From Energy Audits to Energy Savings

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Paris Hilton - Paris Hilton: 'I Only Wear Clothes Once'

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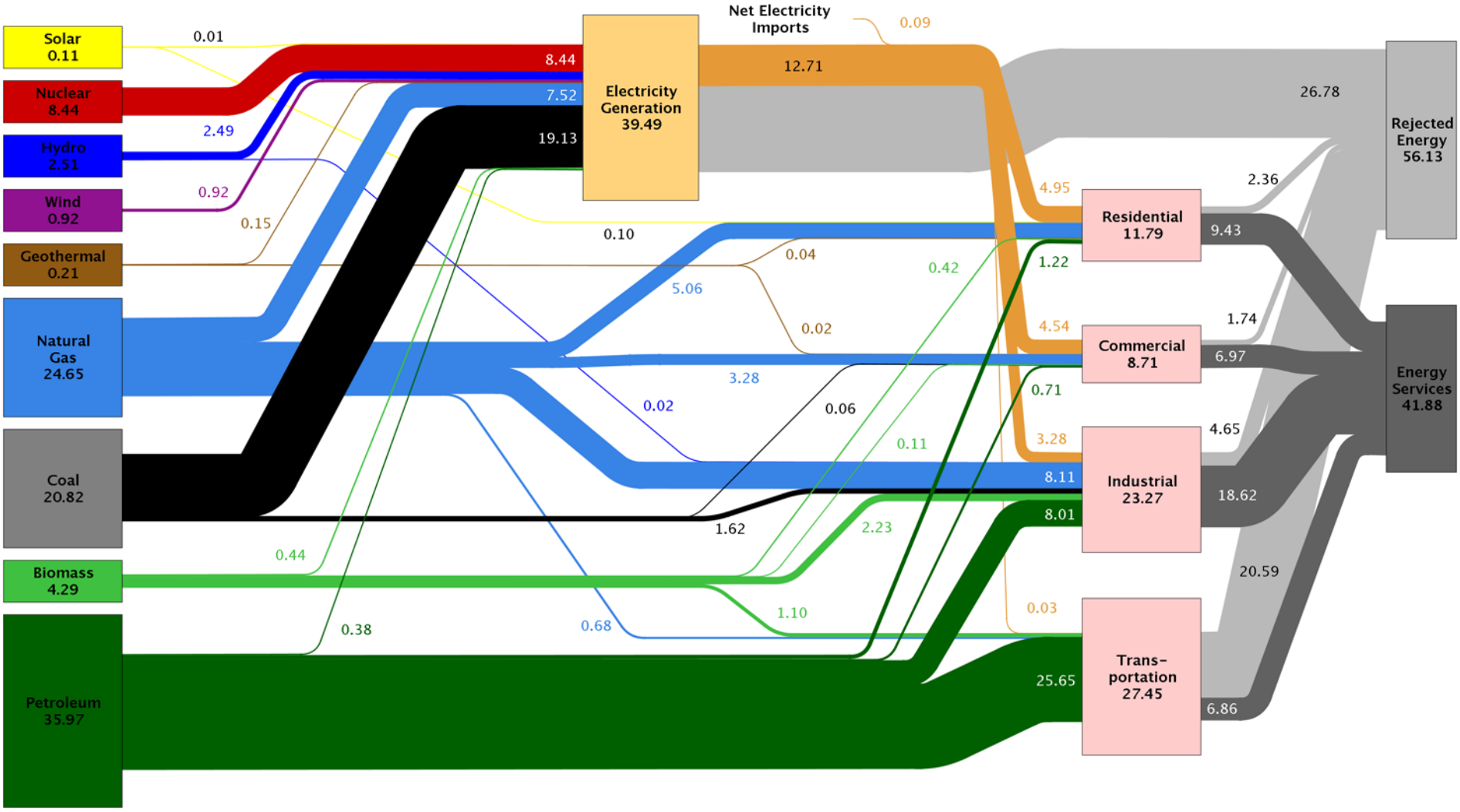
Paris Hilton: 'I Only Wear Clothes Once'

Paris Hilton never wears the same outfit twice and gives most of her clothes away to friends and charity after wearing for the first time.

