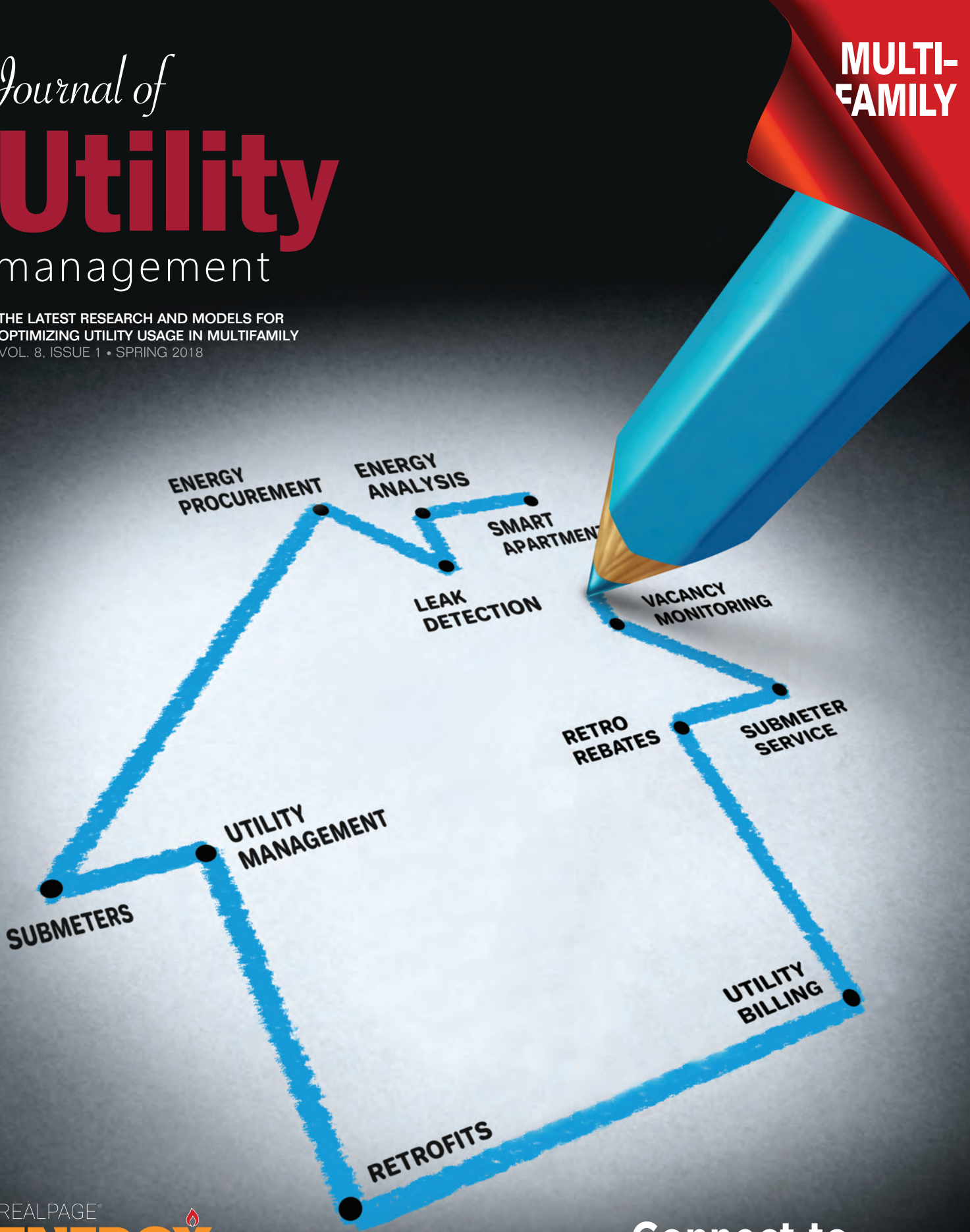
Journal of
Utility management

THE LATEST RESEARCH AND MODELS FOR OPTIMIZING UTILITY USAGE IN MULTIFAMILY
VOL. 8, ISSUE 1 • SPRING 2018

MULTI-
FAMILY



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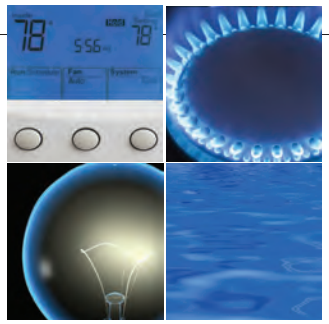

Journal of **Utility** management

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The art of traction

The phrase "where the rubber meets the road" is all about proof of power, the combination of horsepower and torque. It is taking things from a theoretical, purely mathematical application to a practical experience. It is about making the connection and demonstrating results.

The first step to understanding how to control your utility expenses and manage your recovery is to understand the "how." We have to take things from the theoretical world into the real world. That is our job; it is both thrilling and terrifying, especially if you are not sure how. Reality is, that the "how" requires learning, experimentation, and discovery.

In our last issue we got back to basics, talked about what the new "basics" are and scratched the tip of the "how" iceberg. I am excited to share that this special "Energy Summit" issue of the *Journal of Utility Management* is about making the connection—bringing rubber and road together. We are going to connect what is happening in amenities and how they affect your utility expenses (both negatively and positively). We are going to dive into benchmarking to see what trends are on the legislative horizon and we are going to explore the most "uncontrollable" elements of our world: resident behavior. This is an ambitious issue that intends to connect and educate you to all these things.

