# WATTS HOT Newsletter®

YOUR SOURCE FOR ENERGY, TECHNOLOGY, SUSTAINABILITY & RESILIENCY

APOLLO Engineering Solutions®

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## DOCTORS OF ENERGY – ON THE ROAD AGAIN

Where did summer of 2017 go? Hope you enjoyed some time off, the solar eclipse and beach parties with families and friends.


Thank you to all the participants that attended the New England Regional Council of NAHRO (NERC) meeting in June and dropped in for our session *Resilience – The New Sustainability - Will Your PHA be Ready?* Worth repeating with the recent tropical storms is the quote we used to open the NERC session. *It has been said that when the time to perform arrives, the time to prepare has passed* William H. Bennett, noted clergyman. **Watts Hot Newsletter®** will continue to address topics and issues related to resiliency for multifamily and public housing communities. If you couldn't make the session and interested in getting a copy of the presentation, drop me a note at wattshotnewsletter@gmail.com. Would be happy to send you a copy.

## Going to NAHRO's 2017 National Conference and Exhibition, October 27-29 in Pittsburgh, PA?

The Conference and Exhibition will be at the David L. Lawrence Convention Center. Featured speakers include Rocky Bleier - War veteran, national collegiate football champion, and four-time Super Bowl champion with the Pittsburgh Steelers. Hear the latest budget and policy developments coming from the *Hill* and HUD. Most important, don't forget to stop by the 2rw/ Enlightened exhibition booth for a free energy checkup by the Doctors of Energy. Consultation on a wide range of energy and water efficiency topics are available, together with some laughter and storytelling. Drop your business card off for a chance to win a door prize. The Doctors - Bob Somers, Mike Nail, Ken Loar, and Dick Santangelo will be available to discuss an energy checkup on your buildings. Stop at Booth 101 and say *hello* or wave as you go by!

## UPCOMING EVENTS

- **Eliminating the RAD Cap in the FY 2018 Budget Bill**
  September 7, 2017
  Teleconference

- **2017 PHADA Legislative Forum**
  September 10-12, 2017
  Washington, DC

- **National Council of State Housing Agencies Annual Conference**
  October 14-17, 2017
  Denver, CO

- **RAD Fall Collaborative Convening**
  October 18, 2017
  Washington, DC

- **2017 NAHRO National Conference and Exhibition**
  October 27-29, 2017
  Pittsburgh, PA

- **Greenbuild International Conference and Expo**
  November 8-10, 2017
  Boston, MA

# Energy Efficiency and Its Health Impacts*

The indoor environment is a significant determinant of population health. People in industrialized countries spend approximately 80% of their time indoors[1]. Those at extremes of age or in poor health are likely to spend considerably more time at home than others; they may be particularly affected by changes to the indoor environment. The energy efficiency industry, together with the health sector has an important role in ensuring healthy indoor environments for all.

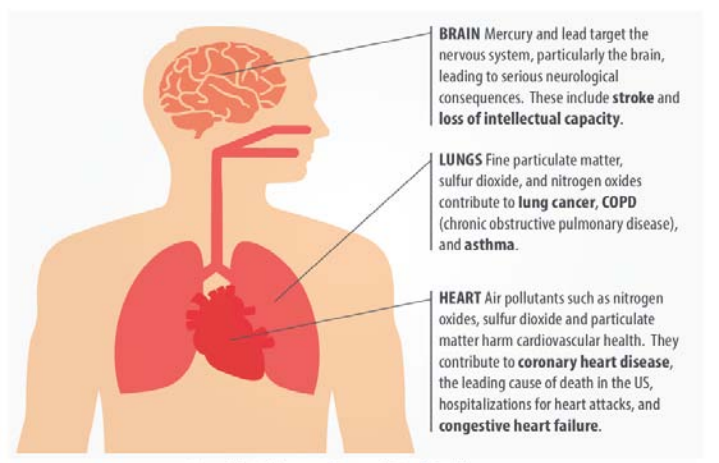
The energy efficiency industry today is focusing its use of technology and best practices to reduce costs, save energy, and produce the same or better levels of services, while improving air quality, comfort and convenience. Lowering the amount of wasted energy reduces our need to burn coal and other fossil fuels to generate electricity. Those reductions in pollution mean big gains for health, as pollutants from fossil fuel combustion contribute to four of the leading causes of death in the United States: cancer, chronic lower respiratory diseases, heart disease, and stroke. These pollutants damage all the major organ systems in the body.

**Changes in the climate also affect the air we breathe, both indoors and outdoors.** The changing climate has modified weather patterns, which in turn have influenced the levels and location of outdoor air pollutants such as ground-level ozone (O3) and fine particulate matter. Increasing carbon dioxide (CO2) levels also promote the growth of plants that release airborne allergens (aeroallergens). Finally, these changes to outdoor air quality and aeroallergens also affect indoor air quality as both pollutants and aeroallergens infiltrate homes, schools, and other buildings. Poor air quality, whether outdoors or indoors, can negatively affect the human respiratory and cardiovascular systems. Higher pollen concentrations and longer pollen seasons can increase allergic sensitization and asthma episodes and thereby limit productivity at work and school.

**Fossil fuel pollutants**, particularly fine particulate matter and nitrogen oxides, contribute to serious respiratory health problems including: lung cancer, which kills more men and women in the US than any other form of cancer; COPD (chronic obstructive pulmonary disease), the third leading cause of death in the country, and asthma, which is at epidemic levels and is disproportionately harmful to children, especially minority and poor children.

