

*Journal of*

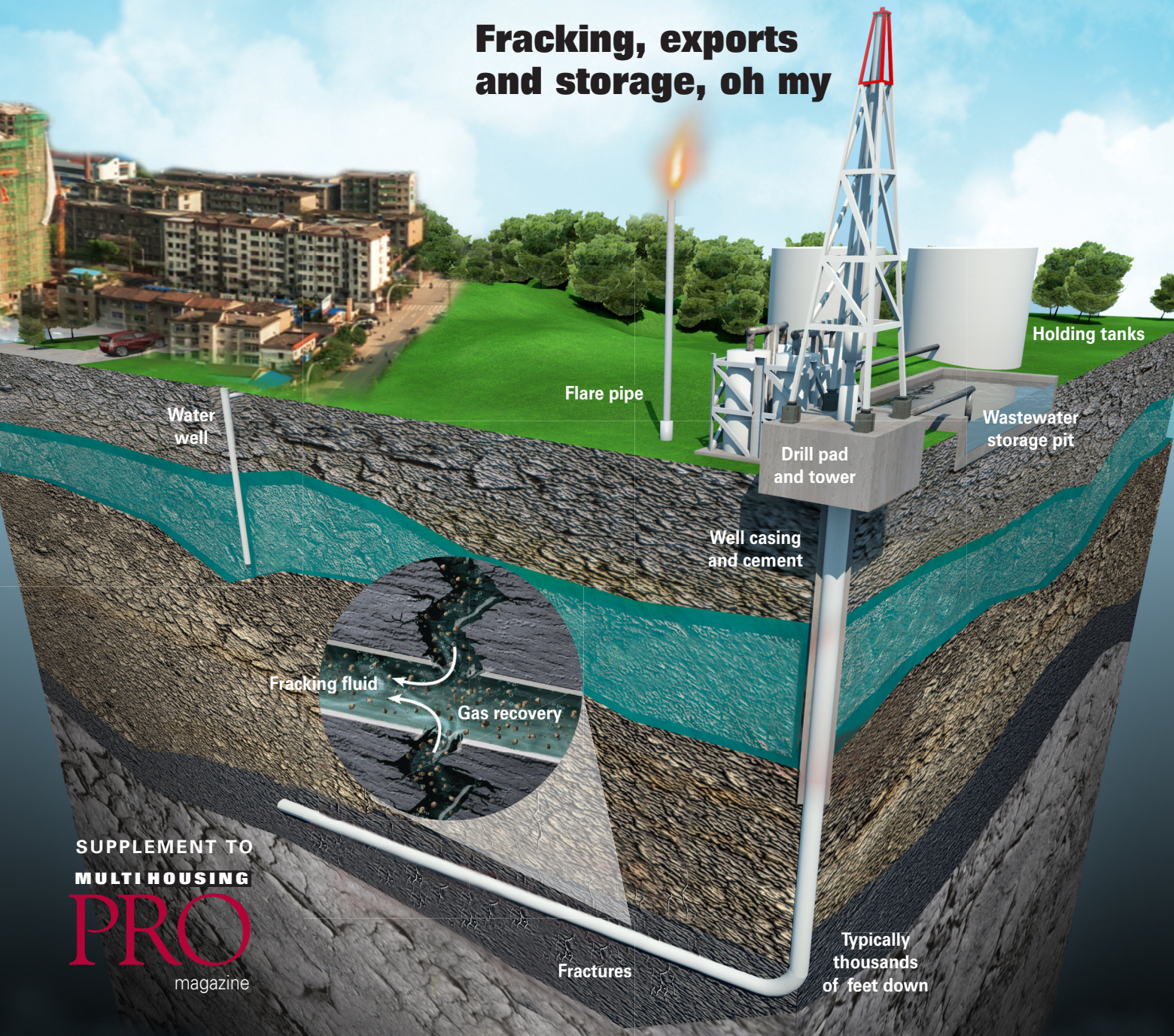
# Utility

m a n a g e m e n t

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OPTIMIZING UTILITY USAGE IN MULTIFAMILY  
VOL. 4, ISSUE 1 • SPRING 2014

## Fracking, exports and storage, oh my



SUPPLEMENT TO  
MULTI HOUSING  
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# Regulatory

U P D A T E



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| TOWN           | LAW / ACTION   | BLDG SIZE   | DISCLOSE TO  | PENALTIES FOR INCOMPLIANCE  |
|----------------|--|---|--|---|
| <b>Austin</b>  | <b>Energy Conservation Audit &amp; Disclosure (ECAD)</b> Owner must track / report consumption for 10 year old-plus buildings  | > 30,000 sq. ft.<br>(> 10,000 sq. ft. on 6/1/14)              | Buyers, government agency at <b>time of sale</b>   | Class C misdemeanor and subject to fine up to \$500. If criminally negligent, a fine of up to \$2,000 may be assessed.  |
| <b>Boston</b>  | <b>Building Energy Reporting and Disclosure</b> Owner must track and report building consumption   | > 50 units by 2015 (> 35 units by 2017)                       | Public website, government agency annually by 2015 | 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. |
| <b>Chicago</b> | <b>Chicago Energy Use Benchmarking</b> Owner must track and report building and common area consumption. An engineer must examine data every 3 years and certify data to the City. | > 250,000 sq. ft. on 6/1/2015<br>(> 50,000 sq. ft. on 6/1/16) | Public website annually by 2015                    | \$100 to building owner for first violation, \$25 per day after that if not fixed.  |
| <b>NYC</b>     | <b>Local law 84</b> Owners must report unit consumption. Audit required every 10 years on buildings > 50,000 sq. ft.   | > 10,000 sq. ft   | Public website, government agency annually         | \$500; continued failure \$500 per quarter with a maximum of \$2,000.   |
| <b>Seattle</b> | <b>Council Bill 116731</b> Whole building data must be reported, including units.  | > 20,000 sq. ft.  | Government agency, residents annually              | Quarterly fines \$500-\$1,000 based on building size. Owner and residents first violation: \$150.   |
| <b>DC</b>      | <b>Clean and Affordable Energy Act</b> Owners must report common area consumption.   | > 100,000 sq. ft.<br>(> 50,000 sq. ft. on 4/1/14)             | Public website, government agency annually         | 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.   |





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Fracking wells in Pinedale, Wyoming. In 2012, hydraulic fracturing supported 2.1 million American jobs and contributed \$284 billion to the U.S. GDP, according to a study by IHS. By 2025, IHS reports that unconventional drilling will support 3.9 million jobs.

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management





## Canary in the coal mine

Allow me to provide a first-hand account from the beautiful Northeast: this winter was brutal. Endless snow, bouts of extreme cold and a polar vortex have made this mother-of-all-winters colder than most winters across the last twenty years.

Chicago had its third snowiest winter on record, Detroit had its second snowiest and others broke wintry-white records from Toledo to Philadelphia to Atlanta.

As such, utility costs are front and center. Along with the snow, many are digging out from winter utility bills that doubled—even tripled—such as consumers in Pennsylvania where electricity has been deregulated. The unfortunate chose or were defaulted to variable plans that fluctuated with wholesale electric prices. These prices spiked hard in the extreme cold, increasing electricity and gas used by power generators. Some of the plans hit 38-cents a kilowatt (compared to the average 8-cents) spurring over 750 complaints to the Public Utility Commission.

It's not that better choices weren't available to these residents. In fact, it's probably certain that an extremely high utility bill was merely an unintended consequence of an uninformed choice.

In the old coal mining days, canaries were used as an early warning system to alert miners of toxic air in time for everyone to safely vacate the mine. It was a fast and simple way to know of impending danger.

