

## PLANNING ISSUES—ENERGY CONSERVATION

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### Objectives



1. To encourage energy conservation, renewable resources use, and clean and efficient transportation.
2. To promote energy conservation and sustainable development practices in county and municipal comprehensive planning.
3. To encourage energy efficiency in design, construction, and siting of new buildings, and support energy-saving innovations in existing buildings.
4. To offer assistance to developers, builders, and other governmental agencies in obtaining tax credits, rebates, and incentives offered by government and local utilities for energy-efficient design and construction.
5. To promote environmental and energy leadership, projects, and programs in Kane County.
6. To discourage the siting of peaker plants in agricultural areas of the county and encourage locations in industrial parks.

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### Chapter Focus



**E**nergy consumption patterns in Kane County are similar to those across the U.S. with a high reliance on non-renewable, finite fossil fuel resources. Reversing this trend requires a reduction in energy use along with a greater use of renewable energy derived from the natural supply of sunlight, wind and vegetation. As Kane County residents and businesses modify energy consumption practices, we will move closer to sustainability, which means we can serve today's needs without jeopardizing the ability of future generations to meet their needs. Energy efficiency also provides significant local economic benefits. Lower expenditures for energy means more dollars are retained in the local economy. Higher energy efficiency levels help protect the local economy during periods of energy price spikes by flattening (reducing) the effects of higher prices. Kane County needs to develop a conservation ethic demonstrating responsible use of energy by improving energy efficiency.

This chapter examines:

- Energy resources
- Energy conservation and design
- Energy efficiency

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### Energy Resources

**I**n Kane County, primarily Commonwealth Edison provides electric power from a variety of energy sources. The major portion is provided by nuclear energy, which supplies 59% of the county's electricity. Coal provides 39% of electricity, with the remaining produced by national gas, petroleum, and hydropower. Only hydropower, providing just 0.04% of Kane County's electrical power needs, is a renewable energy resource.

Electricity is distributed primarily by aboveground power lines. Commonwealth Edison distributes service to most of Kane County with the exception of the municipalities of Batavia, Geneva, and St. Charles that own and operate their own electric services. These municipalities purchase electric power from a national power grid providing reasonable rates and a constant reliable supply of electricity to their citizens.

Natural gas is a fossil fuel that originates from nonrenewable deposits of ancient plant and animal material. Natural gas is distributed through underground pipes from a central system. In Kane County, 88% of reported households use natural gas for

## PLANNING ISSUES—ENERGY CONSERVATION

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heating. Nicor gas is the primary distributor of natural gas in Kane County. Liquefied petroleum (LP) gas is fuel that is both portable and highly adaptable to many different uses. This makes LP gas ideal when other comparable fuels, such as electricity and natural gas, are not available. In Kane County, LP gas use is found primarily west of Route 47.

Solar and wind power are used in Kane County as an alternative resource on a limited individual basis. They are primarily used to supplement conventional utilities. Solar power is strongly dependent on site design criteria involving the use of appropriate building types and material, and setbacks, landscaping, site planning, and other design factors. Wind power has a long history in the region beginning with the U.S. Wind Engine and Pump Company in Batavia in 1863. By 1890, Batavia was recognized as the leading windmill manufacturing city in the entire world. Some of these windmills can still be seen today dotting the agricultural landscape of the county.

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### Energy Conservation and Design

**C**reating and using a diversity of energy sources allows less dependence on a single source. Sustainable and renewable resources offer an opportunity to use material otherwise wasted and to employ energy less degrading to the environment. Environmental design in building construction, land use, and transportation patterns can also help reduce the overall consumption of energy.

Municipal and other government agencies are setting standards for green buildings, often in cooperation with the U.S. Green Building Council and the Sustainable Buildings Industry Council. Both of these organizations, with representatives from all segments of the building industry, work to accelerate the adoption of conservation practices, technologies, and standards. Waste reduction is an important component of green buildings. This includes recycling, management of hazardous and construction waste, and a focus on energy and water savings. Selecting re-used or recycled content materials is also a green policy (Refer to Figure 33).

Effective land-use planning can also provide energy savings by reducing dependence on the automobile. When subdivisions and neighborhoods are designed and rehabilitated to maximize walkability, not only is energy saved, but also residents are able to enjoy several other benefits. These benefits include accessibility for all segments of the population, healthier lifestyles, less noise and cleaner air. There is an increasing consumer preference for location efficiency. Convenience to work, school, shopping, and transit is a key way to reduce the need to drive.

Kane County has begun to introduce energy conservation design in its planning efforts. In the Urban Corridor, energy conservation design can be applied through neighborhood revitalization, infill and redevelopment. In the Critical Growth Area, energy conservation is focused in new construction. Fox Mill and Mill Creek are two master planned communities approved by Kane County in the mid 1990's that include many of the same principles of energy efficiency including walkability, public transit and neighborhood design.