**Air pollutants** produced by burning fossil fuels harm cardiovascular health. They contribute to coronary heart disease, the leading cause of death in the country; hospitalizations for heart attacks; and congestive heart failure, when the heart cannot pump enough blood and oxygen to support other organs in the body.

**Pollutants released by burning coal** target the nervous system, particularly the brain, leading to serious neurological consequences. These include stroke and loss of intellectual capacity due to mercury exposure. Finally, burning fossil fuels contribute to climate change by releasing large quantities of carbon dioxide and methane. Climate change leads to extreme weather events that can severely affect health, from heat waves, droughts and extreme storms to expanding the habitats of disease-carrying insects. ACEEE's Fact Sheet Energy[2] - Efficiency and Health contains an illustrative diagram of the Health Effects of Fossil Fuel Pollutants.



Health Effects of Fossil Fuel Pollutants

Incidents of temperature-related death and illness are on the rise[3]. The number of deaths and illness have increased with concentrations of greenhouse gases. Greenhouse gases lead to an increase of both average and extreme temperatures. This is expected to lead to an increase in deaths and illness from heat and a potential decrease in deaths from cold particularly for many communities especially vulnerable to these changes, such as children, the elderly, and economically disadvantaged groups. Days that are hotter than the average seasonal temperature in the summer or colder than the average seasonal temperature in the winter cause increased levels of illness and death by compromising the body's

ability to regulate its temperature or by inducing direct or indirect health complications. Loss of internal temperature control can result in a cascade of illnesses, including heat cramps, heat exhaustion, heatstroke, and hyperthermia in the presence of extreme heat, and hypothermia and frostbite in the presence of extreme cold. Temperature extremes can also worsen chronic conditions such as cardiovascular disease, respiratory disease, cerebrovascular disease, and diabetes-related conditions. Prolonged exposure to high temperatures is associated with increased hospital admissions for cardiovascular, kidney, and respiratory disorders.

When we improve our efficiency, we reduce the cost of doing business or running a household. We also strengthen our economy by producing goods at a lower cost and creating jobs. Technology upgrades to improve the way your home, building, or business functions typically require some up-front investment. Investments in new systems, better lighting, and insulation lower energy bills. In fact, many types of efficiency upgrades can generate savings for decades.

Some investments, such as insulation in an attic or replacement of an air conditioner, require the help of a specialized installer. This also creates jobs for the local economy. The money that is saved on utility bills goes back into the pockets of property owners and public housing authorities. This ***cost avoidance*** savings gets spent by owners and PHAs to improve the asset value of their properties, creating even more jobs in the local economy.

We in the affordable housing market serve what many have called ***populations of concern***. Climate change is already causing, and is expected to continue to cause, a range of health impacts that vary across different population groups in the United States. The vulnerability of any given group is a function of its sensitivity to climate change related health risks, its exposure to those risks, and its capacity for responding to or coping with climate variability and change. Vulnerable groups of people, include those with low income, some communities of color, immigrant groups (including those with limited English proficiency), Indigenous peoples, children and pregnant women, older adults, vulnerable occupational groups, persons with disabilities, and persons with preexisting or chronic medical conditions. Characterizations of vulnerability should consider how populations of concern experience disproportionate, multiple, and complex risks to their health and well-being in response to climate change. Improving energy efficiency benefits everyone, but especially those sensitive to volatile energy prices: people on fixed or lower incomes. A wide variety of programs are offered by the federal government (e.g., HUD), states, utilities, and local municipalities to ensure that energy efficiency upgrades are affordable and available to those who need them most.

The bottom line of any discussion involving energy efficiency and its impact on health is that energy efficiency is good for our economy, our environment and our health. Multifamily property and PHAs should include energy efficiency as a substantial part of their strategic plans to comply with federal clean air regulations and improve human health of the residents and the communities we serve.

*Many thanks and credits go to the following organizations for their efforts in researching, collecting and presenting the latest information on energy efficiency and health impacts.

[1] Dr Angie Bone MBChB, MRCP, MSc, MFPH (corresponding author), Specialist Registrar Public Health Protection Agency, 7th Floor Holborn Gate, 330 High Holborn, London WC1V 7PP, 07803 010792, angie.bone@o2.co.uk

[2] American Council for Energy Efficiency Economy (ACEEE)/Physicians for Social Responsibility Fact Sheet; http://aceee.org; http://www.psr.org

[3] USGCRP, 2016: *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment.* Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312

# State of Multifamily Energy and Water Benchmarking 2017

*By: Jon Braman, VP Strategic Initiatives, Bright Power*

Jon Braman is our featured writer this quarter on the topic of Multifamily Benchmarking. *You can't manage, what you don't measure* is a basic precept in an effective utility and cost management strategy. Jon Braman is the Vice President of Strategic Initiatives and Energy Analysis at Bright Power. Jon provides oversight, team coordination and mentoring to ensure Bright Power's multifamily clients can successfully understand and manage energy and water over the long-term. He works with building owners, engineers, policy-makers, lenders and advocates to implements cutting edge R&D initiatives and scale up clean energy business strategies for real estate. Jon has published research on green buildings, benchmarking, multifamily energy and water programs, and speaks regularly at conferences on multifamily benchmarking and energy initiatives.