We might find a scant few canaries yet singing in today's multifamily utility billing market.


Even on the West Coast where, in stark

contrast, winters were the warmest on record in San Francisco and Las Vegas, the talk is about utility costs. Seattle utility companies are considering a 30 percent rate increase over the next 6 years.

It could have been worse.

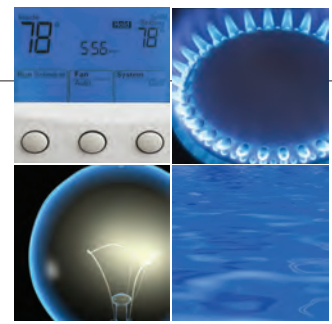
The shale-based energy revolution that I first wrote about a couple issues ago, is not only helping us through the winter, it is building our economy and fortifying our leverage around the world. It is why this winter's energy bills weren't as bad as they could have been, but we can still do better.

Knowledge delivers informed choices. The business of multifamily is only growing in complexity as mounting regulations, shifting legislation and evolving energy markets coalesce as the primal soup of tomorrow's new utility environment.

What if it is as simple as discerning who's ahead of the pack and watching those canaries for clues? 



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Utility  
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*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.

# Reg rush

It has the power to transform multifamily swifter than any other. Here's what you need to know about looming legislation.

Energy conservation rings loudly in the legislative halls of many states as lawmakers tackle issues related to the utility billing of multifamily residents. Since the reasons behind the legislation differ, the bills and lobbying effort take different forms. Those in the utility billing and multifamily industries with presence on Capitol Hill are monitoring and participating in the process to ensure a positive outcome.



## California

In February, 2013 Senator Lois Volk and Assemblyman Paul Fong introduced California Senate Bill 750. SB 750, as introduced, mandates the

installation of submeters for water billing, prevents the use of allocated ratio utility billing system (RUBS) methods, and prohibits the pass-through of administrative fees to residents. The impetus for this bill was two-fold. California legislators hope they can achieve significant water and electricity conservation to help meet required reduction mandates. Additionally, the sponsors wanted to provide a consumer protection framework for California residents.

The sponsors reached out to environmental and tenants' advocacy groups to help craft the legislation. As is the case in Ohio, the terms of the introduced bill would have prohibited long-standing practices (and lease agreement language) in California.

Utility billing and multifamily lobbying groups attempted to work with the bill's sponsors to modify onerous penalty provisions, expansive disclosure requirements, and impossible meter maintenance timelines. They pushed to include language that would streamline the meter testing process with the California Department of Weights and Measures (W&M). The sponsors made some changes to SB 750 but did not make enough to mollify all of the bill's opposition. Due, in part, to last-minute lobbying efforts the bill stalled in the Water, Parks and Wildlife Committee and did not advance to an Assembly vote. At that time, the sponsors decided to make the bill a two-year bill and resume in 2014.

SB 750's sponsors continue to work with multifamily and utility billing groups to modify the terms of the bill in order to secure passage.

In February of 2014, Asm. Adam Gray introduced Assembly Bill 1983. AB 1983 codifies existing accepted practices in California, such as the ability to use allocated (RUBS) methodologies and pass-through administrative fees to residents. AB 1983 contains common-sense consumer protection language and penalty language. It also allows longer timelines for multifamily owners and developers to comply with a submeter installation mandate for newly constructed buildings.

A third bill is likely to be introduced which will tackle some of the issues with W&M. During the negotiations on SB 750 it became clear to all involved that the parties could agree on modifications to the duties, obligations and regulations of the Department of W&M. They will submit a stand-alone bill that will codify the areas of agreement including the ability to test meters in different counties other than where the property is located, the ability to pre-test meters without specifying the exact location where the meters will be installed, and a better definition of when a meter is placed in service; this removes the specter of civil and criminal penalties for meter manufacturers that submit meters for testing that do not pass on a county's test bench. The last point is one of contention which led to the vast majority of meter manufacturers' refusal to ship to California.



## Connecticut

The Connecticut Public Utilities Regulatory Authority (PURA) began codifying regulations regarding electricity submetering in the summer of 2013. Like California, Connecticut has previously enacted a statute that requires energy reductions.

Connecticut legislators realized that the state has a large stock of multifamily buildings that are master-metered for electricity service, yet owners are not allowed to submeter electricity to provide price signals to

residents for conservation. Legislators enacted a law that allows for the expanded use of electricity submeters and tasked PURA with regulating their installation and use.

Accordingly, PURA asked tenants' groups, utility stakeholders, meter manufacturers, utility billing companies, and multifamily owners to participate in drafting regulations pertaining to the installation of electricity submeters and resident billing. The working group provided a draft, approval mechanisms, and other comments to PURA in January of 2014. The anticipated enactment of the regulations had been scheduled for the summer of 2014. However, a group emerged that is concerned about how multifamily owners that have electricity generation or co-generation capabilities will be regulated. This will push back the likely enactment to the winter of 2014.



## Ohio

In October of 2013, the *Columbus Dispatch* ran a three part series detailing the (currently legal) practice of "marking up"

residents' electricity bills by two multifamily owners in Ohio. The affected residents paid more than they would have if they were the customer of record with the local utility and the owners in question recovered more from their billing program than they were billed by the local utility. These are not standard practices in the utility billing industry in Ohio (nor any other state).

In response, Representative Mike Foley introduced House Bill 422. HB 422 not only prevents mark-up or over-allocation of electricity billing, it also prohibits current practices in Ohio such as allocated (RUBS) billing and the ability to pass through administrative fees to residents.

In addition, HB 422 contains onerous penalties. Accordingly, the utility billing industry and multifamily lobbying partners are opposing HB 422 and will introduce a competing bill. This bill will codify existing practices in Ohio, such as the ability to use RUBS and pass through fees, and enact common-sense lease disclosure requirements and consumer protections. ⚙️

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Lithium

# Saving for a rainy day

From backyard tinkerers to big corporations, inventors have been struggling to find a way to store solar, wind and other renewable energy so it can furnish electricity when the sun doesn't shine or the wind doesn't blow.

California is offering businesses a big incentive for success—contracts that the utility industry estimates could total as much as \$3 billion for successful, large-scale electricity-storage systems.

This year, big utilities that do business in California must begin adding enough battery systems or other technology so that by 2024 they can store 1,325-megawatts worth of electricity—nearly 70 times the amount that the handful of mostly experimental systems in the state store now. Regulators are also requiring municipal utilities to buy or lease energy-storage equipment.

The storage systems California wants don't exist on such a scale, so the new rules amount to a big bet—paid for by utility customers—that creating demand will produce workable new technology. If so, other states are likely to follow suit, experts say.

"We're not talking about lab experiments anymore," said Nancy Pfund, managing partner of Silicon Valley venture-capital firm DBL Investors. "We're talking about a real solution to a growing issue as renewables become a bigger percentage of everyone's grid. The whole world is watching this."

Like most states, California has an electric system that was built around big power plants that cranked out electricity around the clock. But utilities here are on track to get a third of the electricity they sell from intermittent resources like solar panels and wind turbines by 2020.

Nationally, renewables accounted for 37 percent of the new generating capacity added last year, according to the Federal Energy Regulatory Commission.

Utilities now use small natural-gas plants to fill gaps when power generation and demand aren't in balance, but the state thinks storage systems would be more efficient and produce less pollution.

At least in the first few years, many of the storage contracts are likely to go to projects that use rechargeable batteries, like the ones in electric cars and buses, industry officials say. Batteries have been tested for durability and safety by the automotive industry, and

they are in widespread use.

