

Editor's Message – Moving Forward

In the last quarter's edition of WattsHotNewsletter® we spoke about resiliency as a life skill we need to cultivate, to keep moving forward and adapt from life lessons learned in difficult times. Science is progressing with advances in immune boosters and medications to create defense mechanisms against viruses and 63 percent of Americans have now taken the vaccine.

"Are you better off than you were four years ago?" This is the question Ronald Reagan infamously asked in his successful 1980 campaign against Jimmy Carter. We are now living through a consequential time in history, the outcome of which will be felt for years, if not decades to come. If we are using economic indicators to answer this question, for millions of Americans the answer would probably be a resounding, "yes." Thanks to stimulus checks, unemployment insurance, and the Child Tax Credit, Americans have an average of 50 percent more money in their bank accounts than before the start of the pandemic.

Overall wages are up, increasing by as much as 11 percent in some sectors. Unemployment has fallen to an astonishing 4.6 percent, back down to pre-pandemic levels. Also, in the midst of a global pandemic, 11 million people were lifted out of poverty. One of the largest investments in our infrastructure was signed in U.S. history, which will lead to improved access to public transportation, expanding broadband to provide high speed internet to every American, and repair crumbling roads and bridges. The December Consumer Price Index (CPI) showed annual inflation hitting 6.8 percent, the highest in 39 years. It has been projected to average 7.0 percent in Q1 2022 before decelerating to 3.8 percent by the end of 2022 under our forecast path of monetary policy. Most professional economic prognosticators think that 2022 will be another strong year of recovery from the virus-induced slump. The Conference Board (an independent business membership and research association) is predicting growth of 3.5 percent.

We look forward to some version of the Build Back Better bill to repair the Nation's social fabric by providing the largest expansion of affordable housing, community development and clean energy tax incentives and spending in a single piece of legislation ever.

Again, the problems were not created overnight and resiliency will get us to a better place. As a life lesson, our weaknesses in business, transportation, hospitality, health care, first-responder welfare, and communications were overtly exposed. It is time to fill our hearts full of hope, grounded in the lessons learned to avert similar events from the past. At the heart of any revival is our resilience to move forward.

**"I can be changed by what happens to me.
But I refuse to be reduced by it."** - Maya Angelou

UPCOMING EVENTS

- » **NERC 2022 Mid-Winter Conference**
February 6-9, 2022
Uncasville, CT
(tentatively in-person)

- » **NLIHC Virtual Housing Policy Forum 2022**
March 22-23, 2022
(virtual)

- » **2022 NAHRO Washington Conference**
March 28-30, 2022
Washington, DC
(tentatively in-person)

- » **NJ/MARC NAHRO Annual Conference and Tradeshow**
May 1-4, 2022
Atlantic City, NJ
(in-person)

- » **CLPHA's Housing Is Summit!**
May 18-19, 2022
Washington, DC
(in-person and virtual)

New Bedford Housing Authority - All in on COVID Safety for Residents and Staff

For years, the New Bedford Housing Authority (NBHA) has been an innovative leader in energy efficiency, resiliency, and most recently the use of solar renewable energy. NBHA is a mission-driven Public Housing Authority that has displayed public housing acumen during difficult periods of declining budgets, Federal administration changes, and now, COVID. The pandemic has established new and ongoing challenges for public housing management and operations in their efforts to keep residents and staff safe. Executive Director Steven Beauregard, and Ms. Cynthia Spence, Director of Modernization, Planning & Development have committed to doubling their efforts in resident and staff safety while maintaining NBHA's daily operational services.

NBHA was established in 1938 and continues to be an integral part of the fabric of the city. With 1,743 federal public housing units and 760 State aided units, NBHA services over 6,000 individuals by providing safe, well maintained, and affordable housing units. In addition, NBHA administers nearly 1,800 federally funded rental vouchers through HUD's Voucher Choice Program.



Boa Vista Tower's High-Rise Building

This allows NBHA to provide rental assistance payments to property owners to assist another 3,300 men, women, and children in securing affordable housing. Funding for NBHA comes from the federal government through the Department of Housing and Urban Development (HUD), the Commonwealth of Massachusetts Department of Housing and Community Development (DHCD), and the collection of resident rents.

The New Bedford Housing Authority is all in on mitigating COVID risk to residents and staff through their recent installation and use of **UV Angel Clean Air™** technology and other CDC recommended procedures related to cleaning and disinfection. Installed into existing and/or new construction and designed directly into a traditional ceiling light fixture, **UV Angel Clean Air™** is a quiet, unobtrusive environmental disinfection system that uses ultraviolet light to kill viruses, bacteria, and fungi in the air 24/7, 365 days a year. The **UV Angel Clean Air™** products operate independent of the central HVAC systems and pulls room air into a sealed high-intensity UV-C light chamber where the air is continuously treated. The clean treated air is then returned to the room. Independent studies have shown it safely neutralizes pathogens in occupied spaces with up to 99.99 percent effectiveness. This approach effectively targets pathogens at the room level, where disease transmission begins as people are present and gathering. The units also wirelessly connected to UV Angel's data cloud, providing real-time information on system use to building administrators.