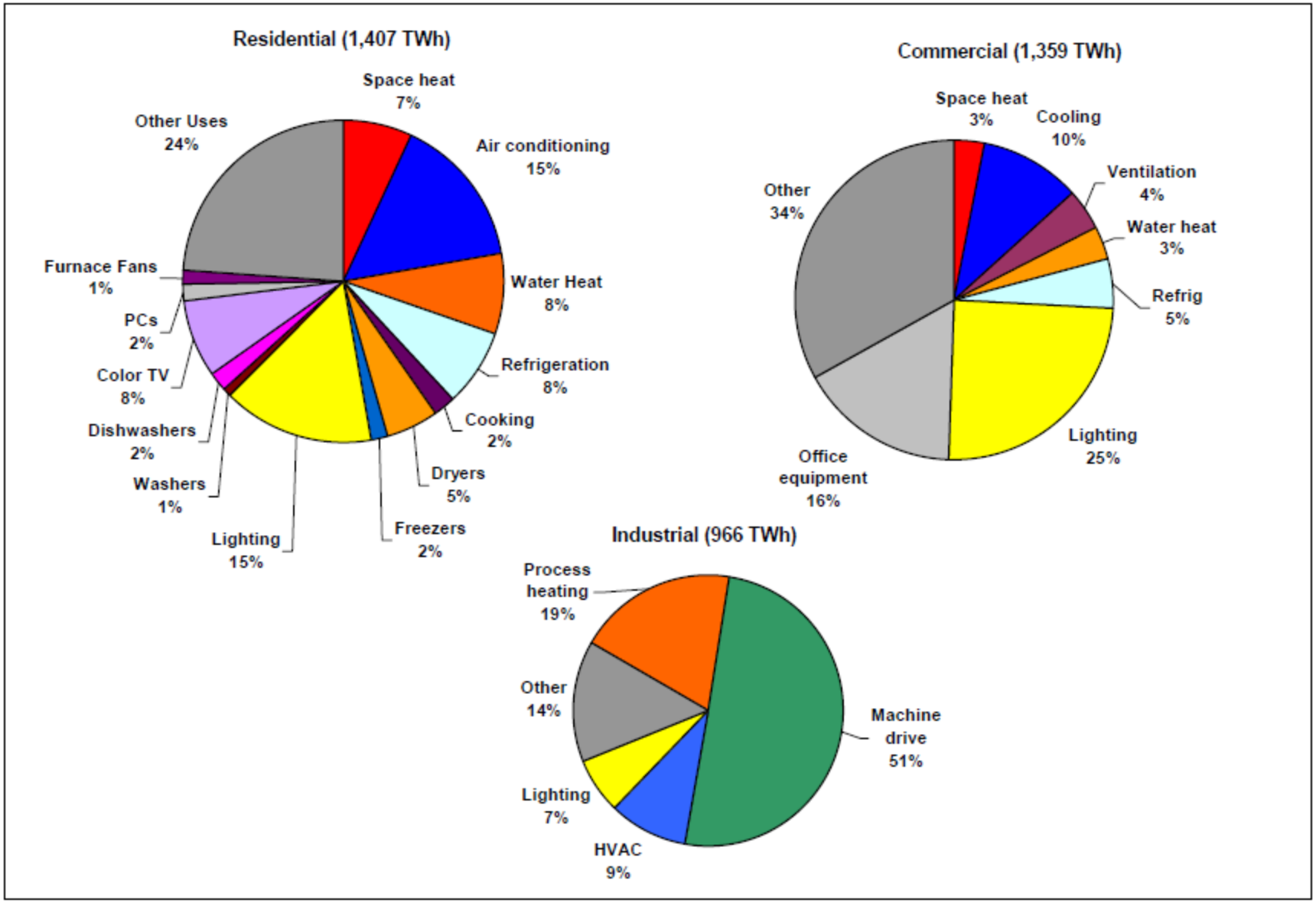
Estimated U.S. Energy Use in 2010: ~98.0 Quads