"Battery technology is probably going to be the immediate, short-run leader," said Jeff Gates, managing director of commercial transmission at Duke Energy Corp. in Charlotte, N.C. Duke built a large battery-storage facility near one of its Texas wind farms, and the company plans to build similar projects in California and other states, he said.

While utilities have installed a handful of battery-storage systems in California and other places, many of them were designed to store less than an hour's worth of electricity. California utilities are likely to want systems that can store at least two or three hours of power to fill in gaps left by solar panels after sunset, Gates said.

Different types of batteries are already being made by manufacturers including General Electric Co., of Fairfield, Conn., and LG Chem Ltd. of South Korea.

Some people hope that California's bet



**NEMA 4, 70 KW lithium** ion battery charger for heavy industrial application. Modern charger technology is the target of much of today's growth and research.

on energy storage will create opportunities for technologies that currently exist only in the lab or in one-off projects, including storage based on compressed air or giant flywheels. Gravity Power LLC, a startup in Goleta, Calif., uses deep underground bore holes, filled with water, to create energy when huge pistons are dropped down central shafts.

Among the questions the California

experiment may answer is where storage devices should be installed. Some experts think they should be built next to wind farms, for example, as Duke did. Others suggest they should be located along transmission lines or installed next to businesses and homes with solar panels.

"I don't think we understand the function of storage on the grid enough yet to know where it would have the highest value," said Mark Nelson, a power-planning manager at Southern California Edison, based in Rosemead, Calif.

SolarCity Corp., of San Mateo, Calif., in December began offering commercial customers rechargeable batteries—the same ones that are used in Tesla Motors Inc. electric cars—along with solar panels. Tesla, of Palo Alto, Calif., said that it plans to build a U.S. battery factory to supply its Fremont, Calif., car factory and SolarCity's energy-storage business. "Storage is important because the sun only shines part of the day, but we use electricity all of the day," Elon Musk, who is chairman and chief executive of Tesla and chairman of SolarCity, said.

Southern California Edison recently installed stacks of lithium-ion batteries at an Irvine, Calif., parking garage that has solar panels on the roof and a row of electric-car chargers on a lower floor. The panels generate electricity for the car chargers and the batteries, which help power the chargers after sunset.

Some utilities and consumer advocates worry that the technologies are expensive and aren't ready for prime time.

Mike Niggli, president of San Diego Gas & Electric Co., a unit of Semptra Energy, said that although there are many storage technologies, "few of them are cost-effective at this time."

The financial strength of some companies likely to offer their products is also a concern, following a series of bankruptcies by battery makers, including Xtreme Power, which filed for Chapter 11 in January, and A123 Systems Inc. and Ener1 Inc., which filed for bankruptcy protection in 2012.

California is one of 37 states that have renewable-energy mandates or goals, but the only one to require utilities to buy lots of storage.

"Energy storage is a highly specialized market now," said Haresh Kamath, a researcher at the Electric Power Research Institute, a utility-funded group in Palo Alto, Calif. "But I expect it to become an important part of the grid's architecture in coming years." ☀

**Excerpt** Cassandra Sweet and Rebecca Smith, energy reporters for *The Wall Street Journal*





After installing the thermostat and completing a Nest set-up, residents can easily schedule their settings day-by-day on their phone or tablet. Temperature settings are moved and changed by drag-and-dropping the circle that turns into a slider when touched.

the report also reveals how their energy use compares to their neighbors, others in the state and the country. In many geographical areas, the Nest is connected to the local utility company and can provide specific data correlated to actual dollars on their energy use with equally-specific recommendations on saving money.

The Nest awards little graphic leaves on the display when being used efficiently and advises residents how well they are saving compared to other Nest owners.

It connects to the Internet allowing the resident to control the apartment's temperature from the web, phone or tablet. Residents can check the apartment's temperature and easily schedule away time while at work, program the thermostat to adjust down at night, auto-calculate the amount of time it will take to heat or cool the apartment before the resident rises, all while saving on their energy bill with every refinement of the device.

Its motion sensor detects and memorizes a resident's movement within the apartment. After a week of learning the occupants' behaviors, including adjustments to the temperature and usually home-not-home patterns, it begins to make small changes in the temperature control to save energy while maintaining the same comfort levels. One way it does this is by circulating hot or cold air already in the space, rather than creating new heat or cold. Another is by raising/lowering the setting when the occupants are not at home. Since residents set the limits of the changes, they can save more or less money, and accommodate pets who may be at home.

The Nest Thermostat is not cheap but at the present, it is the best off-the-shelf way of communicating energy efficiency and behavior modification to residents we can find. Retail, it runs about \$250 a unit. Bulk pricing is available and with the purchase by Google, it's still uncertain whether pricing will change.

Nest also opened its API code, meaning that third-party vendors can access their platform to build and offer additional functions. It works in much the same way as the iPhone is a platform for apps. It's unclear how Google will promote this feature but Nest's original goal was to create a fully-automated home that could be monitored

## Socrates and the thermostat

Feedback informs nearly every decision we make.

Whether it's grades in school, a scowl from our wife or occupancy at our communities, we internally process the responses we receive and that becomes the basis by which we construct future choices. It's a simple principle of human behavior. Think Pavlov.

Another principle is that people want to perceive a certain level of freedom. In other words, the boring teacher with brilliant recall of facts-as-conclusions is statistically less effective than the teacher who provides the facts and coaches the students toward their own conclusions. Such processing, also called scientific method, is more effective in altering human behavior than memorization. Think Socrates.

So what do these simple principles of human behavior have to do with managing apartments?

Enter iPod inventor Tony Fadell, the brains behind the Nest Thermostat purchased by Google in January. Its simple design, like many Apple products, far understates its function allowing the user to quickly and intuitively learn how to use it. At first blush, you may not even know it's a thermostat. Be careful. It's only a Socratic lure coaxing you into greater thought, even behavior modification. And its three-years-plus on the market suggests it's working.

While it may look like a shiny hockey puck stuck to your wall, it's actually a siren calling the resident to energy conservation. And that's what it has to do with apartment and utility management.

Energy conservation is on the hearts and minds of legislatures, utilities, landlords and residents.

Apartments have become the next target for energy savings as regulators begin to hone their reach with benchmarking and

other rules aimed at making metric-based improvements in commercial conservation.

One challenge to these initiatives is something called "split incentive." In a nutshell, apartments are not single-family homes. The same incentives that worked for homeowners can't work for apartments. The landlord who might pay for energy saving retrofits doesn't necessarily pay for the utilities in his units so he wouldn't directly recover the cost benefit. And the residents who use the utilities and might benefit from energy saving retrofits don't own the building, and have little sway in upgrades.

However, owners that invest in in-unit green upgrades will be making long-term improvements to their properties that can be marketed to new or renewing residents and eventually recouped on sale. If utility costs keep increasing faster than rents, these measures will have an impact because they lower the resident's total cost of renting. And regulations like benchmarking will make these investments more visible to investors and residents.

Benchmarking an apartment's energy use will someday be a required standard, but until that day we are reliant on resident's personal conservation choices. Nest addresses that issue inside the personal space of an apartment where no landlord dares to tread.

After a thirty-day-cycle, the resident receives an emailed report of their energy use in a fun infographic format, along with hints on saving energy. To add competition,



The **Nest energy report** is an email sent to residents summarizing the last month's heating and cooling usage and provides tips on saving energy.

from the Internet. As well as temperature and smoke detection, the founders were already working on compatibility with security and entertainment systems.

Nest can make sense for common areas at a property and infrequently used rooms like a fitness center where occupancy is random and the savings can be substantial by resetting temperatures automatically when no one is there.