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Energy and water benchmarking is a simple concept that can mean very different things to different people. For some, the phrase conjures a burdensome and impractical requirement – especially the collection of resident utility data where providers don't make it easy. For others, benchmarking seems like an almost magical catalyst that can unleash a future of high performance, low-carbon buildings. The reality includes both. But whatever your perspective, it's safe to say that in the last decade benchmarking has gone from "cutting edge" to a mainstream practice of the multifamily real estate world. Still, we're just getting started.

Launching EnergyScoreCards platform in 2009, Bright Power has been a leader of multifamily benchmarking for some time, continuing to work with visionary real estate companies, publish research and share best practices ever since. In this article, I draw on that experience to shed light on this rapidly evolving real estate practice, and answer common questions.

**Who is Benchmarking?**

By summer 2017, 18 cities and one state now require multifamily buildings over a certain size to benchmark, and sometimes publicly disclose energy and often water consumption (Source: **http://www.buildingrating.org**). That's big, and between California's requirement taking effect next year, the expansion of the NYC law to include buildings 25k – 50k sf and HUD's new benchmarking rule in development, the number of properties benchmarking annually is set to increase dramatically in the next year. To give a sense of scale, in terms of square footage and CO2 emissions, covered multifamily buildings in NYC alone represent 1.5 Billion square feet and 7.5 million megatons of emitted annually CO2. In Chicago it's 260 million square feet, emitting 1.9 million megatons of CO2, Seattle has 100 million square feet of benchmarking multifamily buildings, Boston 66 million, Philly 5.4 million square feet – and the list goes on.

These numbers, understate the total multifamily properties that benchmark their energy and water consumption, since many do it voluntarily – including the 112 of the 345 partner organizations (that is *portfolios* not buildings) that have signed up for the Better Buildings Challenge, or a number of 250 members of the Global ESG Benchmark for Real Estate (GRESB), an investor led sustainability reporting framework, which includes some of the country's largest multifamily owners and managers. In other cases, lenders like Fannie Mae, Freddie Mac or housing agencies like NYC Department of Housing Preservation and Development (NYCHPD) or the Pennsylvania Housing Finance Agency (PHFA) require that borrowers, or at least those accessing green programs, benchmark their energy consumption, adding to the number of participating owners.

While benchmarking policies undoubtedly include some owners who have been reluctant and may do as little as possible to avoid a fine, the success of voluntary programs shows that leading multifamily owners are now doing it on their own accord; they've reached the conclusion that benchmarking provides real business benefits, and is necessary to proactively manage their properties and stay competitive.

## How Does It Work and Where Do I Start?

Utility bill-based benchmarking rarely requires any new hardware to be installed to collect consumption data, but that doesn't mean it's simple. While even just getting owner-paid data for a large portfolio can require collecting at least 12 months of historical data for hundreds or thousands of utility accounts, the real elephant in the room for multifamily properties is tenant data, which is needed in one form or another to assess whole building consumption and spending, usually required for compliance with local laws. Some utilities have made it easier by providing aggregate whole building data and integrating with ENERGY STAR Portfolio Manager, meaning owners may comply with the laws without having to manually type in utility data, or pay a service provider to retrieve and transfer it.

For other utilities, however, getting tenant data requires the laborious process of getting individual authorizations from residents and then collecting data from the utility, often extrapolating a whole building estimate from a (hopefully) representative sample. Even when working with utilities that integrate with Portfolio Manager and provide whole building data, a building owner still must set up the connection to Portfolio Manager (which often involves some amount of troubleshooting), and collect and enter property information (including square footage, units, bedrooms, information on commercial spaces, etc.). Fortunately, the EPA posts a searchable list of the utilities that offer automatic data integration, HUD has created a helpful benchmarking toolkit, , and many cities with benchmarking requirements also provide a benchmarking hotline or other resources to help with compliance.

While some building owners have the time and interest to take on benchmarking DIY, most prefer to seek assistance from specialized software or service providers to collect, curate, clean and analyze the data. The good news is there are now several options for getting help, including:

- Signing up for a multifamily benchmarking service such as Bright Power's EnergyScoreCards service (which for full disclosure I helped create and oversee) or WegoWise;
- Utilizing a bill aggregator or bill-pay service to transfer data to Portfolio Manager such as Ecova, AUM, NWP, Conservice; or others.
- Using a more broadly-focused sustainability reporting services like Goby or Measurabl, which may include integration with Portfolio Manager.

If you need to or want to benchmark and you don't want to go it alone, there are many companies now ready to assist, some of which have now been running for years, gaining in experience and capability, offering better service and value. Given a range of different offerings, getting an apples-to-apples comparison between providers is critical.

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## What Can I Do With Benchmarking Data?

Too many conversations about benchmarking begin and end with talking about data. Insight and action are the goals – not just data collection. No one ever saved a kWh or made a building better just by staring at numbers on a screen – no matter how quickly they arrived there or how engagingly they were presented. Translating data into insight and action can be done in dozens of ways, from peer comparisons to identifying candidates for building upgrades, to watching trends and tracking progress toward goals, to measuring the impact of specific energy and water saving projects. Unfortunately, benchmarking laws, and even some benchmarking data services, seem to trust that once building owners collect the data, getting value from it will just happen automatically.

At Bright Power, we've seen that while a few owners are adept at translating data into action, most need help from an expert. There are a dizzying number of possible ways to slice and dice and crunch utility data, so performing the right analysis to answer your questions, and then knowing what to do with the answers is difficult. Even simply comparing energy usage between two properties to see which is more efficient is not a simple task: Given differences in geographies, building and equipment types, ages, different metering configurations and other factors, a reasonable expectation for consumption varies from property to property. Buildings are complicated and a meaningful peer comparisons is a complex and evolving field

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(see our recent blogs and whitepaper on the EnergyScoreCards grading model.) Providing analysis and insights from data is really the driver of success for real estate companies.