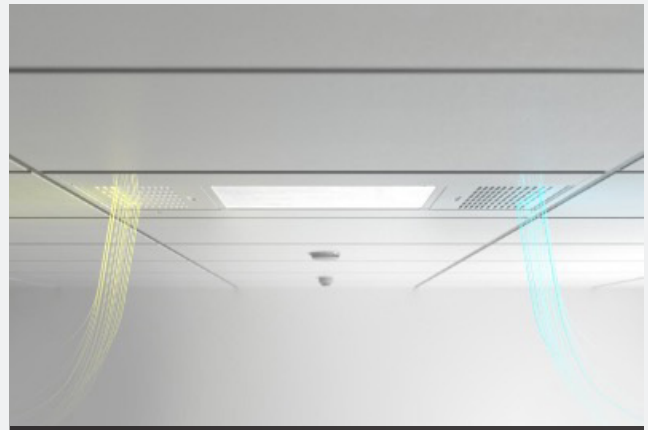


Floor installation plan for BOA Vista

Using Federal CARES Act funds, NBHA purchased and installed its UV Angel Clean Air™ units in Boa Vista Tower with the option to purchase additional units for other sites. The units were installed on several floors of the Boa Vista Tower's high-rise building in areas where people gather, i.e., hallways, lobbies, staff office areas, conference rooms, laundry room, and stairwell landings.



BOA Vista Towers office
space installation



BOA Vista Towers office
space installation

The Omicron variant is now the dominant coronavirus strain in the US, accounting for over 73 percent of new coronavirus cases less than three weeks after the first case was reported according to CDC estimates. Omicron is even more prevalent in certain parts of the country, making up over 95 percent of the circulating virus in parts of the Northwest and Southeast. We may be heading for the perfect storm that will pose a challenge for business administrators. We have a rapidly transmitting virus coinciding with a time when a lot of us are spending time indoors because of the cold and holiday seasons. This new variant has thrown a curveball at the worst possible time.

In the arsenal of infection prevention, ultraviolet lights are used throughout health care and other environments to neutralize viruses on surfaces, in water, and in the air. The New Bedford Housing Authority joins UV Angel's growing list of partners in commercial buildings, medical practices, schools, V.A. Hospitals, and other markets, in the fight to mitigate the impacts of COVID today and adds another important prevention layer for the unknown potential problems in the future.

UV Angel Clean Air™ is one more step in the cleansing process NBHA is undertaking to keep residents safe.

The article on the New Bedford Housing Authority and its installation of UV Angel systems was written by Dick Santangelo and Mike Nail. For more information, contact Dick Santangelo, P.E. at 703-627-7161 or email rsantangelo@apolloengsol.com.

Hot Briefs

Build Back Better – What is in it for *We the People*

Senator Joe Manchin, D-West Virginia, recently announced he would not vote for the Build Back Better Act – a crucial blow to the signature legislation of this administration's bill that included major green energy and affordable housing provisions. In Novogradac's podcast, Michael Novogradac, CPA, is joined by Novogradac director of public policy and government relations Peter Lawrence and Tony Grappone, a partner at Novogradac, to discuss what is next for Congress and the reaction of those in the clean energy world to Manchin's announcement. They discuss how Congress got to this point, what legislative vehicles could involve tax extenders, which community development tax incentives are expiring, how the green energy world is reacting and whether some tax incentives could be enhanced and expanded. They also discuss the role of the child tax credit in the BBBA and what provisions might be in future Build Back Better legislation. This is an excellent podcast outlining the BBB issues and viable solutions that can be viewed in link below.

<https://www.novoco.com/podcast>

Have You Left Your Share of a 179D Tax Rebate in Someone Else's Pocket?

The 179D tax rebate exists at 1.80/sf for **installed lighting, HVAC and building envelope**. 179D is expected to increase in value when Build Back Better eventually passes. 179D is a direct benefit to the project owner (PHA).

To quantify discussion on 179D, you need pre and post construction improvements related specifically to projected savings for energy upgrades and the sf of affected areas. No lifting and service cost is predicated only if the 179D rebate is secured.

Contact Dick Santangelo, 703-627-7161, or email rsantangelo@apolloengsol.com for more information.



Chicago Housing Authority - Danita Childers, Senior Director of Revenue and Partnerships, (left), Michael Gurgone, Chief Investment Officer and Treasurer; and former CEO Eugene Jones, Jr.

Southwest Tribal Entities Go Solar

See how tribes in the Southwest are [tapping abundant solar resources](#) to benefit their communities. This video celebrates successful U.S. Department of Energy investments in the energy futures of two Arizona tribes: [Tonto Apache](#) and San Carlos Apache. Click link for detailed discussion of the solar projects: <https://www.youtube.com/watch?v=CeQfnhMb8nM>.

Carbon Credits Program – Is Your Organization Leaving Money on the Table?

Carbon Credit Program can be a great income resource for your public or private entity if you have an ongoing Energy Performance Contract or equivalent energy conservation program.

What are Carbon Credits? A carbon credit represents one ton of carbon dioxide removed from the atmosphere. They can be purchased by an individual or, more commonly, a company to make up for carbon dioxide emissions that come from industrial production, delivery vehicles or travel. Buyers, purchasers of carbon credits often are driven to offset their GHG production by locality, state, or country’s GHG reduction goals. Ignoring the mandates to reduce GHG can cause significant monetary penalties to a violating party.

Savings reduction in electricity, oil, and gas consumption can cause a reduction of Green House Gas (GHG). Over the years, your energy efficiency project (e.g., EPC) has been reducing GHG that can now be monetized. There is an emerging market with an appetite for Carbon Credits because of GHG national and local reduction legislation.