At present it may be hard to make the case for buying a Nest for units when much of the savings goes to the resident. To offset this you might charge, say, \$10/month for the Nest and it would pay for itself (to the owner) in two years. An additional consideration is that Nest can be used to control costs in vacant units: a property manager only needs the device's product code to view and control its usage.

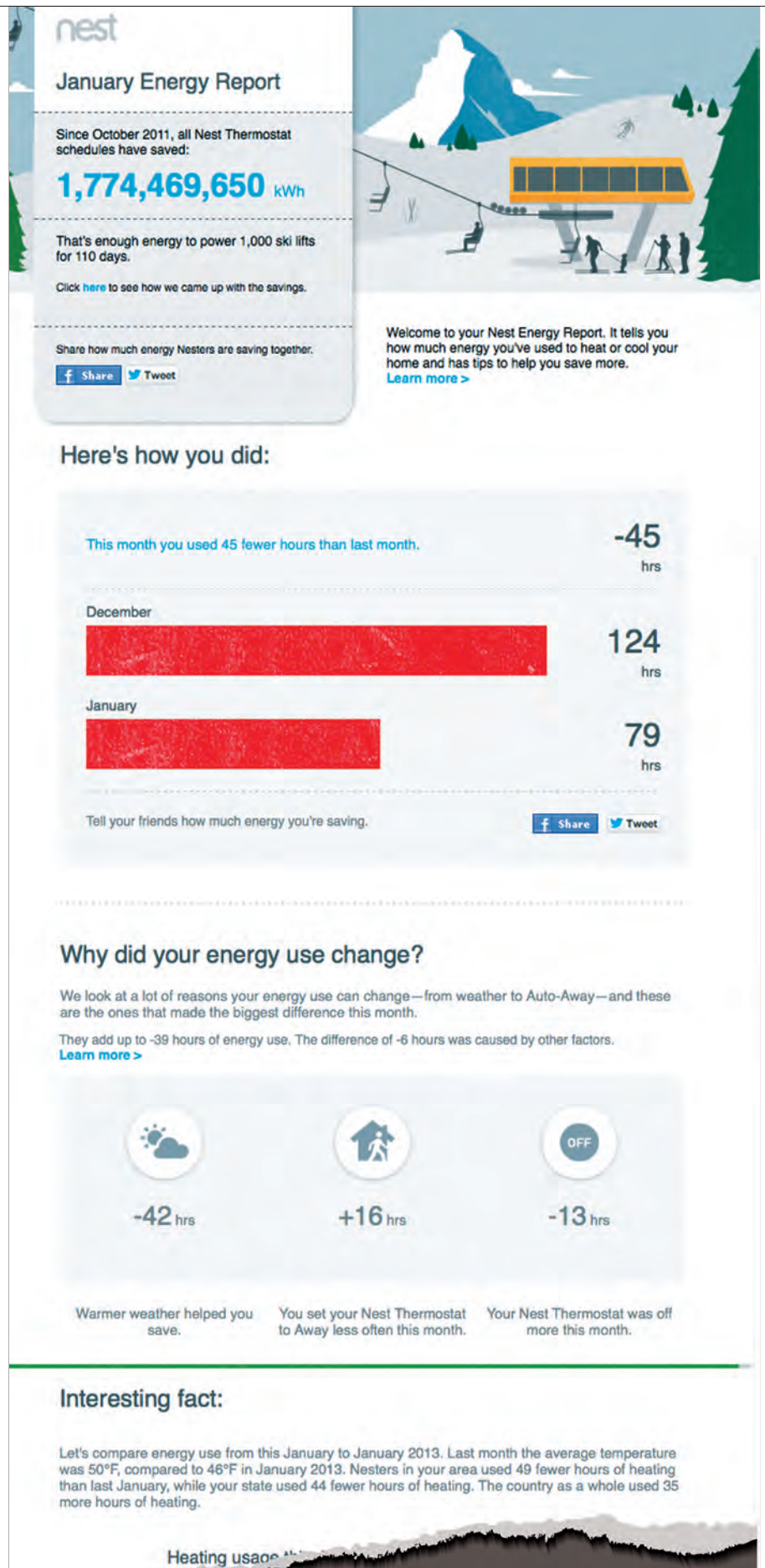
Though still a rich choice at its price point, Nest has a reach that transcends the split incentive. It delivers some energy savings to owners and places residents in control of their space with the competitive fun of a video game. ⚙️



**Authors** DeeAnne McClenahan is the senior director of procurement and sustainability for Greystar, one of the largest owners and operators in the multifamily industry. McClenahan has focused on controlling costs across the portfolio, including supply chain and utility management, raising the focus of energy management, efficiency, and sustainability as a core strategy of Greystar across the country. A LEED Green Associate and Certified Sustainable Building Advisor (CSBA), McClenahan developed the Greystar Green Awards program as a way to engage, motivate, and educate property staff and residents, collect data, and promote sustainability for every community. A graduate of the University of Maryland, McClenahan lives near Phoenix, Ariz.



Tom Spangler is one of the elder statesmen in resident utility billing, meaning he has spent entirely too much time trying to explain what he does to people outside the multifamily industry. Spangler is a consultant currently serving as energy manager for Greystar. Prior to that, he managed ancillary income and utility expense programs for UDR for over a decade. Spangler is a lifelong Virginia gentleman and has an engineering degree from Virginia Tech and an MBA from the Darden School at UVA. Tom lives in Richmond, Virginia.



# Everything old is new again—the California drought

In 1977, California Governor Jerry Brown declared a drought state of emergency. It started with voluntary water reductions, and then was converted to mandatory water restrictions.



**August 25, 1977** Phyllis Olson watches as members of the East Bay Municipal Utility District install a water restrictor that will limit her water flow from 883 gallons per month to 225. (right) December 31, 1949 A boy takes a shortened bath during drought conditions in New York. Water shortages have resulted in a variety of interesting devices.

Households were given a water budget—families were given an allotment of 225 gallons-per-month of water to use. If you used more than that, you were fined. (In the Bay Area, I found record of a \$55 dollar fine. Remember, this was 1977, when a gallon of gas was \$0.62!)

People put bricks in their toilet tanks to reduce the amount of water that flushing used, brought buckets into the shower to capture water run off with which they would then water their plants. Public restrooms were closed because of heavy water restrictions. Water police patrolled neighborhoods to see who was using sprinklers at non-designated days and times. People who were caught with green lawns, had water restrictors installed by the local water company. The devices were so restrictive that only a trickle of water came out of the sink and you could not do dishes and take a shower at the same time.

In 2014, California Gov. Jerry Brown declared a drought state of emergency. He has requested a voluntary 10 percent water reduction by all Californians. Sound familiar? Are we doomed to repeat history?

In the spirit of breaking the trend, let's look at what uses water in the typical U.S. home. According to the EPA, 70 percent of all water consumption occurs indoors and the rest is outdoor use. I believe that, due to the density of multifamily the percentage of indoor water used is about 80 percent (on average). But the breakdown is still valuable. Using the EPA's information—the toilet accounts for 27 percent of all indoor water use, the washing machine is 22 percent, the shower is 17 percent, the faucet uses 16 percent, 4 percent is other water use and 14 percent is assessed as leaks.

