Albertsons North Salt Lake distribution center

Albertsons also completed significant refrigeration system and lighting upgrades at its distribution center in North Salt Lake, Utah, with the help of Pacific Power’s energy-efficiency incentive programs.

“The process is easy and helpful—we learned a lot about saving energy. And when you can save that much money, why wouldn’t you do it?”

Jesse Dare
Facilities Maintenance Manager
Albertsons

About Pacific Power’s energy-efficiency incentive programs

Pacific Power has helped commercial and industrial customers save money and improve energy efficiency for more than a decade. In Washington, our Energy FinAnswer program helps eligible businesses build energy-efficiency into new construction and renovation projects. Energy FinAnswer includes investment-grade energy engineering, assessment and financial incentives. We also offer other energy-efficiency programs for businesses.

Do the bright thing

For more information on how we can help your facility save energy and money:

• Call our Energy Services Hotline toll-free at 1-800-222-4333.
• E-mail energyexpert@pacificorp.com.
• Visit our Web site at www.pacificpower.com and click on Business and Save Energy & Money.

Because we have some requirements to qualify for an incentive, it is important to call us before you start your project.

Albertsons distribution center upgrades

<table>
<thead>
<tr>
<th>Energy efficiency measure (EEM)</th>
<th>Energy savings (kwh/yr)</th>
<th>Demand savings (kw/mo)</th>
<th>Incentive as percent of EEM cost</th>
<th>Simple payback before incentives</th>
<th>Simple payback after incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient condensing</td>
<td>770,915</td>
<td>120.0</td>
<td>120%</td>
<td>1.2 years</td>
<td>3.0 years</td>
</tr>
<tr>
<td>Efficient evaporative operation</td>
<td>109,707</td>
<td>11.0</td>
<td>11%</td>
<td>10.3 years</td>
<td>20.6 years</td>
</tr>
<tr>
<td>Efficient compressors</td>
<td>1,315,119</td>
<td>119.0</td>
<td>110%</td>
<td>1.5 years</td>
<td>3.0 years</td>
</tr>
<tr>
<td>High-speed doors</td>
<td>318,213</td>
<td>29.0</td>
<td>29%</td>
<td>11.2 years</td>
<td>18.0 years</td>
</tr>
<tr>
<td>High-pressure sodium</td>
<td>375,967</td>
<td>34.0</td>
<td>34%</td>
<td>11.2 years</td>
<td>18.0 years</td>
</tr>
<tr>
<td>High-speed fans</td>
<td>413,139</td>
<td>75.0</td>
<td>75%</td>
<td>9.9 years</td>
<td>15.8 years</td>
</tr>
<tr>
<td>Lighting systems</td>
<td>57,590</td>
<td>66.0</td>
<td>66%</td>
<td>9.9 years</td>
<td>15.8 years</td>
</tr>
<tr>
<td>Total</td>
<td>5,861,148</td>
<td>490.0</td>
<td>40%</td>
<td>5.1 years</td>
<td>9.1 years</td>
</tr>
</tbody>
</table>

Energy consultant:
Cascade Energy Engineering

Contractors and suppliers:
Refrigeration: Louis A. Roser Company
Lighting: Maintenance & Service Inc.

Acknowledgments: Thanks to Glenn Barrett and Jesse Dare of Albertsons, and Jim Kelsey of kW Engineering for identifying implementable measures.

Jim Rollody
Principal
KW Engineering

There were good opportunities at each Albertsons store we reviewed. We didn’t walk away from a single store without identifying implementable measures.

Glen Barrett
Energy Management & Procurement
Albertsons

Energy FinAnswer is the best-run, best-delivered program we’ve been involved with.

Energy FinAnswer Case Study: Albertsons

Aberltons improved the efficiency of its entire store refrigeration system using energy in the compressor room (shown above) as well as at the condensers and in the walk-in and reach-in cases.

Albertsons is always looking for new technologies and approaches that will help it operate more reliably and cost-effectively. Pacific Power helped Albertsons conduct a pilot study of one such technology for its grocery store refrigeration system—an evaporative pre-cooler for air-cooled condensers. The pilot showed promising savings in refrigeration system energy savings of 58,000 kilowatt-hours per year—a 5 percent reduction—and 20 kilowatts.

