# CHAPTER EIGHT: ENERGY

*NOTE: None of this chapter has been adopted by Thurston County as the joint plan with Olympia for the unincorporated part of the Olympia Growth Area.*

## INTRODUCTION

Why have an energy chapter? Society spends a lot of money on energy. Most of these dollars leave town--some even leave the country. This has contributed to balance-of-payments problems, increasing concerns about dependence on foreign sources, and economic instability. Much of our energy use generates pollution and/or relies on nonrenewable sources. This is not sustainable.

Though much is beyond our local influence, some things can be done. Households (families) spend a lot on energy. The community is better off if these dollars can stay in the local economy and be spent on other goods and services. Conserving energy conserves money which can then be spent elsewhere in the local economy. Besides, the energy we waste is the cheapest energy we can buy--new sources of energy cost more than conservation.

In 1979, state legislation added energy conservation and solar access protection to the list of permitted optional elements in local comprehensive plans. This chapter will look at what Olympia can and should do in this regard. First we analyze the sectors of energy demand, and the types of uses in each sector. Then we set out goals and policies on the wise use of energy.

## PATTERNS OF ENERGY USE

### The Big Picture

We start by analyzing the energy demand sectors: transportation, residential, commercial, industrial and institutions. A look at the energy uses of each sector provides a picture of where to target energy conservation measures. Each sector presents various degrees of possibilities for local government influence on energy conservation. Understanding the various sectors and their use of energy is key to energy conservation policies. The transportation and residential sectors account for 29 percent of the energy consumption in Washington State. Some decrease in energy use in the transportation sector can be achieved through local action. However, a reduction in the residential sector energy use seems more within our scope of action. And, while commercial, industrial and institutional uses are considerably smaller than transportation or residential uses, local efforts can be taken in these sectors to aid the overall picture of energy conservation. (Ord. 6389, 01/24/06)

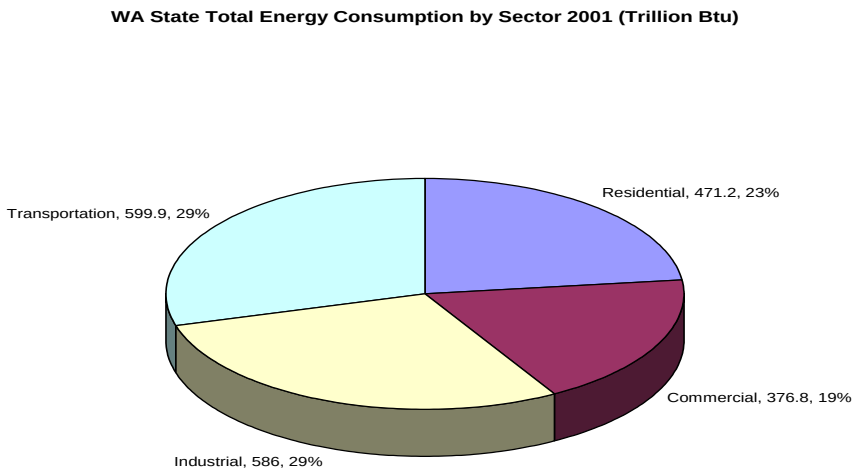
### Transportation

The transportation sector is the largest user of energy in Thurston County and the most difficult to affect at the local level. Efforts in reducing transportation related uses are best suited for long term measures. The two major factors affecting transportation energy efficiency are (1) fuel efficiency of the vehicles, and (2) density of land use.

Local government does not have the authority to regulate fuel efficiency of vehicles. Federal standards and market pressures have helped reduce the fuel consumption per mile. Federal regulations require lower emissions for diesel engines and incentives for energy efficient vehicles. Considerable potential remains for fuel efficiency improvements. (Ord. 6389, 01/24/06)

