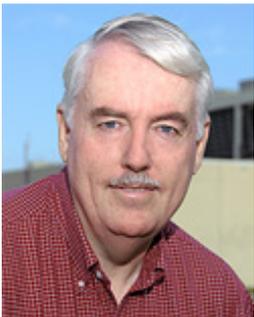




By Brian Wellborn

For any Texan with a stake in reliable electricity, from factory owners to the residential customer, one effect of our fierce summers is well understood. Hot, dry weather leads to spikes in electricity demand, and those spikes lead to calls for energy conservation and, on days of highest demand, the possibility of rolling outages.



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But less understood is the weather's potential limiting effect on electricity generation, according to a 2009 University of Texas at Austin report, *The Energy-Water Nexus in Texas*. The report notes Texas' key sources of electricity generation, those that consume fossil fuels, all require water. Cooling processes at power plants require the largest share of this water, and that cooling water could be in short supply if Texas slides into deep drought again.

Ian Duncan, a scientist at the University of Texas' Bureau of Economic Geology (BEG) and a coauthor of the *Energy-Water Nexus* report, has studied these possible effects.

"It is possible that, with ongoing drought, Texas could face power shortages triggered by plant closures due to lack of cooling water," Duncan says. "We are consulting with the TWDB [Texas Water Development Board] and other state agencies to better understand which plants may be most vulnerable. The economic impact of such shortages could be significant depending on how much production was lost."

Welcome rains in East and Central Texas have ameliorated some of the effects of 2011's disastrous summer. Even so, as of mid-April 2012 nearly a third of the state remained in extreme or exceptional drought, primarily in Texas' western and southern regions.

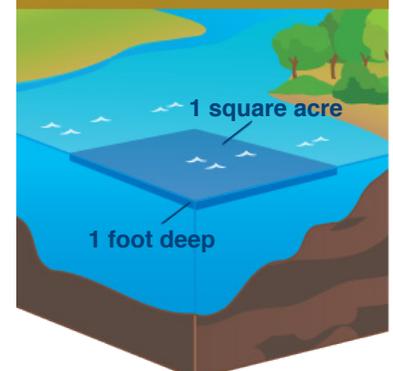


Hot, dry weather leads to spikes in electricity demand.

Texas generated 411.7 million megawatt hours of electricity in 2010.

An **acre-foot** is approximately **326,000 Gallons**

Acre-foot
=
1 square acre
+
1 foot depth





Cooling water could be in short supply if Texas slides into deep drought again.

Water to Energy

With Texas' water consumption increasing year after year, the amount of water required for cooling is far from insignificant, according to a 2008 BEG report. The bureau estimated that each kilowatt hour generated in Texas requires an average water consumption of 0.39 gallons of water. Texas generated 411.7 million megawatt hours of electricity in 2010, according to the U.S. Energy Information Administration.

The Texas Water Development Board (TWDB) estimates that as Texas' energy needs increase in line with population and industry, so too will its need for cooling water. In its *2012 State Water Plan*, TWDB estimates power generation consumed 0.7 million acre-feet of water in 2010, a level that could increase by 121 percent to 1.6 million acre-feet of water in 2060. (An acre-foot of water equates to nearly 326,000 gallons.)

2012 and Beyond

For 2012, cooling water shortages do not greatly worry H.B. "Trip" Doggett, CEO of the Electric Reliability Council of Texas, the power grid that serves the majority of Texas. But he's cautious in his outlook for 2013.

"We have been analyzing information on the reservoir levels, as well as surveying generation owners to review their issues and plans to mitigate those concerns," Doggett says. "Given our latest information, we don't expect to have significant generation loss due to drought this summer. However, if drought continues into 2013, we could have more severe losses of generation."

Doggett explains that if generation levels decrease, wetter areas of the state will not fare better than dry areas in terms of electrical reliability, because of Texas' statewide grid. He says that conservation and a number of engineering advances will be key to ensuring its reliability in the future.

"We are looking into new mechanisms for consumers to be able to control their electricity usage to increase conservation, especially at times of greatest demand," he says. "On the generation side, owners have been taking actions to reduce the impact of the drought on their units' cooling water by building pipelines to remote water sources, procuring additional water rights, adding pumping capability and re-engineering their water intake structures to allow for deeper intake levels."

Duncan also cautions that even regional droughts can hit the entire state economy. "We [the BEG] are in the process of trying to identify which regions of the state are most vulnerable to generation reductions — in general, Central and West Texas are the areas of greatest concern — but the economic impact will be felt across the state in the form of high electric prices and shortages."



H.B. "TRIP" DOGGETT

CEO, Electric Reliability



To find more information about the Texas drought and its effects, see the Comptroller's recent report, [*The Impact of the 2011 Drought and Beyond.*](#)



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