EXHIBIT 2

California Public Utilities Commission

A Review of Pre-Pay Programs for Electricity Service

POLICY AND PLANNING DIVISION POLICY PAPER

Chris Villarreal
Principal Author
POLICY AND PLANNING DIVISION

Marzia Zafar
Interim Director
POLICY AND PLANNING DIVISION

July 26, 2012

DISCLAIMER

This White Paper was prepared by California Public Utilities Commission (CPUC) staff. It does not necessarily represent the views of the CPUC, its Commissioners, or the State of California. The CPUC, the State of California, its employees, contractors, and subcontractors make no warrant, express or implied, and assume no legal liability for the information in this White Paper. This White Paper has not been approved or disapproved by the CPUC, nor has the CPUC passed upon the accuracy or adequacy of the information in this White Paper.

A Review of Pre-Pay Programs for Electricity Service

Introduction

One of the most intriguing electricity service options being discussed today is Pre-Pay. Pre-Pay is defined as a customer paying for electricity service in advance of electricity being consumed. The price a customer pays is known in advance, and, with the installation of Advanced Meters and other advanced technologies, usage and account balance can be tracked by the hour as their balance decreases. Pre-Pay service is similar to auto-pay; however, unlike auto-pay, this new service allows a customer to purchase their electricity in advance and change their behavior to potentially receive a financial benefit in the form of a lower total energy bill. Currently many customers choose the convenience of auto-pay to pay utility bills – this is done by either connecting your utility bill with your bank account or your credit card. The utility at the end of each billing cycle automatically withdraws an amount equal to what the customer has consumed for that billing cycle. However, using auto-pay with a post-pay service, the customer is still paying for electricity after it is consumed, and does not have the same financial incentive to consume less or shift load that makes up the typical Pre-Pay service.

Pre-Pay electricity service is in effect at several utilities, and is currently being piloted in Michigan, Arizona, Texas and Georgia. Customers on Pre-Pay service in other states and utilities tend to use less electricity than customers on regular post-pay service accounts; in some instances, Pre-Pay customers use up to 16% less electricity.

There are several examples of Pre-Pay non-electrical service options currently in use in California, including pre-paid cell phones, pre-paid telephone cards, and bridge and highway tolls to name a few. In the example of a bridge toll collection service, a customer is required to open an account with a minimum balance ($65), and when the balance drops to a pre-determined level, the toll account automatically debits from a customer's bank account an amount of money to bring the toll account up to at least $65. In the instance of pre-paid phone cards and cell phones, a customer buys a pre-set amount of minutes at a certain price, and when those minutes are used, service is disconnected.

However, before considering the potential availability of this service option for electric utility service in California, several concerns must be addressed. First, there is the potential for this option to be unfairly targeted towards low income customers who have a historical pattern of delinquent payments or have had service shut-off in the past. Second, there are existing rules regarding how and when a utility can shut-off service to a customer that may conflict with the goals of a Pre-Pay service. Third, Pre-Pay programs must ensure that customers are notified in a timely manner of their usage and account balance as well as provide convenient ways for a customer to add to their account balance or make a payment to their account to re-activate service. Finally, rules must be in place to ensure that service is not disconnected during heat waves or extreme cold periods.

This paper will examine these issues, review existing regulations in place regarding electricity shut-offs, examine the experiences of other utilities and states that allow Pre-Pay service, and provide recommendations on how to maintain customer protections under a Pre-Pay program for customers of the Commission-jurisdictional utilities in California.

Pre-Pay Examples

There are numerous examples from around the world where electricity Pre-Pay programs are already in effect and are commonly used by those customers. For example, 13% of customers in England take service from Pre-Pay electricity service.[1] In New Zealand, as well as other countries in South America and Asia, Pre-Pay electricity has been around for well over a decade. In New Zealand, Pre-Pay service is also paired with other innovative rate options, such as short notice reduced weekend rates where a customer is notified a day or two before the weekend that there is discount on electricity that weekend, and a customer can purchase electricity at that reduced rate for use over the weekend. A recent report from Pike Research shows growth in prepaid metering services from 20 million worldwide in 2011 to nearly 34 million by 2017.[2] However, the use of Pre-Pay electricity service in the United States is generally limited to utility cooperatives

[1] "Smart Metering Implementation Programme: Data Access and Privacy," Department of Energy and Climate Change, U.K., at 25 (April 2012)
[2] "Prepaid Electric Metering," Pike Research (March 2012).

and other publicly-owned utilities. A discussion of some examples of Pre-Pay service in the United States is below.

Salt River Project

Salt River Project (SRP) is a political sub-division of the State of Arizona, and serves central Arizona. SRP's M-Power Pre-Pay service, one of the oldest in the country, has been in effect since 1993. SRP's Pre-Pay makes use of an in-home display and a card that allows a customer to purchase additional credits at an SRP kiosk or at other designated locations, load those credits on the card, and use the card to load those credits onto their in-home display, which communicates with the SRP meter. The in-home display will provide customers with a notification that their account is running low about four days prior to when a customer's account is projected to run out. The cost of using an in-home display is roughly $100, but most of that cost is refundable to the customer upon leaving the program. SRP's service territory is about 800,000 customers, and roughly 100,000 customers are on the M-Power rate. Importantly, the rate is available to all of SRP's customers, except those on a medical baseline tariff. However, recent reports show that since the start of the program, the average M-Power customer is more likely to be low-income and Hispanic compared to the beginning of the program.[3] Nevertheless, further reporting found that most customers were satisfied with the program, and the main complaint was lack of places to buy credits.