What is in it for My Organization? We are bringing this opportunity to PHAs to educate our PHA clients and others in the industry. We presented a session on the topic during the November 16th HUD Industry Day. We are now currently setting up briefings for NAHRO regions and chapters and other Industry groups to promote this opportunity to our clients, especially those who have recently gone through an EPC. We continue to perform the due diligence on behalf of our clients, who can validate and secure monetized carbon credit sales using open book proposals and pricing. The unique digitized process involves quantifying the opportunity, certifying the carbon emissions reductions, metering/monitoring for ongoing emissions reductions, packaging the carbon credit sales package for investors, identifying preferred investors, and selecting the best opportunity for the PHA or multifamily owner. The resulting income to a public or private entity can be significant. The market value can vary. Using \$100/ton, see chart below. There is also the opportunity for an annuity as the project continues to reduce GHG. We used the below chart for HUD’s Industry Day to introduce a supplemental source of funding for EPC work already underway.

Annual CO2 potential from PHA EPCs

Project	Amount	Maturity	Elect Savings (kWh)	Gas Savings (therms)	CO2 Tons/Year	\$100	\$/ton
1	\$14,000,000	11/20 yrs	1,699,397	563,805	6,500	\$650,044.65	
2	\$10,014,373	11/15 yrs	3,948,205	345,909	4,633	\$463,259.50	
3	\$7,376,625	11/20 yrs	2,005,213	65,975	3,648	\$364,846.35	
4	\$7,337,953	11/15 yrs	427,960	257,054	1,666	\$166,580.98	
5	\$11,959,870	15/20 yrs	1,662,711	76,244	1,583	\$158,295.53	
6	\$8,990,773	13/20 yrs	3,279,902	1,168	2,332	\$233,164.09	
7	\$7,494,029	11/20 yrs	1,726,251	178,979	2,173	\$217,250.07	
8	\$3,105,506	10/12	292,167	4,963	1,046	\$104,645.03	
9	\$2,957,063	6/15	160,674	0	114	\$11,391.79	
10	\$12,129,675	1/15	341,524	291,167	1,785	\$178,532.56	
						\$2,548,010.55	

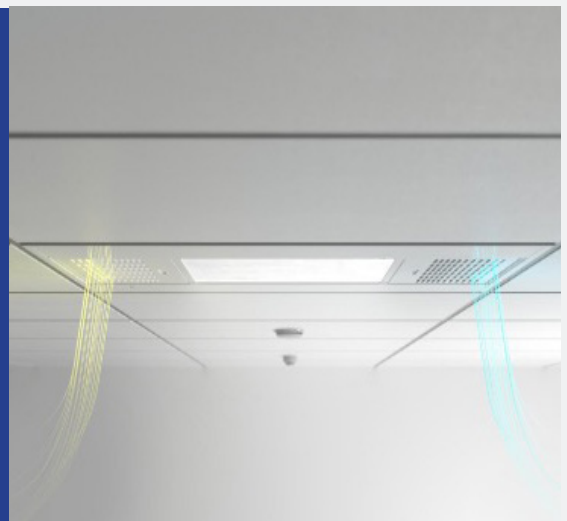
Interested in learning more? For Carbon Credits, if we can get any GHG savings from an audit report (M&V) or the actual utility consumption savings for electricity, gas, oil, we can project the monetized CC values for discussion. No heavy lift or cost to your organization. Contact Dick Santangelo, 703-627-7161, or email rsantangelo@apolloengsol.com for more information.

Watts Hot Marketplace: Welcome Back Campaign

Welcome your residents and staff back to a healthier living and working environment in 2022. The U.S. kicked off 2022 amid a large spike in COVID-19 cases — driven by the highly contagious Omicron variant — that some experts warn will differ from any other time in the pandemic. For residents and staff, UV Angel technology is providing a safer environment where people gather (community centers, offices, child-care centers, clinics, event venues, recreation rooms, etc.). UV Angel has a singular focus: make the world a healthier and safer place for everyone. **UV Angel Clean Air™** units automatically neutralize up to 99.99 percent of all pathogens in the air, 24/7 with no user interaction needed, and are completely safe, even when the spaces are occupied.

We can better prepare for and prevent the events we experienced in 2021 by using this patented ultraviolet (UV-C) light technology. The UV Angel platform provides users with the tools they need to provide measurable safer and healthier environments, bringing peace of mind to staff and customers. In the arsenal of infection prevention, ultraviolet lights are used throughout health care and other environments to neutralize microorganisms on surfaces, in water and in the air.

Installed into existing and/or new construction and designed directly into a traditional ceiling light fixture, UV Angel Clean Air™ is a quiet, unobtrusive environmental disinfection system that uses ultraviolet light to kill viruses, bacteria, and fungi in the air 24/7, 365 days a year. The UV Angel Clean Air™ products operate independent of the central HVAC systems and pulls room air into a sealed high-intensity UV-C light chamber where the air is continuously treated. The clean treated air is returned to the room. Independent studies have shown it safely neutralizes pathogens in occupied spaces with up to 99.99 percent effectiveness.



Air Series -
<https://vimeo.com/432275535>

This approach effectively targets pathogens at the room level, where disease transmission begins as people are present and gathering. The units also wirelessly connected to UV Angel's data cloud, providing real-time information on system use to building administrators. Designed and manufactured in the USA, the UV Angel platform is a proven system backed by years of scientific data and peer-reviewed studies.



Surface Series -
<https://vimeo.com/511270725>

Frequently touched surfaces are being interacted with faster than they can be manually cleaned. UV Angel Adapt Series™ is an intelligent, automated ultraviolet light treatment system for high-touch surfaces that provides an extra layer of safety. The units can automatically detect surface interaction, safely treat the area, and reduce potential threats.

