**The simplest complete definition of CLEP.**

Customer Lowered Electricity Price (CLEP)[[1]](#footnote-1) is a novel Variable Peak Pricing (VPP) rate design;[[2]](#footnote-2),[[3]](#footnote-3) CLEP has both a novel TOU part and a novel Real Time Pricing (RTP) part.

* CLEPm is like the most common kind of time-of-use pricing (TOU) rate: it increases the price of a kWh by a constant amount throughout the utility’s peak hours of the year.[[4]](#footnote-4)
* CLEP5 plus the fixed price for electricity set by ENO’s rates equals a RTP rate design.
* However, CLEP is a bit more sophisticated than any other VPP in these ways:
* CLEPm charges every customer 50¢/kWh for purchases during peak times and zero at other times; the novel ideas are: i) CLEP pays for *delivered* electricity at the same rate, and i) unlike all other customers, homes are given a credit against this charge that increases with the age of the home — so that for the same consumption (or production) during peak times of these four kinds of customers will incur different charges or credits.[[5]](#footnote-5)
* CLEP5 is the 5-minute, marginal wholesale price; marginal means compared to weighted average wholesale price the utility pays for electricity from the wholesale market.[[6]](#footnote-6)

The actual formula that sets the CLEPm payment/charge (payment if >0 and charge if <0) is:

The CLEPm payment/charge is given by: CLEPm = **q**\*$50/kW\*( **d**R - **d**A ), for any month within PUDT (Peak Utility Demand Times);

where

**d**R = Reference Demand for a Home

**d**A = Average Demand during PUDT.

There are roughly 100 PUDT hours in a month.

Only homes have non-zero **d**R, and older homes have larger **d**R than newer homes.

For simplicity, since the number of PUDT hours in a month are always a bit more than 100, we will assume it is exactly 100, but in practice the number of PUDT hours may be as many as 110.

And we will assume that **q** = 1, but in practice **q** = near 95%.

In the following example, all four customers use (or produce) 100 kWh during the 100 PUDT hours of this month. This means that average demand (or production) is 1 kW.

By definition of CLEPm, a business has a 0.0 kW reference demand.

Then CLEPm = 1\*$50/kW\*(0.0 kW – 1 kW) = -$50.

However, the number of hours used to observe average demand was 100, so the average charge /kWh = $50/(100 hours) = $.5/hour during the time the average wattage was 1 kW which is equivalent to $.50/kWh. So, the customer will be charged 50¢/kWh for purchases during PUDT.

CLEPm = 1\*$50/kW\*(0.0 kW – 1 kW) = [$50/kW\*0.5 kW] - [$50/kW\*1 kW] = $0 - $50. I.e., the **Business starts with $0 credit** and is charged @ 50¢/kWh for purchases during PUDT.

Let’s assume that an old home has a 2 kW reference demand.

Then CLEPm = 1\*$50/kW\*(2 kW – 1 kW) = $50.

CLEPm = 1\*$50/kW\*(2 kW – 1 kW) = [$50/kW\*2 kW] - [$50/kW\*1 kW] = $100 - $50. I.e., the **Older home starts with $100 credit** and is charged @ 50¢/kWh for purchases during PUDT.

Let’s assume that a new home has a 0.5 kW reference demand.

Then CLEPm = 1\*$50/kW\*(0.5 kW – 1 kW) = -$25.

CLEPm = 1\*$50/kW\*(0.5 kW – 1 kW) = [$50/kW\*0.5 kW] - [$50/kW\*1 kW] = $25 - $50. I.e., the **Newer home starts with $25 credit** and is charged @ 50¢/kWh for purchases during PUDT.

By definition a solar farm has a 0.0 kW reference demand and this month’s consumption was a negative 1 kW and **q** = 1. Then CLEPm = 1\*$50/kW\*(0.0 kW – [-1 kW]) = $50.

CLEPm = 1\*$50/kW\*(0.0 kW – 1 kW) = [$50/kW\*0.0 kW] – (- [$50/kW\*1 kW]) = $0 + $50. I.e., **the solar farm starts with $0 credit** gets paid @ 50¢/kWh for its production during PUDT.

1. CLEP was introduced by Building Science Innovators (BSI) in 2016 within the 2015 Entergy New Orleans Integrated Resource Planning (IRP) docket and again in in 2019 within the 2018 Entergy New Orleans Rate Case. [↑](#footnote-ref-1)
2. “

   * **Time-of-use pricing (TOU)** — typically applies to usage over broad blocks of hours (e.g., on-peak=6 hours for summer weekday afternoon; off-peak = all other hours in the summer months) where the price for each period is predetermined and constant.
   * **Real-time pricing (RTP)** — pricing rates generally apply to usage on an hourly basis.
   * **Variable Peak Pricing (VPP)** — a hybrid of time-of-use and real-time pricing where the different periods for pricing are defined in advance (e.g., on-peak=6 hours for summer weekday afternoon; off-peak = all other hours in the summer months), but the price established for the on-peak period varies by utility and market conditions.”

   https://www.smartgrid.gov/recovery\_act/time\_based\_rate\_programs.html [↑](#footnote-ref-2)
3. “Given these advances, the tariffs of tomorrow are likely to consist of three parts corresponding to the three elements that comprise electricity costs: a fixed monthly charge, a time-varying energy charge, and a demand charge. The fixed charge (sometimes referred to as a customer charge, service charge, or facilities charge) is expressed in dollars per month. It reflects the costs of servicing the customer, such as billing, metering, and customer service. The time-varying energy charge, expressed in U.S. dollars per kilowatt-hour, recovers energy costs, either in the form of a simple time-of-use (TOU), critical peak pricing (CPP), variable peak pricing (VPP), or real-time pricing (RTP) rate.

   A simple TOU rate defines peak periods during which prices are higher than in off-peak periods and is currently the most common form of time-varying rate. …

   RTP are considered purer forms of dynamic pricing in that they are based on actual market conditions and thereby a better signal of customer changes in the utility’s costs.”

   https://magazine.ieee-pes.org/wp-content/uploads/sites/50/2020/05/PE\_MayJun\_Faruqui.pdf [↑](#footnote-ref-3)
4. CLEPm raises the price of electricity during the roughly 500 hours in a year which are most likely to be the peak hours of the utility. Presumed at first for New Orleans, to be weekdays, between 2 and 7 PM, May through Sept. [↑](#footnote-ref-4)
5. Given the same net consumption during the peak hours of any month, depending on the age of the home when it was new, the resident could be “charged” a CLEPm $.50/kWh ***electric bill decrease*** if the home is 50 years old and a charged a CLEPm $.25/kWh price increase if the home is new; the CLEPm charge could be $.50/kWh for a business and payment for sales or production to the grid by this same $.50/kWh amount. See a full worked out example on the next page. [↑](#footnote-ref-5)
6. Assume that the weighted-average price ENO pays MISO for electricity is $0.03, and during some 5-minute period, the MISO price at the New Orleans node is $0.04. This means the marginal price is $0.01 at that time and CLEP5 would be $0.01. When the MISO Price is $0.01, CLEP5 would be -$0.02 for a kWh purchased during that time. [↑](#footnote-ref-6)