**Figures 8-1 through 8-4 are repealed and replaced with Figures 8-1 through 8-6 (Ord. 6389, 01/24/06)**

# FIGURE 8-1
## Energy Use by Sector
## Washington State 2001 Percent and BTUs

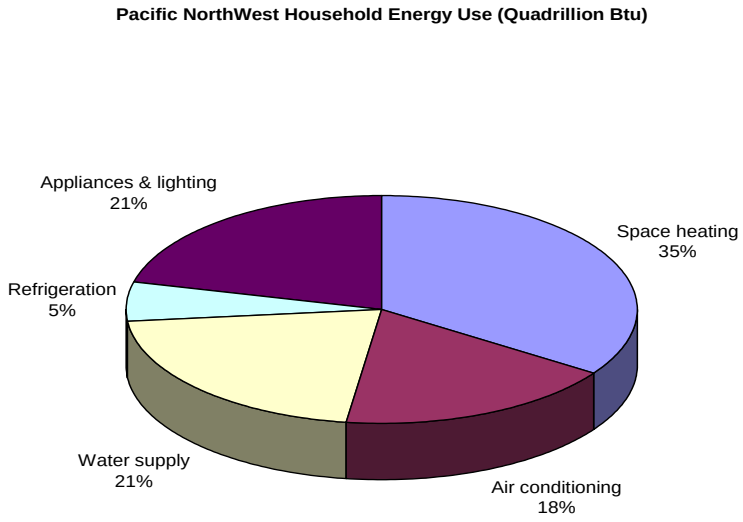



**Source**: US Department of Energy's Information Administration 2001

# FIGURE 8-2
## Washington State Electricity Imports and Exports Trend

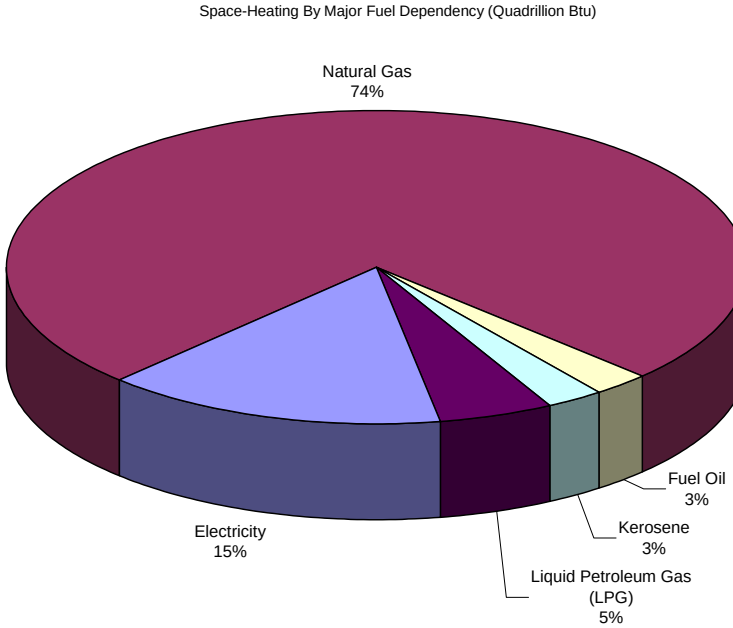

**Source**: US Department of Energy: Energy Information Administration

# FIGURE 8-3
## Pacific Northwest Household Energy Use by Function



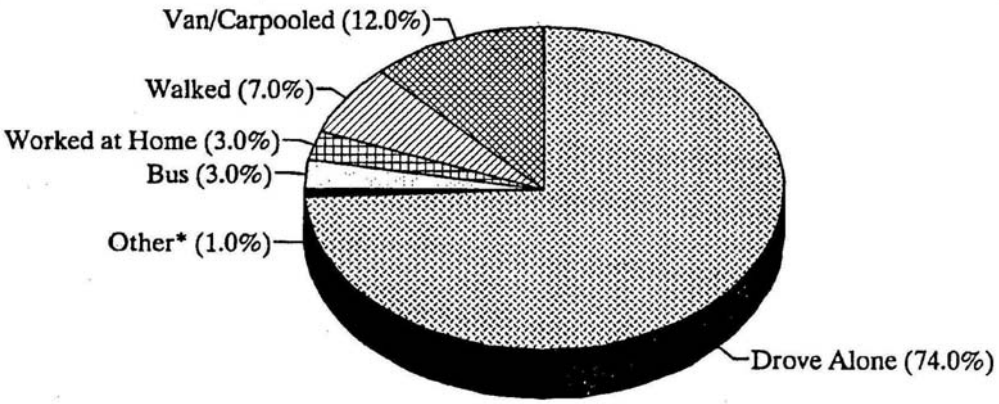

**Source:** US Department of Energy's Information Administration 2001

# FIGURE 8-4
## Pacific Northwest Household Space Heating Energy Source




**Source:** US Department of Energy's Information Administration 2001

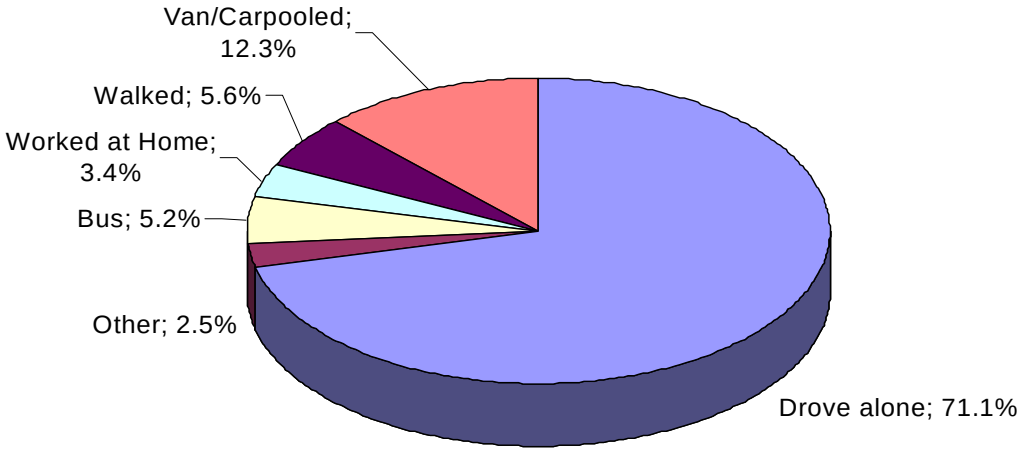
# FIGURE 8-5
## Means of Transportation to Work
## Olympia 1990




*Other consists primarily of motorcycle and bicycle.

Source: 1990 US Census

# FIGURE 8-6
## Means of Transportation to Work
## Olympia 2000




**Source**: 2000 US Census

Local government's biggest influence can come through its policies on land use patterns. Careful blending of residential units with work places promotes energy efficiency. Higher densities contribute to the success of bus systems. Higher densities close to offices and commercial districts help reduce fuel consumption by reducing overall commuter and shopper mileage. Suburban sprawl makes people spend a lot of time and energy on transportation. With a more compact development pattern (double our current residential and mixed-use density), and other transportation improvements, Thurston County's percentage of drive-alone commuters could be cut from 85 to 60 percent. But it would take at least 20 years to evolve to such a pattern.

Group transportation mechanisms also can assist in lower density areas of the city and region. Park-and- ride lots, vanpooling, ridesharing and flexible work schedules help reduce the number of vehicle miles and congestion. Both the public and private sectors can encourage transit use by offering employees bus passes and other incentives. Over a decade or two we could accomplish a 10-15 percent energy savings from more use of transit and other types of group transportation.