Using the latest in advanced UV-C technology, peer-reviewed studies have shown how effective the system is at treating air and surfaces and **we can prove it!**

Watts Hot Marketplace: Welcome Back Campaign (continued)

A recent article <https://www.tandfonline.com/doi/full/10.1080/15459624.2021.1991581> from the Journal of Occupational and Environmental Hygiene concluded UV light air cleaning systems like UV Angel are a safe, highly effective option to decrease the risk of infections for staff and residents - especially important as COVID-19 continues to spike.

UV Angel Clean Air™ and **Adapt Series™** are compliant with CDC guidelines and provide additional peace of mind for management, staff, and clients. Look for **UV Angel Clean Air™** at the New Bedford Housing Authority, New Bedford-MA, and many other commercial buildings, medical practices, schools, V.A. Hospitals, restaurants, and other facilities.

FEMA Public Assistance Funds may also be available to pay for your UV Angel systems. FEMA urges officials to, without delay, take actions that are necessary to protect public health and safety under public health guidance and conditions and capabilities in their jurisdictions. FEMA provides the following guidance (<https://www.fema.gov/fact-sheet/eligible-emergency-protective-measures>) on the emergency protective measures that may be eligible under FEMA's Public Assistance Program under the COVID-19 Emergency Declaration to ensure that resource constraints do not inhibit efforts to respond to this unprecedented disaster.

State, territorial, Tribal, and local government entities (e.g., Public Housing Authorities) and certain private non-profit organizations are eligible to apply for Public Assistance. Many Public-School systems are already taking advantage of this opportunity. FEMA assistance will be provided at a 100 percent Federal cost-share. This assistance will require execution of a FEMA-State/Tribal/Territory Agreement and execution of an applicable emergency plan. Local governments and other eligible Public Assistance applicants will apply through their respective State, Tribal or territorial jurisdictions.

Contact Dick Santangelo, P.E. for information 703-627-7161 or rsantangelo@apolloengsol.com.

Watts Hot Marketplace: Enlightened Enterprises, Inc.

Positioning Your Agency for Success! Three Ways We Can Help

Ideas and Assistance to Help your Agency Diversify, Strengthen, Grow and be Safe

Over the last 17 years, Enlightened Enterprises, Inc., a Service-Disabled Veteran Small Business, has been helping PHAs grow and succeed. With a company resume of over 75 PHAs and \$400 million in successful projects under our belt, Enlightened and our trusted world class partners, Apollo Engineering Solutions, Efficiency Energy, **UV Angel Clean Air™**, Insolcorp and 2rw Consulting Corporation, is ready to help your agency prosper and succeed during this new era. Over the years we have found that having a seasoned, experienced partner to help you navigate the challenges of operating a PHA business can be invaluable. Below are three timely and key areas where we can help you immediately:

PATHOGEN CONTROL: We are still faced with mutating COVID-19 variants and the prospect of other emerging infectious diseases. The Pandemic has forced us to reevaluate what it means to be a provider of safe and sanitary housing and reminds us how unprepared the world has been in dealing with this challenge. While most PHAs have done an admirable job of responding in a crisis-management mode to COVID-19, one of the areas that has been overlooked is preparing for the future by making smart investments now to simultaneously navigate lingering COVID-19 concerns, get staff back to the office, protect residents and prepare for future pandemics or other infectious disease events.

Enlightened can help: We have done our due diligence and have identified proven pathogen control solutions using UV Light that have been subjected to clinical and peer reviews and follow CDC guidelines. We are available to brief your team on how you can implement these proven, cost-effective solutions.

OWNER'S REPRESENTATIVE SERVICES: One of the most valuable actions that any PHA can take that is considering a new construction or modernization project, an energy performance contract (EPC) or RAD project, or how to finance the project is to engage the services of an experienced owner's representative.

Enlightened can help: Our experienced team of construction experts and our policy and programmatic professionals will ensure that your project is:

- Properly and safely developed and in compliance with applicable regulations;
- Effectively managed and construction period savings are maximized;
- Delivered on time and in budget;
- Organized to ensure that all relevant incentives are utilized, and savings are maximized and,
- Managed in such a way that key staff are not pulled away from other important work assignments to focus on what can become a complicated and labor-intensive effort.

ENERGY ISSUES: Because energy costs typically run in excess of 23 percent of total project expenses in affordable housing, it is important to ensure that you have an effective, resilient, and sustainable energy plan that addresses all the key energy using areas in your developments and an implementation strategy to accomplish your objectives and maximizes energy savings.

Enlightened can help: Our knowledgeable professionals can assist your agency with:

- Independent, third-party review and analysis of energy projects and recommendations for improvement including energy audits and energy resiliency recommendations;
- Comprehensive RAD evaluation and implementation services;
- Measurement and verification (M&V) of energy use and cost savings;
- Green Physical Needs Assessments (GPNA), in support of long-term capital improvement plans;
- Securing rebates for public sector entities including PHAs through programs like 179D;
- Analysis of utility consumption and development of engineered utility allowances for affordable housing and Low-Income Housing Tax Credit (LIHTC) properties;
- Electric and Natural Gas Procurement and,
- State-of-the-art Phase Change building envelope and roofing solutions.

Contact Michael Nail, Enlightened's President and CEO at Enlightened1on1@gmail.com or 301-639-3767. Visit www.EnlightenedEnterprisesInc.com for more information or to set up a time to talk.

Update - Integrating Energy Performance Contracting with HUD's Rental Assistance Demonstration

An article published in NARHO's *Journal of Housing and Community Development* (March/April 2016) sought to advise agencies and their stakeholders—including consultants, developers, and lenders—about the issues, advantages, and drawbacks of considering both programs together and in tandem. The authors depict most of the possible scenarios a housing authority can face—from Energy Performance contracts (EPCs) done first, done simultaneously with RAD, done post-RAD conversion, EPCs without consideration of RAD, and a RAD financing that incorporates energy efficiency measures in its mortgage loan. The paper concludes that EPCs under the right scenario can be advantageous for PHAs to consider.