Additionally, making the connection is about bringing different people together to collectively share experiences. In the next few issues of the *Journal of Utility Management*, you are going to hear from some of our guest editors, who have practical experience bringing rubber and road together. You will be treated to their knowledge, proficiency and voices. You see, making the connection is not about me rambling at you, but expanding our basis of knowledge through the collective experiences we have had in our industry. By introducing you to our guest editors, we hope to expand the conversation (and we would be thrilled for you to join in on the discussion). You need to combine horsepower and torque to be the fastest car on the road. You want to manage utilities? You want to add value to the bottom line? Then let's explore the connection: the balance of education and experience. I hope that you are as excited to embark on this journey as I am.

Let's get connected.

Mary Nitschke
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As the data leads

It's simple—if you have and analyze the data. We did that. And it's how we became the first Energy Star Portfolio Manager Service and Product Provider well over a decade ago.

It's building an operation that is constantly analyzing what's now and planning for what's next. It's how we stay ahead of the curve, before anyone else is even thinking about the curve.

We've long understood the big future of utility management for the multifamily industry. We've been building for it for years. It's a trend we saw in the data. This laser-focus on utilities and sustainability provided a monumental head start benchmarking, data analysis and garnering the products needed to get apartment owners to the efficiencies needed—now. Benchmarking is a business where history matters.

What's next? As a matter of fact, we've been working on that, too.

Jason Lindwall
Publisher • jason.lindwall@utilitysmartpro.com

Why won't they turn out the lights?

The foundation for using energy responsibly is resident behavior. Benchmarking is important. Data analysis is critical. But connecting resident consumption with the "on" and "off" switch moves the needle. Can apartment operators really motivate residents to conserve energy and water in their apartments and make a significant impact? Behavioral scientists say "yes."

The concept of sustainability in today's world is complex. Its simple definition has shifted over time, but is generally thought to be: using only what we need so as to leave enough for future generations.

The single-family housing industry has had wide success in proselytizing homeowners on the concept through the Energy Star and WaterSense brands. Unlike apartments, this market lacks split incentives, since the person funding energy saving changes or adopting energy-saving behaviors is also the person saving operating costs. A focus on quantifying consumer savings allowed the EPA's Energy Star program to demonstrate the value of conservation for buyers. Today, Energy Star is one of the most recognized labels in the nation, claiming utility bill savings of $362 billion since its inception in 1992.

However, the for-rent model is far more complicated. It spans a wider range of products, markets, demography, operational models and more. While apartment operators are the single largest distributor of utilities in the nation, there is no universal payment model used when billing residents.

Some apartments include utilities in the rent with no resident visibility into consumption or service cost. Some apartments list rent and utilities as separate line items on residents' bills. Still others bill only rent while the residents purchase service directly from utilities. There are endless combinations of how apartment operators transact electricity, water, and cable, waste, and a growing host of other ancillary services within their property operations.

Given this diversity, how can apartment operators possibly unify a message of conservation across all operational models with any replicable and long-term result?

The world is changing. The need for resident participation in conservation efforts is growing as apartment businesses seek ways to meet lender and government benchmarks—and resident expectations

Such financial and social pressures intensify the need for shared accountability in results-focused programs. New ways of breaching the wall of split incentives—a clear and present barrier to apartment resident buy-in—are important to the ultimate goal of sustainability. With a third of the nation renting, a number that continues to rise, the successful execution of such a social campaign would have a wide impact.

Social marketing steps in

What is social marketing and how can it help? In the apartment business the goal of traditional marketing is to persuade prospects to rent an apartment at your community. Social marketing uses the same methods to coax individuals into adopting new behaviors, attitudes or ideas. It seeks to influence social behavior, not to the benefit of the marketer, but to benefit the target audience and the wider society.

The use of social marketing to influence behavior, especially as related to human health, has been around since the 1970s. Think of the anti-smoking campaigns or Mothers Against Drunk Driving's campaign to assign a designated driver when planning a night out.

Using social marketing to promote conservation is a more recent phenomenon as identified in *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*. Written in 1996 by the environmental psychologist Doug McKenzie-Mohr, and now in its third edition (2011), the work is a primer on the concepts of community-based social marketing (CBSM).

Apartment owners and operators are in a position of influence with regard to advocating environmentally-friendly behavior. In fact, the authors cite the residential environment as providing a significant opportunity to influence sustainable behavior.

The core values of an apartment company are transmitted through its employees to its communities. Having sustainability as part of the corporate mission is a good start to a social marketing campaign for sustainability, since it's harder to sell any concept from scratch. But what are the action steps beyond that?

Dr. McKenzie-Mohr recommends using the scientific method in devising a sustainable CBSM campaign. That means that the results of the campaign must be measurable. The results should also be compared to

changes in behavior of a "control group," not exposed to the campaign so that the campaign's effectiveness can be assessed.

"CBSM is based upon research in the social sciences that demonstrates that behavior change is often most effectively achieved through initiatives, delivered at the community level, that focus on removing barriers to an activity while simultaneously enhancing the activity's benefits," said Jennifer Tabanico of Action Research, a company that promotes behaviors that lead to clean, healthy, sustainable communities. "CBSM brings together knowledge from the field of social marketing with a variety of behavioral change 'tools' drawn from social psychology, environmental psychology, and other social sciences."

5 steps to campaign success

With these overarching concepts in mind, you're ready to begin developing your community's CBSM.

1. Select a target behavior—The campaign should focus on behaviors meeting two thresholds:

a. No behavior can be divisible: Example: Reducing electricity usage is a behavior that can be approached many different ways, each of which is distinctly different with its own barriers and benefits. Complexity dilutes the campaign narrative. On the other hand, turning off a computer when not in use focuses on a single behavior.

b. Every behavior should have an end state—Stated more simply, pick behaviors that are linked to the outcome. Visiting a website does not save energy, but making the thermostat adjustment could.

