed to highlight finish flaws. For these areas, high-efficiency fluorescent fixtures with T5, T5HO, or T8 technology and specular reflectors can provide high surface illumination and excellent color rendition. Of course, all lighting systems should be turned off when not in use.

I. Office Equipment

Dealerships typically use dozens of computers, printers, copiers, and other office equipment. When purchasing new electronic equipment, always look for ENERGY STAR qualified products. Learn more about qualified office equipment, consumer electronics, and appliances at http://www.energystar.gov/index.cfm?fuseaction=find_a_product.

1. Computers and Monitors

ENERGY STAR qualified computers and monitors use 70 and 85 percent less electricity, respectively, than computers and monitors without enabled power management features. In addition to reduced power draw, ENERGY STAR qualified computers and monitors reject less heat thus reducing facility-cooling loads.

2. Printers and Fax Machines

Most dealerships have more than one laser printer. ENERGY STAR qualified printers use over 60 percent less energy than standard printers. ENERGY STAR qualified printers enter a low-power sleep mode after periods of inactivity, and many units have built-in duplexers offering double-sided printing capabilities that save office paper. Like ENERGY STAR qualified computers and monitors, these printers reject less heat, reducing air-conditioning costs. Additionally, ENERGY STAR qualified fax machines use up to 40 percent less energy.

3 Copiers and Scanners

When purchasing a new or replacement photocopier note that ENERGY STAR qualified units use up to 40 percent less energy. ENERGY STAR qualified scanners use over 50 percent less energy than standard units.

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4. Media Systems

Entertainment products such as audio systems, video cassette recorders (VCRs) and digital video disk (DVD) players are common in customer lounges, training rooms, and sales offices. When purchasing new equipment, always consider ENERGY STAR qualified products as they save energy at little or no extra cost when compared to conventional equipment.

5. Refrigerators

Dealerships may have several refrigerators, usually residential grade, on the premises. ENERGY STAR qualified refrigerators use about half as much energy, without sacrificing such features as icemakers and automatic defrost. To maximize refrigerator efficiency:

- Place units away from heat sources such as compressors, copiers, or direct sunlight.
- Allow air to circulate around condenser coils by leaving a two-inch space between the wall or cabinets and the refrigerator. Keep coils clean.
- Make sure door seals are airtight.
- Keep refrigerators between 35 and 38 degrees and freezers at zero degrees Fahrenheit.
- Minimize the amount of time refrigerator doors are open.

6. Water Coolers

A standard bottled water cooler uses more energy than a large refrigerator. ENERGY STAR qualified models require about half as much energy using improved chilling mechanisms, insulation, and separate water cycles for units that dispense both hot and cold water.

7. Vending Machines

Refrigerated vending machines dispensing soda, juice, bottled water, and other beverages are commonplace. Unfortunately, many of these machines consume excessive energy. ENERGY STAR qualified machines use 40 percent less energy than standard machines by incorporating energy-efficient compressors, motors, lighting systems, and options such as a low-power mode, which enables machines to use less energy when the dealership is closed.

Although most dealership vending machines are supplied and maintained by a vending service, it's the dealership that pays the energy bill When evaluating vendors to supply machines on your property, request only ENERGY STAR qualified vending machines. If a vending supplier cannot provide ENERGY STAR qualified machines, ask for reimbursement of excess utility costs. There also are products that limit the energy supplied to vending machines when surrounding areas are unoccupied and that adjust refrigeration power relative to room temperature.

Did You Know?

Even if a dealership does not own its vending machines, it may be spending hundreds of dollars each year to operate them. Request only ENERGY STAR qualified vending machines.

VI. CLEAN ENERGY AND GREEN POWER

Dealership facilities, with their extensive roof areas and acres of property, present the potential for generating clean energy on-site. Options include solar power provided by photovoltaic (PV) panels, and small wind turbines. Generally, renewable energy options such as these may make more of a statement about a dealership's environmental stewardship than about energy cost savings. However, in locations with exceptionally high utility rates, demand charges, and generous incentives, solar or wind systems may be a financially viable option to consider.

Dealerships considering back-up generators or stand-by power should evaluate systems capable of operating in distributed generation mode. Distributed generation involves electricity generated from an on-site resource and fed back into the grid. Clean and efficient distributed generation technologies, such as micro-turbines, can allow a dealership to have standby power available and to offset demand when power is at its most expensive.

