MULTI FAMILY

Journal of

Utility management

THE LATEST RESEARCH AND MODELS ON OPTIMIZING UTILITY USAGE IN MULTIFAMILY

VOL. 3, ISSUE 2 • WINTER 2013

The water issue

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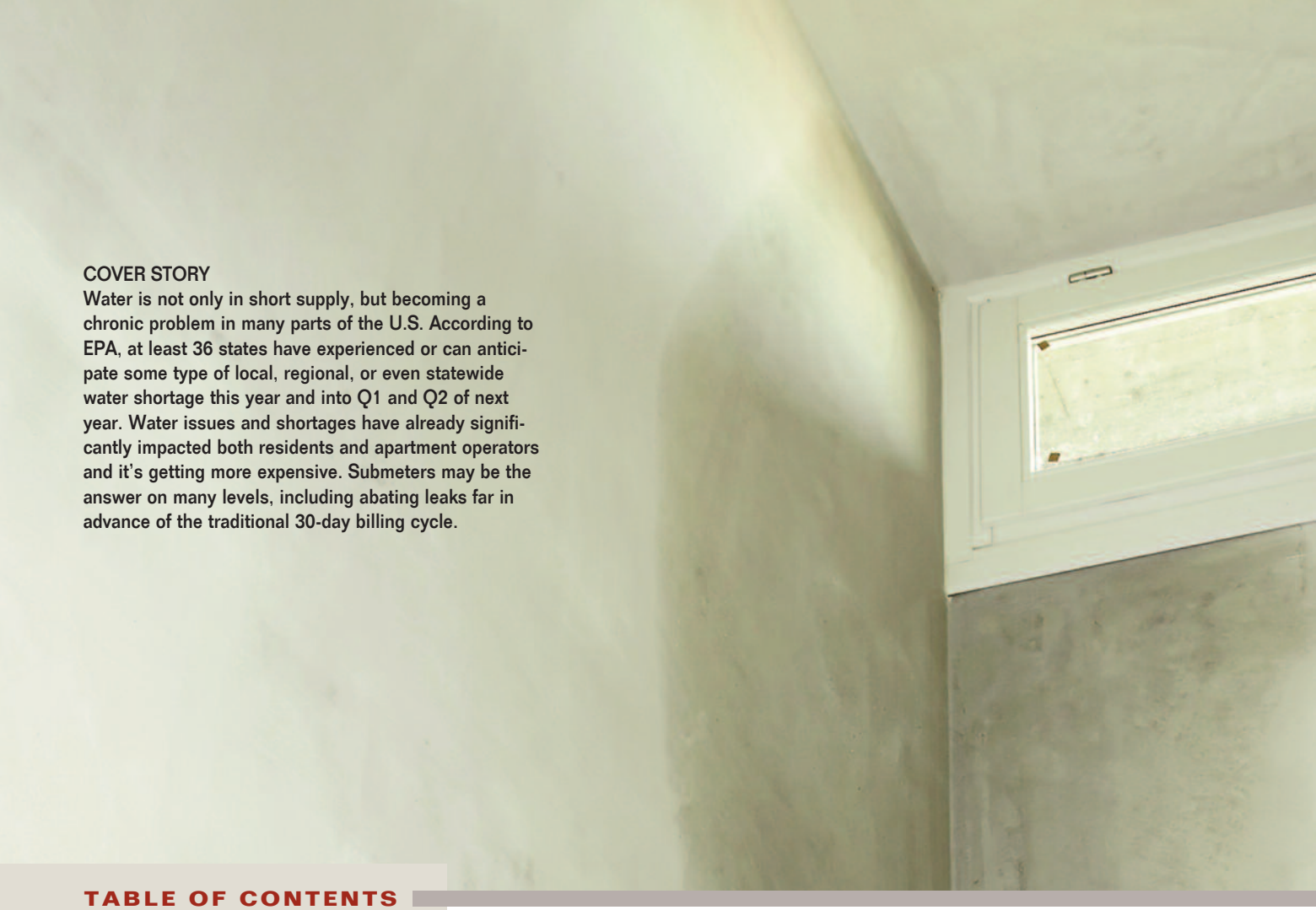
TOWN	LAW / ACTION / DEADLINE	DISCLOSE TO	PENALTIES FOR INCOMPLIANCE
Austin	**Energy Conservation Audit & Disclosure (ECAD)** 5 units +; owner must track /report consumption for 10 year old + buildings 6-1-12: buildings > 75,000 sq. ft. 6-1-13: buildings > 30,000-69,999 sq. ft. 6-1-14: buildings > 10,000-29,999 sq. ft.	Buyers, government agency **at time of sale**	Class C misdemeanor and subject to fine up to $500. If criminally negligent, a fine of up to $2,000 may be assessed.
Boston	**Building Energy Reporting and Disclosure** Owner must track and report building consumption on buildings > 50,000 sq. ft. or 50 units; > 35,000 sq. ft. or 35 units, including all common areas	Public website, government, annual input into Energy Star Portfolio Manager	Non-residential tenants: $35 per violation for not supplying owner with energy data. Residents face no fines. Owners pay $75-$200 /day depending on size /use of building up to $3,000.
Chicago	**Chicago Energy Use Benchmarking** Owner must track and report building and common area consumption by 6-1-15 for buildings 250,000+ sq. ft.; 6-1-16 for buildings 50,000-250,000 sq. ft. An Engineer must examine data every 3 years and certify data to the City.	Public website by 2015	$100 to building owner for first violation, $25 per day after that if not fixed.
NYC	**Local law 84** On buildings > 10,000 sq. ft. owners must report consumption for units. Audit required every 10 years on buildings > 50,000 sq. ft.	Public website, government agency	$500; continued failure $500 per quarter with a maximum of $2,000.
Seattle	**Council Bill 116731** Report all unit consumption on buildings > 20,000 sq. ft. Must include whole building. 4--1-2 for 50,000 sq. ft. +; 4-1-13 for 20,000 sq. ft. +	Government agency, residents	Quarterly fines based on building size. 50,000 sq. ft. +: $1,000 quarterly. 20,000 to 49,999 sq. ft.: $500 quarterly. Owner and residents first violation: $150; subsequent violations: $500.
DC	**Clean and Affordable Energy Act** Buildings > 50,000 sq. ft. must report common area consumption. 4-1-13 for 100,000 sq. ft. +; 4-1-14 50,000-99,999 sq. ft.	Public website, government agency	DDOE will issue a written warning. If violation is not corrected after 30 days of written notice, DDOE can fine owners up to $100 per day.