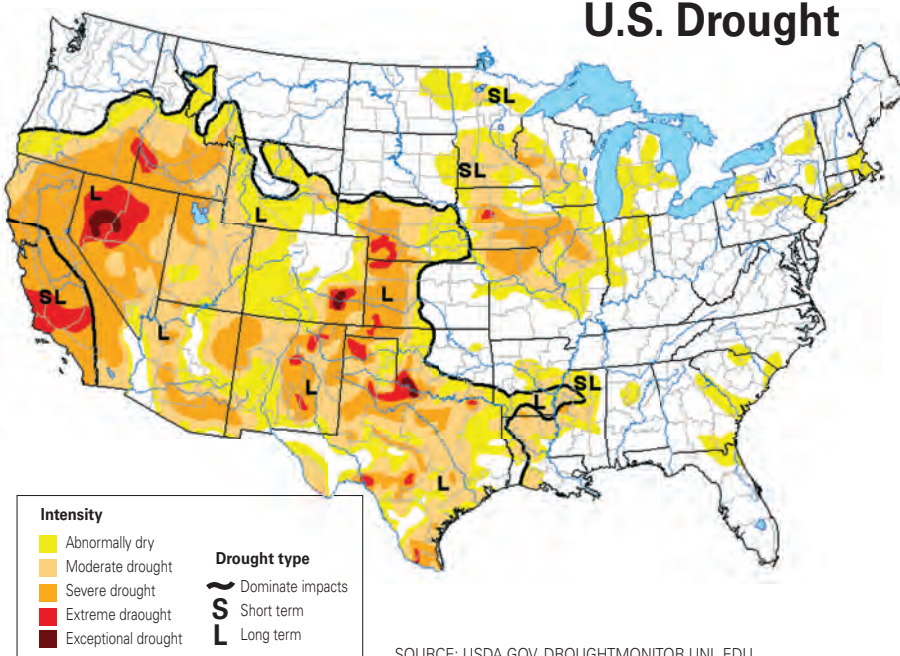
Let me repeat that last one—14 percent of water use on any given home is **leaks**.

Let's look at some low hanging fruit.

In multifamily, we like to say that we should not be held accountable for the water consumption in the unit because we cannot control how many times-per-day residents flush the toilet or how long tenants spend in the shower or if they run the faucet while they are brushing their teeth. But we can control how those fixtures function.

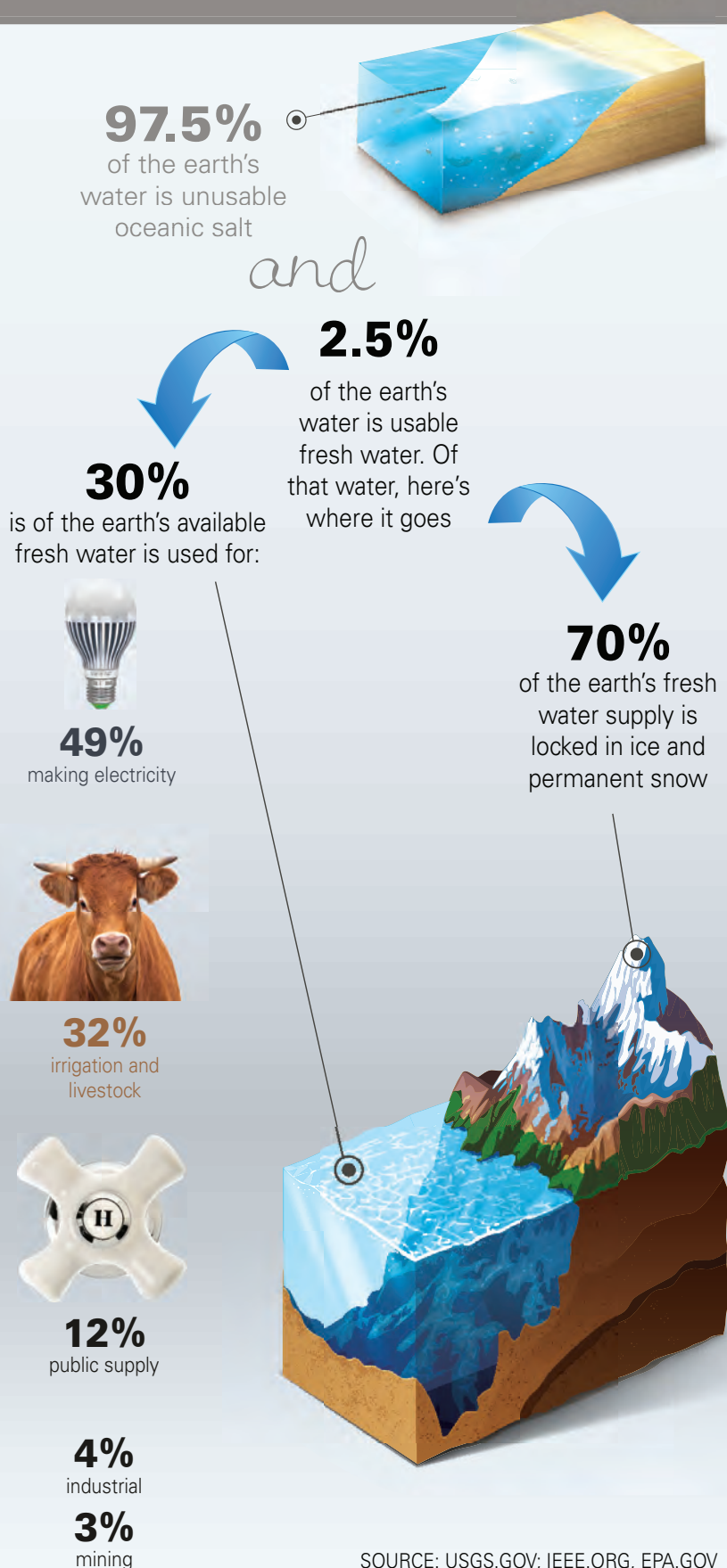
It is our responsibility to keep our fixtures in proper working condition. This means no leaks. What if we simply make it a routine process to inspect the units for leaky faucets, test for toilet leaks and set our toilet fill levels correctly? Potentially we could save up to 14 percent on indoor water use. This means that your residents can save 14 percent on their water bills, which assists in the renewal process. A leaky toilet can lose up to 200-

## U.S. Drought





## FROM WHERE DO WE GET OUR WATER?



SOURCE: USGS.GOV; IEEE.ORG, EPA.GOV

gallons-per-day. If we fix leaks we save water which will save money and save the world.

The dementors are coming! Or water police, whichever name you prefer. They will fine you and suck the water pressure out of your lines.

Technology has changed a lot since 1977, too. Dudes don't need to drive around in cars to see if you are using too much water. There are satellite-based weather tracking irrigation systems out there that check the weather for the month and develop what your water budget should have been for that month and compare that water budget against your actual use. Then you may be fined accordingly for the excess amount of water that you used.

Foster City, California, currently uses this type of system and fines communities that exceed their water budget. This technology is being deployed by other cities. The fines on irrigation will most likely have to be absorbed by the property owner. These costs will be difficult, if not illegal to include in your allocation to your residents. How will you defend yourself?

Active irrigation control will become paramount. The dialogue with our landscapers needs to evolve to involve more than "are my plants pretty?" and "let's walk the property and look at our less attractive areas." Bring your water bill to the meeting with your landscaper and maintain a dialogue regarding water management. Confirm that he understands that his role involves not just the plants, but the water.

We are not condemned to repeat ourselves. We can do better, if we choose. California needs to improve very quickly if we do not want to run out of water.