There's no one-size-fits all answer to how to use energy and water data, but one long-term Bright Power client may spark ideas for how to use benchmarking in your own portfolio. This client, a large portfolio spanning 23 states, began benchmarking several years ago as the key to satisfy GRESB reporting requirements and show their investors they take sustainability seriously. In the last few years, our Energy Analyst and Account Management teams used property spending and consumption data from EnergyScoreCards to identify the sites with the greatest potential for energy and water savings, and target those that could benefit from specific technologies like lighting upgrades or combined heat and power.

We then overlaid project feasibility and savings potential with eligibility for utility and state incentive programs across the country, and identified sites that could receive the largest subsidies for new equipment or more detailed energy audits. Using this strategic, data-driven approach, our engineering and installation teams completed 19 energy audits and over 30 installation projects ranging from common area LED lighting retrofits, to comprehensive whole building energy and water upgrades, to combined heat and power (CHP) installations. Where work has already been completed, we are tracking month-to-month consumption to ensure expected savings materialize, and the owner can rest assured that we are ready to troubleshoot if things don't go as planned.

## What's Next?

In 2007, Bright Power collected data the old-fashioned way and performed a lot of our analysis using spreadsheets. There were no benchmarking disclosure laws and no national multifamily score from ENERGY STAR. There were bill processing companies but few if any who had meaningful analytics for multifamily. Multifamily benchmarking has come a long way in the last 10 years. If current trends continue, we can count on benchmarking to grow as a practice among real estate owners, and the process continuing to get easier, as more utilities provide whole building data and more service providers hone their methods for capturing, storing and analyzing the data. More owners will also successfully follow their own version of the process described above, moving beyond data collection to use the information to drive significant portfolio wide projects to save energy and water, cut operating costs, improve resident comfort, access millions of dollars in incentives and improve the value and longevity of their properties.

The next big frontier in multifamily energy and water data may dive deeper into the data, looking at interval or "real-time" information that tracks consumption on a daily, hourly, or even 15-minute basis, allowing owners to more quickly catch problems and enabling a much deeper level of analysis than possible from monthly utility bills.

Many companies are working on devices and platforms to capture and analyze this type of data, although most remain rather expensive for the typical multifamily building. This more granular data may already make sense for applications like catching leaks, monitoring large HVAC systems, or participating in demand response programs with onsite generation technologies like CHP and batteries. Sometimes, this data is already available from new utility smart meters; in others, it will require installation of new hardware, but the costs appear to keep coming down and capabilities expanding. Really, if you're interested in understanding how multifamily buildings use energy and water – things are just getting interesting.

# 179D Energy Efficiency Rebate Savings Continue at PHAs


***The Chicago Housing Authority (CHA)realized nearly $100,000 in savings as part of the rehabilitation of public housing units through a Federal Energy Policy Act tax incentive that encourages the installation of energy efficient measures. The tax code provision, known as 179D, encourages building owners to incorporate energy efficiency measures in the design and construction of public and private buildings.***

The Chicago Housing Authority (CHA) realized nearly $100,000 in savings as part of the rehabilitation of public housing units through a Federal Energy Policy Act tax incentive that encourages the installation of energy efficient measures. The tax code provision, known as 179D, encourages building owners to incorporate energy efficiency measures in the design and construction of public and private buildings.

The CHA's Investment Division, working with tax consulting firm Efficiency Energy LLC, has pursued 179D benefits on rehabilitation projects throughout its portfolio. The tax provision allows the CHA to share tax savings in partnership with its designers and contractors for the value of the qualifying energy efficient systems.

Building owners that install these energy-efficient components are allowed a tax deduction of $.60 cents to $1.80 per square-foot for buildings placed in service through last year. This is made possible by Section 1331 of the Federal Energy Policy Act (EPACT) of 2005, which enacted Section 179D of the Internal Revenue Service Code, providing a deduction to energy-efficient commercial buildings. Eligible projects included interior lighting systems, HVAC, hot water systems and building envelope.

CHA identified multiple projects in which energy-efficient improvements had already been implemented, including boiler replacement, lighting, domestic hot water replacement and HVAC. CHA's contractor then obtained a third-party certifier to confirm the energy-efficient components had been installed and that they improved industry standards. Currently, CHA has one other similar rebate pending with the IRS and anticipates receiving the second savings soon. The generated revenue would then go to non-federal funds. CHA has negotiated $205k (total) in savings from two projects and helping sister government entities implement and manage 179D programs. CHA also facilitated nearly $1M to the Chicago Public Schools via contract rider. In addition to CHA, the Boston Housing Authority has also secured $239k in savings from lighting retrofits completed 2013-2016.

**179 Update** - A 179D extension through 2019 and increase to $4.75/sf via the **Clean Energy for America Act** was recently introduced in the Senate and a permanent extension at the current $1.80/sf was recently introduced in the House of Representatives. A **recent study** posited the potential **extension and expansion of 179D could create 77,000 jobs**. *Watts Hot Newsletter*® will keep you apprised of further legislative efforts. Efficiency Energy, LLC remains available at your convenience to discuss current outstanding (as well as potential) allocations available to PHAs and multifamily owners. Don't leave hard earned money on the table. Retroactive opportunity remains to recover allocations from new construction and lighting/HVAC/envelope retrofits completed 2013-2016.

