**U. S. Department of Housing and Urban Development**
**Office of Public and Indian Housing**

| **Special Attention of:** | **NOTICE: PIH-2014-18 (HA)** |
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| Public Housing Agencies;<br>HUD Directors of Public Housing;<br>PIH Program Center Coordinators;<br>Public Housing Division Directors;<br>Regional Directors;<br>Regional Environmental Officers;<br>Field Environmental Officers;<br>Regional Energy Coordinators | Issued: August 8, 2014<br><br>Cross Reference:<br>42 USC 1437g(e)(1)(G);<br>42 USC 1437g(e)(2)C);<br>24 CFR 85.36;<br>24 CFR 965 Subparts C-E;<br>24 CFR 990 Subparts A-D;<br>PIH Notice 2009-43;<br>PIH Notice 2011-36. |

**Subject: Guidance on On-Site Utility Technologies And the Rate Reduction Incentive in Public Housing**

**1. Purpose.** This notice serves the purposes of encouraging the use of on-site utility technologies – especially on-site renewable energy technologies – at Public Housing Authorities (PHAs) and guiding the use of the Rate Reduction Incentive (RRI) in support of these efforts. Further, it clarifies the methods for using on-site utility technologies and RRIs in concert with energy- and water-efficiency retrofit activity and Energy Performance Contract (EPC) incentives. This notice supplements related content found in PIH Notice 2009-43 "Renewable energy and green construction practices in Public Housing" and PIH Notice 2011-36 "Guidance on Energy Performance Contracts" and remains effective until amended, superseded, or rescinded.

**2. Applicability.** This notice applies to public housing and provides guidance under the Public Housing Operating Fund Program pursuant to 24 CFR 990 and Energy Performance Contracts pursuant to 24 CFR 965.

**3. Background.** In July 2013, President Obama announced the Climate Action Plan and set forth a goal of reaching 100MW of installed, on-site renewable energy technology at federally subsidized housing across the country by 2020. In support of this renewable energy goal, the

broader sustainability and resilience goals cited in the Department of Housing and Urban Development's (HUD) strategic plans, and the energy and water conservation requirements of the U.S. Housing Act of 1937, the Office of Public and Indian Housing (PIH) is putting forth this guidance and its strong recommendation that PHAs investigate the opportunity to use on-site renewable energy technology in public housing.

Additionally, to facilitate the use of on-site utility technologies – especially on-site renewable energy technologies – in public housing, PIH is herein updating its guidance on the use of the Rate Reduction Incentive. The RRI is a utility cost reduction incentive available for use by PHAs as part of the Public Housing Operating Fund Program and is designed to promote efficiency in the use of natural resources and taxpayer dollars. Conceived prior to several contemporary trends such as utility market deregulation, green power purchasing, net-metering policies, and the solar industry boom, the RRI has needed further development in several areas. However, this notice primarily focuses on updates to the RRI that are relevant to the use of on-site utility technologies; other updates will be provided in forthcoming notices.

Finally, this notice addresses the increasing trend of PHAs pursuing utility cost reduction through efforts towards combined rate and consumption reduction and the resultant need for PHAs to use the RRI in conjunction with EPC Incentives. An existing conflict between the RRI and EPC Incentive formulas that created an obstacle to this combined activity has been resolved in this notice, ensuring that PHAs will receive the full financial benefit resulting from their combined rate and consumption reduction activities. As a result, PHAs will now find it financially and logistically advantageous to pursue both rate and consumption reduction activities, which can lead to larger energy- and water-efficiency retrofit projects and much deeper utility cost savings overall. Thus, PHAs planning to participate in the EPC program should also consider installing on-site utility technologies and/or making other eligible efforts towards utility rate reduction in concert with their energy- and water-efficiency retrofit activity.

While this updated guidance is designed to ensure that PHAs receive the full financial benefit of utility cost savings achieved when using the RRI and EPC Incentives together in general, this notice primarily focuses on the intersection of the RRI and EPC Incentives in the context of the use of on-site utility technologies. Additional guidance on other contexts will be provided in forthcoming notices.

**4. Contents.**

## 5. Definition of On-Site Utility Technologies.

On-site utility technologies are building equipment designed to harness, process, or generate utilities on location, offering an alternative to the traditional process of purchasing utilities from an off-site utility provider. A subset of on-site utility technologies are environmentally preferable and are commonly referred to as "on-site renewable energy technologies." Note, however, that the term "on-site utility renewable energy technologies" is used herein a bit more broadly than its precise definition, including, as just one example, technologies that produce water as well as energy.

Though the distinction can be blurry in some cases, it is important to note that on-site utility technologies are similar but distinct from energy- and water-efficiency measures ("energy conservation measures"). Rather than reducing utility consumption in a building overall, the use of on-site utility technologies shifts utility consumption from a traditional source to an alternative source *that is both generated on site and directly quantifiable*, either in its source or use utility form, via meter or measure of volume, weight, etc. Moreover, unlike energy conservation measures that conserve rather than generate utilities, the use of on-site utility technologies often creates an opportunity for PHAs to sell the generated utilities to neighbors or back into the utility grid. For example, solar photovoltaic panels generate meterable electricity that can be used or sold, whereas a high-efficiency natural gas furnace simply reduces the amount of natural gas consumed.

While the President's Climate Action Plan focuses on the installation of on-site renewable energy technologies, most PIH policies do not draw a distinction between environmentally preferable and non-preferable on-site utility technologies. Generally speaking, Public Housing Authorities are incentivized equally for the installation of either.