One of the main benefits of the M-Power program, according to SRP, has been a reduction in usage by their customers; on average, M-Power customers use 12% less electricity than other residential customers.[4] SRP, and other studies, conclude that the relationship in a Pre-Pay program encourages customers to be more empowered over their usage, and to be more aware of and educated about their electricity budget and usage, such as how and when a customer uses electricity.[5] Rather than struggling to make a payment at the end of the month, a customer can make many payments over the course of a month to keep their account positive. Indeed, the EPRI report found that the average payment was $20 and was made four times a month in winter and seven times a

[3] EPRI M-Power Report at p. 4-6. There are several possibilities for this movement, including the state of the economy or customer preferences.
[4] See, *e.g.*, "Salt River Project: Delivering Leadership on Smarter Technology & Rates," Institute for Energy and the Environment, Vermont Law School, at 18 (June 2012).
[5] *Id.* at 21.

month in summer.[6] Additionally, the EPRI report found that the M-Power program "seems to be tilted toward reduced consumption, or a conservation effect."[7]

The savings is also in relation to the rate charged to M-Power customers. M-Power customers pay a flat rate which changes with the seasons. Rates for May through October are flat, compared to a three tiered increasing block rate for non-M-Power customers.[8] This flat rate sits at about the average for the three blocks; due to paying a flat rate between the upper and lower tiers of the standard tariff, M-Power customers may pay more or less than they would on the standard tariff, depending on a customers' response to the rate. For the November through April time-period, M-Power customers pay a flat rate that is $.015 more than the flat rate paid by non-M-Power customers.[9] As noted previously, part of the reason for this higher rate is that the M-Power rate is a hedge against the differences in consumption across the seasons. Nevertheless, the rates paid by customers in this Pre-Pay program, even if above average rates for the service territory, still provide customers with certainty on costs and how much electricity is available to a customer, especially in summer, and helps customers plan budgets and billing expectations. Studies suggest that the M-Power program helps encourage conservation by providing real-time information and feedback about a customer's account balance and usage patterns.[10]

Finally, SRP reports a high satisfaction rate amongst their customers in the M-Power program.[11] As recently as 2009, SRP reported that customers who are satisfied or very satisfied ranged from 83% to 96% of those surveyed. Additionally, customers on

---

[6] EPRI Report at 1-3.
[7] EPRI Report at 5-5.
[8] SRP has two May through October rates: May-June and September to October is $0.105 per kWh, and July to August is $0.1097 per kWh. See http://www.srpnet.com/payment/mpower/mpowerfaq.aspx#1 (last accessed July 23, 2012).
[9] M-Power's November to April rate is $0.0934 per kWh and the standard flat rate for that time period is $0.078 per kWh. See http://www.srpnet.com/payment/mpower/mpowerfaq.aspx#1.
[10] "Salt River Project: Delivering Leadership on Smarter Technology & Rates," Institute for Energy and the Environment, Vermont Law School, at 21. In 2011, the Arizona Corporation Commission (ACC) approved a Pre-Pay pilot for Arizona Public Service Company noting that Pre-Pay can support the demand response and energy efficiency goals of Arizona. Specifically, the ACC directed the Pre-Pay program to focus "on (a) helping customers better understand and gain awareness of their energy consumption, and (b) provid[e] information on options to reduce their energy use and energy costs." *In the Matter of the Application of Arizona Public Service Company for Approval of a Residential Demand Response Pilot Program*, Arizona Corporation Commission, Decision No. 72214, at 11 (dated March 3, 2011).
[11] EPRI Report at 5-10. See also, "Salt River Project: The Persistence of Consumer Choice," Association for Demand Response and Smart Grid.

M-Power viewed SRP more favorably than the non-M-Power customers.[12] One notable customer protection initiative built into the program is that electricity is not be turned off during non-business hours; however, a customer must first pay off the balance accrued during non-business hours before electricity is turned back on. Unlike the Texas rules, below, it does not appear that SRP has an extreme weather provision or a payment deferral option.

Oklahoma Electric Cooperative

OEC is an electrical cooperative in Oklahoma that serves roughly 49,000 customers in and around the Norman, Oklahoma area. OEC implemented a Pre-Pay option for customers beginning in 2006. As of 2011, OEC reported that roughly 5,000 customers are now on the Pre-Pay service. All customers in the service territory have advanced meters. Initially, OEC charged Pre-Pay customers with fees for the service, but those have since been removed and Pre-Pay service is integrated with the rest of OEC's services. Similarly to other examples, OEC charges no deposit, no late fees and no disconnect or re-connect fees. Usage notifications are sent to customers via email, text message or through a web page that provides customers with usage information. Payments can be made through the internet, or in-person at the utility offices or other kiosks located throughout the service territory.[13]

The rate paid by Pre-Pay customers is the same rate offered for basic residential service: a summer TOU and a winter two tiered decreasing block rate. The summer peak price is $0.15 per kWh, and the off-peak price is $0.073 per kWh. Peak rates are in effect weekdays from June through September, and peak hours are 3:00 PM to 7:00 PM, excluding holidays.[14] If a customer's account goes to zero during the week, the electricity is turned off, but disconnects do not occur on the weekends. If a customer's account goes negative during a weekend, similarly to other Pre-Pay implementations, a customer must first pay off the balance before service can be reconnected.