COVER STORY

Water is not only in short supply, but becoming a chronic problem in many parts of the U.S. According to EPA, at least 36 states have experienced or can anticipate some type of local, regional, or even statewide water shortage this year and into Q1 and Q2 of next year. Water issues and shortages have already significantly impacted both residents and apartment operators and it's getting more expensive. Submeters may be the answer on many levels, including abating leaks far in advance of the traditional 30-day billing cycle.

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The art of the long ball: Who saw that coming?

It's not hard to find examples where an emphasis on short-term performance culminated in short-sighted complacency. It's the intersection where the herd follows the beaten path and champions score atop the vacated field with brazen ingenuity.

Within just the last decade, Alan Greenspan's warnings of a looming energy crisis came with a recommendation before Congress to back a future of gas imports. Warren Buffet leveraged one of the largest utility company buy-outs in history to double down on his bet on rising prices within a country running out of energy.

That was then. This is now. We are poised to become one of the world's leading producers of oil and gas, thanks to the ingenuity of outliers.

Many of those who discovered hydraulic fracturing and horizonal drilling were on the fringes of the oil industry without much background in engineering. What they did have is the clarity and desire to problem-solve with an eye toward fiscal solvency and energy independence.

Within the multifamily industry we have also witnessed a pioneering spirit toward energy efficiency and conservation. We look to control rising costs and remain profitable in an industry where more and more is required on less and less margin.

Benchmarking has become pervasive as legislators across the country set their sites on mapping energy use in apartments with a mind toward conservation. NWP has been in front of this growing momentum for over a decade now.

At the National Multi Housing Council's Op Tech conference in Dallas last month, I had the pleasure of joining my friend, Michael Zatz, chief at the Environmental Protection Agency (EPA) on a panel discussion about utility management technology. Zatz has a strong hand in EPA's ENERGY STAR brand, and my company, NWP, is its only official Portfolio Manager-certified company from the multifamily industry.

At NWP, we've been measuring, monitoring and building high-yield methods of conservation across multifamily portfolios, dramatically cutting utility bills by virtue of simple processes that don't involve a single solar panel or windmill (though when those pencil, we're there.)

Even amidst the noise and confusion of our economy and fiscal imbalance, spreadsheets still speak the truth. Performance is found in first knowing the facts, and acting upon them with clarity and knowledge.

It will continue to be our saving grace and what makes this industry great.

Michael Radice
mike@UMAdvisory.org

Utility Management Advisory

OUR MISSION

The **Utility Management Advisory** is a forum to leverage multifamily owners' real-world experiences and perspectives into information that will drive education to policy makers and property owners, and dispense tangible, actionable recommendations. This alliance will improve multifamily owners' and managers' ability to: conserve, save money, serve residents, while protecting and enhancing their fiscal bottom lines and property values, and staying ahead of emerging policies and requirements.

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Did you flush?

How much water does one person flush down the toilet each year? If your toilet was installed in 2001 or later, it's likely to be 1.6 gallons per flush.

That means (best case is 5 flushes per day) we use 8 gallons per day to cast off our waste. Annually, one person uses 2,920 gallons of water to flush the potty. Some (and I am not saying who) are still using 3.5 gallon-per-flush toilets throughout their communities. Those folks are using 10,220 gallons of water annually, per person, to flush the toilet.

Fun fact: In the U.S. multifamily industry there are 36,426,066 occupants living in 16,060,156 apartments (NMHC 2012 American Community Survey, 1-year estimates Sept. 2013). If we calculate this out, apartments are responsible for at least 106,372,872,720 gallons of water per year—water (and money) that goes down the toilet.

I know what you are thinking—how are these facts fun? How about ensuring that you have the resources needed to continue operating your business? (Fun!)

Consider that less than 1 percent of all the water in the world is drinkable. As our climate changes, so does our ability to tap into this resource.

For decades, water rates were low; we haven't really had to think about what we were flushing away. However, in recent years, water is becoming a main player in the utilities section of our P&Ls. Drought, floods and the increase in fracking for natural gas production have impacted our supply of potable water. There are areas in the country where water is now restricted due to these changes. If drought becomes severe enough, theoretically we could lose the ability to operate our assets.

As Benjamin Franklin once wrote, "we all know the value of water when the well is dry." Eventually, we could be looking at a Mars-like dust bowl landscape where our once lovely apartment community stood.

Water supply is becoming a factor and its scarcity has led to rate increases. There are parts of the U.S. where rates are rising by 20 percent annually or more.

I know what you are thinking—you have submetering or a RUBS program. You can pass these increases onto your residents so it doesn't matter. Wrong.

Consider a family's budget for housing—every dollar allocated for water reimbursement is a dollar less that you can potentially capture on rent or other amenities. If we are not careful with how we manage our water usage at our sites, we could have our costs increase to a point that our rents flatten or residents move out. At that point, we don't increase revenue: we can only offset cost. The best we can do is break even. My preference is to conserve our resources, lower the residents' utility expenses and improve NOI. Now that's fun.

Back to the toilet. How do we control the consumption of this magnificent device? How do we change the world with a toilet? Answer—be brave, and go low-flow. How dare I utter those words.

I may have just suggested that we build outhouses around our communities and encourage our residents to be "old timey" to save water. In some circles, low-flow is synonyms with *flush twice* and *it doesn't really work*. You're hesitant—you've been burned by low-flow before. Consider the technological advances and rapid rate of engineering advancement in recent years. Compare the fabulous brick cell phones of the 80s to the smart phones of today. What was cutting edge in the 1990s is obsolete today. Reflect that green tech is advancing at super science speeds. Then install one low-flow toilet in a unit and see if it works.

Recently I installed low-flow toilets at one of my communities. It went extremely well. I don't want to be braggy, but let's just say that water consumption dropped by more than 15 percent year-over-year in the first month. Resident water charges at this RUBS community decreased. Residents are happily paying less for water. How much easier will it be for my on-site team to renew residents?

You and I are responsible for the consumption of utilities within the units because we install, maintain and eventually upgrade the fixtures. If your property has a big water bill compared to mine, that is not because my demographic is made up of unbathed citizens who practice "if it's yellow, let it mellow." That's silly. My demographic is not that different from yours. I just change the fixtures.

The funnest, most coolest fact of all: if we, as an industry changed out our toilets to low-flow, we could save 15,955,930,908 gallons of water annually (994 gallons per-unit). Think what that might mean to your P&L at 1 cent per gallon. That's the current effective rate for water and wastewater averaged for the 50 largest cities in the U.S.

What could that mean to your communities? What could that mean to your world?

Water you waiting for?

Author Mary Nitschke is passionate about utilities. She is the first president of the Utility Management Advisory Board, holds an Energy Resource Management Certificate from UC Davis, two BAs from UC Berkeley and is Director of Ancillary Services for Prometheus Real Estate Group, Inc.

