

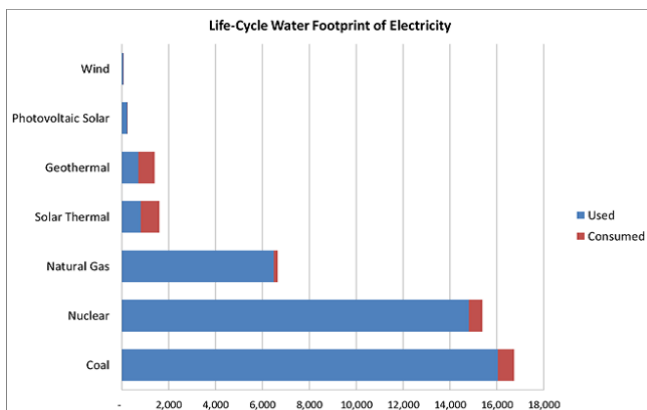
How Energy Impacts Water Availability (and Vice Versa)

ISSUE SUMMARY:

Without adequate water supplies, many of the power plants in Texas would not be able to function. Conversely, without adequate supplies of electricity, Texas would not be able to operate the machinery that treats and pumps water to our state’s citizens, farms, and industrial users.

The relationships and interdependencies between our energy and water resources in this “energy-water nexus” are becoming better understood and appreciated each day. However, Texas will undoubtedly need sufficient supplies of both energy and water to keep our economy growing and quality of life thriving. We must use these natural resources as efficiently as possible.

Additionally, the current severe drought in Texas is putting a focus on anything that can be done to reduce the strains on our precious water resources, especially by large users such as power plants. The following chart shows the current water intensity of various electric generation sources.



Life-Cycle Water Use of Electricity (Gallons/MWh)
Source: River Network

To conserve our increasingly scarce water resources and ensure the availability of adequate electricity in times of drought, Texas should:

- Maximize use of electric generation that utilizes less (or no) water, such as wind and solar photovoltaics;
- Encourage and incentivize the retrofitting of existing electric generation facilities to minimize water usage; and
- Encourage and incentivize water conservation and energy efficiency.

To generate electricity from coal, natural gas, nuclear energy, and other sources that use heat to create steam to drive turbines that produce electricity (i.e., “thermal” electric generators), a substantial amount of water is needed for cooling processes and for the steam itself.

Not all water that is “used” by electric generators is “consumed” -- much of it is returned to its source after being “withdrawn” for cooling. However, the water that is returned is not always in a form that is suitable for all subsequent uses. For example, sometimes the returned water is too hot for immediate use on crops or could adversely affect wildlife in and around the water source.

Regardless, without adequate supplies of water, there can be no electricity generated from these sources.

The over-arching message is that implementing advanced efficiency is the key to the sustainable

use of both energy and water. Improving water efficiency will reduce power demand and improving energy efficiency will reduce water demand. Greater efficiency in usage of either energy or water will help to stretch our finite supplies of both, as well as reduce costs to water and power consumers. The state and local governments should continue, and wherever possible, increase funding and technical support for water and energy conservation and efficiency programs.

POLICY CONSIDERATIONS:

- Create innovative financing options for homeowners and businesses that want to invest in energy and water efficiency projects. SB 385 by Senator John Carona and HB 1094 by Representative Jim Keffer address some of these issues.
 - Continue to encourage the deployment of electric generation that uses less (or no) water, such as wind and solar photovoltaics, through targeted policies and incentives. HB 3147 by Representative Rafael Anchia would require the PUC and ERCOT to consider water use when deciding which generating plants to rely on for power.
 - Encourage existing generation facilities to modify or retrofit their facilities to minimize water usage. State loan guarantees, tax exemptions, and other incentives could facilitate this.
 - Encourage additional water and electricity conservation efforts by generators, users, and consumers to reduce overall demand.
 - Require power plant developers to demonstrate that they have considered technologies that minimize water use in the design of their future plants before receiving applicable permits.
- Require power plant developers to demonstrate water availability at the site of a new power plant before receiving applicable permits.
 - Assess the priority of water rights held by electric generators.

RESOURCES:

Over the Interim, the Texas House Committee on Natural Resources examined “the interplay of water and energy resources and needs in the state” in depth. Pages 45-100 of the Committee’s interim report cover this interim charge and serve as an excellent source on the water-energy nexus.

- House Committee on Natural Resources. “Interim Report to the 83rd Legislature.” <http://bit.ly/VCMEG9>
- Texas Water Development Board (2012). 2012 State Water Plan. http://www.twdb.state.tx.us/publications/state_water_plan/2012/2012_SWP.pdf
- Grubert, Emily et al. “Can Switching Fuels Save Water? A life cycle quantification of freshwater consumption for Texas coal- and natural gas-fired electricity.” <http://iopscience.iop.org/1748-9326/7/4/045801>
- University of Texas at Austin and Environmental Defense Fund. “Energy-Water Nexus in Texas.” http://www.edf.org/sites/default/files/Energy_Water_Nexus_in_Texas_1.pdf
- Ross, D. Lauren. “Water for Coal-Fired Power Generation in Texas: Current and Future Demands.” <http://texas.sierraclub.org/press/WaterForCoal20120229.pdf>
- River Network. “Burning Our Rivers: The Water Footprint of Electricity.” http://www.rivernetwork.org/sites/default/files/BurningOurRivers_0.pdf