Lawrence Livermore National Laboratory



Source: LLNL 2011. Data is based on DOE/EIA-0384(2010), October 2011. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the Department of Energy, under whose auspices the work was performed. Distributed electricity represents only retail electricity sales and does not include self-generation. EIA reports flows for hydro, wind, solar and geothermal in BTU-equivalent values by assuming a typical fossil fuel plant "heat rate." (see EIA report for explanation of change to geothermal in 2010). The efficiency of electricity production is calculated as the total retail electricity delivered divided by the primary energy input into electricity generation. End use efficiency is estimated as 80% for the residential, commercial and industrial sectors, and as 25% for the transportation sector. Totals may not equal sum of components due to independent rounding. LLNL-MI-410527

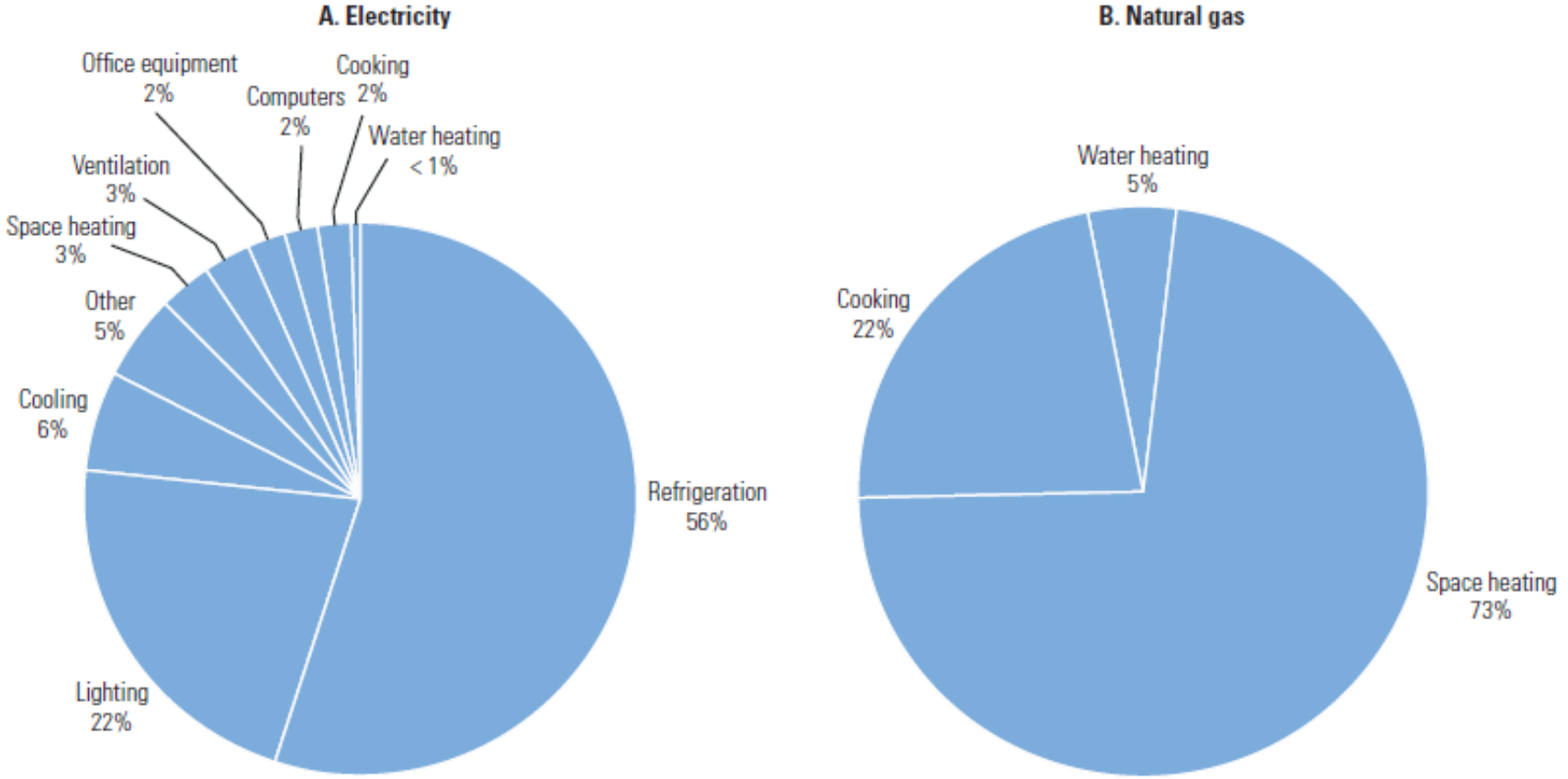
Figure 1. 2008 U.S. Electricity Use by Sector and End Use



Source: Energy Information Administration (2008)

FIGURE 1: Grocery store energy consumption by end use in the U.S.