Choose behaviors with high potential for success by charting:

Impact. Choose sustainable behaviors with the highest fiscal impact. In water-burdened areas, those initiatives targeting water savings might be more impactful than saving electricity.

Penetration: What sustainable behaviors have already taken root in your community that might be expanded? Behavioral change is best propagated at close range. If the community has a recycling program, leverage those already engaged to draw in others.

Probability. What's the potential of your community engaging in the proposed behavior? Select low hanging fruit to get started.

The winning trifecta? Changes with high impact, low levels of adoption (room to improve), and high probability of willingness to change. Promoting behaviors that already exist but have low levels of adoption is easier than launching a campaign from scratch.

2. Barriers and benefits—Internal barriers include a lack of knowledge or motivation and unsupportive attitudes. External barriers are generally those things that are outside of the individual's control–difficulty of program participation, complex forms to fill out, availability of technology. Just as uncovering the objection in the sales process is the first step to overcoming it, so too, is determining the barriers (and benefits) to your sustainability program.

Often, people fear that such initiatives aim to solve problems that the community didn't ask to be solved. Communication is critical.

3. Develop a strategy—This includes the behavior you wish to promote as well as the one you wish to discourage. One tool is social diffusion, the adoption of new behaviors because neighbors have, is a simple technique for the neighborhood environment. At the heart of CBSM is its use of behavior change tools from the social sciences. This also includes social norms, commitments, prompts, cognitive dissonance and others.

4. Run a pilot—Testing on a small scale is important to achieving cost efficiency in the rollout. Once you have a winner, remain consistent in delivery to maintain effectiveness. It's important to not only demonstrate behavior change, but also behavior change for the least cost. Test multiple strategies against one another to determine which has the best ROI.

5. Implementation—You're ready for launch. Feedback to the community is another important step to a high level of success.

How does it work in practice?

Think Blue was a San Diego campaign that set out to reduce pollution from storm water runoff. Think Blue was developed as a wider concept to gather specific, targeted community campaigns under one brand. One such initiative was for La Jolla Shores Cove. The city identified bacteria levels in the Cove as a preservation and safety priority.

Tabanico was part of the campaign. The goal was to reduce cigarette butts, pet waste, gutter debris and standing water running into the bay, causing elevated bacteria levels. A direct business outreach program was created to educate businesses on the problems and to provide them with information on best practices to lessen them.

The San Diego program ran 18 months with notable results. Gutter debris decreased 77 percent, gutter water decreased 67 percent and standing water from washing down-beach equipment decreased by 85 percent. These results were all significantly better than those obtained at a nearby community that had been exposed to the Think Blue campaign but had not received the direct outreach coaching.

Tabanico will be a key note speaker at the RealPage Energy Summit in Richardson, Texas, in April.

Mapping the IoT value model for apartments

The internet of things (IoT) has taken the nation by storm. However, its value to an apartment operation is as varied as the nation's rental product itself. While home chore automation and security have inspired a surge of innovation and enthusiasm, a more direct and obvious driver of cost recovery is already in place for many apartment properties: energy management.

The ability to remotely monitor and control things in the physical world has already changed much of our everyday life, from how companies manage physical assets to how cities operate.

Being able to monitor, manage and acquire data on objects from anywhere has also enabled data-driven decision making, further optimizing system performance, processes and operational intelligence.

McKinsey, a global research firm, estimates that the application of IoT in the area of residential energy management will save over $110 billion in energy annually by 2025. In addition to residential automation, the research notes the impact of smart city initiatives. Municipalities that implement smart meters to reduce loss of electricity through distribution, and sensors to detect water leaks, are projected to add as much as $69 billion in savings per year globally.

For apartment owners and operators, the value proposition on asset energy conservation is simple to prove, and with the right platform, not difficult to implement.

Connecting the dots from utility consumption to consumer

IoT has come with a lot of buzz and even more hype inside the apartment world. Many promise disruption. Few connect the dots to ROI.

Further complicating the ability to quantify the payback is the fragmentation of the apartment business model. The apartment business is not a single business—but many businesses. These days, it's not even always apartments, but can be single family homes.

The automation of energy management is definitive on delivering ROI. Implementing energy management across different products, regions and payment models is driven by one thing: Everyone uses energy. While complicated by disparate billing methods and more, much is being done to strengthen the connection from energy provider to consumer and to positively impact that relationship.

If we're unified on the goal of reducing energy consumption, how do we, as owners and operators, get there? And what is the value opportunity with the technology that's available now?

Just as Uber and others turned transportation into a service, so too do apartment operators have the opportunity to turn energy management into a service. It begins with data.

Facility IoT vs. home IoT and the expansion of ancillary services

Facilities IoT includes equipment with sensors connected to a network. This ecosystem exchanges, stores and collects data which can be used to benchmark, analyze and economize a business operation.

Facilities IoT is the bedrock of many hotels, hospitals, factories—and apartments, at least in common areas. The history of energy management is found in environments with a single line of sight to the building owner, often with short term residents who were purpose-driven: hotel guests, hospital patients, and factory workers. These spaces are also workplaces.

Resident IoT includes light bulbs, dropcams, voice assistants—those devices, controlled over the internet that are portable and owned and operated by the resident.

Home IoT, on the other hand, includes features like smart door locks and thermostats. These devices belong to the apartment owner but are operated by the apartment renter.

