

# The Cost of Water vs. the Cost of Energy

By: **Isaac Barchas, Mitch Jacobson, and Michael E. Webber**

Date: March 2014

## Abstract:

The price dynamics of energy and water in Texas might be about to change. Historically, planners have assumed that the price of energy is volatile and trending up, while the price of water is stable and low. However, current trends in technology, demography, and Texas' natural environment may mean that energy is actually getting more plentiful and less costly, while water may be becoming scarcer and more expensive. These changes would have implications for the trade-offs companies should make in energy vs. water use, in energy- vs. labor-intensive processes, and in the mix of energy sources including fuels, grid energy, cogeneration, and on-site generation.

Source: <http://texasceomagazine.com/features/the-cost-of-water-vs-the-cost-of-energy/>

Keywords: energy, energy costs, water, water costs, clean energy, Texas



THE UNIVERSITY OF TEXAS AT AUSTIN

© Texas CEO Magazine – reproduced with permission  
<http://ic2.utexas.edu>



<http://texasceomagazine.com/features/the-cost-of-water-vs-the-cost-of-energy/>

## The Cost of Water vs. The Cost of Energy

[Home](#) [BIZBITES](#) [DEPARTMENTS](#) [SPEAKER SERIES](#) [FEATURES](#) [ROUNDTABLES](#) [SUBMISSION GUIDELINES](#)

### WHICH IS GETTER MUCH CHEAPER & WHICH IS GETTING MORE EXPENSIVE?

By Isaac Barchas, Mitch Jacobson, and Michael E. Webber

Because energy and water are key inputs for any business, reliable power and water drive the Texas economy.

However, the price dynamics of these two key inputs might be about to change, and that change could require Texas CEOs to rethink the way they structure their businesses around energy and water.

Right now, most business leaders think of the price of energy as volatile, and trending up. Energy gets more expensive over time, with lots of movement in price. That sentiment has been especially true for liquid fuels like petroleum, and the movement towards liberalized electricity markets means the same thing might happen for power prices, too. Conversely, water prices have been stable, and low. Planners have used the same dollar-per-gallon assumption in their spreadsheets for years.

These stereotypes might not be true anymore. Current trends in technology, demography, and the evolution of Texas's natural environment mean that energy may actually be getting more plentiful and less costly. Conversely, water may be becoming scarcer and more expensive.

#### The Cost of Energy

Let's start with energy.

Oil prices have trended up over the past 40 years, and coal prices have done the same over the last decade. There is every reason to think that these trends will continue. So the electricity that powers business will cost more, right?

Not necessarily.

In Texas, it's natural gas – not oil or coal – that feeds the marginal Watt into the grid, and therefore sets the price of electricity. Natural gas prices have dropped by about two-thirds over the past five years. This phenomenon is due to a number of factors, but new natural gas extraction technologies (hydraulic fracturing, horizontal drilling, for example) in which Texas is a leader, are the key drivers. These technologies have unlocked decades' worth of gas around the world, especially here in North America. For the next one to two decades, supply will probably outstrip demand, which means we might have a pleasant period with low and stable natural gas prices. Affordable natural gas puts downward pressure on electricity prices, and can be used as an alternative for petroleum in many applications like for trucking.

In addition, the cost of solar panels has dropped 75 percent in the last three years and the price of wind for long-term contracts has dropped to about 4 ¢/kWh. While renewables are expensive to build, their marginal costs are predictable and very low, which is a hedge against volatility. These trends mean that renewables will start making significant, low-cost contributions to grid energy.

Will all this lead to lower electricity prices in Texas?

It depends on the incentives that regulators provide to new power plant construction. Right now, even with the low cost of gas, it's hard to make money on a new plant. Regulation is likely to catch up with reality pretty soon, and new power plants fueled by gas or renewables will start coming on-line. If so, that should lower the average cost of power in Texas, and make the price of power much more stable.

So how should a business leader react to a potential new world of lower and more stable electricity prices?

First, don't back off initiatives that reduce energy footprints. The future is uncertain. Right now, investing in energy efficiency is still a good idea.

However, think about some unconventional strategies for a future Texas with cheaper, less volatile energy inputs:

Consider substituting energy intensive processes for labor intensive processes. Capital asset allocation decisions should incorporate a scenario in which energy is a declining-cost input, while labor is a constant or increasing cost. And, look at replacing thermal- or transportation-energy with electricity instead (such as electric heating instead of combustion heating, and telecommunications for meetings instead of travel for face-to-face meetings). Fuels for heat and transportation might increase in cost and volatility, whereas electricity might stabilize or decrease.