In the hot, thirsty energy business, water is prized

With so much focus on carbon emitted from the nation's power plants, another environmental challenge related to electricity generation is sometimes overlooked: the enormous amount of water needed to cool the power-producing equipment.

In the U.S. almost all electric power plants, 90 percent, are thermoelectric plants, which essentially create steam to generate electricity. To cool the plants, power suppliers take 40 percent of the fresh water withdrawn nationally, 136 billion gallons daily, the U.S. Geological Survey estimates. This matches the amount withdrawn by the agricultural sector and is nearly four times the amount for households.

Battles for water among these competing interests are becoming more common, and power plants are not always winning. A recent analysis by the Union of Concerned Scientists revealed many examples from 2006 to 2012 of plants that had temporarily cut back or shut down because local water supplies were too low or too warm to cool the plant efficiently.

Proposals to build new plants are also under increased scrutiny, especially in water-stretched regions. The proposed White Stallion coal plant in Texas drew opposition in part because of the plant's water demands. The project was abandoned this year.

Making homes and buildings more energy efficient and using more renewable energy would reduce some of the strain on freshwater supplies. Still, about 84 percent of the nation's electricity will most likely come from thermoelectric plants by 2040, according to the Energy Information Administration. Ensuring that there is enough water for all competing needs will require better technology and better policy, industry watchers say.

Thermoelectric plants use a fuel source—coal, natural gas, nuclear and, in some cases, solar—to boil water to make steam. The steam spins a turbine connected to a generator to produce electricity. Some form of cooling is required to convert the steam back to a liquid that can be boiled again and sent back to the turbine. Three approaches to cooling power plants are prevalent today, each with drawbacks.

So-called once-through cooling withdraws water from a nearby river or lake, cycles it through the plant for cooling, then dumps most of it back, although warmer than when it came in. While once-through systems withdraw huge volumes of water, most is returned to the source. But drawing water into the plant harms fish and other aquatic life, as does the warm water discharged.

In recirculating systems, the water used for cooling is constantly recycled. Once used, it is sent to nearby cooling towers before returning for another run through the cycle. These systems withdraw less water, but consume more than once-through systems because water is lost to evaporation (the steam plumes you see wafting from the towers). An average 500-megawatt coal-fired plant with a recirculating system can gulp 5,000 gallons a minute to replace the water it consumes.

A third approach, dry cooling, is based on huge air-cooled condensers. These use no water for cooling, so such a system would seem to be a good solution to the problem. But they are costly, three to five times more than wet cooling systems. They are also less efficient, especially on hot days or in areas of high humidity, meaning dry-cooled plants will produce less electricity than those using wet cooling methods.

Only 1 to 2 percent of thermoelectric plants rely just on dry cooling. Hybrid systems combining recirculating wet methods and dry cooling are becoming more common, especially for new plants, said Mike Hightower, leader of the Water for Energy project at the Energy Department's Sandia National Laboratories. They can "switch between the two depending on the local weather conditions or water availability issues," Hightower said.

Newer combined-cycle natural gas plants can reduce water use by 60 to 70 percent, compared with older coal and nuclear counterparts, he added.

Researchers are busy working to make dry cooling techniques more economical, while also looking at alternative water sources like municipal wastewater, said Sean Bushart, who manages the water use innovation program with the Electric Power Research Institute, a nonprofit. Begun in 2011, the program has financed five test projects, including one by Johnson Controls, an energy and automotive products company.

Johnson Controls' thermosyphon cooler technology is borrowed from the company's industrial refrigeration units, like those used in meat and beverage processing plants. It draws heat from the water in the cooling cycle.

"Every degree of heat we can remove from the cooling water means less evaporation in the cooling towers," said Jim Furlong, VP in the company's industrial refrigeration group. Initial results from a test system show water savings of up to 75 percent, he said.

While water-saving technologies are evolving, less certain are regulation or policy decisions that might push power plant operators to adopt them.

"From a policy perspective, it's a really tricky issue, given that energy and water are regulated at different scales and in different ways," said John Rogers, a senior energy analyst with the Union of Concerned Scientists. "Even how water is valued and how it figures into our economic math is very different in different parts of the country, which has made it very challenging for getting a handle on this."

At the federal level, a report last year from the Government Accountability Office noted that energy planning and water planning were generally "stove-piped, with decisions about one resource made without considering impacts to the other."

Energy analysts like Rogers want policy makers to recognize that low carbon does not always mean low water.

For example, carbon capture, which stores carbon emissions from fossil-fueled plants, adds about 20 percent to a plant's water needs. And some forms of renewable energy, like geothermal and concentrating solar thermal, which focuses sunlight on tubes to heat a fluid, also depend on water for cooling.

What are needed are "policy decisions that link energy and water," Rogers said.

Author Jim Witkin, *The New York Times*

Drip. Drip. Drip.

Submeters have finally become the smart meters of the multifamily industry

For the past 15 to 20 years, the use of submeters has steadily grown in the multifamily industry—whether due to regulatory requirements or owner preference—to ultimately facilitate utility cost recovery programs. This has allowed owners to lessen their utility expense while also motivating residents to reduce overall consumption by billing them for their specific usage.

Studies have shown a drop in consumption of 15 to 25 percent after installing submeters and, in turn, billing residents for their individual consumption.

The cost to install and maintain submeters has kept some owners from widely adopting them, but now they can be used as smart meters. With more sophisticated communication—particularly submetering systems that are accessible via the Internet and offer meter reads in increments of every hour, 15 minutes, or even more frequently—it is now possible to analyze meter read data to identify leaks and other usage concerns. As a result, the feedback is much closer to real-time rather than in the past when action was only possible after receiving a bill for the prior month.

Benefits of leak detection

The benefits of a leak detection program are many, spanning fiscal and conservation.

Halt damage and waste: First and foremost, you can protect assets by quickly identifying serious leaks and limiting asset damage. While broken pipes can result in significant expense, studies show most unresolved leaks are caused by dripping faucets or faulty toilet flappers.

Here are a few examples of the impact of leaks that can easily go unresolved:

- A dripping faucet consumes 15 gallons per day or 450 gallons per month
- A 1/32" leak consumes 264 gallons per day or 7,920 gallons per month
- A leaking toilet flapper can consume up to one-half gallon per minute or 21,600 gallons per month

Reduce utility expense: Identifying leaks can save residents more than 10 percent on their water bills. Owners also save since they often pick up the tab on larger leaks.

Improve resident satisfaction: Often, the resident does not even realize there is an issue until they receive their bill. Avoid such surprising utility bills by proactively resolving the issue before residents even find out.

Sustainability initiative: Leak detection is a critical element of any sustainability toolbox and should serve as a marketing tool for current residents and prospects not only as part of being green, but also a method of minimizing utility consumption and monthly bills.