In addition to the rented unit, apartment owners often include ancillary services as value-adds to residents. Ancillary services are where residents are offered features and services connected to their apartment. Those can include traditional services like internet, or newer services like notification of a package arriving in a smart locker.

The added capabilities provided by home IoT devices will make a new generation of ancillary services possible.

Apartments are different

Apartments are homes. And apartments are facilities. Split incentives means the owner is responsible for the asset and the non-owner (renter) occupies the space. In office space, for example, building owners can adjust temperatures to find the perfect balance between cost and comfort. This is not possible with apartments, where control of the residents' space is private and protected.

For decades, federal agencies have worked to collect and identify the nation's energy consumption across all built environments in order to plan for future needs. Apartments are one of the last, but also one of the largest, sectors to benchmark energy usage. Acquiring whole building data has been fraught with challenge since resident utility consumption wasn't available under existing privacy laws. New laws and aggregated data have begun to open the doors to identifying paths to conservation.

Following other commercial sectors

Buildings are far from static structures. The convergence of IoT and energy management has turned the built environment into a data-rich field. An effective energy management program can capture, communicate, and analyze crucial energy and operational data, and transform this data into tangible operational performance.

Environmental sensors for temperature, humidity, occupancy, and leak detection are game changers—when integrated as a whole property system. Meters already monitor utility consumption for water, air, gas, electricity and steam (WAGES). Analyzing this data and understanding what it means is a new degree of visibility and operational intelligence. Such diagnostics and control delivers significant movement in preventative maintenance and energy efficiency.

Connected sensors, meters, and controls create the physical infrastructure, as do computing gateways, software and the cloud. The key is putting the ensuing data stream to use. In an apartment environment, that means engaging both the operations team and residents with knowledge, while highlighting what's important.

Residents who are provided information on their energy consumption in real time, in a way that does not raise privacy concerns, are empowered to make positive changes. Controlling heat, lights and appliances remotely benefits everyone. Setting rules for actions like turning down the heat at night or turning on the dishwasher when electricity rates drop is a win for residents and owners. Such a system should provide notifications when it senses residents are wasting energy, for example, by having the air-conditioning on when they are away. Yet, it cannot be seen as hectoring and must be easy to use. Smart thermostats with default settings are high-value, particularly for student and senior properties.

While luxury and other higher-end market rate communities should focus on making certain facilities IoT integrates with resident IoT, the bottom line is data.

A unified platform gets relevant data to those who need it, as well as enabling information sharing and collaboration.

Essentially, integrating technologies to deliver better insight and, in turn, better performance is the fastest way to pay-off. A whole-system operation rests in the platform and its visibility into the widest view of data points.

The internet of apartment things

Mapping the ROI value for apartment owners

Facilities IoT
Owners own it.
Owners operate it.

- WATER HEATERS
- IRRIGATION SYSTEMS
- COMMON AREA UTILITIES

RENTAL APARTMENT
IoT ecosystem

Residents' IoT
Residents own it.
Residents operate it.

- SMART LIGHTBULBS
- VOICE RECOGNITION UNITS
- SMART PLUGS

Home IoT
(ancillary services)
Owners own it.
Residents operate it.

- SMART THEROMOSTATS
- ACCESS SYSTEMS
- PACKAGE LOCKERS

IoT energy management

WILL SAVE
$110 billion
in residential energy annually by 2025

Edge computing provides a faster, more responsive system—necessary for time-critical apps

How edge processing works

facilities IoT + energy management

= most significant ROI potential for apartments

What to look for as rental apartment IoT matures

Business processes will transform operations through
- predictive maintenance
- better asset utilization
- intelligence-driven decisions

Home IoT/ancillary business models will expand as
- remote monitoring enables anything-as-a-service
- Data analysis uncovers opportunities

SOURCE: MCKINSEY; NETWORK WORLD

Coming to a city near you?

Denver recently passed its Green Roof Initiative requiring new and existing buildings to add green spaces to rooftops. Is your city next?

The residents of Denver, Colo., voted to institute a Green Roof Initiative. Buildings over 25,000 sq. ft. must now build out a portion (20-60 percent depending on the size of the building) of their building's roof space as green—or dedicated plant space.

The new building code, which officially went into effect Jan. 1, 2018, requires that all new buildings constructed on or after this date dedicate a portion of their roof to green space. The space can include plant material, a community garden, urban agriculture, or similar treatment. The space may include a combination of plant materials and solar as specified by the ordinance.

The code also requires that all existing buildings greater than 25,000 sq. ft. and over 4 stories high add green space to their roof at the time of normal roof replacement.

Failure to comply with the mandate will result in fines, imprisonment, or both, states the ordinance.

Exemptions include Energy Star-rated buildings, schools and buildings deemed unable to handle the structural load required, and buildings that are 100 percent solar.

Still, many buildings will be required to comply with the new law with the cost falling on the developer or building owner.

Cost is the main concern surrounding such an initiative. Green roofs can cost as much as $15 more per sq. ft. than traditional roofs.

Denver joins San Francisco, the only other U.S. city to effect a mandatory requirement of green roofs on new and existing buildings. At present, a larger number of cities across the country offer incentives for those building or retrofitting green roofs, in order to encourage green roofs.

There is no doubt that this initiative will impact both on our environment and the construction environment in Denver. Will your city be next to adopt this requirement?

Lori Hanson, CAM, CAPS is based in Denver, Colo., and currently serves as a Client Services Manager for Greystar, where she is responsible for organizational initiatives, client relations, and project management. Lori began her career in the multifamily housing industry in 1999, and has held a variety of positions both at the on-site and corporate levels. Lori holds a BS in Management from the Metropolitan State College of Denver and a Master of Science degree in Management from Troy University.