Facilities Maintenance Manager
Albertsons

Pilot study: evaporative pre-cooler

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Better temperature control on refrigeration system to keep

Reduced maintenance and equipment downtime

More features that help extend the life of equipment

Background

According to Albertsons Senior Manager, Energy Management and Engineering, Glen Bentzel, a typical grocery store uses 3.25 kilowatt hours per square foot of floor area each year. By reducing the amount of heat discharged into cases, Albertsons took advantage of Pacific Power’s Energy Efficiency Premium Program, which is designed to encourage and support the implementation of energy-efficient products, services, and practices in the marketplace.

Albertsons took advantage of Pacific Power’s Energy Efficiency Premium Program to reduce the amount of heat discharged into cases or walk-ins, resulting in refrigeration energy savings.

Benefits

Benefits include:

1. Lighting retrofit
2. Nighttime shutoff of rooftop units
3. Reduced defrost cycle
4. Floating suction pressure
5. Float night for main air handlers

Project

There were good opportunities at the Albertsons stores, and through the collaboration shown at Albertsons, Pacific Power, E2 Engineering and Arctec Energy Partners, cost-effective energy-efficiency measures were identified.

Albertsons implemented a comprehensive set of refrigeration upgrades monitored through a master controller, improving the overall refrigeration system, including walk-in and reach-in cases. The system was installed, commissioned and then baseline. After the system was installed, commissioned and then baseline, the case temperatures were measured to determine if the install was successful as it should and corrections can be made. This allows for continuous savings.

Along with the refrigeration improvements, lighting retrofitting and controls installed at many Albertsons stores.

A complete description of energy-saving measures installed can be found on the following page.

Energy Finders Case Study: Albertsons

Through its Energy Finders program, Pacific Power and its partners worked collaboratively, identifying and implementing opportunities to save energy and money at 25 stores. It has been a valuable partnership for the entire project team.

The Albertsons stores selected were all supermarkets with temperature-controlled areas, including the deli and bakery areas. These locations had a high demand for refrigeration energy, and the temperature control systems were tightly controlled, resulting in significant energy savings.

Benefits include:

1. Lighting retrofit: Albertsons replaced existing T12 fluorescent lamps and ballasts with premium performance T8 fluorescent lamps and ballasts, reducing electric energy use, while improving lighting quality.
2. Nighttime shutoff of rooftop units: Instead of running continuously, the 3-ton rooftop packaged units that serve Albertsons’ bakeries, pharmacies and other areas, are turned off during the off-peak hours and during hours when there is low demand. Turning off the units reduces the amount of heat discharged into cases or walk-ins, resulting in refrigeration energy savings.
3. Reduced defrost cycle: Defrost cycles were staged so one fan operated continuously for each condenser and setpoint on all the circuits on the rack. Reducing the amount of heat discharged into cases or walk-ins helps maintain case and walk-in temperatures, resulting in refrigeration energy savings.
4. Floating suction pressure: The system was designed to control the suction pressure by maintaining the head pressure at a constant level, with a minimum flow set to make sure that adequate ventilation is maintained, evaporator coils do not ice, and furnace systems are not over- or under-cooled by the refrigeration system. The strategy keeps low, particularly when the weather is mild or cool. The strategy helps maintain case or walk-in and helps maintain product temperatures.
5. Floating suction pressure: The system was designed to control the suction pressure by maintaining the head pressure at a constant level, with a minimum flow set to make sure that adequate ventilation is maintained, evaporator coils do not ice, and furnace systems are not over- or under-cooled by the refrigeration system. The strategy keeps low, particularly when the weather is mild or cool. The strategy helps maintain case or walk-in and helps maintain product temperatures.
6. Condenser fan control: Condenser fan speed is monitored using outside air temperature. When the outside air temperature is cooler than a setpoint, the condenser fans are slowed down, reducing the amount of energy and money used to maintain the condenser temperature.
Through its EnergyFin program, Pacific Power and its partners worked collaboratively to ensure that Albertsons would maximize its energy and money savings at all its stores. It has been a valuable partnership for the entire project team.

Benefits

- Better temperature control on refrigeration system to keep products fresher, enhancing the customers' shopping experience.
- Improved lighting color to enhance customer experience.
- Reduced maintenance and equipment downtime.
- More features that help to extend the life of equipment.