## 6. Introduction to On-Site Renewable Energy Technology in Public Housing.

Utilizing renewable energy supports the social goals of national security, public health, and environmental protection by reducing reliance on fossil fuels. Further, it increasingly meets the critical financial and operational needs of residential building owners and consumers, including PHAs and public housing residents.

For example, in many parts of the country, on-site solar electric technology is now or will soon be competitively priced with traditional electricity, as pricing for solar continues to drop precipitously. Users of on-site solar electric technology in locations with historically high

traditional electricity prices currently gain direct utility cost savings. In other locations, users of on-site solar electric technology take advantage of the array of tax credits, rebates, and other incentives currently offered by public and private organizations, including the federal government, to make solar financially feasible.

In areas of the country suffering from excessively high peak demand and in areas of the country susceptible to natural disaster, on-site utility technologies can offer safety from grid blackouts, service interruptions, and supply shortages. In locations with especially volatile utility pricing, on-site utility technologies may offer financial stability and predictability. Particularly when used in combination with traditional utilities, on-site utility technologies offer building owners flexibility and stability to meet critical financial and operational needs in the face of shifting supply and demand for traditional utilities.

Moreover, on-site utility technologies offer unique opportunities to building owners for local economic growth and additional revenue generation. The first of these is self-explanatory but mission critical: the use of on-site utility technology by PHAs can directly support local economies and public housing residents through job training programs and immediate job opportunities in a high-growth industry.

In states with net-metering[1] policies in place, building owners using on-site solar electric technology act as both buyers and sellers in the electric grid. Most buildings have "net-negative" performance, meaning that they consume (buy) more electricity from the grid than they produce (sell) into the grid in a given year, and so payments for excess production in one billing cycle are typically given as discounts during other billing cycles. However, buildings that are built or retrofitted for "net-positive" performance can create a new revenue stream to cover other operating costs.

Indeed, though electric net-metering may be the most common practice, building owners using on-site utility technologies often find innovative ways to monetize excess utility production with utility types other than electricity and without the benefit of net-metering policies. Some building owners sell raw materials from their land for off-site utility production; some lease their rooftops or land for others to use for utility production (with or without a contract to buy a portion of the utility production at a reduced rate); some team up with neighbors to develop district heating systems or micro electric grids; and some arrange for direct sales to neighbors of water processed, steam produced, or electricity generated on site.

PHAs are encouraged to think creatively when investigating the opportunity to use on-site utility technologies at public housing. Some important research areas for each PHA include regional precedents, potential partners, local laws, and incentive programs. However, much

[1] Net-metering policies allow building owners to sell electricity back through the electricity grid to their electricity provider, in addition to simply buying electricity. A building owner's electricity bill then reflects their "net" consumption and costs, as calculated by subtracting their production and revenue from their consumption and costs.

attention in planning will focus on two primary questions: First, which on-site utility technologies are appropriate for this site? Second, what are the financing options?

A great deal of information is available online from federal agencies, nonprofits, and universities to assist building owners in their preliminary research regarding which on-site utility technologies are geographically appropriate and what the approximate renewable energy potential for each site is. In particular, the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE, http://energy.gov/eere/office-energy-efficiency-renewable-energy) and its associated network of national laboratories (http://www1.eere.energy.gov/site_administration/doe_labs.html) provide extensive information on these topics, and HUD is partnering with DOE to produce targeted information regarding public housing sites. In the meantime, PHAs should note that while the type and potential for using on-site renewable energy technology will vary according to geographic location, site factors, and market conditions, on-site renewable energy technology can be used successfully in any part of the country.

PHAs should also note that, despite the funding limits that public housing has faced in recent years, installation of on-site utility technologies should not be presumed to be financially infeasible. A variety of financing options are available across the country to assist with the installation costs of on-site solar electric technology, in particular. A state-by-state list of government incentives is available at http://www.dsireusa.org/.

For example, PHAs that are not interested in purchasing and installing their own on-site solar electric technologies may be able to utilize a popular option called a Power Purchase Agreement [2](PPA). Through a PPA, a building owner offers its rooftops or land to a utility provider that installs and maintains solar photovoltaic panels for a designated contract term. In exchange, the building owner will typically receive discounted electricity during the contract term and sometimes may enter a lease-to-own arrangement to gain ownership of the solar photovoltaic panels following the contract term. PPAs allow building owners to begin utilizing on-site renewable energy technology with no upfront costs or maintenance expertise needed.

Regardless of the method chosen by a PHA to install and use on-site utility technology, HUD provides financial rewards that can be used to repay upfront costs or meet operating needs. These are provided through the Rate Reduction Incentive, as explained below.

## 7. HUD Incentives for the Installation of On-Site Utility Technologies.

Because on-site utility technologies affect a PHA's total utility costs in multiple ways, the most straightforward method to promote the use of these technologies at public housing is by utilizing the Rate Reduction Incentive in all scenarios. In other words, as long as utility cost savings are created as a result, a PHA will receive an RRI for the installation of on-site utility technologies regardless of:

[2] http://www.epa.gov/greenpower/buygp/solarpower.htm

- whether the on-site utility technologies are "renewable" or not;
- whether the PHA purchases or leases the technologies;
- whether the initial funding source for the technologies is HUD or third-party funds;
- whether the technologies impact PHA-paid or resident-paid utility types;
- whether the PHA uses or sells the resulting utilities;
- and whether it also has a related EPC or not (though the RRI formula varies according to this factor, as explained in Section 8.3 of this notice).

Although many PHAs have back-up generators installed for extenuating circumstances, the sporadic use of these typically would not result in utility cost savings or an RRI. Logically, if a PHA was able to provide equivalent service while saving money through the use of these technologies, it would likely be using the technologies as part of its primary, rather than back-up, strategy. Of course, RRIs will not be awarded when utility cost savings are created through interruptions or reductions in service quality.

