***CLEP Opening Statement  
Building Science Innovators  
by Myron Katz, PhD***

***Entergy New Orleans Rate Case***

***DOCKET NO. UD-18-07***

***June 17, 2019***

***Evidentiary Hearing***

***The following is the text found in today’s PowerPoint Presentation.***

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**Clep Opening Comments** ENO Rate Case, 6/17 Evidentiary Hearing by Myron Katz, BSI

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**Clep, Customer Lowered Electricity Price**, is a market-based, utility rate-design, that pays customers to lower a utility’s cost of energy, and power, by paying them: almost all the savings they cause. Clep is a voluntary, **OPT-IN** rate, configured to extinguish all subsidies.

***Far better than old-school time-of-use rates, that have no means to pay full negative demand charges,***

***Clep addresses: reliability issues outstandingly, with strategies that finance thermal and electric storage,***

***helps make utility services more affordable, for low- and middle-income consumers,***

***produces market-transformation by financing a wide variety of low-tech energy-performance equipment not otherwise financeable,***

***and in the process, stimulates waves of new clean-energy jobs.***

The time allotted me today will be spent explaining how ***Clep*** functions with various energy retrofits, while comparing it to standard energy efficiency methods, first by using the data from the Direct Testimony and then the data obtained from our Clep simulation software called the “***Clep*** Dashboard”.

Demonstrating and explaining most of the entries in the next two tables, is a goal of this 15-minute presentation.

***5, 4, 3, 2, 1,***

### **Discussion of Table-of-Retrofits, from Direct-Testimony Estimates, Feb 1, 2019**

Only the 2nd and 3rd in this table, are energy efficiency retrofits, and 5 of 6, are almost completely financed by Clep. Before Clep, none of these very important retrofits, could be financed by electricity bill savings, even though: relative to their investment costs, all cause: proportionately, very large, peak-demand savings.

### **Programming a dishwasher.** “With a $0 investment in labor and materials, by setting a standard, programmable **dishwasher** to always operate very early in the morning, a Clep customer will earn $26 per year: $20 comes from Clep-m. Thus, 80% of Clep income, for this retrofit, is expected to come from negative demand charges. 1/5 kW peak demand saved for $0 invested.

### **Timed water heating.** “a $50 investment in labor and materials, for installing a timer, a **standard electric water heater** with a tank, can be set to always heat water very early in the morning. A Clep customer can save $150 a year, where $50 comes from Clep-m. Thus, 1/3 of Clep income, is expected to come from negative demand charges. The payback is about 1/3 of a year. 4/5 kW of peak demand saved for $50 invested by customer. $0 by utility.

### **Heat pump water heater. (**This super *energy efficiency* retrofit was expected to be 20% enhanced by Clep.)

a $300 investment (net of $400 in rebates) in labor and materials, that comes with an App-controlled timer, a customer can install and control a **heat pump water heater** with a tank, to always heat water very early in the morning. The annual cashflows are expected to be 372 from Energy Efficiency and $80 from Clep: of which $50 comes from Clep-m. Thus, 60% of Clep income is expected to come from negative demand charges. Without Clep, the payback period is 0.8 years, but with Clep, the payback 2/3 years. 4/5 kW of peak demand saved for $300 invested by customer. $0 by utility.

### **Ice-Making AC. (**This poor *energy efficiency* retrofit was expected to be 300% enhanced by Clep.) With a $3000 investment in an ice-making AC, a customer can make ice very early in the morning. The annual Clep income was expected to be $1040, of which $800 comes from Clep-m. Thus, 77% of Clep income was expected to come from negative demand charges. Without Clep, Energy Efficiency pays $330 per year and requires a 9-year payback. But, with Clep and Energy Efficiency, the benefit is $1370 per year and pays back in less than 3 years. 4 kW of peak demand saved for $3000 invested by customer. $0 by utility.

### **Electric Battery.** “(using 2016 prices) a $10,000 -investment in a 12-kWh whole-home battery, Clep provides $686 of which $600 comes from Clep-m. This estimate says that 87% of Clep income for this retrofit was expected to come from negative demand charges. However, the payback period is too long, because 14.5 years is longer than the battery’s 10-year warranty. 3 kW of peak demand saved for $10000 invested by customer. $0 by utility.

One way to finance the battery fast enough is displayed in the Dashboard, within the “Combined Effect W/O CS”, column, which can be set up, to aggregate the income and investments, of the Heat pump water heater, Ice-making AC, and the Whole-Home Battery. However, adding all investments’ costs, ENO and the Clep cashflows, pays back the $13300 investment in less than 10 years. And thus, finances the ensemble, thermal and electric storage investments before the battery warranty expires.

### **Community Solar. (**— a critically needed, no subsidy replacement, for: Net Energy Metering.)

### “Assuming a Community-Solar-Farm capital-investment of less than $1 per watt, is amortized over 20 years, a subscriber should be able to **rent 1 kW**, at roughly $7 per month. Thus, the subscriber will pay 7 times 12 = $84 per year, to **rent** 1 kW, for which Clep will pay $235, where $125 comes from Clep-m. This estimate says that 53% of Clep income for this retrofit comes from negative demand charges. Multiplying by 5 to match the assumption of 5 kW, found in the Dashboard, gives $1175 annual income. Since $420 must be paid in rent, this nets $755. 2 kW of peak demand saved, for $0 invested by customer. $0 by utility.

In preparation for the cruise with the Dashboard, here is the summary data you will learn in the next video.