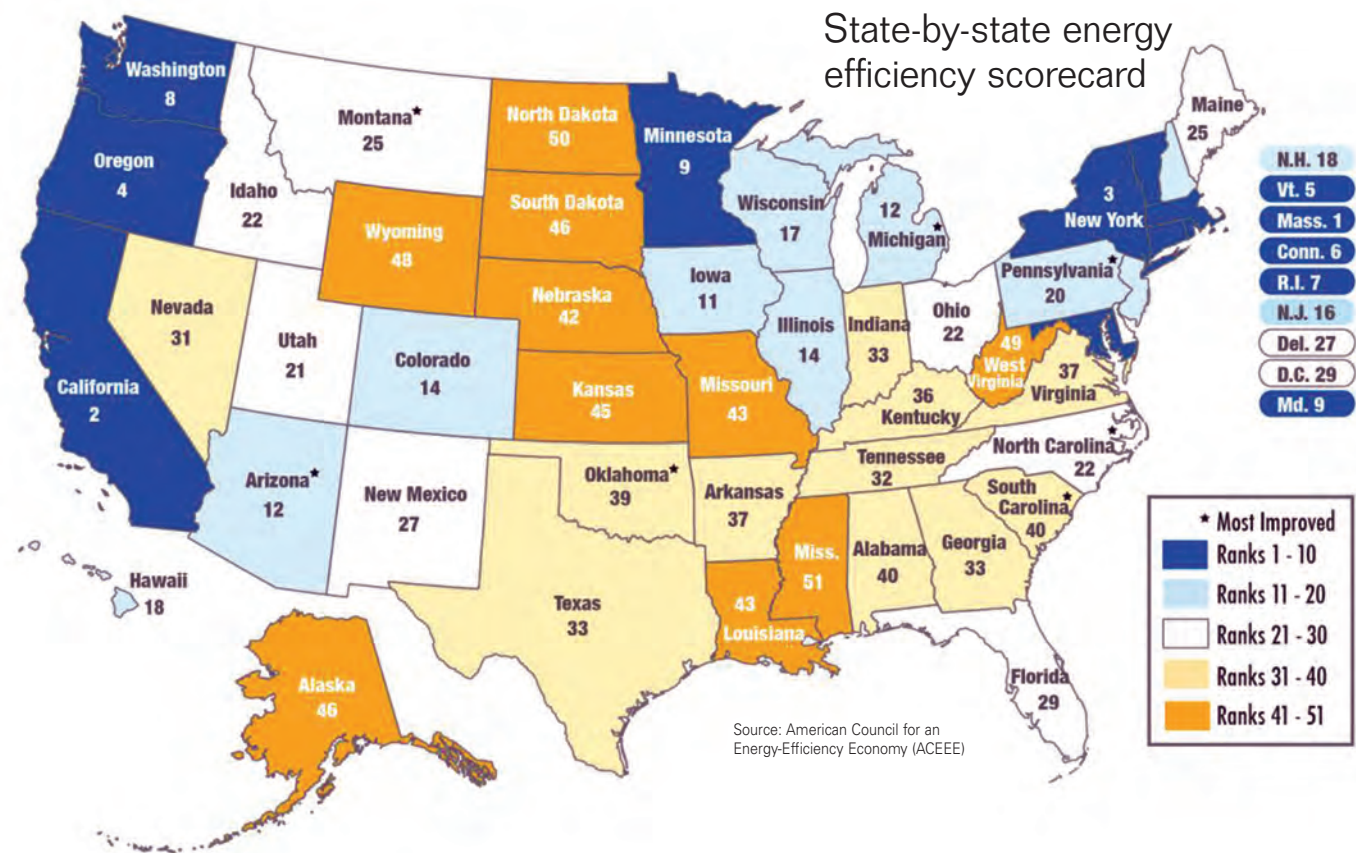
Wasted water will grow more expensive on a national basis. As an industry, we have power when it comes to water management. We have great, garden-style communities, epic fountains and a vast numbers of toilets. As we learned from Spiderman, "with great power comes great responsibility."

Water we waiting for? ☀



**Author** Mary Nitschke is passionate about utilities and should, perhaps, switch to decaf. 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. Nitschke has the first law of thermodynamics posted by her office door, and a 1970 Lincoln Mark III, which over 400 bhp, in her driveway in Northern Calif.



## 5 utility industry trends to watch this year

Last year brought about a number of interesting developments in the energy industry. Here are five key trends we'll be watching closely in 2014.

### Energy efficiency policies continue to spread worldwide

The introduction of new energy efficiency policies and regulations was widespread in 2013—and that momentum appears poised to continue around the world in 2014.

More than half of U.S. states have now officially enacted quantitative energy efficiency targets, and around 30 states offer concrete incentives to utilities that drive reductions in energy demand. Yet even more states have instituted a framework for severing the tie between utility energy sales and revenue, thereby removing the disincentive for utilities to help electricity and natural gas customers lower their bills. Mississippi and Louisiana are the latest players to join the energy efficiency policy landscape.

Across the pond, European member states

recently formalized their action plans to achieve an E.U.-wide 20 percent reduction in energy consumption by 2020, as part of a sweeping energy efficiency directive.

And in Asia—where it's forecasted that more than half of annual global energy will be consumed by 2035—several countries are becoming more aggressive with efficiency policies. Japan, Singapore, China, and many developing nations in the region are finding efficiency to be one of the cheapest and cleanest energy resources at their disposal.

### Natural gas and renewable energy chip away at coal

America's energy portfolio is changing. Natural gas—along with clean power—is persisting in chipping away at coal's segment of the U.S. energy generation mix.

Much of this shift is due to the expansion

of oil and natural gas production here at home. Domestic natural gas production is projected to grow 56 percent between 2012 and 2040. And by 2040—if not earlier—natural gas will displace coal as the primary fuel for U.S. electricity generation. The shift is already under way: in November, the Tennessee Valley Authority—located in one of the top coal-burning states—announced its plans to shutter eight coal plants representing 3,300 megawatts of capacity.

At the same time, the share of renewable energy in the U.S. generation mix continues to grow rapidly.

### Utilities are exploring ways to thrive in a distributed-generation world

How should a bakery respond when, each year, more and more of its customers want to start baking their own cookies?

Electric power utilities will confront a similar situation in 2014, as tens of thousands of additional homes and businesses will start buying less electricity from traditional retailers, instead opting to produce power from their own solar panels. Rooftop solar installations have reached a furious pace in the U.S.: a new system is now brought online every four minutes. And all other things equal, an increase in behind-the-meter distributed generation (DG) means a decrease in sales and revenue for utilities.



This DG-driven revenue curtailment could produce a frightening cycle for the power industry: reduced sales revenues could lead to less system-wide investment, which could lead to a less cost-effective electric grid, which could in turn lead to an increase in rates for consumers. That could drive more high-value consumers opting to produce their own power—which could all lead to further reduced sales revenue for utilities. You get the picture. Rinse and repeat, until the days of a centralized utility give way to a distributed generation world.

The challenge for utilities in the coming year will hinge on constructively participating in this trend, rather than sitting on the sidelines. An innovative pack of utilities are already seizing upon such opportunities which include utilities' leasing solar panels to ratepayers and creating subsidiaries that install rooftop solar outside their regulated service territory.

In parallel to finding an optimal role in distributed generation, utilities are naturally suited to further unlock the potential of large-scale solar. It still accounts for the majority of installed solar electric capacity in the U.S., and it is set to take off in a big way in the next few years.

### Smart meter infrastructure paves the way for dynamic pricing programs

In the last 6 years, the number of smart meters in the U.S. has grown more than sixfold. There are now more than 46 million smart meters installed nationwide—enabling real-time communication of energy data between customers and their service providers.

This trend isn't about to slow down. Worldwide, the installed base of smart meters will triple from 313 million in 2013 to nearly 1.1 billion within ten years, according to a November report by Navigant Research.

But while smart meter deployments become widespread, dynamic pricing—which better matches energy supply and demand through real-time price changes—is not as prevalent. However, some utilities are emerging as leaders in applying dynamic pricing to better engage their customers and ensure system reliability.