A primary benefit of Pre-Pay to OEC has been cost savings to the utility through reduced write-offs, better customer management, and better customer response; as a

[12] EPRI Report at 4.3.
[13] See http://www.okcoop.org/account/prepaid.aspx (last accessed July 23, 2012).
[14] See http://www.okcoop.org/services/rates.aspx (last accessed July 23, 2012).

result, these savings get passed through to their members through lower rates. However, it is important to consider the impacts on their members. To illustrate this, the disconnection rate may be useful. OEC reported that 75% of Pre-Pay customers had service disconnected three times or less in 2011, compared to 8% who had service disconnected 11 times or more. With the implementation of Advanced Meters, OEC is able to re-connect service within minutes of payment, with 91% of reconnections happening the same day, and 51% of those same day reconnections occurring within the first 2 hours. OEC acknowledges that the initial focus for Pre-Pay was to help customers with repeated late payments, disconnects and high deposit requirements. However, OEC has found that many customers may find Pre-Pay beneficial and has a goal of having 20% of their customers on Pre-Pay in five years, as OEC finds benefits from Pre-Pay service to both customers and the utility. Benefits to customers include reduction in fees, easier budgeting, and increased awareness of usage and motivation to conserve. OEC has found that over 85% of participants are satisfied with the service, and 88% would recommend Pre-Pay to others.[15] Lastly, OEC customers on Pre-Pay use 9-11% less than non-Pre-Pay customers in the service territory.

Texas

In 2011, the Public Utility Commission of Texas (PUCT) issued rules to govern the roll-out of Pre-Pay tariffs in Texas.[16] The rules adopted by the PUCT provide customers with several protections against shut-offs, charges and fees, notification and explanation of the service, and limitations on which customers can participate. Specifically, the rules state that a Retail Electric Provider (REP) shall provide between one and seven days notice before a customers' account drops below zero,[17]shall restore within one hour of a customer paying off their balance and having a positive balance in their account,[18]shall not disconnect service during non-business hours or during extreme

[15] OEC Presentation to Oklahoma Corporation Commission (May 23, 2011), located at http://www.occeweb.com/pu/Prepayment%20Project/OEC%20prepay%20presentation%205.23.11.pdf.
[16] *See, Amendments to Customer Protection Rules Relating to Prepaid Service*, "Order Adopting Repeal of § 25.498 and New § 25.498 As Approved at the April 14, 2011 Open Meeting," Public Utilities Commission of Texas, Project No. 38675 (issued April 14, 2011).
[17] Texas Substantive Rules Applicable to Electric Service Providers Sec. 25.498(c)(7)(D).
[18] *Id.* at Sec. 25.498(j)(4).

weather events,[19] shall not offer service to a customer receiving service via a medical service tariff,[20] and shall make available to customers the ability to pay off a negative balance of over $50 over an agreed upon amount of time.[21] Additionally, the rules require that certain information be provided to customers by the REP, including how to make a payment and how a REP will communicate with a customer.[22] Finally, the rules limit the type of charges and fees that may be recovered by a REP that offers Pre-Pay.[23] It must be remembered that Texas is a deregulated market, so the ability of the PUCT to implement robust customer protection rules is limited by their market structure. Nevertheless, it is clear that the rules promulgated by the PUCT do provide customers with a number of protections that are useful in both regulated and unregulated markets.

Detroit Edison pilot

In 2010, Detroit Edison (DTE) requested approval from the Michigan Public Service Commission (Michigan PSC) to offer a Pre-Pay option to their customers on a pilot basis.[24] DTE initially requested up to 200 customers, but later requested to expand it to 1,500 customers. All customers are required to have an Advanced Meter, enroll in on-line or electronic billing, have two means of communication paths, and be on either the general rate or a dynamic pricing rate. Usage will be calculated on a daily basis against their account and the results will be made available to the customer on-line. Additionally, notification of usage, existing balance, low balance and shut-off alerts would be made electronically and not through the mail. DTE specifically noted that they will still send out a 10 day disconnection notice, but it will be through email or text rather than a paper mailing. To initiate this program, DTE requested waiver of several customer protection requirements regarding mailing of bills, time-frame for customer payments, and shut-off notifications. Waivers of existing rules are allowed under Michigan rules;

[19] *Id.* at Sec. 25.498(j)(1).
[20] *Id.* at Sec. 25.498(k).
[21] *Id.* at Sec. 25.498(i).
[22] *Id.* at Sec. 25.498(e)(2).
[23] *Id.* at Sec. 25.498(c)(11)-(12).
[24] *In the matter of the application of The Detroit Edison Company seeking a waiver of R 460.117(1), R 460.120(1), and R 460.138 of The Consumer Standards and Billing Practices for Electric Residential Service, and R 460.1615 and R 460.1624(a) of the Billing Practices Applicable to Non-Residential Electric and Gas Customers*, Michigan PSC Case No. U.16457 (filed October 15, 2010).

the Michigan PSC "may temporarily waive any requirements of these rules when it determines the waiver will further the effective and efficient administration of these rules and is in the public interest."[25] The Michigan PSC approved the pilot and waiver request, but made two modifications: 1) homes with senior resident must be identified by DTE and electricity cannot be shut off during space heating season; and, 2) low income customers must be identified, and within 10 days of disconnection due to low balance, DTE must offer low-income customers assistance to avoid disconnection.[26]

How does Pre-Pay work?

Fundamentally, Pre-Pay is a process where a customer pays for a certain amount of electricity at a price set in advance of consuming that electricity. When that amount of pre-paid electricity is fully consumed, the customer must either purchase more electricity or service will be shut-off. Recent research shows that customers are familiar with this type of payment arrangement and that many would be interested in participating in this type of arrangement.[27] Beyond existing electricity Pre-Pay pilots and programs already in effect across the country (and the world), there are already existing examples of this type of payment arrangement outside of electricity, including in the wireless industry and with bridge or highway toll collections.

