

# Technology Profile

## Refrigeration

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Refrigeration can account for nearly half of electricity costs in a typical food service business<sup>1</sup> or three-quarters of electricity in a grocery store.<sup>2</sup> By upgrading to energy efficient equipment, you can take more control of your electricity costs. PECO can help with financial incentives for high-efficiency refrigeration systems, anti-sweat heater controls and cold-tolerant LED lighting.

### Opportunities Abound

Energy-saving opportunities related to refrigeration are plentiful—and profitable. Achieving a 10% reduction in a grocery store's energy costs is equivalent, on average, to increasing net profit margins by 16%.<sup>3</sup> In addition to lowering costs, energy efficiency improvements can enhance store appearance, improve aisle comfort, help prevent food waste and increase visibility in display cases.

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*Retrofitting an average grocery aisle with door heater controls is equivalent to the profit margin from selling about 750 additional standard cartons of ice cream every year.*

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### Don't Sweat It

When warm, humid air from a store's interior meets the cold surface of a refrigerated display case, condensation can build up on door gaskets to create fogging and "sweating" on doors, obscuring the merchandise and potentially affecting sales. More than 80% of stores run anti-sweat heaters 24 hours a day, 365 days a year. Best practice is to limit heaters to operating when a store's relative humidity reaches 55%.<sup>4</sup>

A simple way to reduce energy costs is to install humidity-sensing controls that ensure the anti-sweat heaters are used only when necessary. Properly tuned heater controls can generate 1,400 kWh in annual energy savings per door.<sup>5</sup> With an incentive from PECO, the controls are likely to pay for themselves in a year or less.



## Blowing Less Hot Air

Shaded-pole fan motors typically run continuously, even though—on average—full airflow is only required about half the time. Replacing a shaded-pole motor with an electronically commutated motor (ECM) lowers energy costs and significantly improves the performance of walk-in coolers and freezers.

An ECM delivers the same airflow as a comparable shaded-pole motor while consuming only one-third of the energy.<sup>6</sup> In a grocery store with hundreds of motors, breakeven payback for an entire motor retrofit is often within two years.

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*Replacing evaporator fan shaded-pole motors with ECMs is equivalent to the profit margin from selling more than 2,000 gallons of milk in a year.<sup>7</sup>*

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## Take Control of Fan Speed

While refrigerant is flowing, evaporator fans need to run at full speed about half the time. During periods of non-refrigerant flow, fan speed can be reduced 75% while the fan circulates cool air.

Evaporator fan controllers sense the flow of refrigerant, reducing fan speed when full airflow is not required. The motor consumes less energy, less heat is added to the refrigerated compartment and the compressor runs less often. Depending on factors such as duty cycle and evaporator motor power, evaporator fan controls yield energy savings of 10%–60%.<sup>8</sup>



## Show Food in a Better Light

Fluorescent light output in cold temperatures can drop significantly. LED lighting performs better in refrigerated display cases—recent tests found LEDs achieve 5% higher efficacy at 23°F than at 77°F<sup>9</sup>—while using half the energy and emitting less heat.

Installing more efficient lighting can also extend product life. Due to the absence of ultraviolet radiation and the ability to maintain colder case temperatures, LED lighting can extend the retail life of packaged meats.<sup>10</sup>

Likewise, LEDs lead to more marketable plants.<sup>11</sup> Minimize product spoilage and benefit from more appealing displays by upgrading to LEDs in your refrigerated cases.

## Get Money to Save Money

PECO offers incentives for a wide range of high-efficiency refrigeration solutions, including door heater controls, fan motors, case shields, LED lighting and various ENERGY STAR® certified equipment.

► **Contact us today!** For more information, visit [PECO.com/Business](https://www.pECO.com/Business) or call **1-844-4BIZ-SAVE** (1-844-424-9728).

<sup>1</sup>[https://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-19809.pdf](https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-19809.pdf)

<sup>2</sup>[https://www.energystar.gov/sites/default/files/buildings/tools/EPA\\_BUM\\_CH11\\_Supermarkets.pdf](https://www.energystar.gov/sites/default/files/buildings/tools/EPA_BUM_CH11_Supermarkets.pdf)

<sup>3</sup><https://www.epa.gov/sites/production/files/2016-03/documents/2015-03.pdf>

<sup>4</sup>[https://www.sce.com/NR/rdonlyres/E29F367C-5426-46A5-9881-CE113E-A190E1/0/Anti\\_Sweat\\_Heater\\_Fact.pdf](https://www.sce.com/NR/rdonlyres/E29F367C-5426-46A5-9881-CE113E-A190E1/0/Anti_Sweat_Heater_Fact.pdf)

<sup>5</sup><http://e3tnw.org/ItemDetail.aspx?id=24>

<sup>6</sup><https://www.distributedenergy.com/home/article/13025524/innovations-in-motor-technology-spark-energy-efficiency>

<sup>7</sup><https://www.pge.com/en/mybusiness/save/smbblog/article/RefrigerationControls.page>

<sup>8</sup>[https://www.mge.com/saving-energy/business/bea/article\\_detail.htm?nid=1780](https://www.mge.com/saving-energy/business/bea/article_detail.htm?nid=1780)

<sup>9</sup><https://blog.springfieldelectric.com/ge-led-products/8-advantages-of-led-lighting/>

<sup>10</sup><https://phys.org/news/2012-01-meating-solution-meat-shelf-life.html#jCp>

<sup>11</sup><https://gpnmag.com/article/led-lighting-and-its-effect-plants-growers-and-world/>