Programs like Pacific Gas and Electric's SmartRate and Baltimore Gas and Electric's Smart Energy Rewards are at the forefront of the utility industry's adoption of dynamic pricing. Their focus is on using time-varying energy prices to keep a grid-friendly balance between electricity supply and electricity demand, and on designing easy-to-understand rates and rebates that help customers manage their consumption in a personalized and energy efficient way.

### Demand response will aid the grid's transition toward supply

Fundamental changes in the electric grid's supply and demand profile are requiring utilities to think creatively about how to manage this transition.

On the supply side, deep investments in utility-scale renewables like solar and wind are bringing into focus the intermittency of these sources. It's no secret that solar electricity production grinds to a halt in the evening, and that wind speeds often pick up after electricity consumers have gone to sleep. And on the demand side, the rise in electric vehicles—the most energy-intensive appliances in the history of the home—could put substantial pressure on the grid at certain times of day.

A mix of smart technologies, customer engagement, and demand response will help bring electricity production and consumption into the precise alignment that the grid requires to function properly. While innova-

tive energy storage approaches may play a future role in managing this exacting dance between power supply and demand, other more proven and more cost-effective options will be required in the near term.

The impressive ability of demand response to reliably stabilize electric systems under pressure has been on full display in the past year: DR helped keep the lights on during hours of record-breaking summer power demand in New York last July, and also during hours of record-breaking winter power demand in Texas in February.

It appears that nimble DR mechanisms (e.g. dynamic pricing and real-time customer engagement) will become increasingly valuable assets for utilities as a low-cost strategy to manage not just weather-driven peaks, but also the day-to-day patterns associated with a cleaner and smarter electric grid. ⚙️

**Authors** Dan Yates and Alex Laskey are co-founders of Opower, a privately-held company that partners with utility providers around the world to promote energy efficiency.

## Negawatt hour

Amory Lovins was right. In 1989, the American physicist noticed a misprint in a report of the Colorado Public Utilities Commission: negawatt for megawatt (MW). He borrowed the word to describe power saved through conservation or efficiency measures, and argued that these were the best way to meet rising demand for power, both for businesses and the environment. The first global study of such measures shows how far they have come.

The report, by the International Energy Agency (IEA), says that investment in energy efficiency is large and growing: \$300 billion in 2011 by companies and governments in 11 countries. That is the same as total investment in electricity generation from oil, gas and coal, though less than investment in renewable electricity plus renewable-energy subsidies. But it saves more in emissions of carbon dioxide than all the spending on renewables, and pays for itself.

As a result, says the agency, "avoided energy"—the difference between the amount actually used each year and the amount that would have been used had there been no conservation since 1974—is now equivalent to two-thirds of annual consumption. That is almost as much as the world's output of oil, gas and coal combined. The result has been a bonanza for energy-service companies, which advise other firms

how to cut fuel costs. In America, these firms' revenues grew by 20 percent a year in the decade ending 2011 to \$7 billion.

Companies are responding to high oil prices which stimulate energy savings everywhere, although energy subsidies dull this effect in some countries. But Robert Tromp, head of the IEA's energy-efficiency unit, says that regulation and technological innovation matter just as much. China, for example, is tightening its vehicle-emissions standards, boosting sales of fuel-efficient cars. It also requires that all new coal-fired plants with a capacity of over 600MW be "supercritical" ones that are about a third more efficient than traditional designs.



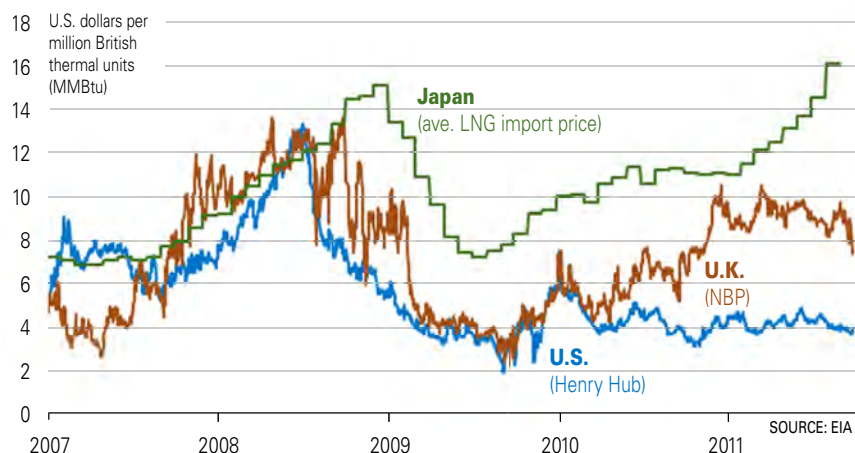
Fridges used to consume more energy than televisions. Now, TV sets consume more because they have got larger, whereas fridges have got more efficient, partly in response to government energy-saving targets. The market for "smart" appliances, which save energy

by switching themselves off when not needed, is almost doubling every year.

Regulations impose costs as well as save them. But when the IEA examined the impact of efficiency targets on Japanese consumer goods, it found the benefits—lower running costs, more innovation—outweighed the extra burden. Efficiencies spurred by regulation will not create a low-carbon energy industry by themselves. But they do more to meet the goal than is usually recognized. ⚙️

**Excerpt** *The Economist*

## Natural gas trends



## Fracking, exports and storage, oh my

Rife with tension and uncertainty are fracking, gas storage and exporting the very same natural gas that had only just begun to ease prices down. So what's next?

Multifamily accounted for a whopping \$18.03 billion in energy bills a decade ago, a number that has only grown alongside overall residential energy use since then, and then add some because of the country's shift from home-ownership to rentals. That was 15 percent of U.S. energy consumption in 2005, the latest year for which this data is available from the U.S. Department of Energy.

### Fracking grows up

Fracking's large footprint on our industry and our country is hard to ignore. Long thought to be the country's energy salvation, it has something for everyone: jobs, controversy, cheap fuel, mystery, geopolitical leverage and dirty water.

This March, the process of hydraulic fracturing, known as fracking, celebrated 65 years since the first patent was issued in 1949 to Halliburton Oil Well Cementing Company. All these years later fracking has matured to elevate the U.S. to lead position in global oil and gas production.

March seemed a big month for energy on other fronts, as well. One of the largest gatherings of researchers and those who drill oil and natural gas (IHS CERA Week) gathered in Houston to discuss a plan to address,

among other things, the environmental concerns of fracking, and its stigma.

"There is a better appreciation for the need to take seriously the need to protect the public and reassure the public this shale boom can be done safely," Jason Bordoff, director of the Center on Global Energy Policy at Columbia University said.

Many think the shift in transparency has more to do with the increasing number of wells making their way toward populations and further from remote oil fields. Dealing with nearby residents will become a must as wells continue to encroach cities and towns.

### The big chill: exports

And then there's the Russian invasion of Crimea. Putin's latest move is heating up the discussion of U.S. gas and oil exports to Europe, a discussion that, heretofore, had been generally stalled on Capitol Hill.

Six European nations rely on Russia for 100 percent of their gas, while seven others get at least half their gas from Russia. And Europeans won't be drilling themselves out of the problem any time soon since European property owners don't have subsurface rights to their property, as do many Americans.

"Why would you be in favor of drilling on your property if you don't stand to gain anything from it?" said Chris Finlayson, chief executive of British energy company BG Group, in regard to instances where mineral rights are controlled by governments, instead of by individuals.

Until now the Obama administration has stood as the last hurdle in the move to export natural gas from the U.S. There are over 20 export license applications stalled at the Department of Energy (DOE), the oldest for over 800 days.

Primarily Dow Chemical, closely-tied to the administration, has lobbied heavily to stall exports out of concern that it will raise domestic prices.

