

## Energy Efficiency - Building Design Strategies: Energy Modeling

**Strategy:** Computer model building design and systems to test the potential energy use and performance of various energy efficiency alternatives.

**Relevant Store Scale/Type:** S,M,L/New & Adapted

### Initial Cost:

1. Design fees for an energy modeler. Typically, refrigeration systems include modeling as part of the purchase; however, it is recommended the store is modeled holistically.
2. It is all recommended that the services include several iterations for design study to best compare design options.
3. \$5,000 start for energy modeler fees; depends on size and complication of system.

### Return on Investment:

1. Savings depend on the design choices made for the energy efficient systems relevant to the cost of the energy model.

### Operator Benefits:

1. Modeling will inform decisions about which selection, or combination of selections, perform the best.
2. General energy analysis data can be extrapolated to multiple stores in a chain, increasing the ROI.

### Technical Considerations:

1. Energy modeling is the best way to project energy use and savings in order to make strategic design / system choices.
2. Modeling is typically necessary for energy rebates.
3. While uncommon for grocery stores, it is ideal to integrate refrigeration modeling together with space conditioning to realize full efficiencies, like heat recovery.
4. Because energy systems of a supermarket are relatively complex, it is recommended that the energy modeling consultant have experience with grocery store/supermarket modeling for a comprehensive understanding of integrating the systems and choices.

### Suggested Programs:

Basic modeling programs include:

DOE2 / eQUEST <http://www.doe2.com/>

More complex programs are recommended for extensive and integrated modeling of supermarkets; check with modeling experts for best programs based on store requirements.

### Product/Manufacturer Suggestions, Resources & Examples:

Supermarket Energy Modeling Conclusions from KTH using CyberMart program for integrated overview:

<http://www.diva-portal.org/kth/theses/abstract.xsql?dbid=217>