Written by William C. Livoti
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Given the surge in demand for electricity and a projected increase in global population (9 billion by 2030), the importance of available energy can't be underestimated. In the United States, our nation's economic growth and prosperity depend on plentiful, reliable and affordable electricity.

For almost a century, coal has been our primary source of electric power—*providing over half of U.S. electricity demand*
. Today, the power industry is being challenged by federal- and state-mandated environmental and energy regulations that will change the industry forever. Environmental concerns about the effects of burning fossil fuels have ignited a worldwide pursuit of renewable energy sources. At the same time, events in Japan have soured interest in nuclear power, leading to projected delays or cancellations of planned construction.

The result of all this? We have effectively eliminated two primary sources of base load power (coal and nuclear)—*sources that are responsible for approximately 75% of electric power generation in our country.*

Emerging technology for cleaner electricity production will play a vital role in our economic growth. How and when this technology is implemented—*and at what cost*—will determine the future of our existing base load fleet. But, what's to become of our economic growth in the mean time? With the focus on renewable energy and the negative press surrounding fossil fuels and nuclear, the power industry has few options to meet the growing demand for power. One of those options (maybe the best one of all) has been staring us in the face for a long time: Efficiency is the future of power generation.

Begging the question

So, what has the U.S. power industry done to improve power-plant efficiency? Answer: For the last 75 years, little to nothing.

Coal plants are still operating in the 33% range. New ultra-super critical units may be approaching 45%, but we can't seem to get past the permitting stage to build them. The short-term solution is "combined cycle." Still fossil-fuel in nature, the upside of combined cycle technology is that it's more efficient than coal (assuming the unit is operating at design point, since reducing loading or going to duct fire has a negative impact on the plant heat rate).

Unfortunately, combined-cycle still doesn't address the projected increase in power demand. TVA and Duke have both announced plans to decommission a number of aging coal plants (the main reason being the cost associated with meeting new EPA legislation). These operators can't justify the cost of bringing their aging units into compliance. Other utilities are being forced to take similar action.

A better way

While we're losing base-load generation due to an aging fleet and with no clear direction from the federal government (think energy plan), federal legislation is forcing utilities to build combined-cycle plants. This will most likely push natural gas prices up (remember the 90s?) the cost of which will be passed on to the consumer.

It seems to me that the most cost-effective solution is to drive more out of our existing plants—*not by pushing equipment beyond its design capacity, but by improving efficiency.*
There are several benefits to this approach, including the fact that with efficiency comes reliability. If a plant's equipment is operating at optimum efficiency, reliability will be optimized, heat rates will improve, parasitic load will be reduced and net megawatt output will increase. And we would get it all for a lot less money and grief than what's involved with the building of a new plant. I'll explore this topic in detail in an article entitled "The Future of Power: Survival of the Efficient." Look for it in September.
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Bill Livoti is sr. principal engineer, Power Generation and Fluid Handling, at Baldor Electric Co., a business of ABB. Email: wclivoti@baldor.com .