Data from the U.S. Energy Information Administration show that refrigeration and lighting account for 78 percent of electricity use (A), and space heating dominates natural gas use at 73 percent (B).

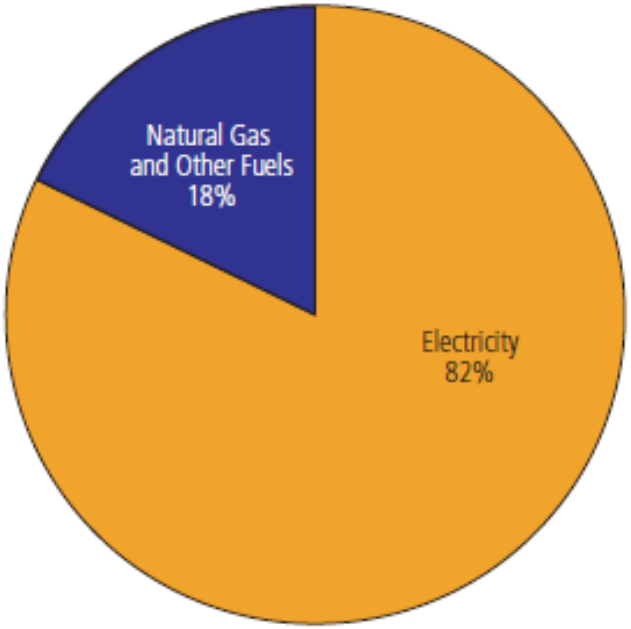


Note: Sum may not total 100% due to rounding; insufficient data were available for the "Other" category.

© E Source; data from the U.S. Energy Information Administration

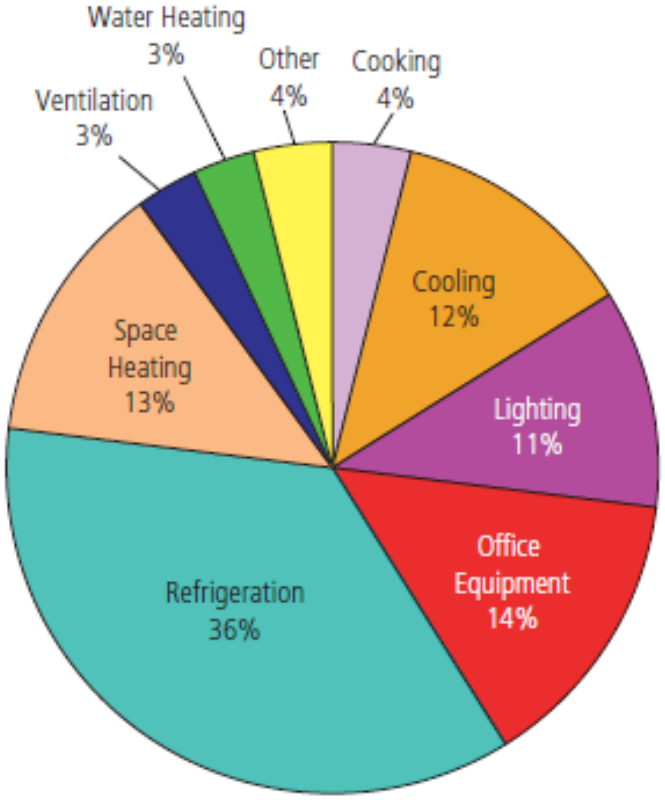
NationalGrid, Managing Energy Costs in Grocery Stores, https://www.powerofaction.com/media/pdf/NGrid-P-4.pdf

Figure B-17. Typical Supermarket: Energy Consumption by Fuel Type



Source: Based on EPA analysis of data from the Energy Information Administration's 2003 Commercial Building Energy Consumption Survey.