Raze the roof

The upside/downside of a green roof

green roof 101

reduces storm -water runoff

Reduces HVAC cooling load

50-75% REDUCTION IN COOLING LOAD

reduces urban heat island effect

absorbs CO^2 removes airborne particles

2 to 3 TIMES THE LIFESPAN

greater lifespan than asphalt

effective insulation

+25% IMPROVE -MENT

SOURCE: EBS CONSULTANTS

- installation and maintenace more expensive than traditional roofs
- social benefit—private expense
- adds load requirements to building
- there is no data on the actual impact of green roofs

watch for

- Root damage to man-made elements
- Soil moisture differentials leading to ground settlement, which can structurally damage buildings
- Damage from falling branches
- Leaves and debris clogging drainage systems
- Moisture retention where sun and wind can't dry building elements = deterioration
- Access into building by vermin/pests
- Waterproofing and building envelope damage

Top U.S. cities with the most intense urban heat island

(Fahrenheit)

Las Vegas	7.3°
Albuquerque	5.9°
Portland	4.8°
Louisville	4.8°
Washington, D.C.	4.7°
Kansas City	4.6°
Columbus	4.4°
Minneapolis	4.3°
Seattle	4.1°

SOURCE: PRINCETON

The Hanging Gardens of Babylon could arguably be called the world's first green roof.

Top down green buildings

Green roofs—solar, garden and combination—are making their way across the country, with the latest ordinance now in effect in Denver, Colo. As owners and operators assess what such measures add to the cost of multifamily construction and retrofits, many wonder about the benefits, detriments and pay-offs of this latest regulatory trend.

Green roofs are nothing new. The first were constructed around 500 B.C. The Hanging Gardens of Babylon are one of the Seven Wonders of the Ancient World. Centuries later, Europeans insulated their roofs with sod to keep homes cool in the summer and warm in the winter. Today, Germany is the leader in green roofs—12 percent of all its flat roofs are green, a number growing by 10 to 15 percent each year.

While green roofs can include both solar and vegetation, most recent laws specifically mandate garden roofs.

Dreaded split incentive

As more cities work to meet their mandated conservation thresholds, looming deadlines have caused some to replace incentives and rebates with laws and mandates.

In 2016, San Francisco became the first U.S. city to incorporate green roof requirements, following rules mandating solar.

Denver residents voted in its Green Roof Initiative even though developers estimated that green roofs would add costs of $15 per sq. ft. and more to roofs, with slow or no fiscal recovery. And while the benefits of garden roofs are environmental and social, their up-front costs are borne by developers. Further complicating apartment business models is the fact that the new Denver rules apply retroactively to product already in the pipeline.

Historically, incentives have provided some balance to the cost equation, making it possible for builders to make deals pencil financially. Regulations, on the other hand, can be burdensome and may create financial models that do not work, thereby impeding development.

Carnegie Melon[1] research suggests that, while green roof installation and maintenance costs more, the social return to some apartments may be favorable. Property location, climate, cost of energy and type of green roof are all important factors in achieving a positive payoff model.

Yet, it's a moving target. While not all locations currently provide good financial models for green roofs, technology, costs, and processes continue to evolve. The technology could eventually mature to be cost effective on a wider scale, while providing social benefits in presently tough-to-pencil climates.

Value proposition

Not all green roofs are the same. Planted roofs are classified by soil depth, load capacity and function. Extensive green roofs may include thinner soil depths, meaning less weight, expense and maintenance. Intensive green roofs are built with deep soil and many layers. They are more costly and require significantly higher maintenance. A combination of solar panels and vegetation has been shown to improve the performance of both.

There are property owner advantages to green roofs: Rooftop gardens provide greater control of storm water runoff, deliver a longer lifespan over asphalt and provide credits toward LEED and other green certifications.

Benefits to residents include better building insulation from climate and noise (10 to 30 percent, per the EPA) and, in some cases, community garden features. Urban neighborhoods benefit from a reduction of the heat island effect, improved air quality through increased oxygen/carbon dioxide exchange, and biodiversity that provides spaces for birds, insects and wildlife.

Green roofs offer a longer useful life than conventional roofs through the protection of the waterproof membrane from ultraviolet light. Plants and the substrate act as a natural barrier from weather. The green roofs of Rockefeller Center in New York City still have the same waterproofing membranes as were installed in the 1930s.

It's hard to know how Denver's Green Roof Initiative will affect the city's rental market. Economist Greg Willett with RealPage has projected another 12,000 apartments to come online this year. Residents absorbed most of last year's new inventory, holding the city's occupancy rate at 94.3 percent.

Denver's Initiative requires that all new buildings constructed after the first of this year dedicate a portion of their roofs to green space. Existing residential buildings greater than 25,000 sq. ft and over 4 stories must add green space at the time of normal roof replacement.

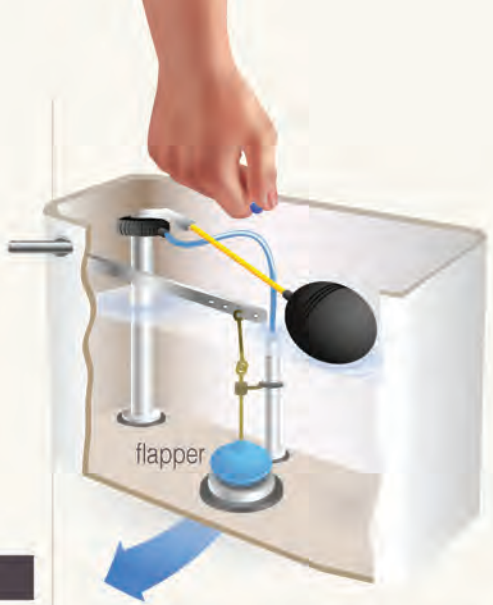
[1] cmu.edu/gdi/docs/cost-effectiveness.pdf

H^2-uh-oh

Toilets account for the single biggest point of indoor water use...

