



## CHAPTER 24

# Overview: Energy Uses

The chapters in the preceding sections of this report examine the potential of various resources to meet Texas' energy needs. The chapters of this section will discuss energy uses and their implications.

Throughout human history, the control, storage and use of energy has helped people survive, improved their quality of life and advanced civilization. For thousands of years before the industrial revolution, our energy use was modest and production was simple. For heat, we relied on the sun or burned organic materials such as wood and straw. For transportation, people walked, animals pulled carts and wind pushed boats across the water. For labor, animals performed the work we could not, and wind and water powered simple machines.

In the eighteenth century, with the perfection of the steam engine, the world began to understand the power of machines. Steam-driven machines could do the work of hundreds of men and dozens of animals. Coal became the fuel of choice for steam-powered machines because it was convenient, portable and readily available, and burned efficiently. Soon coal was powering locomotives, factories and farm implements around the nation. Coal was also used to heat buildings and smelt metal ores. In 1880, a coal-fired steam engine powered the world's first electric generator, Thomas Edison's plant in New York City.

In the latter part of the 1900s, petroleum came to prominence as a cheap, reliable fuel. When Henry Ford created the assembly-line method of mass production for the Model T, cars became available to the general public and petroleum use skyrocketed. And with low-cost automobiles and the spread of electrification, our society changed significantly.

Power plants became larger, and transmission lines extended hundreds of miles between cities, bringing electricity to rural areas. Energy use rose quickly, doubling every 10 years from the early 1900s through 1970. During this time, the cost

of energy production declined steadily, and the efficient use of energy was rarely a concern.<sup>1</sup>

## ENERGY USE TODAY

Energy is used in four distinct sectors: transportation, industry, residential and commercial use and electric power generation. Three major types of energy are consumed by these four sectors: direct heat, transportation fuel and electricity.

*Direct heat use* is the burning of combustible materials to heat buildings, cook food and transform raw materials by melting them and combining them to make finished products. *Transportation fuel* is used to power vehicles. *Electricity* is used to provide heat, power and light to industry, homes and businesses.

**Exhibit 24-1** shows the amount of direct heat, transportation fuel and electricity used in the U.S. for 2000 through 2006.<sup>2</sup>

**Exhibit 24-2** shows the amount of direct heat, transportation fuel and electricity used in Texas for 2000 through 2005.<sup>3</sup>

Energy production today continues to be dominated by non-renewable sources. Petroleum, natural gas, coal and nuclear power account for about 93 percent of all energy production.<sup>4</sup> The use of renewable energy sources, however — including conventional hydroelectric power, wood and waste, ethanol blended into motor gasoline, geothermal, solar and wind power — has grown steadily, from 5.52 quadrillion Btu in 2001 to 6.79 quadrillion Btu in 2006.<sup>5</sup>

The U.S. Department of Energy (DOE) expects total U.S. energy consumption to increase by 1.2 percent annually from 2003 through 2030.<sup>6</sup> Transportation fuel is expected to decline by 0.3 percent, while electricity consumption is projected to grow at a rate of 0.7 percent during 2008. EIA is expecting demand for transportation fuel to increase by 0.9 percent in 2009 and electricity demand to increase to 1.3 percent in 2009.<sup>7</sup> Texas,

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## EXHIBIT 24-1

## Types of Energy Used for the U.S., 2000-2006, In Trillions of British Thermal Units (Btu)

Year	Direct Heat Use	Transportation Fuel	Electricity	Other*	Total
2000	34,267	26,492	38,214	2	98,975
2001	32,751	26,215	37,366	-6	96,326
2002	32,895	26,787	38,171	5	97,858
2003	33,067	26,928	38,218	-3	98,210
2004	33,655	27,820	38,876	0	100,351
2005	32,638	28,249	39,799	6	100,692
2006**	31,916	28,313	39,653	-10	99,872

\*Other is a balancing item, the total energy consumption does not equal the sum of the three energy use components due to the conversion factors for natural gas and coal.

\*\*Preliminary data.

Source: U.S. Energy Information Administration.

## EXHIBIT 24-2

Types of Energy Used for Texas, 2000-2005  
In Trillions of British Thermal Units (Btu)

Year	Direct Heat Use	Transportation Fuel	Electricity	Total*
2000	5,982	2,566	3,524	12,072
2001	5,798	2,677	3,426	11,901
2002	6,134	2,780	3,489	12,403
2003	6,247	2,664	3,425	12,336
2004	5,802	2,701	3,467	11,970
2005	5,289	2,730	3,539	11,558

\*Totals have been rounded to nearest whole number.

Source: U.S. Energy Information Administration.

with its growing population and large industrial sector, is expected to meet or exceed the national pattern.

## ENDNOTES

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