**5, 4, 3, 2, 1,**

### **Discussion of Table-of-Retrofits, using the Clep Dashboard simulator, version March 25, 2019**

### **Timed water heating .** “With a $50 investment for installing a timer, a **standard electric water heater** with a tank, can be set to heat water very early in the morning. The fact that *Cost-of-Energy reduced by* is $146, means that Clep income is $150. This is explained on page 5 of Exhibit 4.

### Because heating water, 12 hours before it’s used for a shower, may require preheating 10° higher, which uses an extra kWh daily, this adds 40 dollars extra cost per year. Thus, $110 is a better estimate of the Clep income, and the payback period is about 5 1/2 months.

### **Heat pump water heater.** This super *energy efficiency* retrofit is 50% enhanced by Clep.) “With a $300 investment (net of rebates). The Dashboard shows at the bottom of that column: $241, with Clep: $378. Thus, *energy efficiency* reduces consumption and the ENO bill by $241. Clep savings adds to that to get 378. Thus, “net” Clep income is 137. The, 378, pays back the $300 investment in 4/5 of a year, or 50% faster with Clep.

### **Ice-Making AC. (**This poor *energy efficiency* retrofit is twelve hundred % enhanced by Clep.) “With a $3000 investment in an ice-making AC, a customer can store energy at night to offset cooling needs in the afternoon. The Dashboard displays: at the bottom of that column: $49, with Clep: $626. Thus, *energy efficiency* reduces kWh consumption and the ENO bill by *only* $49. And the net Clep savings is $577. With just Energy Efficiency, payback takes 62 years. With Clep, it takes less than 5 years, more than 12 times faster.

### **Electric Battery** “(using 2016 prices) With a 10,000-dollar investment in a 12-kWh whole-home battery, The Dashboard displays: at the bottom of that column: $0, with Clep: $495. The 495 Clep cashflow, takes 20 years to pay back the 10,000-dollar investment, more than 2 times the warranted life of the battery; this is far too slow. Although this way to finance batteries doesn’t work, the Direct Testimony provides four alternative ways that do. See the answer to Question 13, starting on page 32.

### One of those ways is displayed in the Dashboard, in the “Combined Effect W/O CS”, column, which I have already set up, to aggregate the income and investments, of the Heat pump water heater, Ice-making AC, and the Whole-Home Battery. See the bottom of that column. $290, with Clep: $1499. Thus, $290 in Energy Efficiency retrofits would take 46 years to pay off the $13,300. If one includes the Clep cashflows, this pays back the $13,300 investment in 9 years. And thus, finances the ensemble, thermal and electric storage investments in less than 10 years.

### **Community Solar.** The Dashboard assumes 5 kW of a Community-Solar-Farm, is rented by a resident for $420 per year. The Dashboard displays at the bottom of that column: $0, with Clep: $1143. Thus, the net cashflow to the customer, is $723 per year. This annual benefit cuts the original residential customer’s obligation to ENO, in half: from roughly 1400 per year, to $700 a year.

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**Electric Battery part 2**

Note that Question 13 in the Direct Testimony was: *How can Clep increase reliability and resilience at a negative cost?* I will not repeat the answer here but take its conclusions from the Hurricane Sandy story. The economic and life-saving benefits of customer-side sited batteries far exceed most other economic benefits elsewhere discussed in this and other testimony. This is sited within BSI’s response to ENO’s 1st Interrogatory. Hundreds of solar-powered microgrids in Manhattan continued to provide electricity in the aftermath of that hurricane. This saved lives. ***5, 4, 3, 2, 1,***

**Community Solar part 2**

The most common means of remuneration for Community Solar is with Net Energy Metering, [Nem]; that pays the retail rate for such electricity. Many regulators in the US believe that Nem creates a cross-subsidy and are thus phasing out Nem. Clep fills this void and thereby rejuvenates Community Solar.

Because Clep operates without subsidies and even extinguishes past subsidies, Clep can fill the gap about to be exposed by the demise of Nem.

The dashboard also states that 9125 kWh’s are generated by 5 kW. Dividing $1143 by 9125 will give the price per kWh… It is $0.125 per kWh. This is more than $0.11 per kWh, namely ENO’s retail price. In fact, the ratio of these values is 113.6%, which means the Dashboard effectively says, Clep pays almost 14% higher than Nem.

Because any customer can rent or own a part of a Community Solar farm, access to solar energy is improved in New Orleans by a factor of ten. Therefore, had Community Solar been accepted when it was offered to the New Orleans City Council in 2007, the currently-deployed roughly 40 Megawatts of rooftop solar in New Orleans would likely have been at least five times as large if deployed within Community Solar Farms, — namely over 200 Megawatts by 2019. ***5, 4, 3, 2, 1,***

**The Environmental & Economic Synergy provided by CLEP**

### The most expensive, and systematically ignored subsidy, commonly in electricity rates, is the externalized cost and environmental burden, caused by rates, that make no attempt to correctly tie retail electricity price, to the grossly, time-varying, carbon-footprint of a kWh. Only Clep remediates this and does so without subsidies because Clep-5 rewards at the wholesale price which is highly correlated with carbon footprint. For many as well as, for synergistic reasons, the wholesale price and the carbon footprint of electricity sold in New Orleans at night is far lower at night than during the day and often is provided by wind farms in Iowa who sell electricity to Miso at minus one cent per kWh. That is why the first four energy retrofits simultaneously lower the cost of electricity and New Orleans’ carbon footprint.