

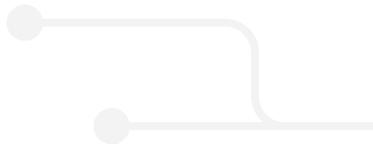


# Inclusive Utility Investments for Energy Efficiency Upgrades in Buildings

## Advanced Q&A for Utility Stakeholders

**What benefits can inclusive utility investments with strong consumer protections provide to customers?**

- Access to a home energy upgrade for all utility customers regardless of income, renter status, or credit score
- A home upgrade paid upfront completely by a utility investment and recovered through a fixed charge on the utility bill that is less than the estimated energy cost savings
- A hassle free turnkey assessment and installation process managed by the utility

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- High quality, correctly installed home improvements such as LED lighting, attic insulation, draft identification and sealing, new and correctly tuned energy efficient heating and cooling systems, smart thermostats, improved air quality and safety, and more.
  - No upfront cost, no debt obligation, no new liens on property
  - The opportunity to acquire more extensive improvements at a fraction of the usual cost
  - An immediate modest decrease in energy costs and a large decrease after the utility recovers its costs
  - Lower exposure to energy rate increases where the utility has capitalized efficiency upgrades because energy use at the site is lower

## **What is the most common program design for inclusive utility investment in site-specific energy efficiency upgrades with strong consumer protection?**

Pay As You Save<sup>®</sup> (PAYS<sup>®</sup>), developed by Energy Efficiency Institute, Inc., is the currently the only well demonstrated design for an inclusive utility investment through a utility tariff with strong consumer protections.

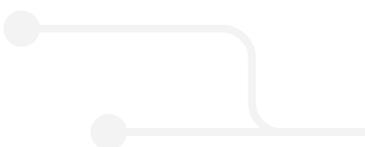
## **What is the portion of the estimated savings that the consumer keeps as a result of the utility's upgrade investment?**

Inclusive utility investments based on the Pay As You Save<sup>®</sup> system are designed to cap the cost recovery charge at 80% of estimated savings. Once cost recovery is complete, the customer will receive 100% of the savings. Where the efficiency upgrades result in average annual energy savings of 25%, initial bill reductions average approximately 5% of total cost, and following full cost recovery, the average annual cost for energy use can drop 20% to 30%.

## **What efficiency upgrades are typically eligible?**

Any upgrades that lower a customer's energy costs can be eligible in a tariff for site specific energy upgrades. Some utilities require that eligible upgrades be physically connected to the property. Upgrade packages for energy efficiency typically include:

- LED lighting, attic insulation, draft identification and sealing, duct leak identification and sealing, new and correctly tuned electric heat pumps or energy efficient air conditioning systems, and smart thermostats. Some utilities have recently added super-efficient hybrid water heaters. ENERGY STAR storm windows and interior panels would also likely qualify.
- Some current programs also include enrollment in demand response programs and installation of smart grid devices like remote controlled water heater switches.



To qualify for utility investment at a given location, proven energy modeling software calibrated with historical billing data and upgrade cost data must show that the upgrade package is estimated to generate enough savings to be cash flow positive. That means that the cost can be covered by less than 100% of the savings (usually 80 percent) over less than 100% of the upgrade's expected lifetime. The savings stream can come from multiple value streams, not only electricity savings. In cases where the estimated savings stream only covers some of the upgrade cost, customers that want that upgrade, usually a new HVAC system, can choose to pay upfront for the portion that the savings cash flow does not cover, enabling the utility to pay for the rest.

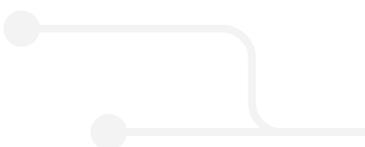
Recent legislation in Illinois allows use of inclusive utility investment to finance the full spectrum of smart grid solutions, such as on-site storage and distributed renewable energy including solar panels. Such upgrades are not economic yet in most cases, but will be so increasingly as prices drop or tax credit reforms expand their accessibility.

