

Electricity and Missouri

In 2005, Missouri generated 90.8 million mWhⁱ of electricity, 20th in the nation. Total electrical use was 81.1 million mWh.ⁱⁱ The Labadie plant, owned by AmerenUE, is the largest in Missouri, generating some 2.5 times as much electricity as the next largest. Of Missouri's 10 largest power plants, 8 are coal-fired.ⁱⁱⁱ

Missouri generates about 12% of its electricity from natural gas.^{iv} Natural gas plants are often turbine plants (essentially giant jet engines). They are of interest because they can be very energy efficient (up to 80%), much leaner (about half the CO₂ plus no SO₂, NO_x, mercury or particulates), and they can be started and stopped quickly, while boilers take hours or even days.^v

There is one nuclear power plant in Missouri, the Calloway plant. It generates about 7.5 million mWh per year, which ranks it 4th or 5th in the state. Nuclear power is controversial, to say the least, and will be discussed separately.

Electrical consumption in Missouri goes to residential uses (48%), then commercial (36%) and then industrial (16%).^{vi} Air conditioning is one of the largest uses, and it is why peak demand occurs on hot summer days. Other uses include lighting, heating, refrigeration, ventilation, and electric motors.

There has to be enough capacity in the system to handle hot, humid days in places like St. Louis. But the boilers in a large plant like Labadie can't be adjusted hourly or even daily. Thus, electrical utilities devise schemes to provide "instant-on" power to handle peak demand. Hydro-electric power is often used for this purpose. The Taum Sauk facility was a twist on this scheme. The utility built two reservoirs at Proffit Mountain in Reynolds County: one inside the top of the mountain (they removed the whole top of the mountain), one at the bottom. During the night, when demand was low but the boilers at Labadie were still hot, they would use the otherwise wasted power to pump water from the lower reservoir to fill the top. Then, during peak demand the next day, they would let the water flow back down, turning generators to meet the demand.

Taum Sauk devastated the ecosystem on the mountain. It created a huge, highly visible scar in one of the most scenic areas of the state. And all reservoirs are vulnerable to failure. When the Proffit Mountain reservoir failed, it wrecked havoc along the Black River and destroyed Johnson's Shut-Ins State Park. Conceptually, however, the project solved serious and important problems for the utility, providing a way to keep coal fired plants closer to peak efficiency and to manage demand fluctuations. It worked for a long time, until the reservoir failed.

In 2001 AmerenUE filed an application to build a similar, but larger, facility on Church Mountain nearby. That application was withdrawn in the face of strong opposition. The Taum Sauk project is being rebuilt.

ⁱ mWh = megawatt-hour, which is a million watts of power generated for one hour.

ⁱⁱ Missouri electricity profile, 2005. Energy Information Administration, http://www.eia.doe.gov/cneaf/electricity/st_profiles/missouri.html.

ⁱⁱⁱ The Carbon Monitoring for Action Database, <http://www.carma.org>.

^{iv} *Missouri energy profile, 12/6/2007*. Energy Information Administration, Department of Energy. Retrieved online 12/8/2007 at <http://tonto.eia.doe.gov/state>.

^v Nersesian, Roy. (2007) *Energy for the 21st Century*. Armonk, NY: M.E. Sharpe.

^{vi} *Missouri's total state electricity bill at a glance*. Missouri Department of Natural Resources, <http://www.dnr.mo.gov/energy/eia-electricity.htm>.