In Kane County, the primary mode of transportation is a petroleum powered, non-renewable, fossil-fueled automobile driven by a single occupant. As the number of vehicles in Kane County increases, there is an opportunity to offer cleaner and more efficient transportation options. Effective land-use planning can reduce the amount of total vehicle miles traveled, reducing the amount of fuel used and improving air quality. A vehicle's greenness (cleaner and fuel efficient) depends not only on its design, but also how it is used. A car is greener when it's carrying two people rather than one and it's greener still with three. And it's

# PLANNING ISSUES—ENERGY CONSERVATION

greenest of all if left at home when there's an alternative cleaner way to go: by foot or by bicycle, by bus or by train, and even by electronic telecommunication.

Smart Growth principles result in energy savings by including the following in land-use plans and site plans:

- Compact and mixed use development
- Redevelopment and infill development of existing areas
- Multiple and convenient transportation options by way of sidewalks, bikeways, vanpools, buses and trains
- Affordable housing options for employees wanting to live closer to work, reducing travel times
- One-stop destination shopping centers catering to walkability and leisure activities



Because power lines and facilities are a visible part of the landscape, it is a challenge to site them appropriately, whether in rural or urban settings. There has been a tendency to site power lines in rural areas, which incur the majority of environmental and visual impacts, yet it is dense urban populations that consume most of the energy. A balance between rural and urban concerns should be taken into account when siting electric distribution systems. Strict criteria should be adhered to when siting power lines and facilities because of potential health concerns, as well as visual, public safety, communication reception, and environmental issues. Peaker plants should be categorized as an industrial use and avoided in the county's agricultural area.

## Energy Efficiency

**E**nergy efficiency is becoming more important in this country. A number of creative energy-efficiency initiatives are being implemented as a result. Energy efficiency initiatives are most often created as a result of partnerships with government agencies and other organizations. Utility companies and the State of Illinois now offer significant incentives: grants, rebates and loans for installing wind and solar systems in homes and businesses. In 1999, the Illinois Clean Energy Community Trust was established to encourage the development of energy efficiency and renewable energy in Illinois. The trust offers grants, loans, venture capital support and other financial support for projects and programs to improve energy efficiency and develop renewable energy resources.

Community-based energy efficiency projects are also being established to reduce energy consumption and costs on a neighborhood basis. Emerging energy conservation strategies include energy service companies selling both electricity and energy efficiency; community utility network investments for improving system reliability; and energy buyers pooling electricity demand to cut costs and generate a demand for green energy.

The Center for Neighborhood Technology (CNT) in Chicago, Illinois advocates for sustainable, neighborhood-based solutions benefiting energy consumers and providers. CNT has created the Community Energy Cooperative, a non-profit membership organization, to develop sustainable sources of electricity and to help individuals and communities manage their energy use and control their energy costs. (Refer to Figure 39).

## PLANNING ISSUES—ENERGY CONSERVATION

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In July 2000, the City of Chicago joined with 47 other local government bodies in a collaborative municipal greening effort. The 48 government bodies have issued a request-for-services to the 13 power providers that have been licensed to sell power in Illinois' deregulated power market. To win as a service provider, the power company must lower energy costs for each member of the purchasing group and by 2005 generate 20% of their power from renewable sources, such as solar or wind energy. Once selected, their new provider must submit plans to reduce the pollution caused by the power they generate.

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### Policies

1. Partner with other governmental agencies, utility companies, and the private sector to conserve limited energy resources.
2. Encourage the development and use of renewable energy resource such as solar and wind power in Kane County.
3. Promote public information on methods to conserve energy.
4. Promote development patterns that will conserve energy and reduce the cost of providing additional utility facilities.
5. Encourage regional cooperation in siting utility, electric, and telecommunication transmission systems.
6. Enforce energy efficient building codes and encourage the use of new building materials and practices that promote energy conservation.
7. Encourage utility and telecommunication companies to incorporate native plantings in right of ways and easements.
8. Discourage the location of peaker plants in agricultural areas.

### Figure 33

#### Green Building in Kane County

Green building is emerging in Kane County. In 2003, Judson College received a 7.5 million dollar federal grant for a new environmentally friendly library and academic center. The grant was secured from the U.S. Department of Energy's, Energy and Water Development Appropriation for 2004. An architecture firm in London familiar with green building design will design the building. The green building design strategies used in the library and academic center will be a model in Kane County. The energy conservation features include:

- Hybrid mechanical system, allowing both conventional heating/cooling and natural ventilation when conditions allow.
- A more energy efficient, daylight friendly building envelope
- Indirect lighting maximized to reduce the need for lights
- Geothermal heat pumps will utilize the mild temperature of the earth to heat and cool the building.

*Source: Judson College, 2004.*

**Figure 34**

**Did you know that...**

- Lighting accounts for 50% of a school’s energy consumption.
- Switching from driving an average new car to a 13-mile-per gallon sport utility vehicle for a year would waste more energy than leaving a refrigerator door open for six years, a bathroom light burning for 30 years, or a color television turned on for 28 years.
- A personal computer and its peripherals typically boost power consumption in the home by about 5% per year.
- Renewable energy used in the U.S. accounts for only 6% of total energy consumption.