The RRI typically allows PHAs to retain 50% of the utility cost savings achieved each year due to their special and significant efforts towards utility rate reduction. RRIs are provided each year that the on-site utility technology is installed and generating utility cost savings. PHAs can apply to their local Field Office to receive an RRI.

Note that the guidance provided herein applies to the installation of on-site utility technologies on public housing property covered by a Declaration of Trust. Installations at non-federal property, such as buildings or sites owned by PHAs' Central Office Cost Centers (COCCs), are unregulated by HUD. PHAs are not required to report these installations and can retain 100% of any utility cost savings achieved as a result of these installations for use by their COCCs.

Table 7.a. and 7.b. below outline common on-site utility technologies for which a Rate Reduction Incentive can be awarded.

**Table 7.a. On-Site Utility Technologies (group 1/2)**

| Source Utility Type | Use Utility Type | On-Site Utility Technologies | "Renewable"? | Incentive |
|---|---|---|---|---|
| | | | | |
| | | On-Site, Environmentally Preferable Water Gathering and/or Processing for On-Site Consumption and/or Off-Site Sale | | |
| Water | Water | - Rainwater Catchment & Processing Systems | yes | Rate Reduction Incentive |
| | | On-Site, Environmentally Preferable Wastewater Processing and/or Diversion | | |
| Wastewater | Wastewater | - Gray / Blackwater Processing & Diversion Systems | | |
| | | - Stormwater Processing & Diversion Systems | yes | Rate Reduction Incentive |
| | | On-Site Non-Combustion Source Electricity Generation for On-Site Consumption and/or Off-Site Sale | | |
| Air / Wind / Water / Land | Electricity Only | - Solar Photovoltaics | | |
| | | - Wind Turbines | | |
| | | - Fuel Cells (using water electrolysis or enzyme) | yes | Rate Reduction Incentive |

| | | | | |
|---|---|---|---|---|
| | | On-Site Non-Combustion Source Heat-Transfer Fluid Tempering for On-Site Consumption and/or Off-Site Sale | | |
| | Heat-Transfer Fluids Only | - Solar Thermal Arrays | | |
| | | - Geothermal Heat Pumps | | |
| | | - Fuel Cells (using water electrolysis or enzyme) | *see note 1 | *see note 1 |
| | | On-Site Non-Combustion Source Combined Heat & Power for On-Site Consumption and/or Off-Site Sale | | |
| | Electricity and Heat-Transfer Fluids | - Fuel Cells (using water electrolysis or enzyme) | *see note 2 | *see note 2 |

## Table 7.b. On-Site Utility Technologies (group 2/2)

| Source Utility Type | Use Utility Type | On-Site Utility Technologies | "Renewable"? | Incentive |
|---|---|---|---|---|
| | | | | |
| | | On-Site Gathered Raw Combustion Gases for Off-Site Sale | | |
| Piped Combustion Gases *see note 3 | Raw Material Gathered On-Site | - Raw Piped Non-Fossil Fuels, Gathered On-Site | yes | Rate Reduction Incentive |
| | | - Raw Piped Fossil Fuels, Gathered On-Site | no | |
| | | On-Site Combustion Gas Electricity Generation for On-Site Consumption and/or Off-Site Sale | | |
| | Electricity Only | - Fuel Cells (using Piped Non-Fossil Fuels) | | |
| | | - Fuel Cells (using Piped Fossil Fuels) | | |
| | | - Turbines / Engines (using Piped Non-Fossil Fuels) | yes | |
| | | - Turbines / Engines (using Piped Fossil Fuels) | no | |
| | | On-Site Combustion Gas Heat-Transfer Fluid Tempering for On-Site Consumption and/or Off-Site Sale | | |
| | Heat-Transfer Fluids Only | - Fuel Cells (using Piped Non-Fossil Fuels) | | |
| | | - Fuel Cells (using Piped Fossil Fuels) | | |
| | | - Boilers / Furnaces *Using Fuels Gathered On-Site* (using Piped Non-Fossil Fuels) | yes | |
| | | - Boilers / Furnaces *Using Fuels Gathered On-Site* (using Piped Fossil Fuels) | no | |
| | | On-Site Combustion Gas Combined Heat & Power for On-Site Consumption and/or Off-Site Sale | | |
| | Electricity and Heat-Transfer Fluids | - Fuel Cells (using Piped Non-Fossil Fuels) | | |
| | | - Fuel Cells (using Piped Fossil Fuels) | | |
| | | - Turbines / Engines w/ Heat Transfer (using Piped Non-Fossil Fuels) | yes | |
| | | - Turbines / Engines w/ Heat Transfer (using Piped Fossil Fuels) | no | |
| | | On-Site Gathered Raw Combustion Fuels for Off-Site Sale | | |
| Other Combustion Fuels *see note 4 | Raw Material Gathered On-Site | - Raw Non-Piped Non-Fossil Fuels, Gathered On-Site | yes | Rate Reduction Incentive |
| | | - Raw Non-Piped Fossil Fuels, Gathered On-Site | no | |
| | | On-Site Combustion Fuel Electricity Generation for On-Site Consumption and/or Off-Site Sale | | |
| | Electricity Only | - Fuel Cells (using Non-Piped Non-Fossil Fuels) | | |
| | | - Fuel Cells (using Non-Piped Fossil Fuels) | | |
| | | - Turbines / Engines (using Non-Piped Non-Fossil Fuels) | yes | |
| | | - Turbines / Engines (using Non-Piped Fossil Fuels) | no | |
| | | On-Site Combustion Fuel Heat-Transfer Fluid Tempering for On-Site Consumption and/or Off-Site Sale | | |
| | Heat-Transfer Fluids Only | - Fuel Cells (using Non-Piped Non-Fossil Fuels) | | |
| | | - Fuel Cells (using Non-Piped Fossil Fuels) | | |
| | | - Boilers / Furnaces *Using Fuels Gathered On-Site* (using Non-Piped Non-Fossil Fuels) | yes | |
| | | - Boilers / Furnaces *Using Fuels Gathered On-Site* (using | no | |