A well-laid-out transportation system will also aid in conserving energy. Smoother traffic flows can increase vehicle efficiency by up to five percent. Proper provisions for pedestrian and bicycle traffic can promote use of these energy saving means of commuting.

## Residential

In the residential sector, heating the home is the primary use of energy at 35 percent. Water heaters are next at 21 percent (Figure 8.4). In 2001, natural gas was the predominant source of energy, with 74 percent of energy demand (Figure 8.5). (Ord. 6389, 01/24/06)

Strengthening building code requirements for energy efficiency is an effective way to reduce energy consumption. Therefore it was a significant positive step when the Northwest Energy Code was incorporated into the City of Olympia's Building Code. New homes built to these newer building code standards are 25 percent more energy efficient compared to those built under the 1986 Energy Code.

When combined with appropriate insulation levels, solar energy can easily meet half the heating needs of a home in Olympia. Many newer homes in our community now meet this level of performance.

Effective layout of subdivisions can also increase energy efficiency by allowing for solar access and protection from winter winds. It is often no more difficult to design a subdivision so up to 80 percent of the lots can take advantage of the sun.

Public education on energy conservation promotes further reduction in consumption. Tips to the consumer can be given through a variety of means, including notes on utility billings, school presentations, brochures, fair displays, etc. For several years Olympia has been supporting energy education services through the Energy Outreach Center. In addition, our local utilities offer conservation programs for the homes they serve.

## Industrial/Commercial

The industrial and commercial sectors together do not use as much energy as either the transportation or residential sector. The competitive environment of industry and commerce stimulates energy efficiency as a sound business practice to reduce production costs and thus increase profit margins.