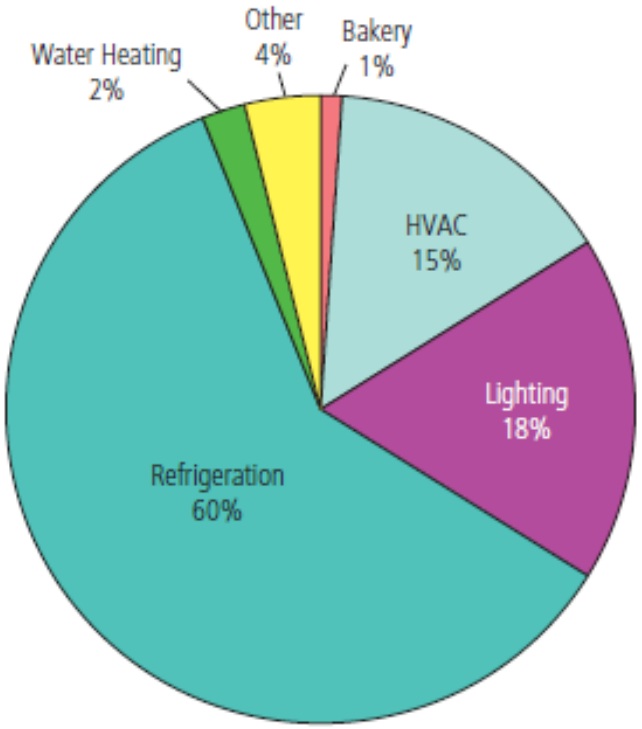
Figure B-18. Typical Supermarket: Total Energy Consumption by End Use



Source: Adapted from E Source (2006). Commercial Energy Advisor. Online at <http://www.esource.com/BEA/hosted/PDF/CEA_groceries.pdf>.

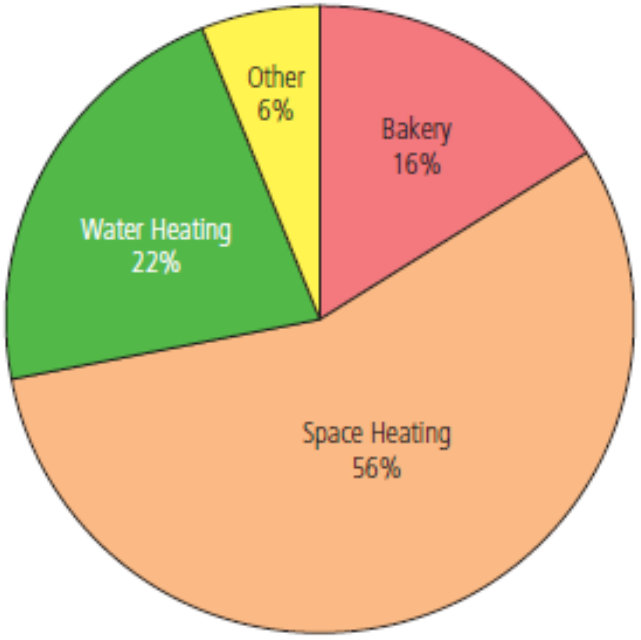
http://www.epa.gov/cleanenergy/documents/suca/sector_collaborative.pdf

Figure B-19. Typical Supermarket: Electric Consumption by End Use



Source: Adapted from Edison Electric Institute (2001). *Managing Energy in Your Supermarket*.

Figure B-20. Typical Supermarket: Natural Gas Consumption by End Use



Source: Adapted from Edison Electric Institute (2001). *Managing Energy in Your Supermarket*.

http://www.epa.gov/cleanenergy/documents/suca/sector_collaborative.pdf

Background

- Supermarkets are the most electricity-intensive type of commercial building, using an average of around 50 kWh of electricity.
- Energy expenses represent the most significant portion of the annual operating budget after labor costs.
- EPA estimates that $1 in energy savings is equivalent to increasing sales by $59.