| | | | | |
|---|---|---|---|---|
| | | Non-Piped Fossil Fuels) | | |
| | | On-Site Combustion Fuel Combined Heat & Power for On-Site Consumption and/or Off-Site Sale | | |
| | Electricity and Heat-Transfer Fluids | - Fuel Cells (using Non-Piped Non-Fossil Fuels) | | |
| | | - Fuel Cells (using Non-Piped Fossil Fuels) | | |
| | | - Turbines / Engines w/ Heat Transfer (using Non-Piped Non-Fossil Fuels) | yes | Rate Reduction Incentive |
| | | - Turbines / Engines w/ Heat Transfer (using Non-Piped Fossil Fuels) | no | |

Table Notes:

1) On-site utility technologies in the category titled "On-Site Non-Combustion Source Heat-Transfer Fluid Tempering for On-Site Consumption and/or Off-Site Sale" are more commonly treated as energy conservation measures and are less likely to be directly quantifiable. As a result, this building equipment will usually be considered under the category of energy- and water-efficiency retrofit activities and incentivized with utility consumption reduction incentives, such as the Operating Fund Benefit (OFB) or EPC Incentives. Where direct metering / measurement of the energy harnessed is possible and the PHA so desires, HUD will consider offering a RRI Incentive as an alternative.
2) On-site utility technologies that engage in cogeneration (a.k.a. combined heat & power / CHP) must be reported carefully in order to ensure that the PHA receives the appropriate financial reward. An example calculation for a fuel cell using a natural gas reformer is provided in Section 11 of this document. However, in the event that a CHP technology has the combined effect of rate reduction via electricity generation and consumption reduction via heat-transfer fluid tempering (as may be likely to occur with a fuel cell using water electrolysis), it may be possible – with careful reporting – for an RRI to be provided for the electricity generation and an OFB / EPC Incentive to be provided for the heat-transfer fluid tempering.
3) Examples of Piped Combustion Gases include: natural gas (fossil fuel); landfill gas, biogas (non-fossil fuels)
4) Examples of Other Combustion Fuels include: fuel oil, coal, coke, propane, kerosene (fossil fuels); wood, wood pellets, biomass (non-fossil fuels)

## 8. Rate Reduction Incentive Updates.

### 8.1. RRIs for Resident-Paid Utilities.

While the process by which HUD subsidizes PHA-paid utility costs is more direct, HUD also subsidizes resident-paid utility types by passing funds through the PHA to residents in the form of a "utility allowance." Though the mechanism by which this happens is slightly more complex in practice, it is easiest to understand utility allowances as a pass-through subsidy. Because HUD subsidizes resident-paid utility types, it is equally important for PHAs to achieve utility cost savings amongst resident-paid utility types as PHA-paid utility types.

However, the policies and processes for the Rate Reduction Incentive were developed at a time when it was not anticipated that PHAs could make special and significant efforts on behalf of their residents to reduce utility rates for resident-paid utility types. Instead, the existing policies and processes for the RRI are tailored for PHA-paid utility types only.

While still rare, PHAs now have increasing ability to reduce utility rates – and ultimately, utility costs – on behalf of their residents, since utility providers are increasingly offering discounts to customers who conduct energy- and water-efficiency and on-site utility technology retrofit activities. As a result, HUD has developed requirementsfor extending RRIs to PHAs that achieve utility cost savings amongst resident-paid utility types, as well:

1. The PHA must demonstrate that it was the special and significant efforts of the PHA – not the resident – that generated the utility rate discount. For example, the installation of rooftop solar photovoltaic panels *by the PHA* would qualify, while the negotiation of a utility rate discount from the utility provider *by the resident* would not.
2. The PHA must to show that the discount is substantive in depth and duration – enough to warrant revision of the utility allowance schedules, which typically occurs no more than once per year.
3. The PHA must show the utility rate discount is active and stable.
4. The PHA must revise its utility allowances schedules to reflect the lower utility costs residents are paying.

Once these requirements are met, the PHA can then apply to receive an RRI in order to retain 50% of these resident-paid utility cost savings, just the same as if it had generated PHA-paid utility cost savings. The application must include proof that all these requirements have been met.

If the utility rate discount ends, the PHA must immediately revise its utility allowance schedules to reflect the lost discount, and the PHA will no longer receive an RRI.