Over 24% according to the EPA. A running or leaky toilet can waste up to 200 gallons of water in a single day. Multiply that by the number of bathrooms on your property and that's serious waste that could be solved with something as inexpensive as new flappers. Many property managers automatically change the flappers upon turnover.

The simple way to check for a leak is to run a dye test. Add a drop of food coloring or a dye tablet to the tank. Wait 15-20 minutes. If dye is present in the bowl, there's a leak.



FAULTY FLAPPERS

CAN COST HUNDREDS OF DOLLARS A MONTH AND UP TO

1,400
GALLONS
OF WATER PER WEEK

BAD CASE OF THE DRIPS

THE AVERAGE HOUSEHOLD LEAKS MORE THAN 10,000 GALLONS OF WATER EVERY YEAR, OR THE AMOUNT EQUIVALENT TO WASHING

270 **LOADS OF LAUNDRY**

ENERGY-WATER NEXUS

The relationship between energy and water is getting more attention in light of growing water and energy demand.

National water-related energy use is expected to increase as water-stressed states like Texas, Florida, Arizona and California shift toward more energy-intensive technologies such as desalinization and inter-basin water pipelines. These shifts will have an appreciable impact on future energy demand. There is still much to be done to quantify water-related energy use.

THE CALIFORNIA PRIMER

OF THE ENERGY CONSUMED IN CALIFORNIA, HOW MUCH IS USED IN THE PROCUREMENT, USE AND DISPOSAL OF WATER?

1/5 OF ITS ELECTRICITY

1/3 OF ITS NATURAL GAS

STATE OF DROUGHT

40 OUT OF **50** STATES EXPECT WATER SHORTAGES IN SOME PART OF THEIR STATE IN THE NEXT DECADE

RESIDENTIAL USES OF WATER

SOURCE: IOP SCIENCE, 2016 WATER RESEARCH FOUNDATION, EPA, CALIF. ENERGY COMMISSION

H^2O ENERGY HOG

25%

MORE U.S. ENERGY IS USED PROCESSING AND DELIVERING WATER THAN IS USED TO LIGHT THE NATION

WATER PROCESSING STEPS

THE ENERGY NEEDED TO DELIVER WATER IS AS SIGNIFICANT AS ITS AVAILABILITY

COLLECTION
TREATMENT
CONVEYANCE
DISTRIBUTION
END-USE PREP
RECONDITIONING
RELEASE

Keeper of the keys

The architect may design it. The builder may build it. The manager may even lease it. But no one knows about the physical performance of a property—inside and out—like the maintenance team. In fact, a recent study found that maintenance techs (or facilities managers) have direct or indirect impact on 82 percent of the points related to Leadership in Energy and Environmental Design(LEED) certifications. Now that's power.

This story begins with energy. Apartment buildings, along with other built environments, use over 75 percent of all electricity produced in the U.S. These same buildings generate nearly half of the country's CO_2 emissions through lighting, pumping, heating, cooling and other operational needs.

New construction techniques improve building performance, but over 90 percent of the U.S. housing stock was built before 1990. Nearly a fifth of that was built in the 1970s. Construction circa-70s, as it turns out, is a legacy that conservationists would rather forget but for the millions of units it has left in its wake. It has proven the worst energy performing construction of all time according to data coming in from NYC's mandated benchmarking.

Even with retrofits, building owners and operators have an uphill climb in achieving their energy reduction and conservation targets, as well as simply maintaining the property. What are we missing here?

Facilities operators—typically the maintenance team in apartments—are the ultimate drivers in the campaign to keep the community running, and now, to meet energy use reduction standards.

No pressure, but the value of energy efficiency is rising by the day. From green loan discounts to the social impact sought by residents, to the fluctuation of energy costs, there is a direct and immediate line of sight to financial pay-offs. This tension will continue to shine a light on results.

All the performance calculations in the world come down to operation

"Include your maintenance team early and often," said Paul Rhodes, National Apartment Association National Safety and Maintenance Instructor. Rhodes will speak at the RealPage Energy Summit in April, 2018. His message: Get maintenance teams on board with conservation projects.

Rhodes has long understood the direct impact of site teams on building performance. "Too often, maintenance teams are an afterthought to energy and facility performance," he said. "In fact, they are the front line in the on-going condition of the asset, as well as its performance—including energy."

Agencies setting the national standards for green building performance agree with Rhodes: "Maintenance teams play a crucial role in implementing these strategies in order to achieve certification," states the Well Building Standard (WELL). LEED and WELL continue to update their standards requiring greater knowledge and skill levels on the part of apartment maintenance teams.

While the roles and responsibilities of maintenance teams vary greatly by organization, it remains the primary responsibility of these teams to maintain safe, efficient and healthy-built environments.

In 2013, LEED raised requirements for building performance around energy and water. Site personnel are at the center of the new standards that cover everything from safe cleaning practices to proper maintenance to upkeep of toilets, sprinkler heads and more.

The drive to improve energy efficiency will only intensify. Maintenance crews must continue their education on building systems with an eye to what building owners expect in the way of building performance. At the same time, building owners should consider the full consequences of their maintenance protocols.