Existing electricity Pre-Pay models allow for a variety of ways to add to their electricity account balance. In one instance, SRP offers an in-home device that contains a physical slot for Pre-Pay smart card. A customer inserts their card into the in-home device, and their account is updated with the amount of electricity that was purchased at a kiosk or some other location. With the introduction of Advanced Meters and other on-line billing and payment tools, many of these transactions can take place manually on the Internet, or on Smart Phones, or occur automatically by automatic debiting from a bank account or credit card. Indeed, several utility programs and pilots currently make use of this framework for customer payments. Pre-Pay also allows for a variety of innovative rate offerings. For example, a service provider in New Zealand offers several types of

[25] *Id.* at 2.
[26] "Order Approving Waiver Request," Michigan PSC Case No. U-16457 (dated December 2, 2010).
[27] "Is Prepay the Way? Consumer Perceptions of Prepay in the Utility Sector," EcoAlign, Survey Report, Issue 9 (January 2011).

Pre-Pay programs, including the ability to purchase electricity, pursuant to an email offer, a day ahead at a highly discounted rate for off-peak usage.[28]

Applying Pre-Pay to electricity, however, poses several challenges. First and foremost is becoming comfortable with the result of a zero or negative balance and disconnecting electricity from that home. For decades, laws and regulations in California have been passed to ensure that electricity stays on, even for those customers with the greatest difficulty in paying their bills.[29] Should such a customer voluntarily sign up with a Pre-Pay program, and is unable to purchase electricity in a timely manner, there is a chance that the customer could be without electricity for an extended duration of time. Indeed, there are concerns about Pre-Pay programs being marketed directly to low income customers or those customers with a history of credit problems, which may exacerbate problems for those customers, such as a lower level of service quality or rationing electricity until they can purchase additional electricity.[30] Whether or not this type of program should be marketed to low income or other similarly situated customers will be discussed below.

Secondly, there are questions around shut-offs during extreme weather events, such as prolonged hot or cold spells. Addressing this issue is necessary to ensure that during extreme or prolonged hot or cold spells customers maintain electricity service. Customers that are reliant upon air conditioning or electric heat must have the ability to keep themselves cool or warm during extreme weather periods. Many Pre-Pay programs in effect have an extreme weather clause to ensure the safety and comfort of customers during extreme weather periods. In addition to weather event clauses, Pre-Pay programs may also limit shut-offs to only business hours. Should a customer's account go below zero during the evening or weekend, the terms of some programs allow for the electricity to stay on until the next business day. However, not disconnecting service when a

[28] For example, PowerShop, a competitive supplier of electricity in New Zealand, offers a variety of special rates to its customers based on a customer's need and in response to available supply, sometimes only available on the day before or day of consumption. See http://www.powershop.co.nz/smarter-power-specials.html (last accessed July 13, 2012).
[29] *See, e.g.*, P.U. Code §§ 779 and 779.1.
[30] See, *e.g.*, *In the Matter of the Application of Arizona Public Service Company for Approval of a Residential Demand Response Pilot Program*, Arizona Corporation Commission, Decision No. 72214; "Order Approving Waiver Request," Michigan PSC Case No. U-16457.

customer's account goes negative may create a burden for the customer to bring their account into the positive.[31] This leads to the third topic on account management.

As explained above, there are several ways for a customer to buy their electricity, but being able to see, understand, and manage their usage and account is vital to a successful program. In order for a Pre-Pay program to be successful, the customer must be knowledgeable about their usage, know how much electricity they bought, and how much electricity is left in their account. With the roll-out of Advanced Meters, the three electric IOUs in California all collect hourly usage information from residential customers, and make that information available to customers online. Additionally, as part of their Advanced Metering Infrastructure (AMI) investment, and subsequent Commission decisions in the Smart Grid Rulemaking, the IOUs have made available online to customers more information about their usage and the price and cost of electricity consumed by the customer.[32] Finally, with Green Button and the expected implementation of the Energy Services Provider Interface standard and Home Area Networks (HAN), this information can be easily obtained by a third party service provider, with authorization from the customer. This third party can then provide customers with additional details and strategies around managing their electricity consumption efficiently. The foundation for new programs and customer options, predicated on the ability of customers to understand their usage and the ability of utilities or third parties to communicate directly with customers, is already in place.

The ability to purchase additional electricity in an easy and timely manner is an important aspect of a Pre-Pay program design. There are several ways that Pre-Pay programs are currently structured, and, as explained below, potentially new ways that can streamline this ability. In SRP's territory, SRP provides customers with an in-home display that is plugged into the wall and provides customers with account balance, an estimate of how many days that credit is expected to last, the cost of electricity during that hour, and how much was spent on electricity for the past day, week and month. A "Smart Card" is also provided which contains information about a customer's account.

[31] An additional option available is to limit the electricity flowing into a customer's house by enabling the governor feature included in most advanced meter installations. The governor feature allows for a minimum amount of electricity to keep necessary appliances and services functioning without completely shutting-off service to the customer.
[32] D.11-07-056.

This Smart Card is used to communicate between the in-home display and the meter, and the Smart Card is also used to load more credits onto the meter. A customer can take their Smart Card to an SRP kiosk and buy more credits to be loaded onto their card.[33] That card is then used with the in-home display to keep the account current and avoid shut-off.