### 8.2. RRIs for Green Power Purchasing.

Green power purchasing is a term like on-site renewable energy technologies that is used herein a bit more broadly than its precise definition. For the purposes of the Rate Reduction Incentive, green power purchasing refers to the purchasing of environmentally preferable utilities from an off-site utility provider. The availability of environmentally preferable utilities for purchase varies with location, but some options may include:

- reclaimed water
- landfill gas
- assorted biofuels
- electricity produced off-site (“green power”) by:
    - solar photovoltaic panels
    - wind turbines

    - hydroelectric systems
    - fuel cells
    - combined heat & power systems using non-fossil fuels
- heat-transfer fluids tempered off-site ("green district heat/cooling") by:
    - solar thermal arrays
    - geothermal heatpumps
    - fuel cells
    - combined heat & power systems using non-fossil fuels

Environmentally preferable utilities are not typically offered for sale at a reduced rate in comparison to traditional utilities, and so engaging in green power purchasing will not typically produce utility cost savings. Unfortunately, HUD does not have a method for incentivizing the procurement of environmentally preferable versus non-preferable utilities strictly based on the social benefits. However, a PHA may be able to secure a discounted utility rate for environmentally preferable utilities compared to the cost of traditional utilities when participating in a local "volume purchase" or "community purchase" program. In the event that a PHA can achieve utility cost savings while engaging in green power purchasing through these or other methods, HUD will consider this type of procurement as evidence of special and significant effort towards utility rate reduction and award a Rate Reduction Incentive.

Further, when it is not possible to install on-site renewable energy technologies on public housing property covered by a Declaration of Trust, PHAs may be able to install these technologies at non-federal property, such as buildings or sites owned by their COCCs, or at other sites in partnership with municipalities and other partners. If the resulting *environmentally preferable* utilities can be purchased at a reduced rate for use by the PHA at public housing property covered by a Declaration of Trust *in a manner compliant with procurement rules*, the PHA may request an RRI from HUD as a financial reward for the utility cost savings resulting from this green power purchasing.

### 8.3. Traditional RRIs vs. EPC-Related RRIs.

Because the policies and processes for the Rate Reduction Incentive were developed at a time when it was not anticipated that PHAs would simultaneously conduct utility rate reduction and utility consumption reduction efforts, a conflict exists between the Traditional RRI and Traditional EPC Incentives that produces a disincentive. In effect, a combined effort towards rate and consumption reduction would yield less financial reward than due, as a result of the RRI and EPC formulas. To resolve this matter and ensure that PHAs are properly incentivized to achieve utility cost savings through both rate reduction and consumption reduction efforts, HUD has developed a formula that will allow PHAs to retain the appropriate amount of utility cost savings overall from their combined efforts.

When *no related EPC is in place* and a PHA makes special and significant efforts to achieve utility cost savings through rate reduction (including the installation of on-site utility technologies, as explained above), the PHA is eligible for a Traditional RRI. The financial reward is equivalent to 50% of the utility cost savings achieved and is calculated as follows:

current utility consumption = $q_{current}$
baseline utility consumption = $q_{base}$
current utility rate = $p_{current}$
baseline utility rate = $p_{base}$
RRI utility cost savings = $\Delta c$
RRI financial reward = $f_{RRI}$

$$f_{RRI} = \frac{1}{2} \Delta c = \frac{1}{2} [q_{current} * (p_{base} - p_{current})]$$

However, when *a related EPC is in place* and a PHA makes special and significant efforts to achieve utility cost savings through utility rate reduction (including the use of on-site utility technologies, as explained above), the PHA is eligible for an EPC-Related RRI or "RRI-for-EPC."

PHAs should use the RRI-for-EPC formula, listed below, when an RRI and EPC *affect the same AMP-utility* and *during the related EPC's incentive term* only. If the PHA is also eligible for an RRI before and/or after the EPC incentive term, the Traditional RRI formula will be used during these outside years. The RRI-for-EPC formula differs from the Traditional RRI formula by assessing utility cost savings in relation to the baseline utility consumption rather than current utility consumption and by awarding 100% rather than 50% of these utility cost savings:

$$f_{RRI\text{-}for\text{-}EPC} = \Delta c = q_{base} * (p_{base} - p_{current})$$

The RRI-for-EPC can work with any of the 3 EPC Incentives: Frozen Rolling Base, Resident-Paid Utility Incentive, or Add-On Subsidy, to allow the PHA to receive a financial reward equivalent to 100% of the utility cost savings that it achieves through its combined efforts during the EPC incentive term.

## 9. Incorporating the RRI into EPC Planning.

The coincidence of an RRI and an EPC Incentive *affecting the same AMP-utility at the same* time triggers the use of the alternative RRI-for-EPC formula, as explained above, to ensure that PHAs will receive 100% of the utility cost savings achieved through the combination of their consumption reduction and rate reduction efforts.

However, this coincidence of an RRI and an EPC Incentive creates an opportunity for a PHA, during its retrofit planning process, to leverage anticipated RRI financial rewards to help fund a larger EPC overall and/or to build additional contingency into the EPC. This opportunity is especially significant when, as one example, a PHA plans to install on-site utility technologies with a relatively high payback rate and conduct energy- and water-efficiency work with a relatively low payback rate. In this case, the utility cost savings generated by the on-site utility technologies can help cover the costs of the energy- and water-efficiency retrofit activity to create an overall cost-effective project.

In order to take advantage of this opportunity, a PHA should pursue a "joint RRI-EPC retrofit project," as opposed to merely "coinciding RRI and EPC retrofit projects." The distinction

relates not to the calculation of the RRI project costs or utility cost savings, but to the incorporation of those project costs and utility cost savings into the EPC Cost Summary and Cashflow. That is, a joint RRI-EPC retrofit project reflects the RRI costs and savings within the EPC framework while coinciding RRI and EPC retrofit projects do not.

Timing will often be the most important factor in whether a PHA decides to present a joint project for the EPC Initial Project Plan Review or merely pursue coinciding projects. While the RRI retrofit activity can be installed before, after, or at the same time as construction on the EPC retrofit project, a PHA will need to have a good estimate while preparing the EPC Initial Project Plan of how much RRI project costs and utility costs savings are anticipated to accrue *during the EPC incentive term* in order to incorporate that information into the Cost Summary and Cashflow. Further, note that even in a joint RRI-EPC retrofit project, RRI project costs and utility cost savings are only eligible to be included in the EPC when they are *both* (1) related to an AMP-utility that is also affected by the EPC retrofit project *and* (2) anticipated to accrue during the EPC incentive term. Any RRI project costs and utility cost savings that have accrued before or are expected to accrue after the EPC incentive term should not be included.

