



Commercial buildings are responsible for approximately 20% of the annual energy consumption in the United States. That number can be improved upon not just by building new efficient buildings, but also by green retrofits of our existing buildings.

Existing buildings have what is called 'embodied energy' which is the energy already invested in the materials and construction of existing buildings. It's been said that 'the greenest building is the one already built'.

<http://www.thegreenestbuilding.org/>

The purpose of this handout is to make building owners aware of methods to improve efficiency and sustainability of their buildings and encourage development of a long term green building energy management plan. It also includes information on financial incentives and link addresses to additional information for an in depth look at some of the topics included. This is a rapidly growing segment of the construction industry. New information will be posted as it becomes available.

http://www.energystar.gov/ia/business/GBN_Energy_Strategy.pdf

The International Code Council is currently developing a Green Construction Code which will apply to all new construction and remodeling of existing buildings. Minnesota intends to adopt this code when it becomes available but in the meantime we encourage you to include sustainable features in your building projects. Hopefully some of the following suggestions will be helpful in turning your building green.

Please note: Most projects will require a construction or remodeling permit.

<http://www.ci.minneapolis.mn.us/mdr/permits/index.asp>

Energy management plans

An energy management plan will reduce costs and provide protection against fuel price increases and even fuel shortages. It may include one or more of the following;

- an energy audit
- commissioning or retro-commissioning
- monitoring and tracking energy use
- improved or advanced control systems
- demand side management
- an efficiency upgrade plan for your equipment
- improving your energy resources
- taking advantage of financial resources for green building improvements

http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index

Energy audits

An energy audit can aid in deciding what the most cost effective options are for improvements in how you use energy. An auditor will evaluate your building for insulation and conservation opportunities, past energy consumption, take an inventory of equipment and controls you are currently using and estimate savings from proposed changes. Calculation estimates are based on improvements being installed correctly and performing as intended. Audits vary in price and complexity from a "walk-through" audit to a more detailed engineered study.

Commissioning or retro-commissioning

Commissioning is testing and verifying the performance of systems and equipment for designed operation. Commissioning can enhance efficiency, comfort and safety. Commissioning for new buildings and retro-commissioning for existing buildings involves the same process but at different times in a building's life span.

http://www.msbj.umn.edu/version1_1/p_5_support.html

Tracking and monitoring energy and water use

Tracking your energy and water use, in detail, can alert you to problems such as sudden increases in usage and can help verify savings from efficiency improvements. Sub metering can help you pinpoint problem areas within a building.

Advanced-automated control systems

An Energy Management System or EMS is used to control building equipment. EMS can be used to control the operation of lighting and heating plus building operations such as elevator, automatic doors and security.

Demand side management

Demand side management is lowering or shifting your electric usage to reduce or eliminate large peaks of usage which can create supply problems for the utility and cause expensive "demand charges" on your electric bill. An example of demand side management is the air conditioner program where you are given a rate break if the utility can shut off your air conditioner when overall demand is very high. Xcel Energy bases the level of the demand charge on the greatest 15 minute average load of electrical usage during a billing period. Avoiding spikes will save money. (Sometimes lots of money)

There are technical tools that can help such as load regulation controls. You can also plan ways to adjust your habits and schedules to avoid spikes and peaks. Strategically planned use of a generator during peak operations (generally this option is only cost effective if there is already an emergency generator in place) can also be an effective way of load shedding.

http://www.xcelenergy.com/SiteCollectionDocuments/docs/WI_Comm_rates_brochure.pdf

<http://www.p2pays.org/ref/36/35295.pdf>

http://www.woodweb.com/knowledge_base/Understanding_Demand_and_Energy_Charges.html

Energy resources

There are several opportunities to reduce energy costs by using alternative renewable energy sources such as solar, wind and geothermal energy. When comparing what type of system to invest in, be aware that 'estimated payback period' or 'return on investment' can vary greatly depending on whether the current price of fuel is used or a projected cost of fuel in the calculation. Before adding equipment to a roof top you will need an evaluation of the weight bearing potential of your roof, the sun or wind availability, the options for storing the power generated, local codes or ordinances regarding solar rights and wind equipment installations. The initial cost of geothermal systems can vary due to land use constraints (a deep vertical system is more expensive) but the underground portion of the system has an estimated life span of 50 years and may provide a reasonable pay back over time.

<http://www.ci.minneapolis.mn.us/council/2011-meetings/20110128/Docs/CodeTextSolar-JWit.pdf>

http://www.ci.minneapolis.mn.us/cped/docs/Wind_Energy_Conversion_System_Application.pdf

http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12640

Disclaimer: Green Building Ideas for Existing Commercial Buildings contains links to many outside sites. These links are set up to provide information that is currently available. The City of Minneapolis cannot guarantee the accuracy of information found at any linked site. Providing links to outside sites does not constitute an endorsement by the City of Minneapolis



Minneapolis Regulatory Services • Construction Code Services

Questions? Contact Vicki.Carey@ci.Minneapolis.mn.us or visit the website at <http://www.ci.minneapolis.mn.us/ccs/greenbuilding.asp>

If you need this material in an alternative format call 612-673-2162. **Attention** - If you have any questions regarding this material please call 311.

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