Energy Star Building Manual, 11. Facility Type: Supermarkets and Grocery Stores, revised January 2008, http://www.energystar.gov/ia/business/EPA_BUM_CH11_Supermarkets.pdf

Benefits from Energy Efficiency

- Increased profitability
- Reduced vulnerability to energy price fluctuations
- Increased sales
- Reduced spoilage
- Enhanced public image

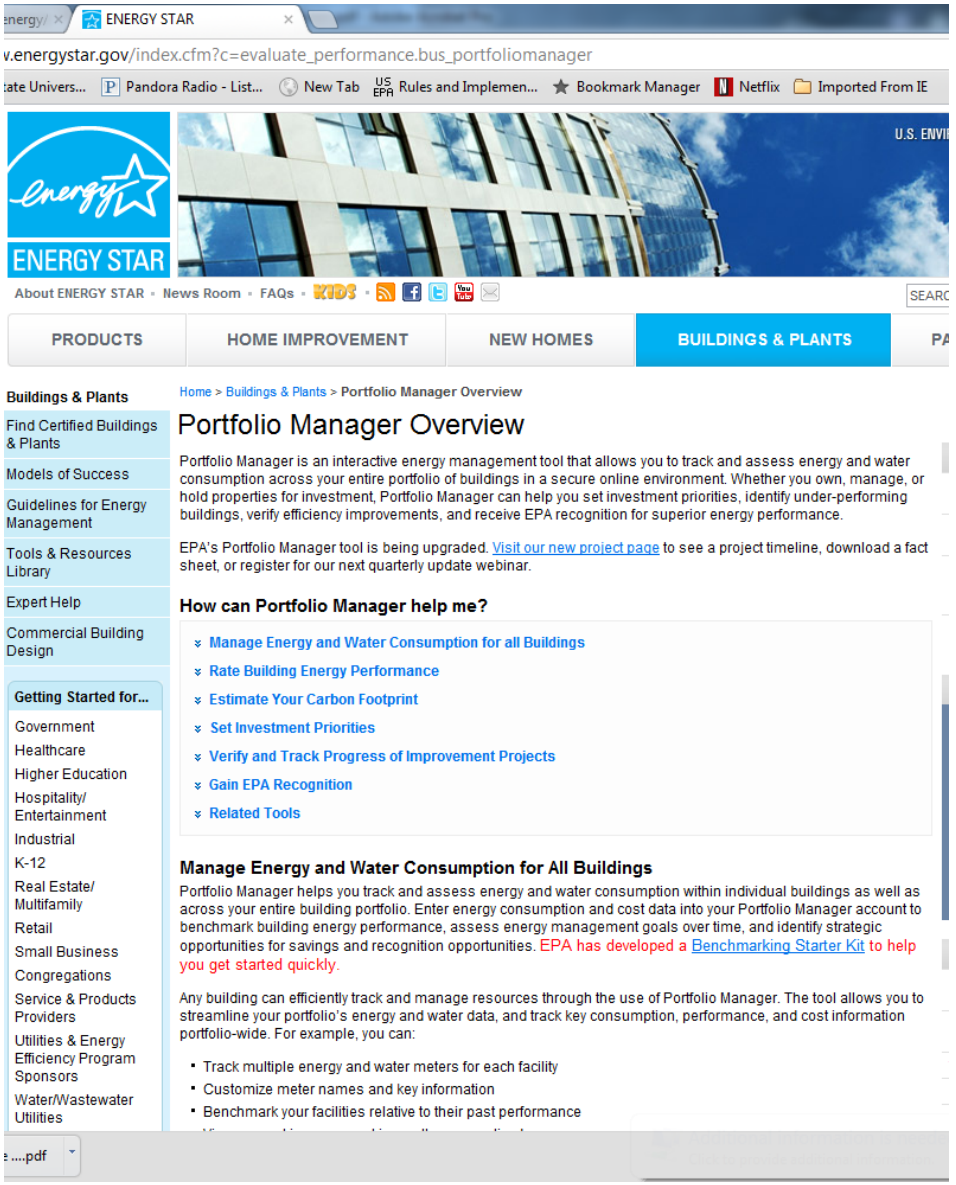
Energy Efficiency Obstacles

- All sectors
  - Lack of management commitment
  - Lack of information
  - Lack of comprehensive measurement tools and methodologies
  - Lack of financial resources
- Grocers
  - Thin profit margins lead to strict thresholds for simple payback periods
  - Customer comfort and shopping experience take precedence over energy performance
  - Constraints on refrigerant use and emissions must be considered because of interaction with efficiency

http://www.epa.gov/cleanenergy/documents/suca/sector_collaborative.pdf

Benchmark

- Energy Star Portfolio Manager
- Find out where you are compared to national average
  - Zip code
  - Gross floor area
  - Weekly operating hours
  - Workers on main shift
  - Presence of cooking facilities
  - Number of walk-in refrigeration/freezer units
  - Percent of the gross floor area that is heated
  - Percent of the gross floor area that is cooled
- Financial tools
  - Building upgrade value calculator
  - Cash flow opportunity calculator
  - Financial value calculator



What Can We Do?