In addition to considerations of leverage and timing, PHAs should consider the following policy implications when deciding whether to present a joint RRI-EPC retrofit project or merely coinciding RRI and EPC retrofit projects:

The Frozen Rolling Base (FRB) and Resident-Paid Utility (RPU) Incentives offer EPC participants a financial reward equivalent to 100% of utility cost savings, whereas the Add-On Subsidy (AOS) Incentive offers EPC participants a financial reward equivalent to the lesser of project costs or utility cost savings. When a PHA presents a joint EPC-RRI retrofit project that pairs the RRI with the FRB and/or RPU, the PHA will receive a financial reward equivalent to 100% of the utility cost savings attributable to the combination of EPC and RRI work. It will receive this financial reward partly through the mechanics of the FRB and/or RPU Incentives and partly through the RRI line item on Forms HUD-52722/3.

When a PHA presents a joint EPC-RRI retrofit project that pairs the RRI with the AOS, the PHA will receive a financial reward equivalent to the lesser of the combined project costs or combined utility cost savings. It will receive this financial reward entirely through the AOS line item on Form HUD-52722. $0 will be provided through the RRI line item, because the utility cost savings attributable to the RRI work will have been credited towards the AOS cost-effectiveness assessment. As such, a PHA that plans to affect the same AMP-utility at the same time through an AOS and an RRI should weigh the pros and cons of receiving the financial reward for its use of on-site utility technologies in direct cash (coinciding projects) versus formula credit (joint projects).

Finally, recall that while this notice is intended to provide guidance relevant to the use of on-site utility technologies at public housing, the policies regarding the combined use of RRI and EPC Incentives are the same regardless of whether an RRI is triggered by the use of on-site utility technologies or other eligible efforts towards rate reduction. Moreover, additional instructions for preparing applications for joint EPC-RRI retrofit projects will be provided in forthcoming notices.

**10. Reporting the Installation of On-Site Utility Technologies.**

In order to assist with tracking progress towards the President's 100MW goal and the efficacy of the policy changes described herein, the Department urges PHAs to promptly report the installation of on-site utility technologies through the EPIC data system. Specific instructions on how to utilize EPIC for this purpose will be provided in forthcoming notices.

## 11. RRI Example Calculations.

Note that in all examples below, the effective rate is calculated simply by dividing the total utility cost by the total utility consumption.

### Example 1: PHA-Owned On-Site Solar

| **Scenario** | |
|---|---|
| On-site technology type? | solar photovoltaic panels |
| On-site at public housing? | yes |
| Affecting PHA-paid or resident-paid utilities? | PHA-paid |
| Affecting which utility type category? | electricity |
| Renewable or not? | renewable |
| PHA-owned or leased? | PHA-owned |
| Purchased with HUD or third-party funds? | either |
| Utilities being used or sold? | both |
| Related EPC active and in place? | no |

| **PHA-Paid Electricity** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Electricity (baselines) | 150,000 kWh | $0.100 / kWh | $15,000 |
| | | | |
| Electricity (used)<br>Generated by Off-Site Traditional Equipment | 100,000 kWh | $0.100 / kWh | $10,000 |
| Electricity (used)<br>Generated by On-Site Solar Photovoltaic Panels | 50,000 kWh | $0.000 / kWh | $0 |
| Electricity (sold)<br>Generated by On-Site Solar Photovoltaic Panels | - | - | ($2,000)<br>*profit* |
| | | | |
| Total Electricity | 150,000 kWh | $0.053 / kWh<br>*effective rate* | $8,000 |

| | | |
|---|---|---|
| Base Utility Subsidy: | 150,000 * 0.053 | = $8,000 |
| Rate Reduction Incentive: | ½ [150,000 * (0.100 – 0.053)] | = $3,500 |
| Total Utility Subsidy: | | = $11,500 |

Explanation: Total utility cost savings through on-site utility technology is $7,000.
($5,000 savings from consumption; $2,000 profit from sale). RRI financial reward is 50% or $3,500.

Additional Notes:

A PHA's profit for selling a utility is equal to the revenue that it generates minus any required input costs for the on-site utility technology. For example, the profit for selling district steam generated by burning landfill gas that was gathered on site would be the revenue from the district steam sales minus the cost of harnessing the landfill gas. The costs of general operations and maintenance should not be treated as required input costs.

When a PHA owns its solar photovoltaic panels, as in the example above, the revenue and profit should be equal, because the required input costs are $0. If the PHA receives an electric bill showing net-metering, the electricity sales revenue for which the PHA was credited should be clearly cited. If the PHA does not receive electric bills showing net-metering but sells its utilities in another manner, it will need to track its revenue separately.