Background

According to Albertsons Senior Manager, Energy Management and Engineering, Glen Barnet, a typical grocery store uses 2.5 to 3.0 million kilowatt-hours of electricity per year. Refrigeration, lighting, and controls are the largest energy users. Albertsons took advantage of Pacific Power’s EnergyFin program to deploy an energy management system in its stores.

Albertsons took a number of energy-saving measures to reduce its energy consumption. Some of the improvements included:

1. Lighting retrofit
2. Nighttime shutoff for main air handlers
3. Controls now turn off case lights when the store is minimally occupied.

Through the collaboration between Albertsons, Pacific Power, EV Energy and Arctic Energy Partners, cost-effective energy efficiency measures were installed.

Benefits

- Albertsons replaced existing T12 fluorescent lamps and ballasts with premium T8 fluorescent lamps, saving energy, while maintaining or improving lighting levels.
- Premium T8 lamps were installed at a cost of $5,726.
- Albertsons estimates the payback at 2.8 years. Because profit margins are thin, the return on investment is important.

Typical Albertsons store efficiency measures

<table>
<thead>
<tr>
<th>Measure description</th>
<th>Annual electricity savings (kWh)</th>
<th>Annual cost savings ($)</th>
<th>Project cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lighting retrofit</td>
<td>132,518</td>
<td>17,874</td>
<td>5,726</td>
</tr>
<tr>
<td>2 Nighttime shutoff of rooftop units</td>
<td>74,153</td>
<td>11,742</td>
<td>3,312</td>
</tr>
<tr>
<td>3 Case light controls</td>
<td>63,938</td>
<td>9,657</td>
<td>3,018</td>
</tr>
<tr>
<td>4 Reduce defrost cycle</td>
<td>37,231</td>
<td>6,005</td>
<td>3,187</td>
</tr>
<tr>
<td>5 Floating suction pressure</td>
<td>26,631</td>
<td>13,967</td>
<td>2,992</td>
</tr>
<tr>
<td>6 Condenser fan control</td>
<td>22,934</td>
<td>12,206</td>
<td>2,141</td>
</tr>
<tr>
<td>7 Nighttime shutoff for main air handlers</td>
<td>22,934</td>
<td>12,206</td>
<td>2,141</td>
</tr>
<tr>
<td>8 Anti-sweat heater controls</td>
<td>22,934</td>
<td>12,206</td>
<td>2,141</td>
</tr>
<tr>
<td>9 Variable-speed drives on main air handler</td>
<td>22,934</td>
<td>12,206</td>
<td>2,141</td>
</tr>
<tr>
<td>Total</td>
<td>151,476</td>
<td>23,487</td>
<td>8,909</td>
</tr>
</tbody>
</table>

Benefits of energy efficiency measures installed at many stores also improved efficiency. This reduces lighting and air-conditioning costs.

Along with the refrigeration improvements, lighting retrofits and controls installed at many stores also improved efficiency. A complete description of energy-saving measures installed at any given store can be found on the opposite page.

The measures

1. Lighting retrofit
   - Albertsons replaced existing T12 fluorescent lamps and ballasts with premium T8 fluorescent lamps and ballasts, saving energy, while maintaining or improving lighting levels.
   - Premium T8 lamps were installed at a cost of $5,726.
   - Albertsons estimates the payback at 2.8 years. Because profit margins are thin, the return on investment is important.

2. Nighttime shutoff of rooftop units
   - Installed on 154 rooftop package units that serve Albertsons supermarkets, pharmacist and pharmacy clinics.
   - The estimated annual energy savings is 3.2 million kilowatt-hours.
   - Including benefits in addition to energy cost savings, Albertsons estimates the payback at 2.6 years.

3. Case light controls
   - Controls allow for the cool-down period in the case when the store is occupied.
   - This reduces lighting and air-conditioning costs.
   - Including the amount of heat distributed per case, it also helps maintain product temperatures.

4. Reduce defrost cycle
   - Installing defrosting high-temperature case and suction units into walk-in and a control system implemented to terminate defrost when the coil and suction temperature is 45°F or lower. This reduces defrost time, thereby reducing defrost energy.
   - In the case study location, the defrost cycle was reduced from 12 hours to 8 hours.

5. Floating suction pressure
   - Refrigeration systems were controlled using single pressure switches to maintain a discharge pressure that can still meet the discharge air temperature requirements.
   - This reduces the amount of heat discharged into the air, improving efficiency.