- Turn things off
  - Plugged-in devices
  - Lights
- Turn things down
  - HVAC temperature setbacks
  - Special-use rooms
- Cleaning and maintenance
  - Check the economizer
  - Check AC temperatures
  - Change air filters
  - Inspect and replace gaskets
  - Clean condenser coils
  - Maintain appropriate refrigerator settings

NationalGrid, Managing Energy Costs in Grocery Stores, https://www.powerofaction.com/media/pdf/NGrid-P-4.pdf

Longer-term solutions

- Optimize refrigeration
  - Electronically-commutated motors (ECMs)
  - Floating head pressure
  - Anti-sweat heater controls
  - Smart defrost controllers
  - LED refrigerated case lighting
- Kitchen appliances
- Lighting upgrades

NationalGrid, Managing Energy Costs in Grocery Stores, https://www.powerofaction.com/media/pdf/NGrid-P-4.pdf

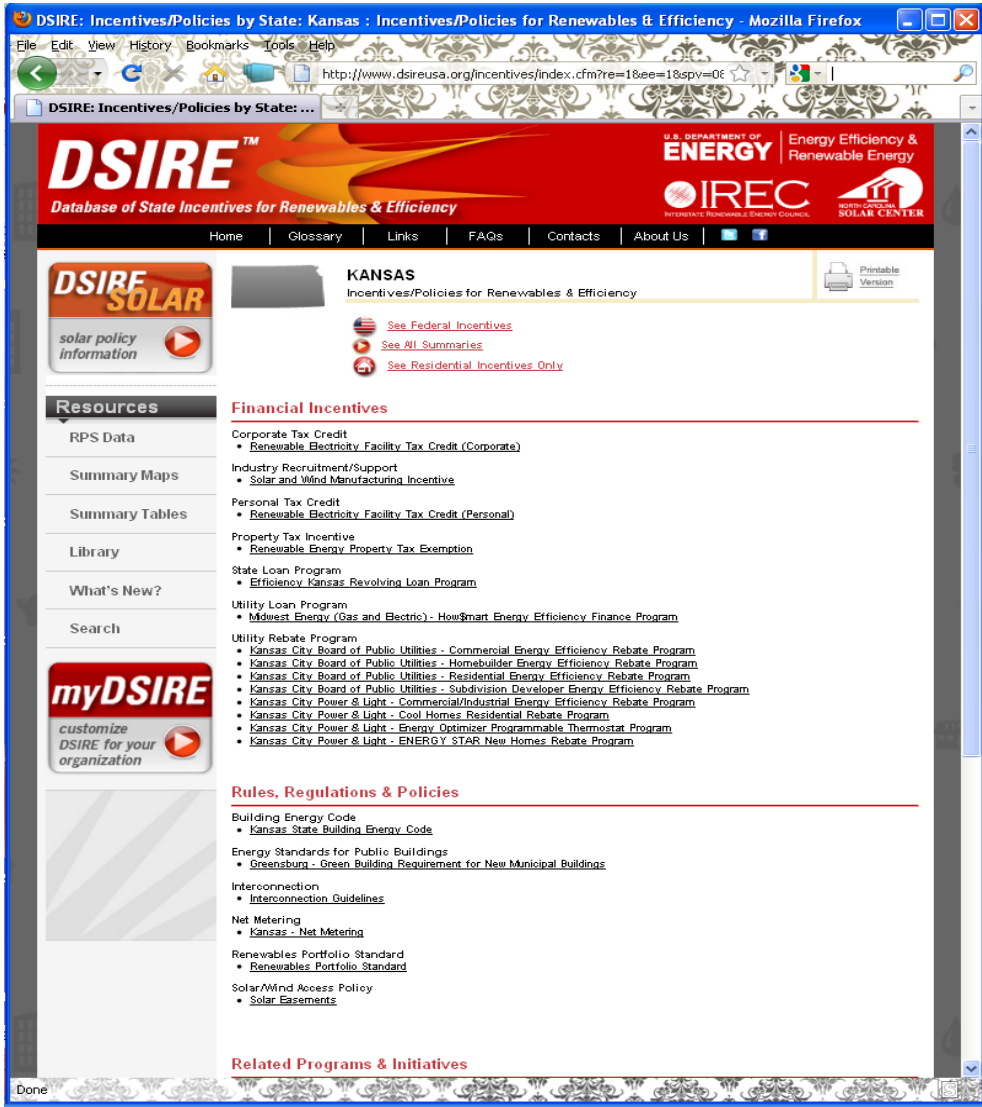
How Can I Pay for It?