Staff incentives, meant to help, can actually deconstruct conservation, rewarding methods that are at odds with asset performance and efficiency. For example, bonuses tied to lowering spending can steer site staff to use less expensive, replacement parts to make repairs that offer less efficient performance. Another example occurs when communities are understaffed and time is at a premium. Many efficiency retrofits are not simple installation. If calibration, finetuning or resident training is required for the full operational value of the upgrade, the extra time needed may be lost in the effort to cut install time.

Even with the perfect alignment of incentives, product and installation, maintenance programs, said Rhodes, "Goals around efficiency are often lost over time. It takes constant follow up. Those on the front line of the asset often have the greatest power to move the needle."

Reference: cmu.edu/gdi/docs/cost-effectiveness.pdf, An Overview of Building Stock by Lawrence Berkeley National Laboratory, LEED standards, WELL standards.

Measure what you manage

Energy Star began identifying energy efficient computers and printers in 1995, and the rest is history. Today, it has rated thousands of apartment properties across the country through its Portfolio Manager benchmarking tool, most recently adding waste to its line up. Most importantly, it's fast becoming the catalyst for local legislatures to mandate benchmarking to drive energy efficiency. EPA's goal, with its average 30 percent savings on the utility bills of apartments utilizing Portfolio Manager: save over $9 billion annually across multifamily housing by 2020.

Energy Star for multifamily, a history

In 1999, Environmental Protection Agency (EPA) created an Energy Star program for buildings. It followed the popular Energy Star rating system that it had created earlier for appliances. To support the building program, EPA developed a free on-line tool called Energy Star Portfolio Manager. Portfolio Manager can be used to evaluate buildings which fall into EPA-defined building classes. It produces a score between 1 and 100 in assessing how efficiently the subject building utilizes energy when compared to other buildings in its class.

The rating provided by Energy Star Portfolio Manager is based on the Commercial Buildings Energy Consumption Survey, which is done every 4 years by the Department of Energy.

Since a building's score is based on how well it performs compared to other buildings of the same class, as the performance of buildings improves generally, the rating for a given building may drop over time, even if it is using no more energy than before. Therefore, a building owner must continually seek energy efficiency improvements in order to maintain the building's rating.

Initially, use of the Portfolio Manager tool to assess a building's energy efficiency was voluntary. Building owners would choose to assess their buildings for a variety of reasons, such as their desire to save money on energy expenses or to be able to market their building as green in order to appeal to environmentally-conscious residents.

Later, incentives were devised to encourage building owners to assess the energy efficiency of their buildings. For example, both Fannie Mae and Freddie Mac offer preferential loan terms in order to encourage energy conservation. Fannie Mae specifically cites EPA's Energy Star Multifamily certification as being a green building certification which would qualify the building owner for a lower interest rate on their loan.

Not satisfied with the pace of assessing all commercial buildings for energy efficiency, some municipalities moved to make assessment mandatory. They were encouraged by interest groups such as the City Energy Project, a joint initiative of the Natural Resources Defense Council and the Institute for Market Transformation.

Multifamily properties were sometimes exempt from commercial building reporting mandates since, for properties with submeters, data on the total energy and water usage was not available to the building's owners. Sharing resident utility data with owners was considered a violation of the residents' privacy rights. Laws were rewritten allowing utility companies to provide aggregated usage data to the building owners in order to enter it into Portfolio Manager.

Today, a number of cities and some states require that multifamily properties above a certain size report their energy and water usage data through Energy Star Portfolio Manager. Annual filing dates begin as early as April 1.

The nuts and bolts of rating

To be eligible to receive an Energy Star rating, a multifamily property must meet certain criteria. It must have 2 or more units per building, and 20 or more units on the property. The property's occupancy must also be more than 75 percent.

Energy Star classifies multifamily buildings as being low-rise (1-4 stories), mid-rise (5-9 stories) and high rise (10 or more stories). If a building has different wings which fall into different height classifications, the number of units in each height classification is counted separately.