In addition to an in-home display or similar device, there is the capability to use a customer's Smart Phone to access their accounts. Smart Phones, in addition to access and availability through the Internet, through the use of Smart Phone apps, can help customers better manage and monitor usage. Apps can also provide customers with a means to purchase more electricity that can be done just as easily, and, perhaps, more conveniently than over the phone or online.

For Pre-Pay to be successful, a customer must be able to understand and act on their usage information. It is important to note that Pre-Pay may not be the optimal rate or program for most customers; however, as recent surveys have shown, a significant number of customers are interested in Pre-Pay and may be willing to sign up for Pre-Pay program.[34] However, it may not be feasible for a utility in California to provide customers with a specific Pre-Pay device located in a customer's home, similar to what is offered by SRP. Rather, there may be other means of notifying customers about their usage beyond an in-home device, such as text message, email, or phone call, and how a customer is contacted should be based on what serves the customer better.

Tying a customer's electricity account with their banking account may be the most efficient means for a customer to add new funds into their electricity, especially if funds can be automatically debited from their banking account into their electricity account. Utilities already offer automatic bill payment services for customers - a similar process for Pre-Pay can be implemented. With the installation of AMI nearly complete, the utility, customers and customer-authorized third parties can have access to hourly usage information that can be used to better track and monitor customer usage. Using

[33] SRP currently has more than 110 kiosks throughout their service territory, many located in grocery stores or in SRP offices.

[34] According to EcoAlign research, 42% of respondents were interested in electricity Pay-Pay service, with 17% of those respondents "extremely interested." See, EcoAlign at 2.

these automated services, a customer may be able to simply choose a point when the utility can debit a pre-set amount of funds to purchase a new block of electricity.

In California, this type of exchange is already in use for bridge toll devices; a customer signs up with a bridge toll service company and deposits a minimum amount of funds into their bridge toll account.[35] As the customer uses the bridge, the toll device tracks their tolls and debits from their bridge toll account. When the bridge toll account goes below a pre-determined amount, the bridge toll service provider debits a pre-set amount of funds from a customer's bank account to refresh their bridge toll account and sends an email to the customer notifying them of the charge. The customer can access their bridge toll account on the Internet and monitor how many times they have been charged for tolls, the time and location of the toll, and how much is left in their account. The customer can also re-set preferences for their account. Utilities should be able to offer similar features available to an electricity customer who chooses a Pre-Pay program.

For those customers without Internet access, other means may be used to access account information or make payments, such as cell phones, Smart Phones, or kiosks located throughout a utility's service territory or making payments over the phone. Depending on the number of customers who sign up for Pre-Pay service, the ability of a utility to install enough kiosks may not make this option cost-effective. In fact, the fees that may be needed to justify the kiosks may result in customer unhappiness and undermine potential cost savings a customer may receive by signing up for a pre-pay service.

The final issue associated with Pre-Pay is what electricity will cost. In SRP's service territory, the rate for Pre-Pay service is a flat rate that changes based on the seasons; ranging from 9.3 cents per kWh in the winter to 10.97 cents per kWh in summer. Only in winter is the Pre-Pay rate higher than the otherwise applicable rate.[36] OEC's Pre-

[35] The benefit of using this service is access to special vehicle lanes solely for vehicles with this service. In other circumstances, use of the transponder allows a vehicle access to other toll lanes, such as commuter lanes that charge a toll to bypass traffic. The toll changes dynamically based on the traffic patterns of the lane (*i.e.*, the toll is designed to maintain a constant flow of traffic; as traffic increases, the price increases to reflect congestion and as traffic decreases, the price decreases to reflect available capacity).

[36] SRP's standard residential rates are an increasing block tier rate structure that, in summer, starts at 10.64 cents per kWh for the first 700 kWh, and increases to 11.41 cents per kWh for 701-2,000 kWh and 12.12 cents per kWh for usage above 2,000 kWh. In winter, SRP has 1 block, priced at 7.80 cents per kWh.

Pay rate is the same as the otherwise applicable flat rate.[37] While it would be beneficial to have relatively simple Pre-Pay rates that can be compared to the otherwise applicable residential rate, due to the existence of legislatively-mandated tiers, baselines, climate zones, and rate caps, it becomes extremely problematic to devise a Pre-Pay rate that can adequately capture the significant differences in temperatures, demographics, and need for the utility to recover a certain amount of revenue for their revenue requirement. Additionally, due to the existence of a 4 tier rate structure, with Tiers 1 and 2 subject to rate caps, the rate must be devised in such a way as to not encourage large users to by-pass the Tier 3 or 4 rates entirely.[38]

California Rules

The above section outlined how Pre-Pay works, with some specifics from other utilities. The next step in the research is to determine if Pre-Pay can be offered to customers in California. This entails a review of existing regulations and policies that cover customers of the three major investor owned utilities in California under the jurisdiction of the Commission. The focus of this section will be on how to ensure customer protection rules are maintained, how to use advanced technologies to support those rules, and how customers can best make use of these policies and technologies.

Shut-off Rules

The ability of a utility to shut-off customers for non-payment of services is explicitly laid out in California's Public Utilities Code. P.U. Code Sec. 779.1(a) provides:

> No corporation subject to this section may terminate residential service for nonpayment of a delinquent account unless the corporation first gives notice of the delinquency and impending termination, at least 10 days prior to the proposed termination, by means of a notice mailed, postage prepaid, to the customer to whom the service is billed, not earlier than 19 days from the date of mailing the

[37] Residential customers in OEC's service territory are on TOU rates in summer (June through September), with an off-peak rate of 7.3 cents per kWh and a peak rate of 15 cents per kWh. For the rest of the year, rates are based on a declining block rate structure. For usage up to 1,000 kWh, the rate is 7.3 cents per kWh, and for usage above 1,000 kWh, the rate is 5.7 cents per kWh.