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# An Alternate Approach to Financing Energy Infrastructure Improvements

Occasionally, usually out of necessity a great idea comes along. Energy Performance Contracting (EPC) in the late 80's early 90's filled a need as an innovative financing technique that uses cost savings from reduced energy consumption to repay the cost of installing energy conservation measures. Normally offered by Energy Service Companies (ESCOs), this innovative financing technique allows building users to achieve energy savings without upfront capital expenses. The costs of the energy improvements are paid back out of the energy savings. Other advantages include the ability to use a single contractor to do the necessary energy audits and retrofit and to guarantee the energy savings from a selected series of conservation measures.

Recently, affordable housing owners and PHAs have looked at alternative financing approaches, resulting from reductions in federal funding. Second on their list of priorities is the aversion to long term debt and commitment. With an evolving landscape in the affordable housing market, is there an alternative approach to achieve energy and water efficiency without locking my development into a long-term debt that can also affect my credit rating? As owners seek to enhance efficiency while modernizing their buildings through brick and mortar capital improvements, crediting worthiness can be adversely impacted by long term debt.

Two basic building owner premises exist that keep owners and their maintenance staff up at night. First, energy and water infrastructure is unreliable, inefficient and the victim of deferred maintenance. Second, owners and PHAs alike, have critical priorities they simply must accomplish after which there is no time, energy or budget for infrastructure. The long-term goal for a property owner would be to replace the old with new and keep it forever young, while addressing the need to reduce operational costs and perform as conscientious stewards of the environment.

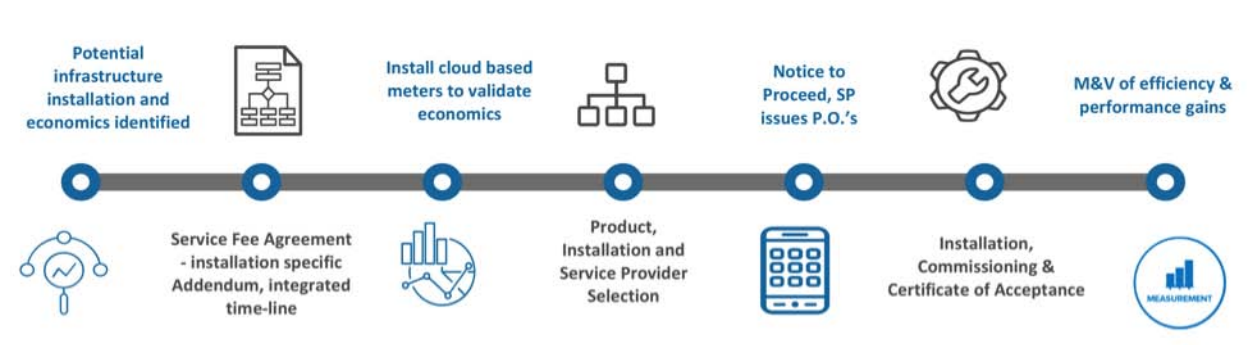
Think about the possibility of energy and water efficiency like your utility service, not an intensive, debt-laden capital investment. A pay-as-you-go, Service Usage-Based Model for affordable housing may be worth considering, particularly the all-inclusive services associated with a Usage-Based Model approach.

**A typical Service Usage-Based Model includes:**

1. Replace Old Equipment with New Equipment at Zero Cost
2. Owner, Through Competitive Process, Achieves Cost Reasonableness; Choose Projects Where Benefits are Greatest: Lighting, HVAC, Water, Motors and Drives, Building envelope, etc.
3. Once Replaced, the Service Provider Keeps These Items Performing Reliably and Efficiently
4. No Required Guarantees, Minimums or Multi-Year Contracts; No Debt Service
5. Service Provider Pays to Keep New Infrastructure Forever Young Through Maintenance, Upgrades and Replacement
6. Infrastructure Upgrades Paid Through Usage Fees

Another advantage of the Service Usage-Based Model is the streamlined process compares to Energy Performance Contracting. Typically, the Service Usage-Based Model is a streamlined process from 20 steps in an EPC to just 7 steps for the Service Usage-Based Model, saving owners overhead and administrative costs and generating cost savings sooner.

Typical process flow chart includes the following steps:



## How do the Economics of a Service Usage-Based Model Work?

The numbers get calculated on both the specific site characteristics and the products that the client and Service Provider agree on. For each specific project, the Service Provider constructs a client spreadsheet, based on all the cost, usage and time factors. The efficiency service fee is similar to the current utility bills, an owner or PHA would receive monthly. The client would continue to pay their utility bills to their utility companies. The client would pay a service usage fee to the service provider for the improved efficiency that includes maintenance, upgrades and eventual replacement. Each month the client can expect a net savings in utility costs from its reduced consumption, including the Service Usage-Based Model fee.

Since it can't be predicted how a client is going to consume energy going forward, what their electricity rates are going to be, what their HVAC system efficiencies will be, etc. the Service Provider, will generally demonstrate a Year 1 savings. The expectation though, is that many of the outside factors, such as utility rate increases, particularly water, will increase utility savings every year, going forward.

When it comes to lights and external watering systems, the savings can easily be envisioned using the Service Usage-Based Model approach. The competitive advantage of the Service Usage-Based Model comes into play with energy systems such as HVAC, cooling towers, chillers, boilers. Here the benefits include not only the traditional cost avoidance savings but also involve utilities savings (cost avoidance) plus planned and unplanned maintenance on the equipment. Taking the discussion one step farther, if it is an asset that will absolutely need to be replaced in 10 years, the replacement costs are included. The Service Usage-Based Model approach is a comprehensive approach, designed to permanently reduce a client's capital and operating expenses and significantly reduce downside risk given that most clients have no option but to use equipment until if fails (run to failure).