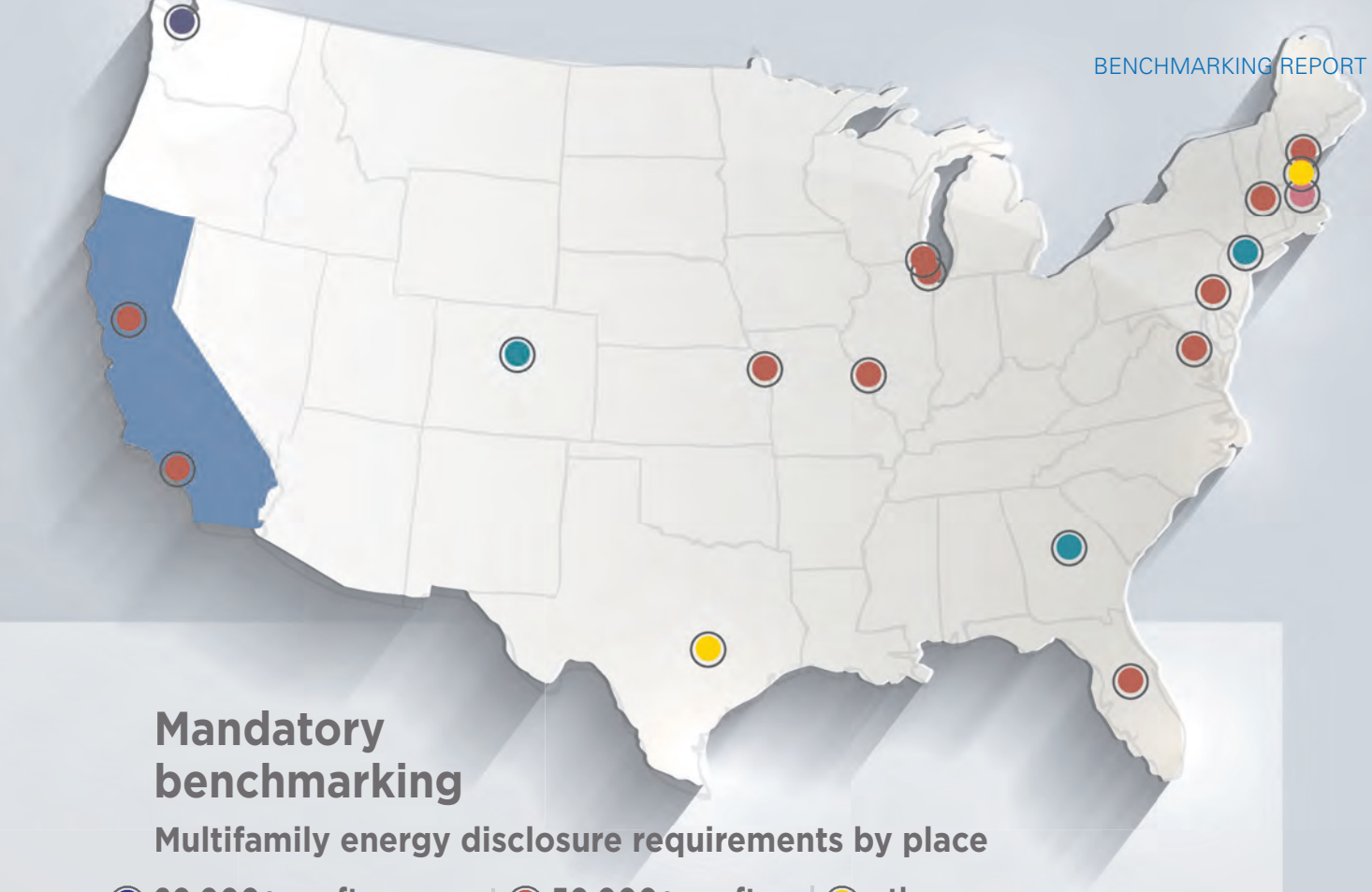
The data that must be entered into Portfolio Manager in order to obtain an Energy Star rating for a commercial building includes the property name and address, its gross floor area and irrigated area, the year it was built and its occupancy percentage. The total number of residential living units, and the number of residential living units in each of the three building height categories must also be submitted. The total number of bedrooms on the property is also required.

Optional information that may also be entered includes the resident population type (student, military, senior, etc.), whether the property is government subsidized, the number of laundry hookups in all units, the number of laundry hookups in common areas, the percent of the property that can be heated and the percent of the property that can be cooled. It is possible that information that is optional today may become mandatory tomorrow, so building owners should consider providing it.

Energy and water usage must be provided from twelve consecutive complete months of energy and water bills. The information must cover the "whole building" usage, which includes consumption of both common areas and that of all of the residents. The meter name or ID must be included.

While the task of entering all of your property's data into the Energy Star Portfolio Manager can seem daunting, EPA has designated companies as Energy Star Service and Product Provider (SPP) partners to assist building owners in this process. They may help the owner enter the building survey data, enter and verify the utility data and generate property performance reports. RealPage of Richardson, Texas, was the first to partner with EPA as a SPP (through its acquisition of NWP). Since then, RealPage has helped thousands of multifamily properties meet its benchmarking requirements.

The process can take from two weeks to two months. Building owners need to determine the mandatory reporting date for their jurisdiction and take this lead time into consideration when planning how to comply.



Mandatory benchmarking

Multifamily energy disclosure requirements by place

20,000+ sq. ft.

Seattle

25,000+ sq. ft.

Atlanta
Denver
New York City

35,000+ sq. ft.

Boston *35,000+ sq. ft. or 35+ units*

50,000+ sq. ft.

Berkeley, Calif.
Chicago
Evanston, Ill.
Kansas City, Mo.
Los Angeles
Orlando
Philadelphia
Portland, Me.
St. Louis, Mo.
Washington, D.C.

other

Austin *5+ units*
Cambridge *50+ units*

In 2019, California will impose a benchmarking mandate on multi-family buildings of more than 50,000 sq. ft. Berkeley will reduce the minimum size building for mandated reporting to 25,000 sq. ft., and Evanston, Ill. and Los Angeles will reduce the minimum size building for mandatory reporting to 20,000 sq. ft.

For detail such as to whom to report, penalties and government links: realpage.com/utility-benchmark/

The first Service and Product Provider (SPP) on Energy Star Portfolio Manager, and multifamily advisor to EPA was **RealPage**

30% SAVINGS
is achieveable and cost-effective on a multifamily property

2.4% AVERAGE ENERGY USE REDUCTION
over 3-year period of buildings that benchmark

7% AVERAGE ENERGY SAVINGS
and 6-point ENERGY STAR score increase among Portfolio Manager buildings

SOURCE: EPA

Use Less Energy and Water While Spending Less for Them

RealPage® in-house energy experts use industry-leading data analytics to find opportunities for you to reduce energy consumption and expense. We help multifamily companies like yours take advantage of competitive energy rates, tax exemption savings and conservation project opportunities. And we can help you stay compliant with the latest energy benchmarking reporting requirements.

Find out how we can help.
Go to www.realpage.com/energy-mgmt
or call 1.877.325.7243

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