

Managing Energy Costs in Auto Dealerships



Reducing energy costs is a major consideration for automobile dealerships, where energy is the third-highest overhead expenditure. According to the National Automobile Dealers Association, U.S. dealerships use about 18 percent more energy per square foot than a typical office building. The best opportunities for saving energy can be found in the areas of highest consumption—lighting and HVAC systems. Additional savings can be culled from other areas, including the building envelope, electric motors, and office equipment.

Quick Fixes

Many of the following HVAC and lighting upgrades can cut your energy bill right away and be implemented at little or no cost.

- *Turn off lights and equipment when not in use.* Every 1,000 kilowatt-hours (kWh) saved by turning things off can equal \$100 savings on the utility bill (assuming average electricity costs of 10 cents/kWh). (All figures in this pamphlet are in U.S. dollars.) Employee education can often be an effective means of motivating staff to turn off lights when not in use—place signs in employee areas as reminders.
- *Use Energy Star–labeled products.* Replace incandescent bulbs with compact fluorescent lamps (CFLs), and install light-emitting diode (LED) exit signs. When replacing older office equipment, select Energy Star–qualified equipment (visit www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing for savings calculators). Put computers in sleep mode when not in use, and turn them off at the end of the day.
- *Install a programmable HVAC thermostat.* These allow pre-programmed setback after hours, such as on nights and weekends, to reduce energy costs.
- *Regularly clean or change HVAC filters.* Buildup of dirt and dust can block airflow and decrease efficiency.

NADA and Energy Star Partnership

In 2007, the National Automobile Dealers Association (NADA) joined with the U.S. Environmental Protection Agency's Energy Star program to launch the Energy Stewardship Initiative. NADA is challenging its 20,000 members to reduce energy use by 10 percent or more. Participants use Energy Star's web-based Portfolio Manager tool to track facility energy consumption and savings. Go to www.nada.org/energystar or www.energystar.gov/autodealers for more information, including training and support resources.

- *Optimize the performance of the HVAC system with an annual maintenance contract.* Regularly schedule preventive maintenance, with documentation of tuning and repairs. This includes checking, cleaning, and lubricating the economizer; a malfunctioning economizer can add 50 percent to a building's annual energy bill.
- *Detect and repair leaks.* Seal and insulate leaky ductwork; use caulk and weather stripping to seal gaps around doors, windows, and electrical outlets; and check compressed air systems for leaks.

Efficiency Solutions: Best Bang for the Buck

Although some measures suggested here can be implemented with little investment, others may require a larger initial outlay. Most improvements pay for themselves quickly.

Lighting Technologies and Controls

Compared to other commercial businesses, auto dealerships are distinguished by heavy use of interior and exterior lighting. Consider these lighting options:

Daylighting. Use of well-designed daylighting systems in showrooms can save energy and provide attractive illumination of featured automobiles. Using natural light to

supplement electric light can decrease a building's total energy costs by as much as one-third. And studies show that skylights may increase sales. To decrease glare and solar gain, consider low-emissivity (low-e) windows with a clear or moderate tint, use appropriate shading techniques, and install daylight pipes that bring in sunlight without glare or heat.

Interior lighting. CFLs can save between two-thirds and three-quarters of the energy consumed by incandescent bulbs, and replacing T12 lamps and magnetic ballasts with T8 fluorescent lamps and electronic ballasts can reduce consumption by 35 percent. The most recent T8 technology, called "high-performance" or "super T8," offers greater efficacy, life, and color quality than do earlier generations of T8 lamps. T5 and T5 high-output

(HO) lamps, which use different sockets than T12 and T8 lamps, are an effective choice in new construction or major renovations.

For high-bay areas, super T8s and T5HO lamps can provide big savings over typical metal halide or high-pressure sodium systems. In spaces where superior color rendering is key, pulse-start ceramic metal halide lamps and electronic ballasts provide better color quality and efficiency than earlier metal halide technology. In low-ceiling areas, install Energy Star-qualified reflector CFLs in recessed can fixtures, and wherever possible, replace incandescent can fixtures with CFL can fixtures.