"A faulty toilet flapper or dripping faucet running 24-7 results is a tremendous waste," shares Wes Winterstein, VP of utilities management at Bell Partners. "Developing a leak detection program to proactively correct such issues is essential to an effective operation and to stay ahead of costs."

What should you expect from a leak detection program?

Proactive alerts: Your property staff is busy so they should not be asked to go to a website or to filter through long reports. An alert should be sent when, and only when, it is believed that there is a real issue.

Avoid false positives: Following the adage of *The Little Boy Who Cried Wolf*, the property staff will cease paying attention to alerts if they repeatedly go to units and find no problem. Make sure that the thresholds are set high enough, and smart enough, to avoid false positives.

Consider resident response: Be careful if, and how, residents are informed. A good leak detection program will allow you, as the owner or manager, to provide stellar service to your residents by resolving unit-level issues before residents are even aware or receive a high bill.

Think twice about residents receiving a leak detection alert directly, as the unintended consequence may be an unhappy resident who blames the property and wants a credit regardless of the facts.

Ultimately, the goal of leak detection is to leverage submetering to provide actionable information to the property staff. This fits into the win-win category as the owner or manager is better able to cut expense and provide effective service to the residents.

"We see the benefit of a leak detection program in so many ways," adds DeeAnne McClenahan, senior director of procurement and sustainability at Greystar. "As part of our sustainability program, this really makes it easy to get our property staff involved and engaged in support of the effort. They receive virtually instant feedback while quickly resolving leaks and other high use situations."

Authors Tom Spangler energy manager for Greystar and Howard Behr of NWP Services Corporation.

California's last drop

California Governor Jerry Brown signed more than a dozen bills aimed at improving access to water in the state, where drought is common and tension is high over the competing needs of residents, agriculture and the environment.

The new laws attempt to address some of the most immediate concerns, including the difficulty faced by small communities when local groundwater becomes polluted or is over-pumped. The measures also reflect growing interest in California in finding ways to safely recycle wastewater so that it can be used again for drinking and cooking.

"California needs more high quality water and recycling is key to getting there," Brown, a Democrat, said in his signing message. To speed the effort, Brown also proposed consolidating the responsibility for all water-quality programs under a single agency, the state Water Resources Board.

Water has long been a sore point in California, where the precious resource has been diverted from mountain lakes and streams to irrigate farms and slake the thirst of metropolitan areas around Los Angeles and San Francisco.

Many of the state's initiatives to deal with the problem, including a long-awaited effort to preserve access to water while addressing environmental problems in the Sacramento-San Joaquin Delta, are highly controversial. They face criticism from all sides and often lead to political stalemates.

Among the most difficult problems in recent years has been the pollution of groundwater in communities throughout the state, either because it has been over-pumped or because chemicals used in agriculture, particularly nitrates in fertilizer, have leached into the water table.

Assemblyman Luis Alejo, a Democrat who sponsored three of the bills, said such pollution is common in the agricultural communities that he represents in Monterey County. One of the measures signed by Brown would authorize grants for poor communities that need funds to clean up their drinking water or find emergency replacements.

"There is a small community of less than 500 people where their entire water system was recently put under a court order that they can no longer drink it because of high levels of nitrates," Alejo said.

Among the problems from drinking water with high levels of nitrates has been "blue baby syndrome," in which infants lose oxygen from their blood, Alejo said.

Other issues involve the availability and cost of water.

Some farmers manage the cost of growing their crops by buying or selling water rights during times when the state limits its use for irrigation. One of the new laws would allow more landowners to do that by loosening the requirements for selling the rights.

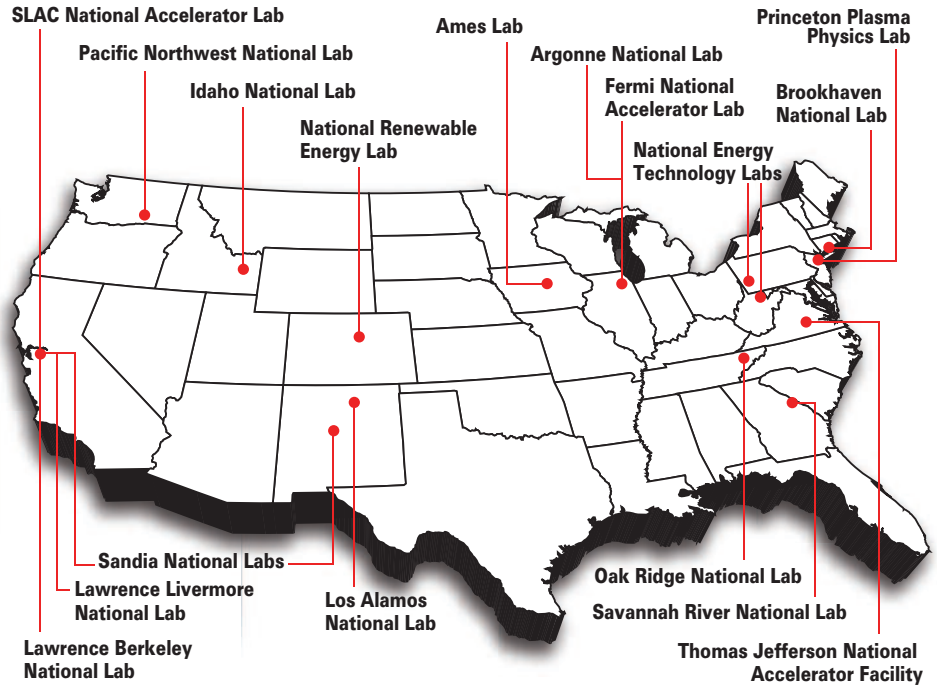
The law promoting the recycling of wastewater is meant to increase the supply of water and reduce the cost, said its sponsor, Democratic state Senator Ben Hueso.

In his Southern California district, avocado growers are chopping down trees because they fear not having enough to irrigate them, while the Colorado River, which also runs through the district, has had so much water diverted for so long that it's time to find other sources, Hueso said.

"We need to find ways to make water more available for those growers while also keeping water more affordable," Hueso said.

His measure directs state water officials to investigate ways to recycle wastewater so that it is drinkable. The law aims at developing regulations by 2016, although Brown, in his signing message, urged administrators to move more quickly.

Authors Sharon Bernstein, Reuters



Visit an energy lab

I recently visited the National Renewable Energy Lab in Golden, Col. near Denver. The U.S. Department of Energy has several such laboratories and research centers throughout the country. Most welcome visitors during normal business hours. For a full listing, visit energy.gov/offices and scroll down to the "Labs & Technology Centers."

