INTRODUCTION

The first written record of coal in the New World is from Illinois. A map from Father Louis Hennepin’s 1668 expedition down the Illinois River shows a “cole mine” at what is now Ottawa (Coal Report 1954). Whether this “mine” was merely an outcrop or a place where Native Americans dug coal is not recorded.

Coal has played a key role in the industrial growth of Illinois. Settlers first mined Illinois coal in 1810 along the Big Muddy River near Murphysboro, shipping the fuel down the Mississippi River on flatboats. By the 1840s, shaft mines were operating near Belleville. The 1840 U.S. Census records coal mining in 19 counties.

From 1833 to 2004, about 6.1 billion tons (5.5 billion metric tonnes) of coal have been mined in Illinois (Coal Reports 1882 to 2008). This quantity amounts to a cubic block of coal more than a mile on a side. A train loaded with this much coal would have to be long enough to encircle Earth 21 times at the equator. Six billion tons (5.4 billion tonnes) of coal could generate 9.3 trillion megawatts of electrical energy, enough to serve every household in the United States for 6.25 years. Yearly production since 2001 has averaged between 30 and 35 million tons (between 27 and 32 million tonnes) (Coal Report 2008).

Through 1954, Illinois ranked third in the United States (behind Pennsylvania and West Virginia) in all-time bituminous coal production. Illinois’ rank has fallen to eighth in recent years due to enormous growth in output from western states, where low-sulfur coal seams as thick as 100 feet (30.5 m) are mined in gigantic open pits (Keystone Coal Industry Manual 2003). Mining thinner seams in Illinois is more labor intensive; the higher sulfur content of most Illinois coal also places it at a disadvantage. Even though near its lowest point for a century, coal production provides nearly $1 billion a year to the economy of Illinois.

Seventy-three of the 102 counties in Illinois have produced coal at one time or another. Currently, Illinois coal production is near a 100-year low, and only 11 counties reported coal production in 2007. The three leading counties were Saline with 10.9 million tons (9.9 million tonnes), Macoupin with 4.5 million tons (4.1 million tonnes), and White with 2.5 million tons (2.3 million tonnes). The ranking of total coal production since 1882 by counties is (1) Franklin, (2) Perry, (3) Williamson, (4) St. Clair, (5) Macoupin, (6) Christian, (7) Saline, and (8) Fulton. Each of these counties has produced more than 300 million tons (272 million tonnes) of coal (Figure 14-1).

Coal-bearing rocks underlie 37,000 square miles (95,830 km²), or 68%, of the state, and more than 211 billion tons (191 billion tonnes) of coal are estimated to remain in place (Jacobson and Korose 2003). Illinois is second among all states for total coal resources and first for bituminous coal. Available coal resources in Illinois contain as much energy as Saudi Arabia’s oil (Office of Coal Development, Illinois Department of Commerce and Economic Opportunity 2006). Coal makes up nearly 85% of total fuel resources in the United States, and, at present rates of consumption, coal resources should last more than 250 years.

Electricity generation is by far the largest use for U.S. coal, and coal-fired power plants provide 52% of the nation’s electricity. By 2020, electricity consumption is expected to grow by 35% in the United States and by 70% worldwide.

ORIGIN OF COAL

Illinois coal originated as in-place peat deposits in freshwater to brackish water swamps that occupied a vast coastal lowland bordering the shallow Pennsylvanian sea. During the Pennsylvanian age (Chapter 10, Pennsylvanian and Permian), Illinois lay near the equator, and forest plants (nearly all extinct today) flourished in the tropical climate. Giant ancestors of present-day club mosse, horsetails, ferns, conifers, and cycads dominated these forests. Dense undergrowth included ferns, fernlike plants, and club mosses. The lack of annual growth rings in coal-forming trees points to rapid growth and a year-round hot, wet climate typical of modern tropical lowlands (White and Thiessen 1913, Jacobson 2000).

Under these conditions, plant debris rapidly accumulated, forming mats of peat many feet to tens of feet thick. Highly acidic, oxygen-poor swamp water retarded decay. As the Illinois Basin subsided, the swamps were drowned, and the peat was covered with sediment. With continued subsidence and burial over time, peat gradually was transformed into coal. Pressure, heat, and time expelled water and volatile matter and reconstituted the carbon com-