

Frequently Asked Questions:

Pay As You Save (PAYS) for Clean Transport

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What is Pay As You Save?

Pay As You Save® (PAYS®) is a transaction design that accelerates investment in cost-effective energy upgrades by removing the upfront cost barrier. It allows the customer to benefit from the resulting savings immediately, and allows the utility to recover its cost through a monthly service charge that is less than these savings.

In a PAYS transaction, the electric utility offers its customers an opt-in tariff that allows the utility to pay for the upfront cost of the asset (EE upgrade, charging infrastructure, etc.) and to recover its cost on the monthly bill with a charge that is less than the estimated savings. The customer gains from the energy savings of the asset, and the utility ultimately recovers the entire cost of the asset, at which point ownership of the asset transfers to the customer.

Where has PAYS been applied before?

PAYS was developed for building energy efficiency upgrades by the Energy Efficiency Institute (EEI) in the United States. Energy Efficiency Services Limited (EESL), a public-private joint venture in India, has also used a similar system by the same name to finance energy efficient appliances.

In the U.S., utility regulators in New Hampshire, Kansas, Kentucky and Arkansas (among others) have approved opt-in tariffs for efficiency upgrades in buildings. Several private, investor-owned and co-operative utilities have implemented programs with positive results. PAYS has also been implemented for investment in solar water heaters in Hawaii, and water efficiency upgrades in California.

What is PAYS for clean transport?

PAYS for clean transport applies the same on-bill investment concept to tackling the high upfront costs of electric mobility, starting with clean transit. Electric buses are now close to cost parity with diesel buses on a lifecycle basis, and in some scenarios, already cost effective. This owes in part to declines in battery costs as well as significant savings in fuel and maintenance relative to conventional buses in many markets. An EV bus and charger can cost as much as 150% of a diesel bus, presenting a capital cost barrier that prevents transit agencies from investing in them, despite their potential long-term cost effectiveness and significant environmental benefits.

In PAYS for clean transport, as with the energy efficiency example, electric utilities finance the expensive equipment that raises the capital cost of electric buses – batteries and charging equipment – allowing the transit agency (the customer) to purchase an electric bus at the same upfront expense as a diesel bus, and pay for the equipment through a dedicated fixed charge (tariff) on the monthly bill for meter serving the charging station used by the bus. The tariffed charge is set at less than the estimated operating cost savings (predominantly from reduced fuel and maintenance costs). As a result, the transit agency receives an immediate benefit, in addition to both having a pathway to ultimate ownership of the batteries and charging infrastructure and a viable means of accelerating fleet electrification. The utility benefits from significantly higher electricity sales to the customer (unlike the energy efficiency case).

Is PAYS a trademarked term, and if so, in which markets?

The Energy Efficiency Institute (EEI), co-creator of PAYS, holds a trademark for to protect the phrase Pay As You Save and PAYS in the United States only. The trademark protection prevents the name from being appropriated in the United States to refer to program designs that do not meet the minimum criteria for a tariffed on-bill program. This protection does not apply in international markets, and as a result, there are a few instances of the same term being used to brand different program designs.

What are the benefits of electric buses over diesel buses?

In all but the most carbon-intensive grids, electric buses produce lower well-to-wheel carbon emissions than their diesel counterparts. The drivetrain energy efficiency is up to 500% higher than that of a diesel engine. They are quieter and produce lower levels of harmful urban pollutants (NOx and fine particulates). For governments aiming to reach greenhouse gas emissions targets in the transport sector in the next 10-15 years, the transition to electric bus fleets must begin now, as the average bus is in service for about 12 years.

How environmentally friendly are electric buses with a 'dirty' electricity supply?

Electrification is a prerequisite to decarbonizing the transport sector, and it can take more than a decade to complete without adding stranded assets to the full cost of the transition. Electric buses fueled by an electrical grid powered by carbon intensive sources may have small or even negative carbon emission reductions when compared to diesel. However, the much greater tank-to-wheels efficiency of the electric drivetrain means emissions reductions improve quickly as the grid emissions factor falls. While some power resource portfolios will have relatively high emissions factors (e.g. South Africa), they are expected to fall over time as renewables are integrated into the grid supply.