Here's what I learned about renewable energy and energy efficiency:

- Insight into when it makes sense to use LED lighting versus CFL
- Perspectives on untapped energy in sunlight, wind, and waves
- How trees and landscaping can help reduce a building's heating and cooling

I believe those little nuggets of knowledge will make me a better energy manager in the long run, and will surface in future situations I have yet to anticipate.

Author Kent McDonald is director of utility management with NWP.

You don't miss the water until the river runs dry

Texas is in its fifth year of near-record drought; only the dry spell of 1950-57 was worse. While such weather cycles are typical for Texas, the optics on fracking may be magnifying an already unwieldy management of the state's fresh water.

Truth be told, the Texas State Water Board reports that water use by the oil and gas industry amounts to less than 1 percent of the overall water use in the state. But during record droughts, it's still 1 percent the state doesn't have.

Known for its weather cycles, Texas has suffered chronic water shortages throughout its history. Certainly, a perfect storm of dry weather, fracking's stigma, and a legislative drive toward conservation has particularly articulated the need to effectively manage this precious resource.

For their part, the oil and natural gas industries have become increasingly creative in their water management efforts so that producing the vast oil and natural gas underfoot has gotten more efficient, using less water over time.

With the proliferation of fracking dollars has come advancing technology that includes everything from proprietary water recycling architecture to water systems that work with total dissolved solids (TDS) and brackish (salty) water. Such headway will be important to the country's evolving acceptance of fracking and conservation of existing fresh water reserves.

As property owners and operators must rely on facts to inform efficient operations, it's important that the public and policymakers seek to manage future water use based on accurate data rather than public perception.

The true culprit may be the state's rich taste for lush landscapes. The volume of water used by Texans to water their lawns is 18 times greater than that used in hydraulic fracturing operations according to University of Texas Professor Rusty Todd. Conservation is important. And targeting the biggest water users for efficiency makes the greatest sense on the bottom line.

According to the State of Texas, and as quoted within its state water plan, the top three water user categories in Texas are municipal (people), agriculture (irrigation of crops) and industrial (manufacturing).

Still, it will be fracking revenue that will fund the state's Proposition 6 which passed in November. The much-deliberated amendment establishes a fund beginning with $2 billion of tax revenue from oil and natural gas production. These monies will fund infrastructure development providing additional water supplies during periods of drought, and earmark 20 percent for new methods of conservation.

Advocates saw it as necessary relief to the ongoing lack of water that is only expected to get worse. Opponents saw it as a scheme to set the state up as a bank. All agreed that something be done to ease the tension between water use and a growing population expected to double in the next 50 years.

Texas is growing at a rate of about 400,000 people a year; with that growth comes an increased demand for water from a proverbial well that is already low.

"In the 1950s, about 85 percent of our population lived in rural areas," says Dr. Andrew Samsom, head of the Meadows Center for Water and Environment at Texas State University. He was referring to the record-breaking drought of the 1950s. Now 85 percent live in urban areas.

In the 50s, those in rural settings had a better understanding of resource dynamics. Today there is a greater distance between supply and demand. People turn on their faucets or flush their toilets and just assume water will be there.

Samsom and others see conservation as important to protecting the state's future fresh water supply. The easiest water to save is the water we already have, says Samsom. In dry El Paso, San Antonio, even Las Vegas, you don't have to explain conservation, he said. They get it and look for inventive ways to reduce water consumption.

Education to modify group behavior is the fastest and lowest-cost way to save water in homes and apartments, and directly affects water's largest user group. And the fact that the whole of Texas is suffering through the water shortage may also be a teachable moment and fertile ground to instill principals of conservation.

Group-think seems to be the most effective way to guide populations toward conservation according to a recent study.

Researchers ran an experiment in hotels where they compared the effect of 2 different messages printed on cards and left on the towels in the bathrooms: Message 1 was "save the environment. Re-use your towel." It got only a moderate response.

The second message: "Over 75 percent of our guests re-use their towels. You, too, can help save water."

Nearly half of those who saw the "everyone is doing it" note participated in the conservation program and re-used their towels.

So my message to Texas: "Institute water conservation measures at your communities today and get the savings the rest of us have already banked."

Author Mark Copeland heads management operations of Atlas Residential based in Addison, Texas. Atlas manages 3,500 units.

What is your return on utility retrofits?

As utility costs continue to rise—driven largely by water and sewer—owners and managers scramble for alternatives to lower the net utility costs for their portfolios.

The focus has shifted from increasing the pass-through portion charged to the residents to, now, eyeing underlying costs. Resident charge-backs are quickly approaching their maximum limit, either legally or due to market conditions. Owners are pressed by residents to address their side of the equation, and are compelled to do all they can to lower the underlying costs incurred inside and outside the apartment.

With natural gas prices still near historic lows (figure 1), most owners have already taken advantage of the drop (even if by accident) and now work to hedge pricing as the rebound undoubtedly nears. But water costs continue to rise (figure 2) faster than any other utility and the overall Consumer Price Index (CPI). With aging water and sewer infrastructure across the country, these increases are nowhere close to done.

Owners are being forced to focus on consumption to further mitigate increasing costs. But before you launch into the latest technology and retrofits—or worse yet—decline the project because you don't see value or pay-back, there are factors to consider when evaluating the go/no-go decision, and to ensure you optimize any return on utility retrofit projects.

Spend the time on the due diligence underwriting the project. In today's market, underwriting a potential acquisition or development project involves looking at market conditions for potential increases in rent and occupancy, outlook for job growth, overall economic indicators, etc.

But often times when evaluating a utility retrofit project, owners simply look at cost and return based on today's dollars. Few project expected increases in utility costs, its impact on resident retention and the useful lives of the assets.

Beyond that, owners are held back by extended pay-back periods (i.e. in excess of 5 years) even though the true return on a retrofit is significantly higher than merely the NOI and cash flow return on the underlying real estate asset—and would be accretive to the overall results.

For example, owners and investors look at a typical transaction of flipping an asset at a lower cap rate than originally purchased and the income made on that value creation. This often results in an internal rate of return (IRR) approaching 20 percent.

Owners, however, often overlook a utility-focused retrofit or investments that might yield an IRR of 40 percent in the same time period. Granted, there are several factors in this calculation (leverage, net utility costs after resident rebilling, etc.), but the results still justify project inclusion.

To optimize the return of their capital investment dollars, owners should consider the benefits of the increased NOI from utility retrofits and not just cosmetic changes, such as new kitchens and baths, which may take longer to recognize added value. In a simple comparison of an asset that is purchased at a 7.5 percent cap and sold at a 6 percent cap versus a utility investment with a pay-back of nearly 7 years, the IRRs are drastically different.