## Example 2: PHA-Leased On-Site Solar

| **Scenario** | |
|---|---|
| On-site technology type? | solar photovoltaic panels |
| On-site at public housing? | yes |
| Affecting PHA-paid or resident-paid utilities? | PHA-paid |
| Affecting which utility type category? | electricity |
| Renewable or not? | renewable |
| PHA-owned or leased? | leased |
| Purchased with HUD or third-party funds? | N/A |
| Utilities being used or sold? | both |
| Related EPC active and in place? | no |

| **PHA-Paid Electricity** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Electricity (baselines) | 150,000 kWh | $0.100 / kWh | $15,000 |
| | | | |
| Electricity (used)<br>Generated by Off-Site Traditional Equipment | 100,000 kWh | $0.100 / kWh | $10,000 |
| Electricity (used)<br>Generated by On-Site Solar Photovoltaic Panels | 50,000 kWh | $0.050 / kWh | $2,500 |
| Electricity (sold)<br>Generated by On-Site Solar Photovoltaic Panels | - | - | ($1,000)<br>*profit* |
| | | | |
| Total Electricity | 150,000 kWh | $0.076 / kWh<br>*effective rate* | $11,500 |

| | | |
|---|---|---|
| Base Utility Subsidy: | 150,000 * 0.076 | = $11,500 |
| Rate Reduction Incentive: | ½ [150,000 * (0.100 – 0.076)] | = $1,750 |
| Total Utility Subsidy: | | = $13,250 |

Explanation: Total utility cost savings through on-site utility technology is $3,500.
($2,500 savings from consumption; $1,000 profit from sale). RRI financial reward is 50% or $1,750.

Additional Notes:

When a PHA leases solar photovoltaic panels, as in the example above, it may do so in a variety of ways. When utilizing a Power Purchase Agreement, the PHA will typically receive payment for the use of its rooftop or land in the form of a discounted electricity rate, as shown above. If the PHA also receives a share of the profit from the sale of electricity from the solar photovoltaic panels, that profit should be included here.

## Example 3: Combined Heat & Power via Fuel Cells (using Natural Gas Reformer)

| **Scenario** | |
|---|---|
| On-site technology type? | fuel cells (using natural gas reformer) |
| On-site at public housing? | yes |
| Affecting PHA-paid or resident-paid utilities? | PHA-paid |
| Affecting which utility type category? | electricity & piped combustion gases |
| Renewable or not? | renewable |
| PHA-owned or leased? | owned |
| Purchased with HUD or third-party funds? | either |
| Utilities being used or sold? | used |
| Related EPC active and in place? | no |

| **Actual Costs for Fuel Cells (using Natural Gas Reformer)** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Natural Gas (amount used towards heating)<br>Used in On-Site Fuel Cells, Purchased Off-Site | 1,000 MMBtu | $5.00 / MMBtu | $5,000 |
| Natural Gas (amount used towards electricity)<br>Used in On-Site Fuel Cells, Purchased Off-Site | 170 MMBtu<br>*- converted to -*<br>*50,000 kWh* | $5.00 / MMBtu<br>*- converted to -*<br>*$0.017 / kWh* | $850 |
| | | | |
| Total Piped Combustion Gases | 1,170 MMBtu | $5.00 / MMBtu<br>*effective rate* | $5,850 |

| **PHA-Paid Electricity** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Electricity (baselines) | 150,000 kWh | $0.100 / kWh | $15,000 |
| | | | |
| Electricity (used)<br>Generated by Off-Site Traditional Equipment | 100,000 kWh | $0.100 / kWh | $10,000 |
| Electricity (used)<br>Generated by On-Site Fuel Cells<br>**from above, amount converted to electricity* | 50,000 kWh | $0.017 / kWh | $850 |
| | | | |
| Total Electricity | 150,000 kWh | $0.072 / kWh<br>*effective rate* | $10,850 |

| | | |
|---|---|---|
| Base Utility Subsidy: | 150,000 * 0.072 | = $10,850 |
| Rate Reduction Incentive: | ½ [150,000 * (0.100 – 0.072)] | = $2,100 |
| Total Utility Subsidy: | | = $12,950 |

| **PHA-Paid Piped Combustion Gases** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Piped Combustion Gas (baselines) | 3,000 MMBtu | $5.00 / MMBtu | $15,000 |
| | | | |
| Natural Gas (used)<br>Used in On-Site Traditional Equipment, Purchased Off-Site | 2,000 MMBtu | $5.00 / MMBtu | $10,000 |
| Natural Gas (used)<br>Used in On-Site Fuel Cells, Purchased Off-Site<br>**from above, amount not converted to electricity* | 1,000 MMBtu | $5.00 / MMBtu | $5,000 |
| | | | |
| Total Piped Combustion Gases | 3,000 MMBtu | $5.00 / MMBtu<br>*effective rate* | $15,000 |

| | | |
|---|---|---|
| Base Utility Subsidy: | 3,000 * 5.00 | = $15,000 |
| Rate Reduction Incentive: | ½ [3,000 * (5.00 – 5.00)] | = $0 |
| Total Utility Subsidy: | | = $15,000 |

Explanation: Total utility cost savings through on-site utility technology across both electricity and gas is $4,200. RRI financial reward is 50% or $2,100.

Additional Notes:

In this example, fuel cells that use a natural gas reformer are being used to produce both heat and electricity. To calculate the appropriate RRI, the PHA must divide the costs for the natural gas reformer into 2 buckets: that which is used for heating and that which is converted to electricity.

Because this is a simple example, the quantity of MMBtu that is processed into electricity by the fuel cells is converted from MMBtu to kWh using the standard conversion factor (1 MMBtu = 293 kWh). However, the actual conversion factor will depend on the efficiency of the on-site utility technology, and the actual kWh output should be used in real life calculations.

Following this conversion, the consumption and cost information associated with the fuel cells' electricity and heating processes can be incorporated into the standard electricity and piped combustion gas tables, respectively. The calculation of the RRI proceeds as usual from this point.