## What benefits can an inclusive utility investment program provide to utilities?

- Underwrite most of the cost of a virtual power plant, which combined efficiency and demand response upgrades to create value for customers and investors
- More rapidly meet 100% clean energy, zero carbon, or other government mandates or voluntary targets
- Lower energy and demand costs of wholesale supply
- Deferred investment in peak power
- Address hot spots and service to areas constrained by delivery capacity
- Defer operation and maintenance costs on otherwise overloaded transformers, switches, and substations
- Reach under-served market segments, including renters and low-moderate-income households
- Improved customer satisfaction
- Low cost, market-based options to attain clean energy and carbon pollution targets
- Inject millions or billions of dollars into the local economy creating thousands of jobs and improving livelihoods

## Is there a maximum duration of cost recovery based on the useful life for upgrades?

Yes, the maximum duration is typically 80% of the estimated useful life of the upgrades -- or the duration of a full parts & labor warranty, whichever is longer. For whole building efficiency upgrades, the period is typically 12 years, which is 80% of the 15 year period of useful life for whole home energy upgrades.



## How should energy upgrades be evaluated at each site?

Energy upgrades should be evaluated by a site specific assessment of expected cash flow. To determine which upgrades would meet the threshold for immediate estimated net savings for customers, the analysis performed for each site includes (A) the cost of installing the upgrades, (B) less rebates and/or incentive payments from any applicable source, (C) the utility's cost of capital, and (D) estimated savings for customers based on physics based building energy modeling using data on heating and cooling and water heating equipment models and vintage, direct measurement of building shell and duct system tightness and insulation, calibrated using historical billing data, and current rates.

## Does an inclusive utility investment program guarantee savings?

No, it generates the best estimate of annual and lifetime savings and allows a reasonable margin for overestimation by setting the annual cost recovery charge significantly below the estimated savings (e.g. the 75 to 89% of estimated annual savings over 80% of the useful life of the product). Participants retain the freedom to change their energy use at the location for any reason from raising or lowering their thermostat setting, to buying new powered equipment, to adding or changing occupant use patterns.

More recent tariffs, such as the Ameren Missouri Ameren PAYS<sup>®</sup> tariff, require measurement and verification at least one year after the upgrades are installed to evaluate whether the cost-recovery charge remains lower than estimated savings. Where this is the case and it is due to inaccurate saving estimates, the utility may reduce or eliminate the cost-recovery charge so that the customer realizes the projected savings.

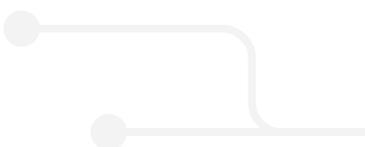
## Does an inclusive utility investment program guarantee the energy upgrades will continue to work throughout the cost recovery period?

Current tariffs require the utility to suspend the tariff if an upgrade fails before all costs are recovered. If a participant notifies the utility during the cost-recovery period that an upgrade has stopped working due to no fault of their own, the utility must suspend charges, arrange for repair, replacement or other remedy. The utility is permitted to extend the cost recovery period in order to recover the repair costs.

## Does a utility's cost recovery charge for an inclusive utility investment apply automatically to successor customers at an upgraded site?

Yes, inclusive utility investments are made through approved tariffs for site-specific upgrades, and the cost recovery charge for each upgraded location, which is less than the estimated savings, automatically applies to successor customers at that location until the utility's costs are recovered.

Meanwhile, the successor customer (whether renter or owner) will enjoy the net savings from the upgrades compared to less efficient conditions previously addressed at that location.



Due to the on-bill payments made by the prior customer(s) served at that meter, a successor customer will have fewer billing cycles remaining until cost recovery is complete, at which point they will enjoy 100% of the savings.

## **How are the interests of successor customers taken into account when a utility invests in energy upgrades at a site?**

The utility only invests in upgrades for which the estimated cash flow is positive even after allocating to the customer a portion of the immediate estimated net savings. Because the fixed charge does not increase when rates increase, rate hikes create additional value for customers with energy efficiency upgrades. As a result, a successor customer will receive the benefits of an improved building and receive a lower bill than would otherwise be due for the energy services at that site.

## **What happens during a prolonged vacancy?**

The utility only bills for service when its meter is active. If a site is vacant, the meter may be inactive, in which case cost recovery will resume when a successor customer opens an account at that site. If the utility misses cost recovery due to inactivity at the meter, the most common tariff for inclusive utility investments assures the utility can extend the cost recovery period to collect the missed payment cycles.

If the cumulative period of inactivity extends beyond the continued functioning of the upgrade (e.g. if the building is abandoned), the utility may choose to charge-off the cost of the upgrade to the site as uncollectible.