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Many utilities also offer power that has been at least partially generated from renewable sources such as solar, wind, and biomass. Utilities that offer green power typically sell it at a slight cost premium. Where green power is not available, dealerships may want to consider purchasing renewable energy certificates.

Learn More on the Web

U.S. EPA Clean Energy Programs

http://www.epa.gov/cleanenergy

U.S. EPA Green Power Partnership

http://www.epa.gov/greenpower

USGBC—U.S. Green Building Council

http://www.usgbc.org

VII. GREEN BUILDINGS

In addition to the cost-saving energy efficiency opportunities described above, dealerships should consider incorporating green building features in their facilities. Green building is simply the practice of designing facilities to be more sustainable and to blend more seamlessly into the natural and human environment. Green buildings incorporate features that reduce impacts to the environment through energy efficiency improvements, on-site renewable energy generation, storm water management, and the use of recycled and reused construction materials. Green buildings are more ecologically benign facilities that provide a healthier and more productive environment for employees and customers. Many green building features are incorporated into new construction or major renovation, but they also can be added to existing buildings and interiors.

VIII. BUSINESS DECISIONS

Making energy efficiency improvements involves business decisions. Many businesses constructing facilities, replacing equipment, or conducting upgrades look only at up-front capital costs and fail to consider potential utility and maintenance cost reductions or productivity increases. Energy efficiency improvements, like any other business investment, should be evaluated using tools such as return on investment (ROI), payback, and facility/equipment lifecycle costs. Energy efficiency improvements integrated into the plans and specifications for new facilities and upgrades to existing facilities can yield excellent rates of return. Lifecycle costs of energy efficient equipment and facilities often yield a positive return on investment, with simple payback periods of less than two years for the best improvements. Sound energy efficiency investments also serve as a hedge against future energy cost spikes and may reduce the dealership's environmental footprint.

Energy-Efficiency Investment Decisions				
Financial Indicator	Implement Now: Incredible Investment	Strongly Consider: Good Investment	Consider with Caution: Generally a Good Long- Term Investment	Decide to Implement on Factors other than Energy
Simple Payback	Less than 3 years	3 to 6 years	7 to 15 years	Greater than 15 years

A. PERFORMANCE CONTRACTING

Energy service companies sometimes offer performance-contracting opportunities. Under a performance contract, the energy service company will usually audit the dealership's facilities, propose a series of energy efficiency improvements, implement the improvements, pay for upgrade costs, and guarantee a percentage of the savings to the dealership. The energy service company absorbs the risk of upgrades and installations are often turnkey. To be attractive, dealerships typically must present very substantial potential energy savings, ruling out many relatively new facilities (10 years old or less), and those with less than several hundred thousand square feet of building space. Also, upgrades may be focused on the highest return on investment rather than absolute quality. Nationwide, performance contracting has resulted in billions of dollars in facility energy efficiency improvements. When considering a

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performance contract, request that the energy service company provide examples of similar facility upgrades they have performed.

B. Group Purchasing

Group purchasing involves the collective participation in a buying initiative or national/regional account of products and services by a number of facilities. Group purchasing makes it easier and more cost effective for these facilities to obtain products and services that reduce energy costs and improve facility quality. Many dealerships participate in or are familiar with group purchasing programs offering everything from paper to accounting services. Advantages include:

- Lower-than-market prices for products and services.
- High-quality, pre-screened offerings that meet the purchasing group's needs.
- Facilitated purchasing including catalogs co-branded with a sponsoring organization and/or online purchasing from national accounts.

Contact NADA for more on dealership group purchasing opportunities involving energy efficient products and services.

C Energy Incentives

Certain state public benefit funds and individual energy utilities offer a variety of incentives designed to assist with facility energy upgrades, new facility design and construction, and even renewable energy installations. Incentives include grants, rebates, loans, and tax incentives that can help "buy down" the initial cost of upgrading a facility, improving the potential for long-term investment benefits. When evaluating energy efficiency upgrades or new construction, contact the following organizations to determine what financial opportunities are available:

- Electric, Gas, and Water Utilities
- State Energy Offices
- State Economic Development Authorities
- U.S. Small Business Administration
- U.S Internal Revenue Service
- Association of Small Business
- The National Small Business Association

Contact a tax advisor regarding federal and state tax incentives for heating and cooling system improvements, capital investments in equipment, and/or renewable energy installations.