Also, keep in mind the opportunity cost of waiting; what is the loss on using an owner's or PHA's capital, alternatively, what are the soft costs to go through a procurement process to source and finance a project which the Service Usage-Based Model can do in a more streamlined and efficient manner? The Service Usage-Based Model may sound like a power purchase agreement (PPA), often used with renewable solar installations. The Service Usage-Based Model is quite different in 2 key ways. Most PPAs require long-term commitments. The Service Usage-Based Model is on a month-to-month basis, no long-term commitment is required. Also, the inventory of eligible energy and water equipment, including building envelope is more expansive under the Service Usage-Based Model than is permissible under a PPA.

**The Service Usage-Based Model may be value-based proposition, worth your consideration as you move forward on the development of your energy and water efficiency project. We will be covering more on this innovative approach in the coming year. Contact us at wattshotnewsletter@gmail.com if you would like to learn more information.**

# Utility Forecast Fall/Winter 2017-2018

*Source: Energy Information Administration*

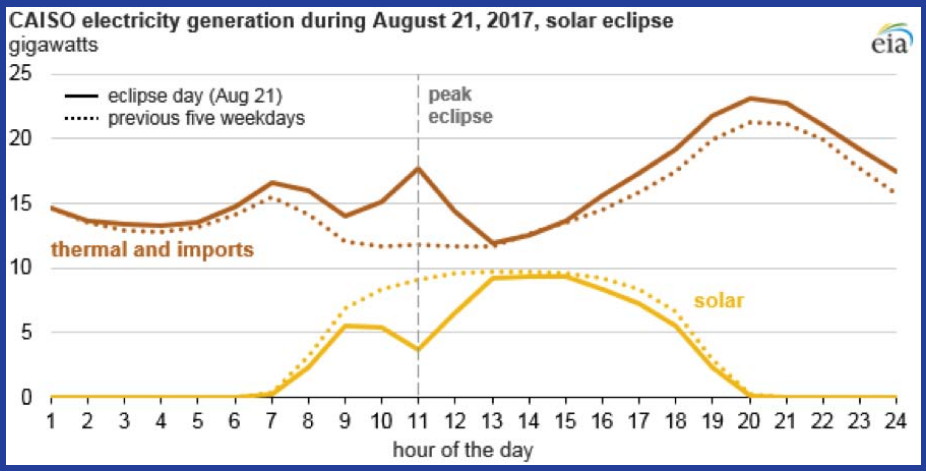
### Think the Solar Eclipse Was Just Another Cosmic Event? Think Again…

The U.S. Energy Information Administration (DOE-EIA) reported that California increased electricity imports and natural gas generation during the solar eclipse.

During the solar eclipse that passed across the continental United States on August 21, 2017, solar output on the California Independent System Operator (CAISO) electric system dropped while the sun was partially obscured. Much of the decrease in solar output was made up by increased electricity imports and increased generation from thermal units, most of which is fueled by natural gas.

*Photo: NASA*

The chart below depicts the reduction in solar output and the compensating increase in electricity imports and increased power generation from natural gas during the eclipse.




*Source: U.S. Energy Information Administration, based on California Independent System Operator, Daily Renewables Watch*

Although California was not in the path of totality during the eclipse, meaning the sun was not completely obscured, California contains 43% of the national total for utility-scale solar and 40% of small-scale solar, (as of May 2017). Much of the state's solar capacity is located in areas where sunlight was obscured by as much as 60%–70% during the eclipse.

Based on an average of the previous five weekdays, CAISO's solar power output typically increases to about 9.1 gigawatts (GW) between 10:00 – 11:00 a.m. Pacific Time, or to roughly 31% of total load. On August 21, as the moon partially obscured sunlight, CAISO's solar power output fell to a low of 3.6 GW for that hour, about 60% lower than normal.

CAISO oversees the operation of the bulk power system in much of California, operating 89% of California's 10.0 GW of installed utility-scale solar capacity (based on data as of May 2017), including larger solar photovoltaic and solar thermal systems of at least one megawatt (MW) in capacity. In addition, California contains 5.7 GW of small-scale PV capacity (based on data as of May 2017). Electricity generation from small-scale capacity is not directly captured by CAISO but is reflected in a smaller overall load.

For the first time, EIA's *Short-Term Energy Outlook* (STEO), includes forecasts for small-scale solar photovoltaic (PV) capacity and electricity generation. EIA forecasts that total U.S. small-scale solar PV capacity will grow from 14.3 gigawatts (GW) at the end of April 2017 to 21.9 GW at the end of 2018. The forecast 2018 capacity includes 13.7 GW in the residential sector and 8.2 GW in the commercial and industrial sectors. Annual U.S. small-scale solar PV electricity generation is expected to grow from 19,467 gigawatt hours (GWh) in 2016 to 25,400 GWh this year and 32,900 GWh in 2018.

EIA categorizes PV systems that have a generating capacity of less than one megawatt (MW), which are typically installed on business or residential rooftops, as small-scale systems. Small-scale solar photovoltaic (PV) data are based on reported alternating current (AC) capacity and may differ from other capacity estimates that use direct current (DC) ratings of PV panels. Solar PV systems in the residential sector accounted for **more than half of U.S. small-scale solar capacity** in 2016, even though individual residential PV systems are typically relatively small. The commercial sector, which generally has larger PV systems than the residential sector, accounted for 36% of total small-scale solar capacity last year. The industrial sector accounted for 8% of total small-scale capacity.