Lighting controls. Occupancy sensors can add further savings in interior areas not frequented by customers, such as offices, conference rooms, and storage areas. Photocell controls dim lights or turn them on or off in response to natural light; these can be particularly useful in exterior lighting applications or in combination with an interior daylighting strategy.

Exterior lighting. Although high-intensity discharge systems (metal halide or high-pressure sodium) are still the predominant sources for parking-lot and exterior facility lighting, induction lamps and larger CFLs are also viable choices that can increase efficiency. In the coldest applications, metal halide lamps may still have an edge. Efficient T8, T5HO, and T5 fluorescent lamps and electronic ballasts can also be incorporated into exterior lighting, whereas high-brightness LEDs are an efficient option for outdoor signage and displays. In the not-too-distant future, LEDs may be effective for parking-lot lighting as well.

Note that exterior lighting levels of auto dealerships often exceed those recommended by the Illuminating Engineering Society of North America (which specifies 10 to 20 foot-candles of illumination for auto dealership lots). Reducing exterior lighting levels can minimize glare and reduce operating costs. Ideally, parking-lot lighting should incorporate full-cutoff luminaires,

Real-World Savings

Increasing numbers of auto dealerships are implementing efficiency upgrades. In Wisconsin, Mike Burkart Ford-Mercury and Don Jacobs Toyota installed new metal halide lighting systems, reducing electricity consumption by 42,632 kilowatt-hours (kWh) and 154,000 kWh per year. California-based Capitol Honda installed more than 900 solar panels on its roof and was the first dealership to receive a solar rebate from Pacific Gas & Electric Co., equal to half of the system's \$1.3 million cost. This system is expected to reduce the amount of electricity purchased from the utility by an average of 30 percent.

Pat Lobb Toyota in Texas has applied to become the first Leadership in Energy and Environmental Design-certified dealership. Design elements in the new 56,000-square-foot (ft²) (5,202-square-meter [m²]) building include a cool roof, an aluminum exterior consisting of recycled materials, efficient lighting and windows, water-efficient bathroom faucets, and carpet made of recycled automotive windshield glass or a corn derivative. An 8,660-gallon cistern collects rainwater and condensation from the building's air conditioners for irrigation of disease-resistant native-plant landscaping. The heating system uses recycled waste oil, the hydraulic lifts use vegetable oil, and the car wash reduces water loss by two-thirds. Notably, construction costs were only approximately 5 percent more than those for a conventional dealership—about \$127 per ft² (\$1,367 per m²).



which direct light downward and are the most efficient type of luminaire. In Calgary, Alberta, Valentine Volvo, Advantage Ford, and Lexus of Calgary won awards from the Royal Astronomical Society of Canada for installing energy-efficient exterior light sources, including full-cutoff fixtures and low-intensity, internally illuminated signs, that reduced light pollution and saved energy.

Heating, Ventilation, and Cooling

The following measures can boost HVAC efficiency:

High-efficiency HVAC units. A highly efficient packaged air-conditioning and heating unit can reduce annual cooling energy consumption by 20 percent or more compared to a unit that just meets federal minimum efficiency standards. For new construction, work with the design team and HVAC service providers to specify efficient, cost-effective, and appropriate HVAC systems for your climate.

Demand-controlled ventilation (DCV). DCV systems determine occupancy levels by sensing fluctuations in CO₂ levels and decrease the outdoor ventilation air supplied by the HVAC system during low-occupancy hours. This saves energy because it reduces the amount of air that needs to be heated or cooled. DCV systems can save from \$0.05 to \$1.00 per square foot (ft²) (\$0.54 to \$10.76 per square meter [m²]), depending on the occupancy schedule, climate, and electric or gas rates.