On the local level, governments have few alternatives for influencing industrial and commercial energy uses. Education and some incentives are the only practical means to influence existing business. The commercial and industrial sectors use energy in very diverse

ways: heating, cooling, refrigeration, a multitude of industrial processes, lighting, electronics, etc.

Building codes applied to new construction provide some influence, but even here the diversity of business operations limits the City's ability to influence energy use. To a varying extent, existing buildings can be improved in energy efficiency. Utility programs are available in some cases. The City may also be able to develop incentive programs for conservation in existing buildings. In one incentive program, the Washington State Energy Office gave an "Energy Edge" award to a new restaurant built on Percival Landing.

Commercial lighting appears to be a particularly promising area for conservation efforts. Lighting typically accounts for 40 to 70 percent of commercial electricity use. In the last few years there have been enormous strides in lighting technology, so that it may be technically feasible and cost-effective to save up to 75 percent of the electricity used. A demonstration project is now underway in Seattle, which would provide many useful lessons for Olympia.

Cities can also assist in energy conservation by encouraging the use of industrial "waste heat." Some industrial operations produce waste heat in water, exhaust or other by-products which can be used to fuel or supplement a district heating system. For example, in Olympia, heat pumps could draw heat from LOTT Sewage Treatment Plant waste water to provide the primary energy to heat the Capitol Campus buildings and other large downtown businesses. The City did a study with the Washington State Energy Office to determine the feasibility of this approach. The results of the study showed the cost effectiveness of such a strategy depends on the relative cost of electricity and natural gas. As long as natural gas prices remain more competitive than electricity the use of "waste heat" in Olympia is not cost effective. However, if gas prices become higher than electricity, then the use of "waste heat" from LOTT could potentially give customers significant savings on their energy costs.

## Institutions

Although the institutions sector is a small percentage of the energy consumption picture in Thurston County, it is a very visible part of that picture because of the public's interest in its tax dollar. As the price of energy rises, citizens become more attentive to their own use of energy as well as to the energy use efficiencies of their institutional structures.

As a promoter of energy conservation, local government should set the example for efficient and conscientious energy use. Education on energy conservation in this sector includes both educating the user--employees, students, etc.--and informing the public on how energy is used by the institution. Over time, local government buildings and equipment can become models of efficiency in the use of construction methods and materials, as well as efficient pumps, heating systems, lighting, and the like. Local government operations can likewise be models of responsible energy use, as with the use of alternative fuel sources or the encouragement of non-motorized travel. The Washington State Energy Office also provides technical and financial programs for improving the energy efficiency of institutional buildings, equipment, and operations.

## Supply

The supply of energy in Olympia is heavily dependent on outside sources. However, some energy sources do exist which can be promoted at the local level. These include wood, solar, and recycling.

A large number of Washington households use wood as a secondary heating system. There is however a significant pollution problem that accompanies this energy alternative. In recent years the State has enacted standards which

regulate when wood stoves can be used. There have been increasing incidents when wood stoves are prohibited from being used, due to pollution conditions, unless they are the only heating source for the home. Local governments can help reduce the air pollution impact of wood heat through building codes requiring efficient woodstoves, and through education methods as well.

In the Northwest, solar energy can impact the overall picture of energy consumption despite the popular belief that the skies are always overcast. Land use planning and building orientation can enhance the potential for solar energy. Even buildings without special solar heating features can reduce their heating needs 15 to 25 percent by proper orientation to the sun. Proper solar access will also increase the ability to convert to solar power in the future as conventional sources rise in price and as technology brings the cost of solar devices down.

Recycling can be effective in all sectors of the energy picture. Recycling can conserve energy both by deriving further energy from a particular source and by reducing the amount of energy spent on disposing of the waste. Recycling education and incentives contribute to energy conservation by encouraging reuse or further use of a "spent" resource. The section on Solid Waste in the Utilities and Public Services Chapter has more discussion on recycling.

# GOALS AND POLICIES

In order to promote the wise and efficient use of energy in our community, Olympia adopts the following goals and policies:

**GOAL ERG1. To the best of our local ability, take community-level actions which will help our citizens to have a sufficient supply of energy for present and future needs.**

**POLICIES**:

ERG 1.1 The City should promote the use of renewable and inexhaustible energy sources over non-renewable energy sources including:

a. Substituting renewable alternatives for fossil fuels in City operated vehicles;
b. Participating and encouraging renewable energy promotions and events in the City; and
c. Pursuing renewable energy supply portfolios for the City from the power suppliers. (Ord. 6389, 01/24/06)

ERG 1.2 Decisions regarding energy use should be designed to protect the environment.