Residential small-scale solar PV capacity has increased significantly in recent years, reaching 7.4 GW in 2016, a 43% increase from 2015. Small-scale PV capacity in the commercial and industrial sectors has also grown, albeit at slower rates; the combined capacity in those two sectors increased 26% last year, reaching nearly 5.8 GW.

Barring any natural or man-made disasters the Energy Information Agency's short-term projects appear to be stable through first quarter of 2018.

- EIA forecasts that global petroleum and liquid fuels inventories will be largely unchanged in 2017 and then increase by an average of 0.2 million b/d in 2018.

## NATURAL GAS

- U.S. dry natural gas production is forecast to average 73.5 billion cubic feet per day (Bcf/d) in 2017, a 1.2 Bcf/d increase from the 2016 level. Natural gas production in 2018 is forecast to be 3.9 Bcf/d above the 2017 level.

- **Natural gas prices may rise** - In July, the average Henry Hub natural gas spot price was $2.98 per million British thermal units (MMBtu), about the same as in June. Higher natural gas exports and growing domestic natural gas consumption in 2018 contribute to the forecast Henry Hub natural gas spot price rising from an annual average of $3.06/MMBtu in 2017 to $3.29/MMBtu in 2018. NYMEX contract values for December 2017 delivery that traded during the five-day period ending August 3 suggest that a range of $2.17/MMBtu to $4.48/MMBtu encompasses the market expectation for December Henry Hub natural gas prices at the 95% confidence level.

## ELECTRICITY, COAL, RENEWABLES, AND EMISSIONS

- **Electricity prices may rise** - Total U.S. electricity generation from utility-scale power plants averaged 11,145 gigawatt hours per day in 2016. Forecast U.S. generation declines by 1.2% in 2017, which mostly reflects expectations of milder temperatures in the third quarter of 2017 compared with the same period last year. Forecast generation grows by 1.8% in 2018 based largely on a forecast of colder temperatures during the first quarter 2018 compared with the same period in 2017 and on the expectation of a growing economy.

- EIA expects the share of U.S. total utility-scale electricity generation from natural gas to fall from an average of 34% in 2016 to about 31% in 2017 because of higher natural gas prices, increased generation from renewables and coal, and lower electricity demand. Coal's forecast generation share rises from 30% last year to almost 32% in 2017. The projected generation shares for natural gas and coal are nearly identical in 2018, averaging between 31% and 32%.

- **Wind electricity generating capacity** at the end of 2016 was 81 gigawatts (GW). EIA expects wind capacity additions in the forecast will bring total capacity to 88 GW by the end of 2017 and 102 GW by the end of 2018.

- **Solar continues to grow** - Total utility-scale solar electricity generating capacity at the end of 2016 was 22 GW. EIA expects solar capacity additions in the forecast will bring total utility-scale solar capacity to 29 GW by the end of 2017 and to 32 GW by the end of 2018.

- After declining 1.7% in 2016, energy-related carbon dioxide (CO2) emissions are projected to decrease 0.3% in 2017 and then to increase 2.0% in 2018. Energy-related CO2 emissions are sensitive to changes in weather, economic growth, and energy prices.

# Energy Champions Podium

Each quarter *Watts Hot Newsletter®* will recognize *Energy Champions*, individuals in the affordable housing industry that are *game changers*. Their efforts and contribution have made a significant difference in policy, project design, energy innovation, sustainability or resiliency, improving the life of the residents they serve.

**Nominations for Energy Champions** are up to you, the reader. Say *Thank You for Your Service*, by nominating a colleague, industry professional that stands out in your opinion. An individual, group or team that has made a difference to your organization, community related to energy and water conservation, sustainability and resiliency. Provide a narrative as to why this individual(s) should be recognized. It is our intention that each quarter we share with our readers and recognize an individual(s) that is responsible for game changing outcomes. Unfortunately, for the summer edition we did not receive nominations. Remember sometimes a simple thank you is the best way to recognize dedication, loyalty and professionalism. To paraphrase a quote, *an individual that contributes to the benefit of others is like a four-leaf clover, hard to find and lucky to have.*

Congratulations to all the energy professionals that work every day to keep the air clean, residents healthy and support the goal of providing more opportunities for affordable housing.

# Watts Hot at HUD

## PIH Notices

**Guidance on HUD's Lead Safe Housing Rule Pertaining to Elevated Blood Lead Levels for the Public Housing, Housing Choice Voucher, and Project-Based Voucher Programs**
*Issued August 10, 2017*

HUD provides general guidance to PHAs, Housing Choice Voucher property owners and Project-Based Voucher property owners on the required actions they must take when a child in a family receiving HCV or PBV assistance is identified as having an elevated blood lead level (EBLL). The notice focuses on recent changes to HUD's Lead Safe Housing Rule as it relates to children identified as an EBLL.

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## HUD Releases Notice on RAD Cap Increase and Rent Setting

On August 23, HUD released a Federal Register notice that increases the unit cap for the Rental Assistance Demonstration (RAD) and sets rents for units accepted under the increase. The Fiscal Year 2017 budget of a 185,000-unit cap on Public Housing conversion was increased to 225,000. HUD also changed the September 30, 2018 deadline for submission of RAD applications under the first component to September 30, 2020.

