

All electricity is not the same

by EDSON KINDLER, vice president of customer services

The basics of electricity are constant.

Electrons flow through electric wire to do work. But how those electrons get into the electric wire, and more importantly when, can be quite different.

Most consumers are unaware that electricity can be generated in various ways. Each type of generation plays a different role in meeting our overall demand for electricity.

Baseload generation. A baseload electric generation plant produces electricity 24 hours a day, 7 days a week. They are the reliable workhorses of the electric industry, and generally use coal, nuclear or water (hydroelectric) to generate power.

The amount of energy from baseload plants can be scaled up or down, depending on consumers' demand for electricity at any given time.

However, they must operate at approximately 50 percent of capacity to "keep the fires burning" so to speak. A baseload electric generation plant only shuts down for maintenance. Once it does so, it requires days or even weeks to come back online and once again generate electricity.

Peaking plants. When consumer demand for electricity nears the maximum capacity of a baseload generating plant, peaking plants can be brought into service very quickly, often in a matter of minutes.

They typically use natural gas or diesel fuel to power an engine that turns a turbine to produce electricity.

Unlike baseload plants, peaking plants are designed and licensed to operate only for relatively short periods of time, usually less than 24 hours at one time.

While less expensive to construct than baseload plants, peaking plants are considerably more expensive to operate. That's especially true today with the increasing price of natural gas and diesel fuel.

Renewable generation. Renewable energy sources are getting a lot of attention lately.

While solar and wind are the most commonly discussed, renewable sources also include various forms of biomass, such as landfill gas, biodigesters and biodiesel.

Solar and wind are categorized as intermit-

tent electric generators, because they only produce electricity when the sun is shining or the wind is blowing.

Biomass is more constant, and can be used either as a baseload or peaking power.

The differences matter. Whether an electric generation source is defined as baseload, peaking or intermittent has a great deal to do with its reliability in producing electricity.

As consumer demand for electricity rises and falls throughout a particular day or seasonally during the year, electricity from baseload and peaking generation sources can be "dispatched" when and where it is needed. Intermittent resources cannot.

Wind and solar generation require baseload plants to be kept in reserve, so electricity keeps flowing when the wind stops or slows significantly enough that electric generation drops. The same applies to the sunshine.

This aspect of wind and solar frequently is overlooked in discussions of their use.

Additionally, the nation's transmission grid is what moves electricity from place to place. Its infrastructure is no longer adequate to take on an abundance of additional electricity, regardless of how it is generated. In general, additional transmission capacity is needed to meet consumers' growing electric needs.

The entire picture. Most certainly renewables will be a growing part of America's energy mix. But their limitations must be as understood as their benefits if they are to play a meaningful role in securing a reliable energy future for our country.

Intermittent electric generation sources such as solar and wind can offset the use of coal, nuclear or other baseload produced energy when the conditions are right.

Renewables by themselves, however, cannot replace the need for additional construction of new coal, nuclear or other baseload electric generation plants that serve as their back-up when the conditions are not adequate to meet consumers electric needs.

South Central Power members are encouraged to go to www.ourenergy.coop and begin (or continue) the dialogue with their elected officials in Washington DC about energy policy.