When optimizing the return of any utility efficiency project, owners and managers cannot simply complete the retrofit and move on. Most consumption-targeted projects require review to keep results in line with expectations. Maintenance programs must be followed, and available resources should be used to their full potential, to set goals and monitor the performance.

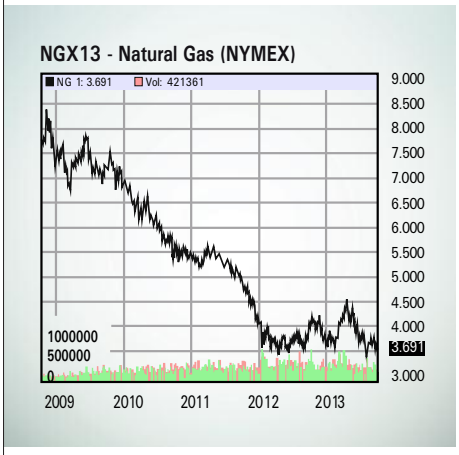
Simple procedures like monitoring irrigation settings help mitigate any change by landscapers or on-site teams overriding the system and missing out on potential benefits. With the latest tools, owners and managers should budget for expected results. Utilities can be budgeted at both the consumption and rate level—not just cost.

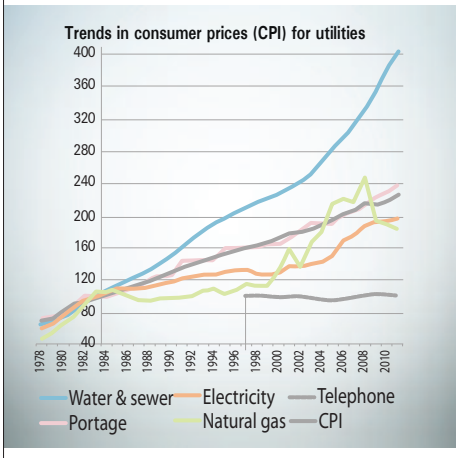
Such visibility allows stakeholders to quickly ascertain the reasons for any variances from expectations. All too often, the true cause of a variance (or true benefit) is hidden in net cost, which leads to distrust in the project and future benefits.

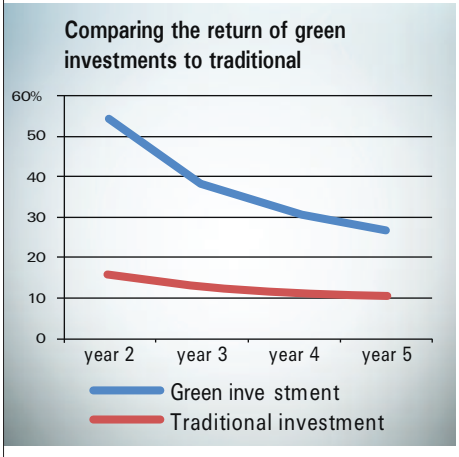
For example, an increase in utility costs of 5 percent after a significant retrofit could sour investors and owners to future utility projects. However, if this 5 percent increase is due to rate increase of 20 percent and a consumption decrease of 15 percent, the reality may be that the project is, in fact, delivering the results expected, and boosting the bottom line significantly.

The underwriting, management and measurement process for optimizing utility retrofits is no easy task. The variables involved continue to complicate the analysis (whether it's turnover in on-site teams, vendor changes, or simply not enough time to focus on the programs).

When the available technology, tools and resources are combined with the discipline to execute, retrofit projects can in fact lead to great returns across the portfolio.







Author Tim Rogers is vice president with SmartSource by NWP.

Energy and water: an alliance of purpose

There is an inherent connection between energy and water use and the need for co-management of energy planning. Most of the energy we use requires copious amounts of water to produce, and most of the water we use requires a considerable amount of energy to treat and transport.

Despite this inherent connection, it's actually uncommon to see energy and water utilities collaborating to identify best practices to save energy and water and even lower costs. Think of it this way: If energy and water utilities worked together, their unique perspectives could uncover joint cost-saving solutions, customers would save more money and utilities could share data to better understand their holistic energy-water footprint.

Identifying why there is a lack of collaboration and how to overcome these barriers was the motivation behind the American Council for an Energy-Efficient Economy's (ACEEE's) recent report. The report goes beyond citing discrepancies, though, and provides solutions for energy and water utilities to create better, more resource-efficient programs for themselves and their customers.

The report highlights a number of ways U.S. energy and water utilities have collaborated to identify mutually-beneficial energy and water savings. It lists successful energy and water utility programs from a variety of different sectors, including residential, commercial, industrial, agricultural and municipal.

One energy-water success story the report features comes from my own backyard, Austin, Texas. Traditionally, it's difficult to incentivize energy and water savings in multifamily dwellings because residents only rent the property. While the resident pays the utility bill, the landlord is the one responsible for long-term efficiency improvements. To fix this split incentive, the City of Austin created the Multifamily Energy and Water Efficiency Program, which provides multifamily dwelling owners with holistic energy and water efficiency evaluations, rebates and other incentives to conserve both resources. The program is a collaboration of Austin Water Utility, Austin Energy and Texas Gas Service.

It's important to note that without technology, these savings would not be realized. As the ACEEE report suggests, smart electric meters—devices that enable two-way communication to and from the utility and the customer—are lifting the veil, so to speak, by allowing utilities to understand how and when customers use energy and uncover opportunities for conservation. Smart water meters, on the other hand, are much less common than smart electric meters and the technology is not as advanced. But these smart water meters are key to unlocking holistic energy-water savings.

Pecan Street Inc., a smart grid living laboratory based in Austin, Texas, is one of the only smart grid demonstration projects in the country working to bridge this water information gap. By installing smart water meters on homes of willing participants, residents can access water usage data down to the hour-by-hour level, giving utilities clear oversight to detect leaks and even theft. The goal is to share important lessons learned with other utilities and municipalities and spur further innovation in the smart water meter sector. Of course, some utilities are already ahead of the curve.

In April of this year, the City of Davis in California launched a cloud-based, city-wide Water Conservation Program that provides its 14,000 residential customers with a dual billing and usage data platform. The technology provider, WaterSmart Software, also sends participants personalized Home Water Reports that display household water use, compare household usage to other similar-sized homes and suggest conservation tips.

By breaking down the silos between different utilities, the cities of Austin and Davis overcame many barriers that joint programs face and established programs that unlock all-inclusive energy-water savings. These success stories are just some of the examples documented in ACEEE's report. It's clear there are numerous opportunities for utilities to create more joint programs to help save both energy and water.