6. Condenser fan control
   - Condenser fan status was monitored using outdoor air temperature. When the outdoor air temperature is less than 85°F, condenser fan status is turned off.
   - This reduces the amount of heat discharged into the air, improving efficiency.

8. Anti-sweat heater controls
   - Anti-sweat heater controls are less efficient than electronically commutated motors.
   - In this case study, the anti-sweat heater controls were replaced with electronically commutated motors.

9. Variable-speed drives on main air handler
   - Many of the stores had main air handlers with a constant-speed motor that was used to control the main air handler.
   - Installing a variable-speed drive on the main air handler enables the controller to control the speed of the motor, saving energy.
   - The constant-speed motor is used to control the main air handler when the areas are not occupied.

10. Electronically commutated motors
    - Installing electronically commutated motors (ECMs) for the main air handler in this case study resulted in an additional 5.5 percent energy savings.

Note: It is critical to ensure that the condensing pressure is kept low, particularly when the weather is mild or cool. The strategy is to control the condenser fan to maintain the condenser head pressure above 35°F, to ensure that the condenser fan is operating efficiently.
Albertsons North Salt Lake distribution center

Albertsons also completed significant refrigeration system and lighting upgrades at its distribution center in North Salt Lake, Utah, with the help of Pacific Power’s energy-efficiency incentive programs.

“The process is easy and helpful—we learned a lot about saving energy. And when you can save that much money, why wouldn’t you do it?”

Jesse Dare
Facilities/Procurement Manager

Albertsons

About Pacific Power’s energy-efficiency incentive programs

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• E-mail energysupport@pacificpower.com.

• Visit our Web site at www.pacificpower.com

Because we have some requirements to qualify for an incentive, it is important to call us before you start your project.

Energy consultant:
Cascade Energy Engineering

Contractors and suppliers:
Refrigeration: Louis A. Roser Company
Lighting: Lighting Maintenance & Service Inc.

Pilot study: evaporative pre-cooler

Albertsons is always looking for new technologies and approaches that will help it operate more reliably and cost-effectively. Pacific Power helped Albertsons conduct a pilot study of one such technology for its grocery store refrigeration system—an evaporative pre-cooler for air-cooled condensers. The pilot study showed promising savings in dry climates.

Water is sprayed over specially treated cellulose pads in the pre-cooler and as air is drawn through the pads it is humidified and cooled. The inlet air temperature for the condenser is reduced, increasing the capacity and efficiency of the condenser. This results in lower head pressure in the system and reduced refrigeration compressor energy use.

Detailed testing at the pilot site in Utah showed a total refrigeration system energy savings of 58,000 kilowatt-hours per year—a 5 percent reduction—and 20 kilowatts.

For more information on the pilot study, as well as at the condensers and in the walk-ins and reach-in cases.

Albertsons improved the efficiency of the entire store refrigeration system, saving energy in the compressor room (pictured above) as well as in the condenser and in the walk-ins and reach-in cases.

Glenn Barrett
Energy Management & Procurement

Albertsons

Energy FinAnswer® Case Study: Albertsons

There were good opportunities at each Albertsons store we reviewed. We didn’t walk away from a single store without identifying implementable measures.

Jim Kelony
Principal
KW Engineering

at a glance

Albertsons

Project:
Refrigeration system and lighting upgrades at Albertsons stores

Project overview:
Number of stores
6

Total demand energy savings (kw/mo)
1,179

Average store demand energy savings (kw/mo)
18

Total percentage reduction
37%

Average after incentives
5.8 years

Energy consultant:
KW Engineering Inc.

Contractors and suppliers:
Refrigeration: Louis A. Roser Company
Lighting: Lighting Maintenance & Service Inc.

Acknowledgments: Thanks to Glenn Barrett and Jesse Dare of Albertsons, and Jim Kelsey of KW Engineering for identifying implementable measures.
Energy FinAnswer case study: Albertsons

Through its EnergyFinAnswer program, Pacific Power and its partners worked collaboratively to equip several Albertsons stores with energy-efficient equipment and controls to keep energy and money at bay. It was a valuable partnership for the entire project team.