[38] It is unclear at this time, however, whether the utility would make up the difference in lost revenue from avoided Tiers 3 and 4 payments by the volume of sales at a lower pre-paid rate.

> corporation's bill for services, and the 10-day period shall not commence until five days after the mailing of the notice.

Furthermore, P.U. Code Sec. 779.1(b) provides that:

> Every corporation shall make a reasonable attempt to contact an adult person residing at the premises of the customer by telephone or personal contact at least 24 hours prior to any termination of service, except that, whenever telephone or personal contact cannot be accomplished, the corporation shall give, either by mail or in person, a notice of termination of service at least 48 hours prior to termination.

Additionally, P.U. Code Sec. 779 provides limitations on when the utility can shut-off an account when there is an investigation into that customer's account.

Clearly, existing rules in California around the ability and timing of when a customer's service can be shut-off provide customers with many opportunities to settle any delinquent accounts. Just as clearly, it is likely that the implementation of Pre-Pay electricity service will violate these shut-off requirements due to the nature of the program itself. Implementation of a Pre-Pay program is predicated on the rule that when a customer's account goes below zero, their electricity is shut-off. **California's rules are in place to ensure that customers have a reasonable opportunity to pay past due charges before electricity can be shut-off. Any move towards implementing Pre-Pay electricity service in California must take in account these protections.**

However, existing Commission policy related to rate protections under Tiers 1 and 2 allow a customer, should they so choose, to voluntarily choose a different rate design and leave the rate protections afforded them by current statutes.[39] D.06-10-051 explains that alternate rate options can be made available to customers on a voluntary basis, even if they may result in rates higher than the rate caps currently in place for residential customers. D.06-10-051, which allowed PG&E to offer a voluntary Critical Peak Pricing (CPP) tariff, explained that the Commission "merely allows residential customers to test a different, experimental option. The CPP tariff is a voluntary tariff that acts as an overlay to the E-1 tariff. If a customer elects to try CPP pricing, their overall electric rates could remain the same, decrease, or increase in relation to the standard E-1

[39] *See* P.U. Code §§ 739, 739.9, and 745.

rate, depending on the customer's actual individual usage and consumption pattern."[40] Furthermore, the Commission also noted availability of voluntary alternative rates "is also consistent with other decisions where we have authorized similar tariff options enabling customers to better manage their overall electricity consumption patterns, thereby helping to ensure adequate state-wide electricity supply as more broadly intended by AB 1X."[41] Even though a customer may choose an alternate rate, existing customer protection rules, as noted above, remain in effect.

Since Pre-Pay service would be voluntary, customers should have the ability to make their own decisions around how they use their electricity, and that includes making the decision to relinquish statutory rate protections. Additionally, Pre-Pay does support the goal of providing customers with options to better manage usage and can result in lower overall bills to customers. Nevertheless, it would be unreasonable to allow customers to voluntarily relinquish their statutory rate protections without providing some level of protection, education and minimum requirements around usage information.

Finally, there is a potential for an increase in the number of disconnections, which may cause some concern. A recent goal of the Commission has been to reduce the number of disconnections across the utilities, and a fully implemented Pre-Pay program may cause the number of disconnections to rise. However, the length of the disconnection becomes very important in the context of Pre-Pay service. The example of OEC provides some context to this situation. OEC has roughly 5,000 customers (out of 49,000) on Pre-Pay service. In 2011, 41% of those customers never had their electricity shut-off, and another 34% had power shut-off 1-3 times during the year; in other words, 75% of OEC's Pre-Pay customers experienced a disconnection 3 times or less during 2011. Of those customers who had electricity disconnected, 91% had their power reconnected the same day, and 5% were reconnected the next day. Of the same-day reconnections, 51% occurred within 2 hours of the disconnection.[42] While disconnection rates are a useful way to monitor and measure utility practices around shut-off

[40] D.06-10-051 at 3-4.
[41] *Id.* at 5.
[42] "The Prepaid Energy Experience at Oklahoma Electric," presentation to DEFG 2012 Prepay Energy Working Group (March 22, 2012).

requirements and the economic health of their customer base, Pre-Pay introduces some amount of uncertainty into that calculation. In the situation of widespread use of Pre-Pay electricity service, it may not be unusual to see an increase in the number of disconnections, but the important measurement is how long those disconnections last.

Customer Protections Under Pre-Pay

In order to offer Pre-Pay electricity service, protecting the customer interest must be maintained. As noted above, however, existing statutes substantially limit the ability of a typical Pre-Pay electricity service to be offered in California. So, how can a Pre-Pay program be implemented that also protects the customer? What customer protections are in effect in other locations with Pre-Pay? Simply monitoring disconnection rates may not be a meaningful way of measuring or understanding the effect a Pre-Pay service is having upon the utility or its customers.

At a minimum, all current Pre-Pay programs tout the advantages of Pre-Pay service by elimination of disconnection and reconnection fees, elimination of late charges, and elimination of up-front payment for customers deemed a credit risk. However, there are other fees that may be associated with Pre-Pay service, such as fees for in-home devices or fees to use utility kiosks. In order for the customer to be aware of the terms of the program, rules should be in place that outlines what must be provided to customers around the details of the program, the rights of the customer, and the ability of the customer to make decisions in their best interest.