To increase collaboration, the report recommends:

- Begin a dialogue about opportunities between the two (or more) utilities and establishing relationships
- Create utility partnerships for joint messaging
- Collaborate to identify unique funding opportunities
- Develop a format to add energy savings to water programs and vice versa
- Work with energy regulators to establish credit for embedded energy savings from water efficiency programs

In the future, we hope utilities and regulators take the report's recommendations under consideration to create more joint programs in Texas and beyond.

Author Kate Zerrenner leads the Environmental Defense Fund's campaign to influence and enact state and national energy and water efficiency policy, including breaking down financial, regulatory and behavioral barriers.

The report mentioned within this article is the American Council for an Energy-Efficient Economy's "Saving water and energy together: helping utilities build better probrams," by Rachel Young, Oct. 2013, Report E13H

LED Induction

	LED	Induction
Lifetime	100,000 hours at L70	100,000 hours at R50
Color rendering	70 to 90 CRI (good)	80 CRI (fair)
Cold tolerant	-30 F (instant on)	-40 F (may require warm up)
Performance	Turns on instantly, no flickering, strobing or noise	Instant start, no flickering, strobing or noise
Energy efficiency	120 lumens/watt and improving	90 lumens/watt
Lume depreciation	30% at 60,000 to 100,000 hours	35% at 60,000 to 100,000 hours
Initial cost	High	High
Maintenance cost	Low	Low
Rebates	Good	Good
Recycling	Contains no mercury; easy discard	Contains mercury requires special disposal handling

Light fight

LED and induction lights are the longest lasting and best light for the dollar. It stands to reason that they are the two most common retrofit choices for multifamily applications where it's inconvenient to change bulbs. So now which?

Getting their start from Nikola Tesla in the 1890s, induction lamps are basically fluorescent lights without filaments or electrodes (the part that burns out). Instead, they transfer power by magnetic field. The result is a lamp with an extraordinary life of up to 100,000 hours, or 11 years of 24/7 operation. They have been used for years at gas stations, warehouses and for street lighting, just to name a few applications.

LEDs produce light through electrons in a semiconductor material emitting positive-negative pulses. This newer technology has continued to improve, and garners more attention as researchers have solved the issues related to its color rendering, lumens and on-off performance. The final hurdle for LEDs has been price. LED prices continue to fall due to increased manufacturing efficiencies, however, the prices are generally higher than the equivalent induction products.

Which is right for your community? First consider your specific need. Do you want a wide cast of light or should it be directed? LEDs can do both. They take the lead in directional lighting but can be cost prohibitive. Induction lighting doesn't have the directional capacity of LEDs, but takes the lead in high-level, broad lighting applications. You can't beat the intensity of induction lighting with systems that deliver up to 36,000 lumens, whereas LEDs have barely broken the 20,000 lumens hurdle. This could change with time as LEDs continue to make great strides in R&D due to focus and research dollars aimed at LEDs. I've seen claims from both products stating they will last 100,000 hours. I've also seen claims that induction lights lose lumen strength between 60,000 and 70,000 hours. When shopping for either product, pay attention to lifespan claims as they vary by product and manufacturer.

When considering induction lighting, two items of note: First, induction lamps contain solid-state mercury and need proper disposal. Pure mercury is poisonous, however, when mercury is mixed with other elements, as it is in induction lights, the toxicity is neutralized. Disposal of induction lamps is no more complex than the disposal of other fluorescents. Second, induction lamps emit UV light which may fade some items. LEDs don't have either of these concerns.

What does this all mean? Induction lighting and LEDs both achieve impressive consumption savings but each have their own strengths, based on the application. Do your research and choose the best fit for your needs and budget.

Author Timothy Haddon is director of ancillary services with Associated Estates.

Budgeting for a utility price increase

Budget season is here. Perhaps yours is already done. If so, count your lucky stars. If not, here's a quick primer on rate increases, a weather outlook for the coming winter, and an outlook on natural gas and electricity prices. Oh yes, and don't forget the impact of weather on budget variances.

Consumer Price Index

(all urban consumers)

12-month percent change Year	Electricity	Gas	Water /sewer	Trash
5 year max 2008 - 2012	6.4	13.8	7.4	5.5
5 year avg 2008 - 2012	2.3	(4.5)	6.5	3.2
3 year avg 2010 - 2012	0.7	(4.8)	6.5	2.4

SOURCE: CONSUMER PRICE INDEX (U.S. BUREAU OF LABOR STATISTICS)

With regard to the Consumer Price Index (below) I like the first row because it is a worst case scenario showing the highest annual increase in the last 5 years.

There are also 5 year and 3 year average annual increases shown. If you prefer, you could use that instead. Note that natural gas has experienced a **decrease,** on average, but that is not expected to continue. It also shows historical performance. In the case of water/sewer and trash, this is probably a good gauge for setting future expectations.

Since energy (electricity and natural gas) tend to be more volatile, you may want to avoid historical averages and instead use the U.S. Dept of Energy's forecasts for retail price increases for 2014. Currently, those numbers (charts to left) are: electricity 1.4 percent increase, and natural gas 10.6 percent increase.

Note that the U.S. Department of Energy (DOE) releases updated numbers about once a month. These numbers are from the October 8, 2013 release. If you can wait to finalize your budget until the next update, it might make sense to use their current numbers as a placeholder and refresh your budget when the new numbers are published.

Weather review

For the summer months, (June, July, and August) the National Weather Service reports above-average temperatures for the western U.S., and below-normal temperatures for portions of the central U.S.

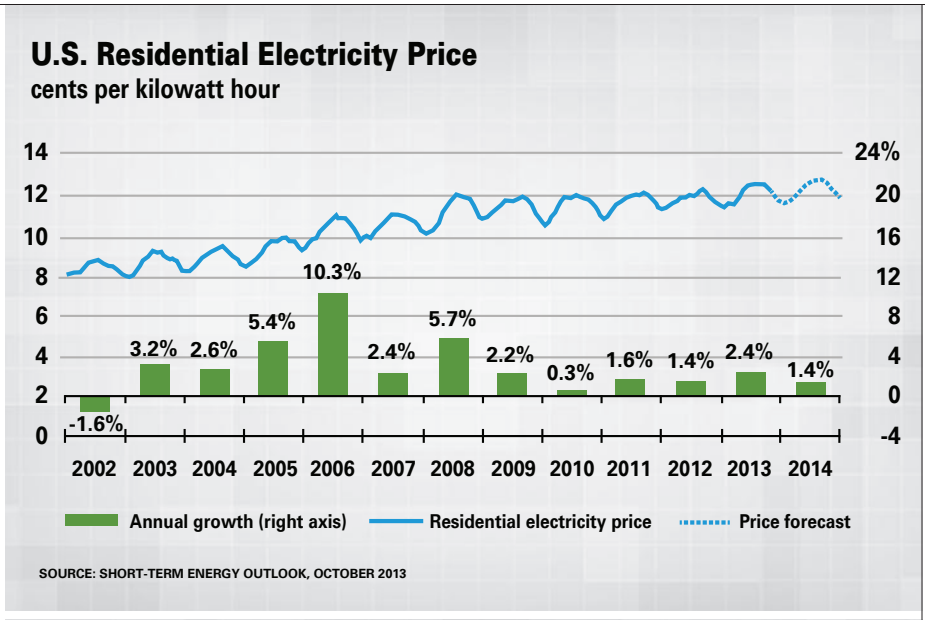
Generally, the peak winter weather months are December, January, and February. For those months, the National Weather Service predicts above-average temperatures for the western U.S., and normal temperatures for the eastern U.S.