## Example 4: Landfill Gas Gathered & Used On-Site

| **Scenario** | |
|---|---|
| On-site technology type? | boiler using piped landfill gas gathered on-site |
| On-site at public housing? | yes |
| Affecting PHA-paid or resident-paid utilities? | PHA-paid |
| Affecting which utility type category? | piped combustion gases |
| Renewable or not? | renewable |
| PHA-owned or leased? | owned |
| Purchased with HUD or third-party funds? | either |
| Utilities being used or sold? | used |
| Related EPC active and in place? | no |

| **PHA-Paid Piped Combustion Gases** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Piped Combustion Gas (baselines) | 3,000 MMBtu | $5.00 / MMBtu | $15,000 |
| | | | |
| Natural Gas (used)<br>Used in On-Site Boiler, Purchased Off-Site | 2,000 MMBtu | $5.00 / MMBtu | $10,000 |
| Landfill Gas (used)<br>Used in On-Site Boiler, Gathered On-Site | 1,000 MMBtu | $2.50 / MMBtu | $2,500 |
| | | | |
| Total Gas | 3,000 MMBtu | $4.16 / MMBtu<br>*effective rate* | $12,500 |

| | | |
|---|---|---|
| Base Utility Subsidy: | 3,000 * 4.16 | = $12,500 |
| Rate Reduction Incentive: | ½ [3,000 * (5.00 – 4.16)] | = $1,260 |
| Total Utility Subsidy: | | = $13,760 |

Explanation: Total utility cost savings through on-site utility technology is $2,520.
RRI financial reward is 50% or $1,260.

## Example 5: Wind Power Affecting Resident-Paid Electricity

| **Scenario** | |
|---|---|
| On-site technology type? | wind turbines |
| On-site at public housing? | yes |
| Affecting PHA-paid or resident-paid utilities? | resident-paid |
| Affecting which utility type category? | electricity |
| Renewable or not? | renewable |
| PHA-owned or leased? | owned |
| Purchased with HUD or third-party funds? | either |
| Utilities being used or sold? | used |
| Related EPC active and in place? | no |

| **Resident-Paid Electricity** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Electricity (baselines) | 1,500 kWh | $0.100 / kWh | $150 |
| | | | |
| Electricity (used)<br>Generated by Off-Site Traditional Equipment | 1,000 kWh | $0.100 / kWh | $100 |
| Electricity (used)<br>Generated by On-Site Wind-Turbines | 500 kWh | $0.000 / kWh | $0 |
| | | | |
| Total Electricity | 1,500 kWh | $0.066 / kWh<br>*effective rate* | $100 |

| | | |
|---|---|---|
| Utility Allowance (Reimbursed by HUD): | 1,500 * 0.066 | = $100 |
| Rate Reduction Incentive: | ½ [1,500 * (0.100 – 0.066)] | = $25 |
| Total Utility Subsidy: | | = $125 |

Explanation: Total utility cost savings through on-site utility technology is $50. Utility allowances should be reduced in accordance with the new lower costs and reported to HUD as such. RRI financial reward is 50% or $25.

## Example 6: RRI & FRB Coinciding on PHA-Paid Electricity

| **Scenario** | |
|---|---|
| On-site technology type? | wind turbines |
| On-site at public housing? | yes |
| Affecting PHA-paid or resident-paid utilities? | PHA-paid |
| Affecting which utility type category? | electricity |
| Renewable or not? | renewable |
| PHA-owned or leased? | owned |
| Purchased with HUD or third-party funds? | either |
| Utilities being used or sold? | used |
| Related EPC active and in place? | yes – FRB |

| **PHA-Paid Electricity** | **Consumption** | **Rate** | **Cost** |
|---|---|---|---|
| | | | |
| Electricity (baselines) | 200,000 kWh | $0.100 / kWh | $20,000 |
| | | | |
| Electricity (used)<br>Generated by Off-Site Traditional Equipment | 100,000 kWh | $0.100 / kWh | $10,000 |
| Electricity (used)<br>Generated by On-Site Solar Panels | 50,000 kWh | $0.000 / kWh | $0 |
| | | | |
| Total Electricity | 150,000 kWh | $0.066 / kWh<br>*effective rate* | $10,000 |

| | | |
|---|---|---|
| Base Utility Subsidy (Using FRB Incentive): | 200,000 * $0.066 | = $13,333 |
| Rate Reduction Incentive: | [200,000 * (0.100 – 0.066)] | = $6,666 |
| Total Utility Subsidy: | | = $20,000 |

Explanation: Total utility cost savings through consumption reduction is $3,333, and the total utility cost savings through rate reduction is $6,666. By utilizing the RRI-for-EPC formula in combination with the FRB, the PHA retains 100% of the utility cost savings, or $10,000.

## 12. Further Assistance.

Clarifying questions regarding policies discussed herein should be sent to the Public Housing Management and Occupancy Division (PH-MOD) at HUD Headquarters. Waiver requests should first be submitted the local HUD Field Office, which will coordinate with HUD Headquarters to respond. Assistance requests related to energy audits, procurement rules, green training, etc, should also be directed to the local HUD Field Office.

HUD Public Housing Management and Occupancy Division
Attn: Neil B. Paradise, 202-402-4089
PIH_EPC_Policy@hud.gov

Persons with hearing or speech impairments may access these numbers by calling the Federal Information Relay Service at (800)877-8339.

Additional information on the Public Housing EPC Program, Utility Cost Reduction Incentives, and other sustainability and resilience initiatives can be found at the Public Housing Energy Conservation Clearinghouse (PHECC) website at http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/phecc.

The HUD forms referenced in this notice are approved under the Paperwork Reduction Act - OMB Control Number 2577-0029.

/s/
Jemine A. Bryon, Acting Assistant Secretary
for Public and Indian Housing