How a customer is notified about the state of their account and any impending shut-offs is also a concern for Pre-Pay service. Several utilities offer the customer with several options of how they would like to be notified of status updates and account warnings. Current California rules appear to limit notifications solely to paper mailings. With the advent of Advanced Meters, online presentment of data, widespread availability of email, the near universal use of landline and cellular phones, and the ability to send text messages, limiting notification options solely to paper mailings clearly show a conflict between the use of advanced technology and long-held customer protection measures. Indeed, paper mailing requirements for Pre-Pay service may hinder the customer's ability to purchase additional electricity; it is feasible that a customer's

account could hit zero before they receive their shut-off notification via mail. Allowing the utility and the customer to choose alternative means of notification may not only facilitate the introduction of Pre-Pay service, but may also allow the utility to reach more customers and provide them with more useful and timely information on their usage.

Allowing Negative Balances to be Paid Off in Installments

In the basic framework for Pre-Pay service, as implemented by OEC and piloted by Georgia Power, customers are required to first pay down any balance generated during non-working hours before service can be re-connected. In more recent pilot proposals, such as at Oklahoma Gas and Electric,[43] a more nuanced way of paying down those negative balances is being used. In those examples, paying off a negative balance is spread across payments. In other words, if a customer generates a negative balance of $50 during the grace period, a portion of that negative balance is paid off over subsequent payments, rather than requiring the entire balance be paid off first. This type of deferred payment plan is explicitly allowed in the rules adopted by the PUCT.[44] The ability to spread payments over multiple payment periods reduces the potential for customer harm should a customer run out of credits during an identified severe weather alert or hot weekend where a customer consumes an excess of electricity and runs up a large negative balance.

AMI Functionality

Beginning in 2002, the Commission began its march to replace existing analog meters with Advanced Meters using digital technology. These Advanced Meters measure usage on an hourly basis and transmit that usage data back to the utility several times a day. The data is then verified and made available to customers the following day via the utility webpage and the customers' MyAccount webpage. As part of this roll-out, utilities also implemented a communications infrastructure capable of sending directions to their meters and receiving data from the meter. One of the identified benefits of these

[43] See, "Presentation of Oklahoma Gas & Electric," Oklahoma Corporation Commission" (May 23, 2011); "Pay-As-You-Go Pilot," Presentation of Oklahoma Gas & Electric, Oklahoma Corporation Commission (June 22, 2011).
[44] Texas Subst. Rules Sec. 25.498(i).

Advanced Meters is the capability to do remote disconnects/reconnects; in other words, the utility would no longer have to send an employee to physically disconnect or reconnect service to a customer. This reduces overall utility costs through reduced truck rolls, man hours, and overhead. Additionally, this capability also allows for other services to be provided to customers including demand response and Pre-Pay. Indeed, as early as 2007, Southern California Edison, in their AMI business case, identified the ability to offer Pre-Pay service to customers as a potential benefit of AMI implementation.[45] The ability of a utility to remotely disconnect and reconnect service, plus the Advanced Meter hourly reads, provides the utility the opportunity to make available Pre-Pay service to their customers with the ability to provide customers with the tools to monitor their usage and respond accordingly.

In addition to this capability, the Advanced Meters in California are capable of sending usage information directly into a customer's home via the HAN. The HAN facilitates communication between a customer, a customer's meter and a third party owned device, located inside the customer's home. Communications with the meter provides a real-time feed of, at minimum, usage information.[46]

Many Pre-Pay programs and pilots in effect across the country depend on the presence of an Advanced Meter. DTE and Arizona Public Service's Pre-Pay pilots and Oklahoma Gas and Electric Company's proposed Pre-Pay pilot are only available to customers that have an Advanced Meter. Furthermore, DTE requires two ways to communicate with those customers on Pre-Pay: an email address is required, and either a phone number or text message number can be used for the second. Similarly, a recently approved pilot for Georgia Power is only open to Georgia Power employees that have an Advanced Meter.[47] Finally, the rules adopted by the PUCT also envision the use of an Advanced Meter to provide Pre-Pay services to customers.[48]

---

[45] In D.08-09-039, the Commission approved a settlement agreement that removed Pre-Pay benefits from SCE's AMI business case. In support of this position, the Commission noted that is "has not expressed a policy position on the appropriateness of prepaid meter programs or the customer protections needed to support them." D.08-09-039 at 35.

[46] Advanced Meters are capable of collecting and transmitting additional information such as power quality, voltage, and current.

[47] *In Re: Georgia Power Company's Request to Implement Prepaid Electric Service Program*, "Order Approving Prepaid Pilot," Docket No. 35771 (issued May 25, 2012).

[48] *See*, *e.g.*, Tex. Subst. Rules Sec. 25.498(b)(3).

With the widespread adoption and availability of Advanced Meters, online data presentment, other management tools, Smart Phones and Internet billing, it appears that the SRP model, with its added costs for equipment, fees and customer's time, is becoming outdated. With the availability and use of online tools, "MyAccount" services, and Smart Phones, this also allows the customer to monitor their account, monitor their usage, perform estimations on costs, and make payments online. Finally, the functionality enabled by the Advanced Meter, HAN and online tools may also enable third parties to offer customers innovative products to manage their usage more efficiently. Indeed, these third party offerings may include home automation services, demand response and energy efficiency services, and other home management offerings to help customers reduce overall consumption or shift usage to a different time period, should Pre-Pay service be time-based.

Why Do Pre-Pay?