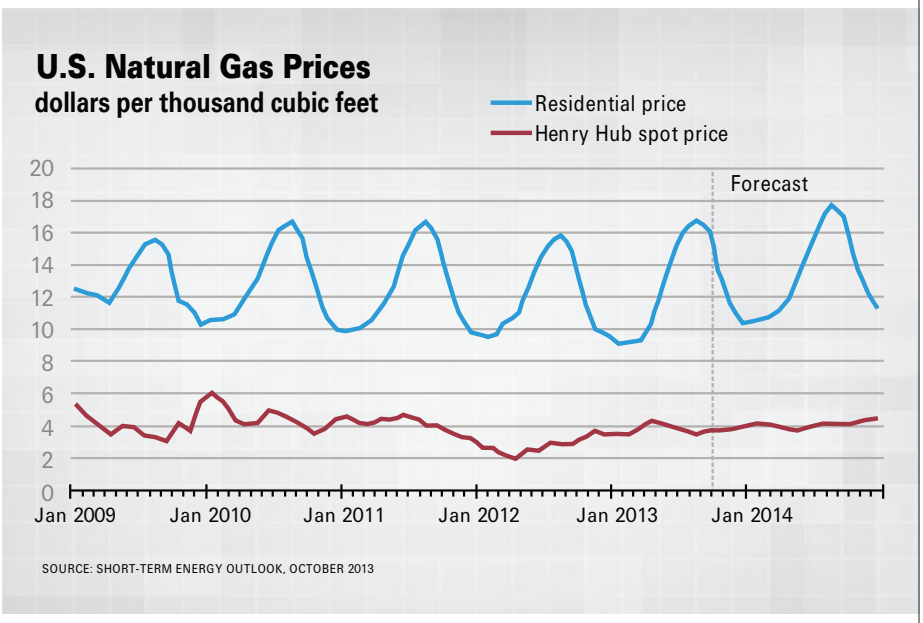
Natural gas price outlook

According to the DOE, "Natural gas spot prices averaged $3.62 per MMBtu at the Henry Hub in September, up 19-cents from the previous month. While prices declined from April through August, they began increasing in October in anticipation of the winter heating demand.

The U.S. Energy Information Administration (EIA) expects the Henry Hub price to increase from an average $2.75 per MMBtu in 2012 to $3.71 per MMBtu in 2013, and $4 per MMBtu in 2014. Natural gas future prices for January 2014 delivery (for the five-day period ending October 3, 2013) averaged $3.83 per MMBtu.

Current options and future prices imply that market participants place the lower and upper bounds for the 95 percent confidence interval for January 2014 contracts at $2.91





Prices	2011	2012	2013	2014
WTI Crude Oil DOLLARS /BARREL; W TEXAS INTERMEDIATE	$94.86	$94.12	$98.69	$96.21
Brent Crude Oil DOLLARS /BARREL	111.26	111.65	107.96	102.21
Gasoline DOLLARS /GALLON; AVG REG PUMP PRICE	3.53	3.63	3.52	3.40
Diesel DOLLARS /GALLON; ON-HWY RETAIL	3.83	3.97	3.93	3.76
Heating Oil DOLLARS /GALLON; U.S. RES AVG	3.66	3.79	3.77	3.62
Natural Gas DOLLARS /THOUSAND CUBIC FT; U.S. RES AVG	11.03	10.66	10.76	11.90
Electricity CENTS / KILOWATT HOUR; U.S. RES AVG	11.72	11.88	12.16	12.33
Coal DOLLARS /MILLION BTU; ELECTRIC POWER GENERATION FUEL COST	2.39	2.40	2.33	2.34

per MMBtu and $5.04 per MMBtu, respectively. At this time a year ago, the natural gas futures contract for January 2013 averaged $3.84 per MMBtu and the corresponding lower and upper limits of the 95 percent confidence interval were $2.77 per MMBtu and $5.31 per MMBtu.

Electricity price outlook

According to the DOE, "The rising cost of generation fuels, particularly natural gas, contributes to a projected increase in the residential price of electricity. During the upcoming winter months, EIA expects residential electricity price to average 11.9 cents per kilowatt hour, which is 2.3 percent higher than the winter of 2012-2013."

Authors Kent McDonald and Darren Novich

Terms *MMBtu:* million British thermal units, a standard unit of measure for energy, roughly equivalent to dekatherms or 1,000 cubic feet.

Henry Hub: Pipeline connection point in Louisiana, used as a proxy for natural gas pricing in the U.S.A. although local prices will vary somewhat from this reference point.

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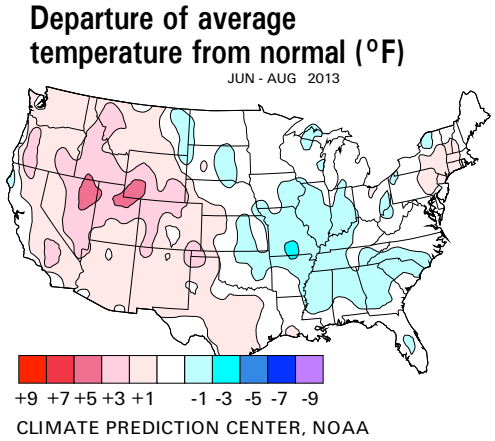

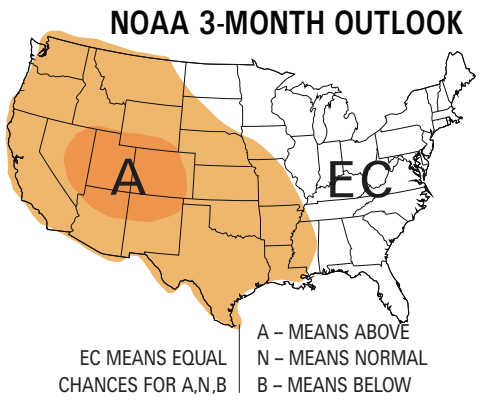

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