ERG 1.3 The City should continue to fund and promote energy education services, including the Energy Outreach Center, in order to inform citizens on energy conservation and the use of renewable energy sources.

**GOAL ERG2. Provide leadership by setting a good example in the wise use of energy.**

**POLICIES**:

ERG 2.1 All new publicly funded buildings should be models of cost-effective, energy- efficient design. (Ord. 6389, 01/24/06)

ERG 2.2 The City should set up an energy accounting system that tracks how much it spends for energy in all government

operations. (Ord. 6389, 01/24/06)

ERG 2.3 Olympia should encourage energy conservation practices in its own buildings by raising the awareness of city employees of their own energy use.

ERG 2.4 The City should conduct energy audits of city buildings, evaluate potential conservation measures, then carry out those measures that are appropriate.

ERG 2.5 The City should encourage ride-sharing, van-pooling and the use of flex-time by its employees. *[See also the Transportation Chapter.]*

ERG 2.6 In lieu of free parking, Olympia should continue to provide free transit passes to its employees who wish to commute by transit.

ERG 2.7 Olympia should evaluate an energy-sensitive fleet management program, to include driver training, the use of alternate energy sources such as electricity, diesel or bottled gas, fuel-efficient vehicles, frequent tuning and maintenance of vehicles, and the use of re-refined motor oil in fleet vehicles. *[See also the Solid Waste section of the Utilities and Public Services Chapter.]*

ERG 2.8 Olympia should monitor the efficiency of the pumps in its water and sewer systems, and should operate and maintain them at peak efficiency. When cost effective options are possible, the one using the least amount of energy shall be preferred. (Ord. 6389, 12/26/06)

ERG 2.9 Olympia should continue to implement a solid waste strategy which:

a. Reduces the solid waste stream by recycling and other means;

b. Investigates ways to convert non-recyclable solid waste to energy; and

c. Promotes the purchase of recycled and recyclable goods. *[See also the Solid Waste section of the Utilities and Public Services Chapter.]*

d. Where and when allowed by the uniform building code, encourages the use of building construction materials made from recycled and recyclable materials.

ERG 2.10 The City should manage its street lighting needs by applying lighting standards and using lamps that will assure safe and effective illumination at minimum cost and energy use.

ERG 2.11 The City should publicize its energy conservation actions to raise public awareness of the value of wise energy use.

**GOAL ERG3. Achieve efficient use of energy in new and existing buildings.**

**POLICIES**:

ERG 3.1 The City should promote weatherization programs for existing buildings, including subsidizing materials for low-income citizens and providing information to all citizens.

ERG 3.2 The City should help publicize energy audit and other conservation services available from local utilities and other organizations.

ERG 3.3 Olympia should promote energy efficient home construction by establishing its own awards program for exceeding the Washington State Energy Code.

ERG 3.4 Olympia should promote energy efficient lighting practices for commercial buildings, especially encouraging the use of daylighting.

ERG 3.5 Easily accessible stairwells should be encouraged so tenants and users will have an alternative to elevator use.

ERG 3.6 Olympia should promote the design of energy-efficient commercial buildings.

ERG 3.7 The City should continue to fund and promote educational services on energy-efficient building design.

**GOAL ERG4. Achieve efficient use of energy in commercial and industrial processes.**

**POLICIES**:

ERG 4.1 Encourage cogeneration at local industries where it is economical, environmentally sound, and not in conflict with permitted land uses.

ERG 4.2 The City should fund and promote educational activities on efficient energy use in commercial and industrial processes.

**GOAL ERG5. Achieve efficient use of solar energy.**

**POLICIES**:

ERG 5.1 Olympia should encourage the use of building construction techniques and site development practices that result in the efficient use of energy and the use of solar energy and renewable energy sources.

ERG 5.2 Olympia shall support efforts to protect solar access in existing structures and to incorporate solar access provisions into new development projects.

a. The City should require all new subdivisions to maximize the number of lots with solar access.

b. The City should establish residential height limits and setback standards

which maximize solar access.

c. The City should facilitate the recording of solar access easements, in order to guarantee access to sunlight for existing users of solar energy.

ERG 5.3 The City should fund and promote educational activities on the use of solar energy and renewable resources.