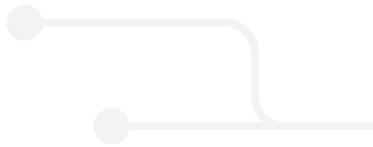
## **Should customers who opt into an inclusive utility investment program be eligible for the same rebates and incentive funds as other customers?**

Yes. There is no justification for disparate and inequitable treatment of customers who exercise their option to participate in an inclusive utility investment program that addresses the upfront cost barrier, enabling their participation in programs that award financial incentives already enjoyed by other customers.

## **What is the typical scale of energy efficiency upgrades made through an inclusive utility investment program?**

The scale of energy efficiency upgrades at a site depends on the type of site, weather zone, the energy use equipment in the building, the utility's cost of capital, and the useful life of the upgrades being undertaken.

For residential energy efficiency upgrades undertaken through inclusive utility investment programs in Kansas, Kentucky, and Arkansas, the average cost of energy efficiency upgrades at a site are in the range of \$5,500-8,000.



For non-residential customers, the range is much wider, and multiple utilities have reported capitalizing upgrades that cost more than \$100,000 per site.

## **What happens if a customer chooses to use more energy services at an upgraded site?**

The tariff for an inclusive utility investment program does not preclude occupants from using any amount of energy for any purposes they choose, which is an important consumer protection.

Changes in behavior or occupancy at an upgraded site do not affect the cost recovery charge for upgrades obtained through an inclusive utility investment program. Energy efficiency upgrades eliminate energy waste and continue to reduce usage at a location compared to what would have been needed to serve the occupant's end uses if the demand for energy services increase.

## **Do inclusive utility investment programs in energy efficiency and demand response upgrades generate benefits that flow to all ratepayers?**

Yes, there are cross-subsidies from participants to non-participants. Two categories of benefits include avoided demand costs and deferred capital requirements:

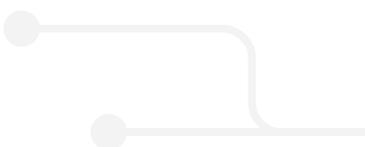
- Utility systems can reduce wholesale peak demand costs by investing in energy efficiency upgrades to buildings that require the most energy during the hottest and coldest periods.
- Utility systems with distribution circuits or substations that are approaching their capacity can defer investment in expansion by focusing on energy efficiency upgrades in areas served by that infrastructure.

Non-participants pay only what is warranted for the benefits of the inclusive utility investment program. These programs have not yet produced “free riders” because none of the customers receiving upgrades would have installed them in the absence of the program. There is no failure trigger event that would have required the customer purchase upgraded. As a result, the net-to-gross ratio is one.

In addition, the cost of saved energy is extremely low because no hassle, no upfront cost, no debt upgrade offers generate high volumes of expression of interest and conversion rates of 70 to 90% which keeps program operation costs low. In cases where utilities are not offering incentives the operation cost leverages 6x to 8x investment which is ultimately recovered from the participants.

## **Among utilities offering an inclusive utility investment program based on the PAYS system, have any reported disconnecting program participants for non-payment?**

At least two utilities with experience are not able to query their internal data systems to answer this question, and among the others, none have reported a disconnection for non-payment of program service charges.



Even while possible, disconnection for non-payment is less likely at locations where the utility bill is lower as a result of efficiency upgrades that reduce the amount of money spent on wasted energy.

### **Do the terms for an inclusive utility investment program include disconnection for non-payment of cost recovery charge for the site-specific upgrades?**

Yes, in all current programs essential utility services delivered on a site-specific basis, such as energy efficiency upgrades, are secured by the same protocols for disconnection for non-payment that apply to the utility's other investments. Should the utility choose another protocol for securing its investments, inclusive utility investment would be similarly secured.

### **If a utility customer is a renter, are they required to secure landlord approval before upgrades are installed at a site through an inclusive utility investment program?**

Yes, before a utility can upgrade the energy performance of a building it serves, the owner must consent.

### **Is a building owner obligated to notify a successor customer at the site that the utility has paid for energy upgrades at the location?**

Yes, before a utility can upgrade the energy performance of a building that it serves, the owner must agree to notify successor renters or prospective buyers that the utility has made improvements for which the estimated savings exceed the cost recovery charge at that location. The agreement provides the owner with language that can be added to a lease agreement, for example.