Good News! As expected, results over past several years indicate that EPCs have had beneficial results on RAD rents.



Since the EPC program's inception in the 1980s, PIH reports that approximately 315 EPCs (affecting approximately 250,000 units) have been approved, representing nearly \$1.5 billion in utility cost reduction investments. These performance contracts have been executed in all 10 HUD regions and in PHAs with sizes ranging from small (fewer than 250 units) to large (6,600 units or more).

HUD continues to spend a sizable portion of its public housing budget on utility costs. HUD spends over \$6 billion 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 1.0 million public housing units. HUD is the only Federal Agency that pays utility expenses calculated on actual consumption. Public Housing Authorities (PHAs) pass these funds through to utility providers, with HUD or PHAs having adequate resources to change the trajectory of this spending unless they employ Energy Performance Contracting.

HUD continues to encourage, promote EPCs, as demonstrated in the recent HUD Industry Day event (November 2021) to help address public housing energy-efficiency needs and to reduce utility waste via energy conservation measures. EPCs allow PHAs to employ private borrowing practices to make much needed energy improvements. Using an EPC model, HUD agrees to continue to pay utility costs at a "frozen" consumption level for 20 years while incentivizing PHAs to make performance improvements. The difference between the frozen consumption level and the newly reduced energy spending allows for repayment of the ESCO loans which results in realized savings and incentives for the PHA.

A direct infrastructure investment for energy improvements allows PHAs to create more energy-efficient properties with a greater sense of urgency, improves comfort and livability for residents, increases portfolio marketability, and preserves properties for the next generation in need. Implementing these initiatives via EPC when repositioning is not an immediate option would also end the long-term demand for HUD to fund inefficient utility consumption levels indefinitely. Direct infrastructure investments in energy improvements would also lead to larger realized savings across the public housing portfolio to accrue even more quickly, which further allows PHAs to integrate energy efficiency, resiliency, and sustainability solutions to optimize operational performance.

The successful integration of Energy Performance Contracting with HUD's Rental Assistance Demonstration has led to an increase in RAD calculated rents. HUD's EPC program provides PHAs with three incentives: Frozen Rolling Base Incentive (FRB), Add-On Subsidy Incentive (AOS), and Resident-Paid Utility Incentive (RPU). These incentives adjust the Federal operating subsidies available to PHAs to enable utility conservation improvements in public housing that reduce utility consumption from baseline levels. The Department also offers the Rate Reduction Incentive (RRI), which can be included in an EPC but can also be a separate incentive independent of the EPC program. The RRI allows PHAs to recoup costs of interventions that reduce the rates paid for utilities. RRIs may be used with the FRB, AOS, or RPU incentives (HUD, 2014). The incentives enable PHAs to allocate more of their operating subsidy toward needed repairs and other eligible expenses.

When calculating RAD rents, PHAs may increase the rents proportionally to match the EPC incentives. This form of incentive funding moves forward regardless of the EPC term, and the EPC before RAD provides energy-efficient units that maintain reduced operational costs. Once the AMP is converted to RAD, they are no longer in the EPC Program and the PHA can retain 100 percent of the EPC incentive as part of the new RAD rent.

An increase in RAD rents, i.e., financial benefits of a successful EPC-RAD integration, were realized by the Tampa Housing Authority (THA) in the following case example:



Rate Reduction Incentive. RRI was included in RAD rent calculations. The RRI value within the RAD rents was \$33 per unit per month.



Frozen Baselines: Reduced utility spend per year by \$3.4M/year. Increased RAD rents by \$94 per unit per month.



Adjustments to Ops Subsidy: Increased the RAD rents by an average of \$49 per unit per month above.

The EPC program provided the Tampa Housing Authority on average, an increase to the RAD rents of **\$176** per unit per month. Better yet, going forward, the annual RAD rent will increase based on the Operating Cost Adjustment Factor (OCAF). The successful integration of EPC and RAD has performed better than anticipated over the six years since NARHO's *Journal of Housing and Community Development* (March/April 2016) EPC-RAD integration article was published. Recognition is given to HUD's promotion of EPCs and RAD and their evolving policies that facilitated the carryover of EPC savings benefits and integration into the RAD rents.

Dick Santangelo co-authored [Intersection of EPC and Rad: A Roadmap for PHAs Article JHCD March – April 2016](#) with Jaime Bordenave, Steve Morgan, and Mike Nail for NAHROs "Journal of Housing and Community Development" to address concerns regarding AMP repositioning with existing energy performance contracts. WattsHotNewsletter also recognizes Johnson Controls Inc. for their contribution to this article, specifically Janelle Butler, Joe Pash - Sr. Account Executive, Public Housing Solutions, JCI; and, Mary Fox, National Vertical Market Director, Public Housing, Johnson Controls Building Efficiency.

Where to Look for Utility Bill Savings

The U.S. Energy Information Administration (EIA) reports that energy costs are at or near multiyear highs. Changes in supply and demand, the pandemic, and a colder winter forecast in much of the U.S. are all contributing to this budget-busting perfect storm. Those who heat with natural gas (nearly half the U.S. population!) will spend 30 percent more than they spent last winter on average. Those who heat with propane will spend 54 percent more on average. Those who heat with oil will spend 43 percent more on average.