- Rural Energy for American Program
- DSIRE database
- USDA Rural Development Community Facility Grants?
- Performance Contracting

DSIRE Database

www.dsireusa.org

- Database of State Incentives for Renewables & Efficiency
  - Comprehensive source of information on state, local, utility and federal incentives and policies that promote renewable energy and energy efficiency
  - Funded by the U.S. Department of Energy



Tax Credits/Exemptions

- KSA 79-201
  - Property tax exemption renewable energy equipment for Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric.
- KSA 79-32245
  - Kansas provides an investment tax credit for certain renewable energy facilities in cooperation with the Department of Commerce.
  - Credit is 10% of the first $50 million invested in the project and 5% for an expenditures above $50 million.

Manufacturer Rebates

- To encourage customers to buy energy efficient products, manufacturers occasionally sponsor special offers, such as sales tax exemptions, credits, or rebates on qualified products.
- Energy Star Rebate Finder

  www.energystar.gov/index.cfm?fuseaction=rebate.rebate_locator
- Other Examples?

Other Sources

- Home Depot
  - http://www.homedepotfoundation.org/how-we-help/grants.html
  - Up to $5,000
  - Registered 501(c)(3) nonprofit organizations, public schools, or tax-exempt public service agencies that use volunteers to improve the physical health of their community
  - Grants in the form of The Home Depot gift cards for the purchase of tools, materials, or services
  - **Accept proposals for grants beginning February 6, 2012 through August 13, 2012**

Utility Rebates, Incentives, Financing

- Many Kansas Utilities provide rebates, incentives or financing.
  - Projects include: Air-source, water-source and ground-source heat pumps; package terminal heat pumps; resistance heating systems; electric boilers; and electric water heaters.
  - Incentives are also provided for new construction for the energy efficient design and construction of new or renovated non-residential buildings.

Performance Contracting

- Energy Performance Contracting (EPC) is a mechanism to implement energy efficiency improvements with minimal up-front costs.
  - Typically delivered by an Energy Service Company (ESCO)
  - Uses savings from project to pay for work over a period of time.
  - Provides customers with comprehensive set of energy efficiency, renewable energy, and distributed generation measures.
  - Often accompanied with guarantees the savings produced will be sufficient to finance the full cost of the project.

Benefits of Performance Contracts

- **Better Buildings and Systems**
- **Wise Investment-** Energy performance contracting allows you to divert funds that would be spent on energy bills into investments in your buildings.
- **Improvements Without Sacrifice-** Energy performance contracting allows you to tackle energy efficiency projects now even if no funds are available.
- **Cost Savings-** New systems and equipment can lower your energy costs.
- **One-Stop Shopping-** Performance contracting offers a streamlined approach to making facility improvements.

Resources

- SBEAP and PPI
- Energy Star – www.energystar.gov
- Energy Star Building Manual - http://www.energystar.gov/ia/business/EPA_BUM_CH11_Supermarkets.pdf
- Sector Collaborative on Energy Efficiency Accomplishments and Next Steps - http://www.epa.gov/cleanenergy/documents/suca/sector_collaborative.pdf
- National Grocers Assocation workshops - http://www.nationalgrocers.org/events-education/the-nga-show/education-schedule/workshops

Questions?

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