Rethink your electricity sourcing strategy. Today, many energy intensive businesses generate all or part of their own electricity. If energy prices are going to trend down, it may make sense to substitute grid power for co-generation. Conversely, if the costs of solar and micro-gas generation continue to decline faster than overall grid prices, then it might make sense for some businesses that currently buy grid power to consider on-site generation.

Review the energy hedging posture. Due to historic energy price volatility, many large and sophisticated Texas companies hedge their energy price risk. In the new energy environment, trimming the horizon of those hedges might be prudent.

### **The Cost of Water**

Now let's turn to water.

If there are reasons to think that energy prices in Texas may start trending down, the opposite is true with water.

The reasons are demography and environment. Texas's population has grown by over 80 percent since 1980, and economic activity has grown by 170 percent. But we still have the same water resources we had 33 years ago, or even 133 or 233 or 1033 years ago. We are drilling our wells deeper, we are seeing our lakes shrink, many scientific models project increased drought. While there are many alternative sources of energy, there is no alternative to water.

Texas's historical water pricing (low, stable) may be unsustainable. Today, for example, water pricing is the same in the summer and winter, even though demand is vastly different. Many of today's water users paid for their water rights decades ago, at prices that make today's water essentially free. Water is priced by over 1300 local agencies. The "water market" in Texas today hardly resembles a market rather it is a hyper-fragmented, historically biased, system of mid-century command-and-control pricing with central regulators.

In our view, this mismatch between the vibrant and growing Texas economy and the frozen-in-amber Texas water pricing apparatus means that our State will probably have to move towards a system in which water is priced by supply-and-demand rather than by regulatory edict. In other words, Texas will move to market pricing for water.

What will market priced water mean for Texas business? Water will get more expensive, and the price of water more volatile. Some of that is good news: high prices encourage conservation. But some of it is bad news: high prices fail to consider the human right to water, and puts pressure on industry to remain competitive in light of rising costs.

Australia – which looks a lot like Texas in terms of population, economy, and ecology – recently introduced market-priced water. There, water prices have increased 50-75 percent over the past six years. Australia has also seen significant jumps in water price volatility. Their experience has some useful insights for Texas.

So how should you adapt to prepare for a scenario of priced (more expensive, more volatile) water?

Bring business discipline to water use. Examine business processes to understand where water is being used, and how to reduce it. Today, it is estimated that 10-40 percent of all water in municipal water distribution systems is wasted through leaks and spills. Why should you think that your business's use of water is more efficient? Conducting a water footprint of your company's direct uses (on-site for cooling, drinking, irrigation, etc.) and indirect uses (throughout the supply chain) is a good first step.

Consider redesigning business processes to use less water. For example, in a future where water is getting more expensive but electricity is getting cheaper, it may make sense to substitute energy processes for water process wherever possible, to use reclaimed water for flushing toilets and irrigation, and to replace water-intensive landscaping with native plants and grasses that do not need as much water.

Factor water availability and price into site selection decisions, especially if your business is water intensive. Water prices are likely to vary significantly based on geography within Texas.

Develop a strategy for hedging water prices. All those smart people whom you used to pay to hedge energy? They may have a new job.

As Yogi Berra said, it's hard to make predictions, especially about the future. No one, including the three of us, knows with certainty how Texas energy or water prices will move in the future. However, given undeniable shifts in technology, demography, and the environment, Texas CEOs should at least plan for the likely scenario in which energy and water prices start moving in opposite directions from each other and from their historical trends.

*Isaac Barchas is head of the Austin Technology Incubator (ATI) and works with companies in clean energy, IT and wireless technology. Isaac was with McKinsey & Company and has an undergraduate degree from Stanford and a master's and law degree from the University of Chicago.*

*Mitch Jacobson is the lead advisor on clean energy at ATI and has a 30 year career in technology previously working with Dell and Tech Data Corporation.*

*Michael Webber is the Deputy Director of UT's Energy Institute, Co-director of the Clean Energy Incubator at ATI, and an associate professor in mechanical engineering at the University of Texas at Austin. Dr. Webber's research focuses on the convergence of policy, technology, and resource management related to energy and the environment.*

ATI, Austin Technology Incubator, drought, electricity, electricity sourcing, energy, energy costs, Isaac Barchas, Michael E. Webber, Mitch Jacobson, UT Energy Institute, water, water costs

Copyright © 2011-2013 Texas CEO Magazine.

---