**Temperature Dropping;
Energy Cost Rising**



Energy managers, utility auditors, and other energy stakeholders in your PHA, tribal entity or property owner organization, tasked with assessment of utility bill accuracy, need to have a working knowledge of utility bill processing and data collection. An in-depth understanding of utility bills is helpful in auditing and then detecting utility bill errors and savings opportunities. Think of your organization's monthly utility bills as a treasure chest of data, just waiting to be mined for substantial savings. How can your staff interpret that data to save energy and money? Much of the audit investigation requires little or no training to implement. The potential to help you spot savings for your organization may be right under your nose.

Date audits are important because date errors can cause faulty energy analytics and unreliable audit results. This is because date-related audits affect key comparisons from billing period to billing period, such as average daily use or average daily cost. Start your utility auditing program with a focus on date accuracy for current and historic bills. Dates are important. Audits often reveal data entry errors and can also reveal utility billing errors by the utility company. Here are some important date-related audit observations that may reveal savings opportunities:

- **Billing Period Length is abnormally long or abnormally short.** An "abnormal" length can be determined by comparing the current bill with historical bills. Is this a monthly bill or a quarterly bill? If the billing period length is abnormally long or abnormally short, it could indicate that there is a data entry error that may affect other audits.
- **Gap between End Date of last bill and Start Date of current bill.** Gaps between bills may indicate a missing bill or a bill entry error. Most utility vendors use the End Date of the last bill as the Start Date for the current bill. But a handful of vendors assume meter reading at midnight, so the Start Date for the current bill is one day later than the End Date of the last utility bill. Know your utility company's practice, so you can determine if your bills reflect the correct dates.
- **Due Date or Statement Date is too long after End Date.** Typically, the bill Due Date is 20 to 30 days after the Statement Date. The Statement Date will be one to four days after the End Date. Anything outside these parameters may indicate an issue with the bill.
- **End Date is later than today.** Some bills may include a future End Date, but these situations are very uncommon. A future End Date may indicate a bill entry error that will negatively affect your analytics and audits.

- **Due Date or Statement Date is before End Date.** This type of audit result is typically the result of a bill entry error.
- **Start/End Dates (meter read dates) overlap with another bill.** This is an unusual situation that may indicate a cancel/rebill situation, data entry error, or possibly a meter change. But an overlap with other bills for the same meter could also be an indication that the customer has been billed repeatedly for the same energy.

Energy use-audits can reveal errors date-audits miss.

- **Use-Per-Day is the same as the prior bill.** It is unusual for commodity use to be identical from billing period to billing period, since so many factors affect monthly energy use. If your audit reveals identical use values from one month to another, check to see if the bill is estimated. If it is estimated, and especially if it has been estimated for several consecutive billing periods, a billing error may be costing you a lot of money.
- **Bill has cost but no use.** Although some accounts/meters are not billed on use (streetlights, some water accounts in some locations), this is the exception and not the rule. A bill with cost but no use could indicate that the meter is inactive and should not be incurring utility expenses. Check it out.
- **Highest Use-Per-Day in the last 12 months.** Whenever the use or the use-per-day values hit a 12-month high, determine if the use is reasonable. An investigation may reveal a billing error, a faulty meter, a leaky pipe, or another important and costly situation. Prompt attention may result in valuable savings.

Like energy use-audits, cost-audits can reveal errors from a faulty meter, a faulty meter read, billing errors or data entry errors. Since utility rates may vary significantly from billing period to billing period due to factors like seasonality, electric demand, use, and ratchet situations, cost-audits may be more difficult to perform. But several cost-related audits may offer opportunities for savings.

- **Cost-Per-Day or Unit Cost varies from average of last two months bills.** This audit may not be a good test for seasonal meters, since comparisons with "swing months" may generate false positive audit results. But many meters do not have seasonal loads. For those meters with steadier month-to-month use, a cost analysis can often reveal problems and opportunities. It is also important to analyze cost-per-day in tandem with the monthly cost and unit cost data since each value will offer insights. A meter with nearly identical daily or monthly cost, but a significant decrease in unit cost may provide a clue that points to undesirable use patterns (savings opportunity).
- **Cost-Per-Day or Unit Cost varies from same month last year.** This audit is more appropriate for seasonal meters, for the same reasons mentioned in the discussion of energy use-audits. Consider both unit cost and average daily cost since both comparisons offer unique insights into energy performance. A jump in average daily cost may signal a significant jump in use or a rate change. Unusual variances in unit cost can often point to data entry errors.
- **Highest Cost-Per-Day or Unit Cost in the last 12 months.** In these situations, it is always important to confirm the accuracy of the cost values. Record high values are undesirable for any organization and may point to future energy savings opportunities. Always ask, "Is this cost reasonable?"

Using various audit approaches and targets usually reveal issues with a faulty meter, a faulty meter read, a billing error, or data entry error. Many can reveal long-standing problems or issues. The savings can be tens or hundreds of thousands of dollars. One independent cost analyst during a preliminary review before an Energy Performance Contract discovered that for years the public housing authority had been paying an expensive monthly utility bill for a near-by fire station. It was not until the consultant's persistence revealed a pattern of higher-than-normal use estimates (cost-audit), conducted several site visits (use-audit), and faulty meters were uncovered (data-audit) that the problem was discovered. The utility company reimbursed the PHA for the overcharges.

EnergyCap and the Energy Information Administration are recognized for the technical research content contained in this article. Thank you to those organizations for their contributions.