- All new awards made because of the cap increase and any subsequent awards will use rent levels based on a FY16 RAD rent base year. HUD has now published the 2016 RAD rents for every public housing project subject. Projects issued CHAPs under the previous 185,000-unit cap will continue to use the existing rent table based on 2014 RAD rents.

- **Teleconference on Eliminating the RAD Cap in the FY 2018 Budget Bill:** Join us on Thursday, September 7 at 2:00 PM/EST to discuss prospects and steps in urging Congress to eliminate the RAD cap and extend RAD conversion authority to Section 202/PRAC projects for seniors.

  **When:** Thursday, September 7 from 2:00-3:00 PM/EDT
  **RSVP to:** info@radcollaborative.org so we can plan sufficient call-in capacity.
  **Call-In Info & Materials:** will be sent after Labor Day.

- **RAD Collaborative Convening:** Join us on October 18, 2017, 10:00 AM to 6:00 PM in Washington, DC. Plan to attend our fall convening on "taking the demonstration out of RAD" and making it a permanent program!

  **When:** Wednesday, October 18, 2017, from 10 AM to 6 PM
  **Where:** Hyatt Regency—Capitol Hill, Washington, DC
  **Registration & More Info:** Will open after Labor Day and be posted via a RC Update then and at www.radcollaborative.org. Space will be limited to the first 125 registrants.

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## HUD EPC Measurement and Verification Workshop (No Cost to PHAs)

The housing sector consumes about one-fifth of all energy consumed annually in the United States. HUD spends over $6B annually on heating, lighting, and cooling its portfolio of public and assisted housing, an amount increasing every year. PIH provides funding and regulatory oversight to approximately 3,200 Public Housing Authorities (PHAs), representing about 1.2 million public housing units.

The Secretary, as part of HUD's strategic plan, has established a Strategic Goal 3, *Utilizing Housing as a Platform to Improve the Quality of Life, and strategic goal 4, Build Inclusive and Sustainable Housing Free from Discrimination*. PHAs that engage an Energy Services Companies (ESCo) or undertake a self-managed project, endure performance risks to reduce utility costs, and to improve the quality of housing for residents through healthier living conditions, training, and job opportunities. Through HUD's energy and water saving incentives, PHAs are recognized and financially rewarded for their leadership in undertaking an Energy Performance Contract (EPC). The accurate determination of energy and water savings related to EPC incentives is critical to PHAs' subsidy eligibility process and the achievement of the Secretary's goals.

Accurate subsidy eligibility benefits all PHAs by ensuring the fair distribution of appropriation funding. Meeting a PHA's **fiduciary responsibilities involves** acting for the good of PHA and its residents, exercising reasonable care in all decision making, and, sound financial accountability without placing the PHA under unnecessary risk. All long-term energy and water contracts bear risk and are predicated on determining accurate energy and water savings to remain sound.

Developing your staff's capacity and capability to validate your project costs and savings is an important oversight responsibility related to effectively managing an energy performance contract. Training will roll out over the next 12 months. Six or more locations to be announced by HUD. *Watts Hot Newsletter®* will continue to report on the rollout schedule.

## Other News – Grant Opportunities

**Constellation Energy** believes that providing quality educational opportunities and career development are among the most important tools to help communities succeed long term. To that end, the energy company is accepting grant applications for local community-based projects designed to inspire students to think differently about energy.

Grants of **up to $25,000** will be awarded for projects at the 6-12 grade level and **up to $50,000** for projects at the college level. The company will give priority to team-oriented, learning-focused, hands-on demonstration projects that achieve specific results and reach a minimum of a hundred students. Proposed projects must be located in areas where Constellation Energy does business.

To be eligible, applicants must be a school, school district, or 501(c)(3) nonprofit organization.

See the Constellation Energy website for complete program guidelines, an FAQ, past featured winners, and application instructions.

**View Complete RFP here**.



## Contact Us

For further follow-up information on the *Watts Hot Newsletter®* articles or questions about the newsletter you can call or email:

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# Advertise in *Watts Hot Newsletter*®


*Watts Hot Newsletter*® is produced quarterly by Dick Santangelo and Mike Nail ("Doctors of Energy") focusing on the newest energy and water technology for the residential Multifamily housing marketplace. *Watts Hot Newsletter*® is a reference guide for the MF residential marketplace of proven technologies, services, and vendors.

The Doctors of Energy will share with readers their combined experience (over 80 years in the energy business) with products, services, and vendors with a proven record of accomplishment for success. We invite guest authors to share experiences in a communal environment of housing professionals to reduce operational costs and maintenance, while improving portfolio's resiliency. *Watts Hot Newsletter*® recognizes Energy Champions in our industry that have made significant contributions to conservation, sustainability, and resiliency in our Energy Champion's Podium.

Technology is technology. Whether you are private, non-profit, HUD-subsidized, state-financed, controlling operational costs are the key to quality housing. Energy and water costs represent a bigger share of your investment dollar every year, especially if your portfolio is aging. Finding the most effective technical solution to reduce energy and water costs is the common denominator.

*Watts Hot Newsletter*® current circulation of approximately 5,000, comprises MF property owners, non-profits, public housing authorities, housing industry organizations, HUD/DOE staff, energy services companies, energy consultants, RAD developers, financing institutions. As a leading housing energy technology resource, *Watts Hot Newsletter*® is a fantastic, cost-effective method to advertise to the affordable housing community. Advertising space is limited and is available on a first-come, first-served basis.

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