While the world hungers for natural gas, the truth is that it will still take time for Europe to see any American liquefied natural gas (LNG); the first U.S. LNG export terminal out of the six approved isn't expected to start production until late 2015.

With all the controversy circling natural gas and making matters worse for consumer prices, an unusually cold March eroded stockpiles already at an 11-year low.

About 49 percent of U.S. households use gas for heating, especially in the Midwest according to the U.S. Energy Information Administration (EIA). With more cold weather forecasts looming, it seems hard to catch a break on utility bills. This is not good news for apartment owners or their residents.

Who could have prepared for such a perfect storm of rising energy costs, weather, and politics? It's critical to our operations and our residents that we get in front of energy prices because this is certain: energy prices will remain volatile and we are tied to this ebb and flow until we make and improve channels to control costs.

Old models of gas price drivers based on hurricane activity in the Gulf of Mexico have been replaced by a new model. Prices are now tied to everything from Putin invading Crimea to how much is left in storage to weather in the Northeast.

Thanks to an unusually cold winter and supply bottlenecks, natural gas recently hit its highest price since December 2008. So how long will prices stay elevated and how can one possibly get ahead of the game?

### A penny saved

Under normal conditions, natural gas consumption is cyclical. Historically, between April and November more natural gas is produced than consumers demand. Producers use a system of underground pressurized storage that builds inventories until mid-fall



which are then used through winter. That said, in recent years gas has started to partially displace coal as a raw fuel for electricity generation which has had a moderate increase in natural gas demand during the summer months of air conditioning use.

Natural gas is stored in depleted oil or gas reservoirs, in natural aquifers, or in salt caverns. Federal energy forecasters in March predicted that natural gas prices next winter will average about 3 percent higher than they did this winter. Still, gas supplies will re-build as production increases.

The arctic weather that hit much of the nation created record demand that consumed an enormous surplus of gas in storage according to the EIA.

But it could have been worse. Despite record temperatures not seen in over a generation, natural gas storage levels and new supply such as fracking helped control price spikes in wholesale markets to a few days.

While prices have fallen since February, they have yet to drop to where they were a year ago and probably won't until reserves reach previous levels according to the EIA.

Continuing cold weather is expected to keep reserves down through April, and set the stage for record production through the spring and summer. Gas producers are expected to ramp up production in order to take advantage of the higher prices.

The EIA projects a surplus by 2018 leaving supplies robust enough for a healthy export market.

Until then and beyond, multifamily will need to stay in tune to an ever-changing globalized market and political ebbs and flows of pricing. ⚙️

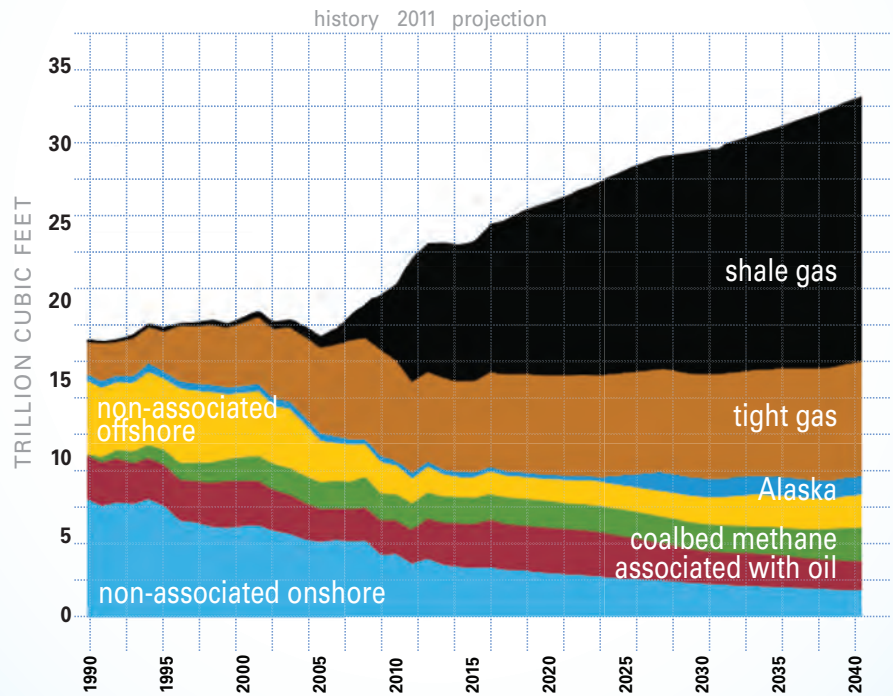
**Authors** Tom Spangler is one of the elder statesmen in resident utility billing, meaning he has spent entirely too much time trying to explain what he does to people outside the multifamily industry. Spangler is a consultant currently serving as energy manager for Greystar. Prior to that, he managed ancillary income and utility expense programs for UDR for over a decade. Spangler is a lifelong Virginia gentleman and has an engineering degree from Virginia Tech and an MBA from the Darden School at UVA. Tom lives in Richmond, Va.



Darren Novich is managing partner at The Energy Link where he reduces energy costs for some of the largest multifamily companies in the country. Novich has also worked with several energy supply providers. He served four years in the U.S. Air Force and graduated from the

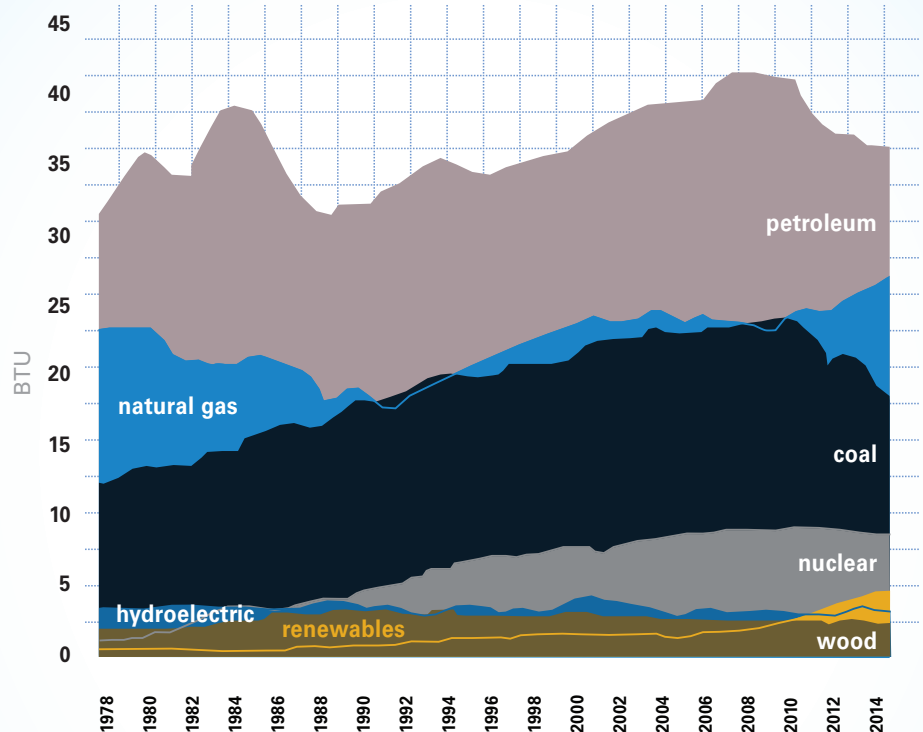
University of Florida. Novich lives near Atlanta, Ga. His knowledge and experience as an energy trader gives him the advantage against any therm or Kwh.

## U.S. dry natural gas production



SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION, ANNUAL ENERGY OUTLOOK 2013 EARLY RELEASE

## Energy consumption in the U.S.



SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION

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