The utility offering inclusive utility investment also notifies new customers at locations where upgrades have been installed, a redundancy that comes after the point at which a successor customer would receive a notification from the landlord or prior owner.

### **Is customer satisfaction data available from utilities with inclusive utility investment programs?**

The How\$mart™ program offered by Midwest Energy is the largest and longest-running inclusive utility investment program using the PAYS® system for residential energy upgrades. In a Congressional briefing, Midwest Energy reported that 85% of its general membership gave the cooperative a high score for customer satisfaction, compared to 97% for participants in the How\$mart program. Similarly, the utility reported that 68% of its general membership gave the cooperative a high score for value compared to 96% for How\$mart participants.

## If inclusive utility investments are so effective, why haven't they been more widely & speedily adopted?

There are three primary reasons PAYS has been slow to be adopted:

1. **Utility misconception of PAYS as a loan program** - Many utilities have misunderstood how the PAYS system actually works, and mistakenly believed that in adopting PAYS they would become “a financial institution that holds loans or liens on equipment on the customer’s side of the meter.”<sup>1</sup> In fact, with PAYS, the utility does not hold a loan or lien but rather owns the asset during the cost-recovery period and upgrades belong to the site owner thereafter.
2. **Utility resistance to changing their prevailing business models** - Initially PAYS was developed as a way to dramatically increase energy efficiency, which actually discouraged adoption because selling less electricity or gas was antithetical to most utility business models. Utilities, especially rural electrical cooperatives, are now increasingly seeing the potential for PAYS to enable demand flexibility that improves their financial position even while helping customers stop wasting money on wasted energy. Electrification is attractive to both nonprofit and for-profit utilities, and that has been a game-changer in both California and New York where the building electrification imperative is codified into law.<sup>2</sup>
3. **Utility reluctance to be early adopters** - Most utility managers and governing boards are largely risk averse, preferring others to assume the perceived risks and costs of being among the first to try something new. Thankfully, we now have a dozen established programs in ten states that have forged paths for other utilities to follow. That said, every utility has needed to climb its own learning curve and follow its own diligence process, so we have learned that key types of assistance can accelerate that experience.

## Where can I find more information on inclusive utility investments for energy efficiency building upgrades?

The best introductory resource for utility managers is [The Utility Guide to Tariffed On-Bill Programs](#)<sup>3</sup>, published by the Southeast Energy Efficiency Alliance with sponsorship provided in part by the U.S. Department of Energy.

The Department of Energy’s Better Buildings Solutions Center has also published an [Issue Brief](#)<sup>4</sup> that provides a good overview for a general audience of energy policy analysts, utilities and their regulators.

The Building Decarbonization Coalition has published [Towards an Accessible Financing Solution](#)<sup>5</sup>, a report that provides more details on program design choices and consumer protections.

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<sup>1</sup> MO PSC. (2019). [Before the Public Service Commission of the State of Missouri File No. FO-2019-0132](#) (<http://www.eeivt.com/wp-content/uploads/2019/12/Report-and-Order-MEEIA-Dec2019.pdf>).

<sup>2</sup> Load growth alone is not a sufficient incentive for investor-owned utilities whose profits come from earning a regulated rate of return on invested capital, which at 6% to 10% makes most site-specific investments uneconomic. Regulators in Missouri, however, have solved this problem, by having the participants pay a portion (currently 3% or 4%) of the regulated rate of return and spreading the remaining cost across all customers, just as with all other utility investments.

<sup>3</sup> [https://www.seealliance.org/wp-content/uploads/SEEA\\_TOBGuide\\_FINAL\\_UPDATED\\_2020\\_04\\_13.pdf](https://www.seealliance.org/wp-content/uploads/SEEA_TOBGuide_FINAL_UPDATED_2020_04_13.pdf)

<sup>4</sup> [https://betterbuildingsolutioncenter.energy.gov/sites/default/files/IB%20L-1%20EE%20Financing%20through%20On-Bill%20Tariffs\\_Final\\_0.pdf](https://betterbuildingsolutioncenter.energy.gov/sites/default/files/IB%20L-1%20EE%20Financing%20through%20On-Bill%20Tariffs_Final_0.pdf)

<sup>5</sup> [https://www.buildingdecarb.org/uploads/3/0/7/3/30734489/bdc\\_whitepaper\\_final\\_small.pdf](https://www.buildingdecarb.org/uploads/3/0/7/3/30734489/bdc_whitepaper_final_small.pdf)