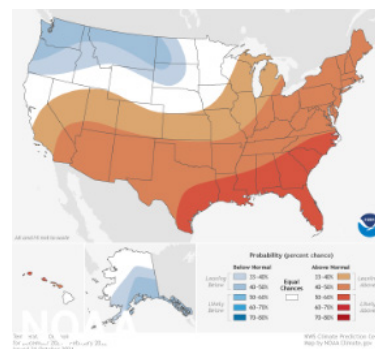
NOAA Winter Weather Predictions

Above-average temperatures are favored across the South and most of the eastern U.S. as La Nina climate conditions have emerged for the [second winter in a row](#) according to NOAA's [Climate Prediction Center](#) — a division of the [National Weather Service](#). In NOAA's 2021 Winter Outlook — which extends from December 2021 through February 2022 — wetter-than-average conditions are anticipated across portions of the Northern U.S., primarily in the Pacific Northwest, northern Rockies, Great Lakes, Ohio Valley, and western Alaska.

NOAA experts also continue to monitor the widespread, ongoing drought that has persisted across much of the western half of the U.S. since late last year, keeping a close eye on the Southwest region. Consistent with typical La Nina conditions during winter months, we anticipate below-normal temperatures along portions of the northern tier of the U.S. while much of the South experiences above-normal temperatures. The Southwest will remain a region of concern as we anticipate below-normal precipitation where drought conditions continue in most areas.

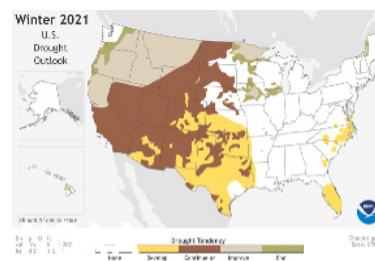
Temperature

This U.S. Winter Outlook 2021-2022 map for temperature shows warmer-than-average conditions across the South and most of the eastern U.S., while below average temperatures are favored for southeast Alaska and the Pacific Northwest eastward to the Northern Plains. (NOAA Climate.gov, using NWS CPC data) warmer-than-average conditions are most likely across the Southern tier of the U.S. and much of the Eastern U.S. with the greatest likelihood of above-average temperatures in the Southeast. Below-average temperatures are favored for southeast Alaska and the Pacific Northwest eastward to the northern Plains. The Upper Mississippi Valley and small areas of the Great Lakes have equal chances for below-, near- or above-average temperatures.



Precipitation

The Pacific Northwest, northern Rockies, Great Lakes and parts of the Ohio Valley and western Alaska have the greatest chances for wetter-than-average conditions. Drier-than-average conditions are favored in south-central Alaska, southern California, the Southwest, and the Southeast. The forecast for the remainder of the U.S. shows equal chances for below-, near- or above-average precipitation during winter months.



Short-Term Energy Outlook

Liquid Fuels

- The December *Short-Term Energy Outlook* (STEO) remains subject to heightened levels of uncertainty related to the ongoing recovery from the COVID-19 pandemic. The emergence of the [SARS-CoV-2 Omicron variant](#) raises uncertainty about the level of energy consumption throughout the world compared with last month's forecast. U.S. gross domestic product (GDP) declined by 3.4% in 2020 from 2019 levels. We forecast that global consumption of petroleum and liquid fuels will increase by 3.5 million b/d in 2022 to average 100.5 million b/d. U.S. regular gasoline retail prices averaged \$3.39 per gallon (gal) in November, a 10 cents/gal increase from October and \$1.29/gal higher than in November 2020. The November monthly average was the highest since September 2014. We forecast that retail gasoline prices will average \$3.13/gal in December before falling to \$3.01/gal in January and \$2.88/gal on average in 2022.

Natural Gas

- In November, the natural gas spot price at Henry Hub averaged \$5.05 per million British thermal units (MMBtu), down from the October average of \$5.51/MMBtu but up from an average of \$3.25/MMBtu in the first half of 2021 (1H21). After rising in recent months, natural gas prices declined in November amid mild weather across much of the country that resulted in less natural gas used for space heating than expected. U.S. natural gas inventories ended November 2021 at over 3.5 trillion cubic feet (Tcf), 3% less than the five-year average for this time of year. Natural gas production in the forecast rises to an average of 95.3 Bcf/d during the rest of this winter (December–March) and averages 96.0 Bcf/d for all of 2022, driven by natural gas and crude oil price levels we expect will support enough drilling to sustain production growth.

Electricity

- We forecast that the share of electricity generation produced by natural gas in the United States will average 37% in 2021 and 35% in 2022, down from 39% in 2020. For 2021, the annual share for natural gas as a generation fuel declines in response to our expectation of a higher delivered natural gas price for electricity generators, which we forecast will average \$4.99/MMBtu compared with \$2.40/MMBtu in 2020. The natural gas share declines in 2022 because of continued high fuel costs and an increasing share of renewable generation. Because of the higher expected natural gas prices, the annual forecast share of electricity generation from coal rises from 20% in 2020 to 23% in 2021 and then drops slightly to 22% in 2022. For renewable energy sources, new additions of solar and wind generating capacity have been offset somewhat by reduced generation from hydropower this year. We forecast that the share of all renewables in U.S. electricity generation will average 20% in 2021, about the same as last year, before rising to 22% in 2022. The nuclear share of U.S. electricity generation declines from 21% in 2020 to 20% in 2021 and 2022.

Coal

- We expect coal production to rise by 48 million short tons (MMst), or 9%, in 2021 and by an additional 38 MMst (6%) in 2022. The increase in production reflects more demand and higher prices for coal in the electric power sector because of higher natural gas prices this year compared with last year. Despite the increase in production, growth has not kept pace with rising domestic demand for steam coal in the electric power sector and export growth. Coal inventories held by the electric power sector fall by an expected 51 MMst (38%) in 2021 and a further 10 MMst (13%) in 2022.