Are the electric buses purchased new or retrofitted?

The electric buses are all purchased new from the manufacturer.

Who owns the batteries and charging equipment for the buses?

At the outset, the utility owns the batteries and charging equipment. The PAYS tariff is applied to the meter for the location at which the bus charges. At the point at which the utility has recovered its costs, its cost recovery charges end, and ownership of the batteries and charging equipment moves to the transit agency.

What does the utility provide?

The utility provides the upfront capital for investment in the batteries and charging infrastructure for the electric bus. This could be done on-balance sheet, using internal capital or through issuing a debt instrument (e.g. green bond) or similar; or off-balance sheet through a special purpose vehicle and potentially limited-recourse debt.

Once the bus is in operation, the utility provides electrical service to the charging site, and the cost of that electricity is defined in a tariff for electricity service that applies to all customers that qualify for that rate. For that reason, the tariff that defines the electricity rate is separate from the tariff (or tariff rider) that defines the PAYS charge.

What does the transit agency provide?

The transit agency provides the upfront capital for the purchase of the electric bus only (without the batteries or charging infrastructure), at a cost approximately in line with the purchase cost of a diesel bus. Once the bus is in operation, the transit agency commits to paying the tariff to the utility until expiration.

What, if any, is the role of external capital providers?

External capital may be required in three cases:

- **Alternative capital source.** If the utility cannot (or prefers not to) finance the purchase of the batteries and charging infrastructure internally, it may seek external capital to provide the financing required. This could be done privately through a bespoke financial instrument, which could include a public debt or bond offering.
- **Copayment to buy down the upfront cost to a level that is cost effective.** Under certain conditions, the total cost of ownership of an electric bus will still be above that of a diesel bus, and the utility will be unable to recover the investment in the batteries and charging infrastructure at a rate cost-effective to the transit agency. In such a case, the transit agency will either have to make an upfront co-payment to cover this gap, or grant funding/concessional capital will have to be raised by the transit agency to cover it.
- **Professional services for initial implementation in a specific market.** The legal, consulting, and administrative fees associated with the first-time design and implementation of the Pay-As-You-Save system for a specific market can be paid by the utility, which may seek to have those costs covered by external grant funding as a public benefit.

What happens if the transit agency does not meet its obligations under the terms of the PAYS tariff?

In the US applications of on-bill financing, regulators have consistently agreed that delivery of energy efficiency upgrades on the demand-side of the meter is an essential utility service, and therefore, the PAYS tariff can be considered part of electrical service as a whole. For that reason, the cost recovery charge can be treated similar to charges for utility services, including disconnection of service in case of non-payment. Assuming this is also the case in other contexts, denial of service is the utility's security against non-payment.

Even if the transit agency encounters financial difficulties, or is not particularly creditworthy, it is less likely to not pay its electricity bill than other financial obligations because that would result in cutting fuel to the transit system. The PAYS transaction design may present less counterparty risk to the utility than the transit agency's credit rating might otherwise indicate.

What happens if the utility does not meet its obligations under the terms of the PAYS tariff?

As specified in the terms of the PAYS tariff, the cost recovery charges are suspended if the equipment stops working for no fault of the customer and it is not repaired. The manufacturer's warranty should cover equipment performance during the period of cost recovery. The utility may include extend the cost recovery period to recover repair costs, if any are incurred.

Is the value of grid services provided by an EV included in a PAYS tariff?

The benefits provided by grid connected batteries do have value, and that value should not be conditional upon the source of financing for the battery. All customers that can provide such services should be eligible for similar compensation, including those that use a PAYS tariff to procure on-board energy storage and charging stations. These additional benefits can be factored into the estimated savings of a PAYS tariff, which helps reduce the cost recovery charge or the cost recovery period.