Learn More on the Web

For more on energy efficiency, incentives, and renewable energy:

ENERGY STAR's Directory of Energy Efficiency Programs

http://www.energystar.gov/index.cfm?fuseaction=DEEPS.showSponsorSearch

Lawrence Berkeley National Laboratory's Energy Crossroads

http://eetd.lbl.gov

Database of State Incentives for Renewable Energy

http://www.dsireusa.org/

For more on energy efficiency tax incentives, visit:

Association of Small Business Development Centers

http://www.asbdc-us.org/

EnergyTaxIncentives.org

http://www.energytaxincentives.org/

U.S. Department of Energy

http://www.energy.gov/engine/content.do

U.S. Small Business Administration

http://www.sba.gov/

U.S. Internal Revenue Service

http://www.irs.gov/

National Small Business Association

http://www.nsba.biz/

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IX. A DEALERSHIP SUCCESS STORY

One excellent way to learn about potential energy efficiency improvements is from industry peers. Such success stories can reveal details of the work, time, and investment involved and the improvements achieved.

Evidence of the potential for dealership energy efficiency improvements is a Virginia Acura, Lexus and Chevrolet dealership, visited in conjunction with the development of this guide. The sprawling automobile campus has three dealerships and a number of service buildings adding up to a quarter million square feet of space, not including an off-site collision repair center.

The successes achieved at this facility were made possible due to the efforts of the dealership group's facility manager, with the support of the dealer-owners. Many energy efficiency improvement opportunities have been taken advantage of, within the constraints of the franchisors' design specifications. Various dealership personnel are involved in the improvements, as are several outside product and service providers, including lighting professionals.

Energy efficiency measures incorporated into building shells include:

- Better than energy code insulation in roofs, walls and slabs.
- High-efficiency heating and cooling units.
- Vapor-retardant barriers under buildings.
- Double-paned, Low-E glass windows.
- A master switch that shuts down the entire facility at closing, except for select security lighting.

Energy and water efficiency measures incorporated into showrooms include:

- T8 fluorescent fixtures and parabolic fixtures and electronic ballasts for most fixtures.
- Metal halide lamps in areas with high ceilings.
- LED exit signs.
- Extensive day lighting.
- ENERGY STAR qualified computers.
- Occupancy sensors in restrooms.
- Motion detecting toilets.
- Some programmable thermostats.
- Ceiling fans.

Energy efficiency measures incorporated into the parts and service areas include:

- Metal halide HID lighting in service bays.
- Radiant heating.
- "Fast Track" garage doors.
- Blower compressors with air-drying.
- Suspended and looped compressed air-distribution systems.

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Energy and water efficiency measures incorporated into vehicle washing and detailing areas include:

- Greater than 50 percent water reclamation.

Energy efficiency measures used on the dealership lot and building exteriors include:

- Lot lighting designed by a lighting professional.
- Exterior lighting incorporating photocells to reduce day burning.

Energy efficiency opportunities incorporated into the body shop include:

- A mix of metal halide fixtures and fluorescent lighting.
- High-pressure sodium exterior lighting.
- T5HO lighting for the bodywork examination area.

Further potential upgrade opportunities might involve:

- Additional sub-metering of gas and electricity to better understand and manage energy use.
- Programmable thermostats or an integrated building automation system.
- T8 lamps and electronic ballasts to replace the T12 lamps with magnetic ballasts used in the parts storage areas.
- R-Type compact fluorescent lamps to replace the R-Type halogen lamps in the showrooms.
- Pulse start instead of probe start lamps for lot lighting.
- T8, T5, or T5HO fluorescent lamps and electronic ballasts in the body shop.

To achieve similar results consider contacting appropriate professionals to review or energy audit your facilities for potential energy savings.

X. CONCLUSION

Many opportunities exist for cost-effective energy efficiency upgrades at dealership facilities. In addition, even more fruitful opportunities exist for dealerships involved in new construction or major facility renovations. These opportunities will only become more numerous and attractive in the future as energy costs increase, and new technologies and strategies become available.

For further information and assistance for your dealership contact NADA or the ENERGY STAR Small Business Network at 1-888-STAR-YES or http://www.energystar.gov/smallbiz.

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