Renewables

- Planned additions to U.S. wind and solar capacity in 2021 and 2022 increase electricity generation from those sources in our forecast. We estimate that the U.S. electric power sector added 14.6 gigawatts (GW) of **new wind capacity** in 2020. 17.2 GW of new wind capacity will probably come online in 2021 and 7.1 GW in 2022. Utility-scale solar capacity rose by about 10.4 GW in 2020. Our forecast for added utility-scale solar capacity is 16.2 GW for 2021 and 20.9 GW for 2022. We expect significant **solar capacity additions in Texas** during the forecast period. In addition, in 2020, small-scale solar capacity (systems less than 1 megawatt) increased by 4.4 GW to 27.6 GW. Texas and Florida had **large increases of small-scale** solar capacity in 2020. We project that small-scale solar capacity will grow by 5.1 GW in 2021 and by 5.0 GW in 2022.

Carbon Emissions

- U.S. energy-related carbon dioxide (CO₂) emissions **decreased by 11% in 2020** because of less energy consumption due to reduced economic activity and to end user responses to the COVID-19 pandemic. For 2021, we forecast energy-related CO₂ emissions will increase about 7% from 2020 as economic activity increases and leads to rising energy use. We expect a 1% increase in energy-related CO₂ emissions in 2022. We forecast that after declining by 19% in 2020, coal-related CO₂ emissions will rise by 17% in 2021 and then fall by 3% in 2022.

Watts Hot at HUD

HUD as part of its Virtual Industry Day confirmed its commitment to energy efficiency, resiliency, and sustainability. As demonstrated by Dr. Charles Marshall Director, Energy Branch, Financial Management Division, and Mike Blanford, Office of Policy Development & Research, HUD has updated its Energy Policy, EPC procedures, and Rate Reduction Incentives guidance. PHAs are encouraged to take advantage of the links below to learn more.



HUD Virtual EPC Industry Day – November 16, 2021

A one-day workshop for PHAs Hosted by the Office of Public Housing Financial Management Division Energy Branch. Topics included emerging HUD EPC policy; Energy and Water Efficiency in PH; ESCOs and the EPC; Beyond EPCs: Alternative Vehicles for Energy Conservation Projects; and Innovating Through Integrating EPC and Incentives.

Copies of the slide presentations can be obtained on the following link:
<https://www.apolloengineeringsolutions.com/resources.html>

Innovations in Energy Efficiency Webinar Series – Department of Housing and Urban Development and Department of Energy, a DOE-HUD Collaboration

The innovations in Energy Efficiency Webinar Series are an eight part virtual conference. This online seminar series is a collaboration between the Department of Energy and the Department of Housing and Urban Development with a focus on energy efficiency in housing. The content of the webinars will be basic, practical, and actionable with an emphasis on the rehabilitation of single- and multi-family housing. Online seminar topics range from an introduction to energy efficiency fundamentals to advanced topics such as exterior retrofits and the latest energy code requirements.

<https://www.huduser.gov/portal/energy-webinars/home>

Apollo Engineering Solutions, LLC., with its DOE and HUD colleagues, were proud to participate in this critical DOE-HUD collaboration.

Energy Performance Contract (EPC) Incentives Management Training

The Energy Performance Contract (EPC) Incentives Management Training consists of eight vignette training videos developed by HUD's Energy Branch of the Public Housing Financial Management Division. These videos assist Public Housing Authorities (PHAs) with an EPC to develop the knowledge and skillsets needed to better understand EPCs and review and request various EPC incentives on Form HUD-52722 and 52723 during the annual Operating Fund Grant (OpFund) process.

<https://www.hudexchange.info/trainings/courses/epc-incentives-management-training>

Under a HUD contract with Econometrica, Apollo Engineering Solutions, LLC., with its partners Synchronous Solutions, Inc. and Facility Strategies Group, LLC., were proud to participate in this important HUD training initiative.

HUD Rate Reduction Incentive (RRI) Training

The HUD Rate Reduction Incentives Training assists Public Housing Authorities (PHAs) in understanding HUD's incentives to promote energy conservation through rate reduction as promulgated in regulations at 24 CFR 990.185. The training consists of one vignette training video developed by HUD's Energy Branch of the Public Housing Financial Management Division. This video, which will become available in early 2022, will assist PHAs in:

1. Knowing what the Rate Reduction Incentive (RRI) is;
2. Learning how to calculate rate reduction savings;
3. Identifying documentation required to include in the Rate Reduction Incentive submittal and,
4. Understanding HUD's review process for Rate Reduction Incentive.

Enlightened Enterprises, Inc. (Mike Nail) with its partner Facility Strategies Group, LLC. (Matt Pesce, P.E.), were proud to participate with Abt Associates and Quadel Consulting Corporation in this important HUD training initiative. The RRI training is scheduled to be posted sometime early in 2022. WattsHotNewsletter® will post the training link when it becomes available.

Congratulations on Your Retirement

In closing, we wanted to mention that Mr. Greg Byrne retired in 2021. Greg was instrumental to HUD's success in repositioning much of HUD's Public Housing portfolio to RAD. We wish him success in his new consultant role and pass on that Greg can be reached at 301-801-0530 or emailed at greg@gregbyrneconsulting.com.

His chalk-talks videos can be found at <https://www.gregbyrneconsulting.com/chalk-talks>.

Also retired in 2021 was Mr. Brian Ruth with over 18 years at HUD. Brian was the Real Estate Assessment Center's Product Manager for Physical Inspections Quality Assurance. Brian's management style, leadership, and real estate expertise will be missed by REAC and HUD. Brian was a consummate professional!



Greg Byrne

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