



## DAYLIGHT SAVING TIME

by Jeanette Chapman

Daylight saving time (DST) is the system used around the world to save energy by taking advantage of the lengthened daylight hours during the spring and summer months. Daylight saving time begins in the United States when clocks are set forward one hour on the first Sunday of April and ends when clocks "fall back" one hour on the last Sunday of October. This time change is observed in 48 states and some 70 foreign countries. The states of Hawaii and Arizona (excluding the Navajo Indian Reservation, which lies within three states) and the Eastern time zone portion of Indiana do not observe daylight saving time.

The purpose of this issue brief is to provide a history of daylight saving time, identify savings of energy, identify disadvantages of DST, and describe alternatives to observing daylight saving time.

### The History of Daylight Saving Time

Benjamin Franklin first proposed something akin to daylight saving time in a 1784 essay on the thrift of natural versus artificial light. He pointed out that families could save candle wax by going to bed when it was dark and rising with the sun. In 1916, the British first instituted a schedule of daylight saving during World War I, in an effort to save energy for the war effort.

In 1918, Congress adopted four standard time zones based on those established by the railroad companies. That same year, Congress put the country on DST for the remainder of the war. The law was so

unpopular, particularly among farmers, that it was repealed in 1919. Upon entering World War II, Congress again instituted mandatory DST in February of 1942 and remained one hour ahead until 1945.

From 1945 to 1966, states and local communities were free to observe daylight saving time, and could choose the monthly schedule on which it was based. This lack of uniformity caused considerable confusion, particularly in travel and media as trains and television stations were continually republishing their schedules to reflect daylight saving time.

The Uniform Time Act (Public Law 89-387), passed by Congress in 1966, adopted a uniform time, called "Standard Time," within each of the time zones. It further established the schedule for DST, mandating that clocks be advanced one hour the last Sunday in April and turned back one hour on the last Sunday of October.

Since the early seventies, Congress has modified the schedule for daylight saving time numerous times, varying between four and six months in length. The most recent change came under the Reagan Administration in 1986 when the spring shift was set to the first Sunday of April.

### The Effect on Energy Use and the Environment

The United States and other countries have determined that observing daylight saving time in the summer months does indeed save energy.

**Oil savings.** The U.S. Department of Transportation conducted studies of energy consumption during the mid-1970s and determined that DST saves the equivalent of 10,000 barrels of oil per day. The change in 1986, from the last Sunday in April to the first Sunday, was made to further conserve energy. Including the entire month of April in DST is estimated to save 300,000 barrels of oil each year.

**Electricity savings.** In 2001, California studied the effect of daylight saving time on electricity use. The study found that daylight saving in the winter and summer months would cut peak electricity use by about three percent. During the summer months, electricity use shifts to low-demand, cheaper morning hours, affirming that DST reduces overall energy use.

There is speculation that daylight saving time actually increases energy use during the summer months. Without DST, it is reasoned, people would go home later from work and would not need to run their air-conditioning as much when they get home. The California study showed that the opposite was true; peak use actually increases without DST as commercial use of air-conditioning during the workday outweighs the home air-conditioning load.

**Reduced carbon monoxide levels.** In the 1980s Colorado considered implementing permanent DST as a means to reduce carbon monoxide (CO) levels in metropolitan areas. A report from the Denver Metropolitan Air Quality Council found that the additional hour of sunlight afforded by DST would aid in dispersing CO concentrations during the evening rush hour. Near sunset, auto emissions are trapped near the ground by winter temperature inversions. Sunlight helps to break up the CO and reduce emissions trapped by the cold air. When Denver switches from DST to standard time, CO concentrations increase.

The report indicated that Denver could realize a nine percent reduction in carbon monoxide through observing DST year round, as part of the state's effort to comply with the federal Clean Air Act.

## **Opposition to Daylight Saving Time**

A Canadian study in 1991 found an eight percent

increase in traffic accidents on the Monday after clocks are moved forward, suggesting the lost hour of sleep negatively affects driving ability. In addition, concerns are often raised about the safety of school children waiting for buses in the dark morning hours of spring and fall. When year round DST was in effect in 1973, one reason it was eventually repealed was an increase in school bus accidents in the early morning.

Farmers have historically opposed daylight saving time as well. Most agricultural activities are based on daylight hours as opposed to clock hours, and crops and livestock maintain their schedules regardless of the time reflected on the clock.

Inconvenience is generally cited as the main problem with daylight saving time. It was one thing to move all clocks forward an hour and then back again in 1966. In our high-tech society, clocks, VCRs, computers, cell phones, and personal data assistants all need to be readjusted twice a year.

## **Daylight Saving Time or Not**

A state cannot elect to observe daylight saving time for its time zone year round, however, it is possible for a state to petition the U.S. Department of Transportation to change time zones. The state legislature must enact a resolution requesting the Department consider the change, and provide a socio-economic study to assure the convenience of commerce.

A state that lies entirely within one time zone may also exempt itself from observing DST, as Arizona and Hawaii have done, if the entire state will observe *standard* time for its time zone. A state like Indiana, which is split over two time zones, may exempt the entire state or the entire area within a zone. In Colorado, such change would require legislation. Section 2-4-109, C.R.S., establishes mountain standard time as the standard time for Colorado and enacts observance of daylight saving time.

The General Assembly has made several unsuccessful attempts to opt out of daylight saving time or to experiment with year-round DST. For example, a resolution in 1987 urged Congress to allow the state to experiment with year-round daylight saving time to cut air pollution. That resolution failed in the state House of Representatives and attempts to strike

the language from Colorado law outlining the observance of daylight saving time in the state have been similarly unsuccessful.