Benefits

- Better temperature control on refrigeration system to keep products cool and improve its energy efficiency.
- Improved lighting color to enhance customer experience and reach-in cases. The system was installed, commissioned, and controls installed at many stores also improved efficiency.
- Additional benefits, such as upgraded lighting, upgrades at its distribution center in North Salt Lake, Utah.

There were good opportunities at the Albertsons stores, and the collaboration between Pacific Power, Fenn Engineering and Aztec Energy Partners, cost-effective solutions for reducing energy use and cost savings. The system was installed at 36 stores in Washington, Oregon and Utah. *

1. Lighting retrofit

Albertsons replaced existing T12 fluorescent lamps and ballasts with premium efficiency T8 fluorescent lamps and ballasts, resulting in approximately 10 percent, representing a reduction of about $1,900 per annum for each store.

2. Nighttime shutoff of rooftop units

Installing a variable-speed drive on the fan motor enables the fan to slow down in response to the cooling or heating load in the building. This means that the fan ran at the same speed regardless of the cooling or heating load in the building.

3. Cooling coil fans

 Cooling coil fans in walk-in coolers and freezers typically use shaded-pole fan motors. Shaded-pole motors are inexpensive and have been the standard for the supermarket industry for many years. However, shaded-pole motors are much less efficient than electronically commutated motors. Cooling coil fans were controlled to ensure that the condensing pressure is kept low, particularly when the walk-in is dead cool. The strategy is to control the fans to take advantage of the cooling margin. 10. Electronic commutated motors

Electronic commutated motors typically are about 30 percent less energy in the walk-in compared to the fans in this application. In addition, they add less heat into the walk-in, resulting in refrigeration energy savings.}

### Table: Typical Albertsons store efficiency measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Annual electricity savings (kWh)</th>
<th>Actual cost saved ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lighting retrofit</td>
<td>112,338</td>
<td>17.0</td>
</tr>
<tr>
<td>2. Nighttime shutoff of rooftop units</td>
<td>74,913</td>
<td>13.1</td>
</tr>
<tr>
<td>3. Cooling coil fans</td>
<td>6,770</td>
<td>2.0</td>
</tr>
<tr>
<td>10. Electronic commutated motors</td>
<td>12,579</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### Table: Albertsons stores

| Store Location | State | State | Average 260,238 | 18 37% 5.0 3.1 |
|---|---|---|---|---|---|
| Bend OR | 291,568 | 12 44% 4.8 2.7 |
| Yakima WA | 216,547 | 11 35% 7.3 4.7 |
| Magna UT | 249,749 | 14 39% 5.4 3.3 |
| Draper UT | 300,430 | 26 24% 4.8 3.7 |
| Redmond OR | 166,742 | 12 30% 8.7 6.1 |
| Medford OR | 422,608 | 34 47% 3.8 2.0 |
| Medford OR | 237,148 | 21 41% 6.6 3.9 |
| Medford OR | 297,313 | 24 48% 4.6 2.4 |
| West Valley City UT | 134,003 | 18 58% 1.9 0.8 |
| Sandy UT | 258,219 | 16 41% 5.0 3.0 |

### Table: Additional energy-efficiency measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Annual electricity savings (kWh)</th>
<th>Actual cost saved ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Electronic commutated motors</td>
<td>12,579</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### Energy savings

**1. Lighting retrofit**

- Albertsons replaced existing T12 fluorescent lamps and ballasts with premium efficiency T8 fluorescent lamps and ballasts, resulting in approximately 10 percent, representing a reduction of about $1,900 per annum for each store.

**2. Nighttime shutoff of rooftop units**

- Installing a variable-speed drive on the fan motor enables the fan to slow down in response to the cooling or heating load in the building. This means that the fan ran at the same speed regardless of the cooling or heating load in the building.

**3. Cooling coil fans**

- Cooling coil fans in walk-in coolers and freezers typically use shaded-pole fan motors. Shaded-pole motors are inexpensive and have been the standard for the supermarket industry for many years. However, shaded-pole motors are much less efficient than electronically commutated motors. Cooling coil fans were controlled to ensure that the condensing pressure is kept low, particularly when the walk-in is dead cool. The strategy is to control the fans to take advantage of the cooling margin.

**10. Electronic commutated motors**

- Electronic commutated motors typically are about 30 percent less energy in the walk-in compared to the fans in this application. In addition, they add less heat into the walk-in, resulting in refrigeration energy savings.