*Source: “Renewable Energy,” Energy Information Sheets, Energy Information Administration, Department of Energy, 2004; Huber, Peter, and Mark Mills, “Got a Computer? More Power to You,” The Wall Street Journal, Sept. 7, 2000; Corning, Owens, “Smart Energy Decisions for Home and School,” Owens Corning, In the News,” NEWSCOM, Aug. 5, 1999; “Driving Up the Heat: SUVs and Global Warming,” Global Warming & Energy, Sierra Club.*

**Figure 35**

**Wind Power**

**An energy efficient alternative**

Although we are not far from the “windy city”, Kane County, along with the majority of the state, is classified as having class two annual average wind power (class seven being highest). Although these wind speeds are not high enough to utilize large wind turbines, small wind turbines can be used at any wind speed. Wind turbines harness the renewable resource of the wind to generate electricity. Wind power can be generated for individual residences, however it is more economical to produce wind power for a number of houses or a subdivision. While the cost of capturing power from wind turbines is not inexpensive, the long-term benefits will outweigh the initial start-up costs over time. A number of financial incentive programs are available to help offset the initial investment needed to implement renewable energy systems in buildings and transportation systems. Federal programs include but are not limited to the U.S. EPA (Green Power Partnership), U.S. Department of Energy (Clean Cities, Rebuild America), and the U.S. Department of Transportation (Congestion Mitigation and Air Quality Improvement Program).

*Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, 2003; and “PUBLIC Investment—Renewable Energy and Energy Efficiency Incentives for Local Governments,” A special edition of the APA PAS Memo, American Planning Association, December 2002.*

**Figure 36**

**School Pool uses Collective Purchase Power to Reduce Electric Costs**

SchoolPool, a partnership of Ohio school administrators, school business officials and the school board association, takes advantage of the collective purchase power of 660 Ohio school districts to obtain lower utility rates under deregulation. This partnership uses an energy management consultant to aggregate accounts and negotiate for efficient purchasing methods.

*Source: "Ohio SchoolPool Selects Strategic," Strategic Energy, Pittsburg, PA, 2000.*

**Figure 37**

**Freedom CAR and Fuel Initiative**

Freedom CAR and Fuel Initiative is a \$1.2 billion federal fuel initiative to reverse America's growing dependence on foreign oil by developing the technology needed for commercially viable hydrogen-powered fuel cells—a way to power cars, trucks, homes and businesses that produce no pollution and no greenhouse gases. In partnership with the private sector, the fuel initiative will develop new vehicle and fuel technologies and infrastructure needed to make it practical and cost-effective for large numbers of Americans to use fuel cell vehicles by 2020.

*Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, 2003.*

**Figure 38**

**Fuel Cells**

Fuel cells, an energy device that converts hydrogen and oxygen into electricity, is thought to be one answer to the nation's energy needs. Not only are fuel cells powered by abundant, renewable hydrogen fuel, but they also produce no tailpipe emissions and are a true Zero Emission Vehicle as defined by the U.S. Environmental Protection Agency. Fuel cell technology has been used by the U.S. Space Program since the 1960's and is now undergoing research and demonstration projects with heavy investments from the federal government and major automotive companies. In partnership with Daimler-Benz and Ballard, the Chicago Transportation Authority is operating fuel cell powered buses as a demonstration project and as an initiative to reduce bus emissions in Chicago.

*Source: EPA Newsroom, U.S. Environmental Protection Agency, 2003; and "The CTA Moved Into the Future With Alternative Fuel Technology," Chicago Transportation Authority, 2002; The Online Fuel Information Center, Fuel Cells 2000, website: [www.fuelcells.org](http://www.fuelcells.org), 2003.*

**Figure 39**

### **Planning for the Energy Future of Kane County**

Kane County and the Community Energy Cooperative with funding from the State of Illinois have initiated a new project to study Kane County's energy options. This new project will chart the county's energy future. The project will evaluate how demand for energy is likely to grow in the county. It will explore strategies for using aggressive energy efficiency and demand reduction programs to manage growth and produce economic and environmental benefits. The project will:

- Analyze the projected growth in energy use in Kane County and its impact on future infrastructure needs.
- Assess the potential to manage growing energy demands and reduce costs to residents, businesses, and local governments. This will be accomplished through energy efficiency, demand reduction, and distributed generation strategies.
- Assess the potential of demand reduction to delay future expansion of energy infrastructure.
- Promote existing energy efficiency and demand reduction programs in Kane County, specifically the Energy-Smart Pricing Plan.
- Develop a plan for implementing the most cost-effective strategies.
- Educate public officials, developers and community and business leaders about energy use and cost reduction strategies.

Once the strategies are identified the project team will create an implementation plan and provide for community outreach and education. A project report will be issued that includes the implementation plan, results of the analysis of energy use, energy reduction strategies, potential impacts of infrastructure and recommendations.

*Source: Kane County Development Department, 2004.*