Heating with waste oil. Almost every dealership's service department collects a great deal of waste oil, which can be burned in a waste-oil furnace or boiler to provide heat. This not only saves on fuel purchases by recycling waste materials but also decreases oil disposal costs. Prior to investing in a waste-oil furnace, calculate the amount of waste oil collected each year to determine the cost-effectiveness of this approach, and choose high-efficiency units whenever possible.

Water heating. Select high-efficiency water heaters—the higher the energy factor or coefficient of performance, the more efficient the unit. Gas water heaters are usually

Additional Opportunities for Savings

Energy management systems. A building automation system (BAS), also called an energy management system, uses direct digital technology to control energy-consuming equipment in a building to make it operate more efficiently. Employees can control equipment through a computer, web browser, or devices such as personal digital assistants or cell phones. When programmed and operated properly, BASs save an average of about 10 percent of overall building energy consumption.

Electric motors. Dealerships use electric motors in many applications, including compressed air systems, hydraulic lifts, bay doors, vacuums, and pressure washers. Over the life of a motor, the purchase price is typically no more than 5 percent of the cost of operation. Therefore, it makes sense to select the most efficient motors available, which are those that carry the National Electrical Manufacturers Association Premium logo. Other motor upgrades include variable-speed drives, which enable dramatic energy savings compared to single-speed motors in applications with highly variable loads, such as air and water applications.

Compressed-air systems. Most compressed-air systems are inefficient, wasting energy through leaks, inappropriate uses, and poorly designed components. Many systems also circulate air at a pressure much higher than necessary. According to the U.S. Department of Energy, optimizing compressed-air systems can improve their efficiency by 20 to 50 percent. Ask a compressed-air service provider if they provide assessment of facility compressed-air needs and control strategies, leak detection, or monitoring of energy use. If adding or replacing compressed-air systems, select the most efficient systems for your dealership's needs.

Vending machines. Vending-machine lights not only cost money to run but also heat the refrigerated compartment. Disconnecting the ballasts for vending-machine lights can save about \$100 a year. Or upgrade to Energy Star-qualified vending machines, which use 40 percent less energy compared to conventional models. During periods of inactivity, these machines automatically enter low-energy lighting and refrigeration modes, which can decrease consumption by an additional 20 percent.

more cost-effective than standard electric. But heat pump water heaters may be cost-effective compared to gas tank units, especially if electric rates are low and gas rates are high. Heat pump water heaters use about half the energy of standard electric heaters and can be a good choice for dealerships that use a lot of hot water (such as in a car wash). Efficiencies of tankless and condensing heaters can be 20 to 50 percent higher than those of mainstream tank-type units, while electric-assisted solar water heaters offer low operating costs in sunny climes.

Existing building commissioning. Commissioning is a process in which engineers check and tune up existing building systems to ensure efficient operation and that occupant comfort requirements are being met. Periodic commissioning typically results in energy savings of 5 to 15 percent or more, and can cost between \$0.05 and \$0.40 per ft² (\$0.54 and \$4.31 per m²).

Building envelope improvements. Although major improvements to the building envelope require larger investments of time and money, they can dramatically

decrease heating and cooling loads and provide substantial savings. Appropriate envelope materials include efficient windows with low-e glazings, insulation, and light-colored cool roofs. Ask your local utility representative for more information about initiating such projects.

Resources

National Automobile Dealers Association and Energy Star Energy Stewardship Initiative: www.nada.org/energystar and www.energystar.gov/autodealers.

Office of Energy Efficiency, Natural Resources Canada, Commercial and Institutional Organizations, <http://oee.nrcan.gc.ca/commercial/index.cfm?attr=0>, and Programs and Initiatives <http://oee.nrcan.gc.ca/corporate/programs.cfm?attr=20#regulations>.

Public Works and Government Services Canada, “Daylighting Guide for Canadian Commercial Buildings” (2002), prepared by Enermodal Engineering Limited, www.advancedbuildings.org/Daylighting%20Guide%20for%20Canadian%20Buildings%20Final6.pdf.