Pre-Pay is a service that is used throughout the world for electricity, and is used in a number of other markets. Pre-Pay cell phones make up nearly 20% of the U.S. market, and serve the majority of the cell phone markets in other countries, such as Brazil.[49] With the availability of advanced technology, such as AMI, Smart Phones, online banking and online availability of data, the major hurdles to offering Pre-Pay electricity service are gradually being lowered. Pre-Pay is not an unfamiliar option for many people across California, as bridge and highway tolls are routinely managed by drivers using the same concepts as Pre-Pay. There is little standing in the way, technologically, to offer this same service to electricity customers. Indeed, in Pre-Pay electricity service, similarly to existing bridge and highway toll programs, funds can be added to a customer's Pre-Pay account days before the account runs out, thereby preventing disconnection from occurring.

Pre-Pay electricity service is an increasingly preferred means of service in other parts of the world, notably Latin America, England, New Zealand and Australia. In the United States, Pre-Pay electricity service has been primarily used by cooperatives, which

[49] According to data from the Brazilian regulator Anatel, pre-paid cellular and mobile services account for nearly 82% of the market in Brazil; out of 255 million mobile subscribers, 208.5 million use pre-paid mobile services. See http://www.teleco.com.br/en/en_ncel.asp (last accessed July 13, 2012).

have an incentive to keep rates low for their members, and Pre-Pay services have been used to that effect. As evidenced by OEC, Pre-Pay service has helped reduce write-offs, helped with bill collection, and helped customers reduce total consumption; all of those help reduce total utility costs and keep rates down for OEC's members. It is useful to note that cooperatives are member-based organizations, and serve the needs of their members. Additionally, in all examples of Pre-Pay service, Pre-Pay is a strictly voluntary program. While Pre-Pay may be an obvious program to assist certain customers by reducing fees, it should not be used solely for those customers or be used against those customers. There are numerous other benefits to Pre-Pay that warrant the service to be made available to all customers, regardless of credit or income level.

Customer feedback to SRP and OEC demonstrate that customers on Pre-Pay are more engaged than non-Pre-Pay customers. Some of that must be attributed to the risk of disconnection, which is, arguably, the main point of Pre-Pay service: a customer has a direct interest in their consumption and its impacts on their budget. Customer engagement is one of the main goals of Advanced Meters and, in California at least, utilities' Smart Grid investments.[50] By leveraging Advanced Meters, Pre-Pay may be a useful program to start deriving immediate benefits from Advanced Meters and customer engagement strategies. Research has indicated that simply giving customers information on their usage provides a 5% reduction in consumption.[51] Providing customers with information on usage and coupling that with a Pre-Pay program may derive additional benefits not currently explored or available to customers where Pre-Pay is currently offered. Additional research shows that there is a segment of customers who are interested in using Pre-Pay to help manage budgets, monitor usage, and aligns better with their lifestyle.[52]

---

[50] D.10-06-047 (June 24, 2010). D.10-06-047 directed that utility Smart Grid Deployment Plans to include a description of how Smart Grid investments support a "Smart Customer." D.10-06-047 at 35-36.

[51] See "Comments of Google Inc. on Proposed Policies and Findings Pertaining to the Smart Grid Policies Established by the Energy Information and Security Act of 2007," Cal. PUC Proceeding No. R.08-12-009 at 3 (filed October 29, 2009) (citing Sarah Darby, The Effectiveness of Feedback on Energy Consumption: A Review for DEFRA of the Literature on Metering, Billing and Direct Displays (April 2006) at http://www.eci.ox.ac.uk/research/energy/downloads/smart-metering-report.pdf)..

[52] EcoAlign at 4 ("Consumers cited the following top three benefits for using a voluntary prepay option: 1) paying for energy as you use it, 2) eliminating any surprises at the end of the month; and 3) control over costs. Additionally, saving money and bill management were cited by consumers as the biggest drivers for a voluntary prepay option."). Further, "Consumers pointed to "ease" and "convenience." This implies that

Furthermore, Pre-Pay programs have been shown to result in reduced consumption when compared to non-Pre-Pay programs. SRP's Pre-Pay customers consume, on average, 12% less than the normal SRP customer on the standard tariff.[53] OEC's Pre-Pay customers consume, on average, 8-11% less than normal OEC customers on the standard tariff. There may be various reasons why this is so, from customers using less electricity than the average customer, to customers responding to the threat of disconnection, to customers actually managing usage and consuming according to their budget. This linkage to reduced consumption is attractive to many utilities; indeed, Arizona Public Service is using Pre-Pay as an energy efficiency program to meet their energy efficiency goals, and those reductions count toward their RPS requirement.[54] Nevertheless, the concern associated with customer self-rationing electricity should not be taken lightly, but this is not a Pre-Pay issue itself. Customers that cannot pay according to the Pre-Pay program rules are likely to have difficulty paying their standard tariff electricity bill as well. These customers need help beyond the benefits available through a Pre-Pay program, and customer protections should be in place to provide support and assistance to those customers should they enroll in a Pre-Pay program.

Nevertheless, despite the apparent benefits of offering customers the option to choose Pre-Pay service, there are relevant concerns related to customer protection, disconnection practices, and maintaining a customer friendly program. These issues impact long-held protections and policies, but it is possible to develop a Pre-Pay program that maintains many of the goals of these programs. Mitigation of these concerns is highly reliant upon the use of AMI, its communication infrastructure, advanced technologies, cellular and Smart Phones, and the various online tools currently available to customers. These new disruptive technologies require a new look at long-held customer protections. Advanced technology can send customers, via email, text messaging, or to a Smart Phone, reports on usage, available balance, and approximate

---

prepaid is aligned to consumer preferences in regard to bill pay channels and lifestyle choices. This is especially true of younger Americans (18 – 30) who put a premium value on mobility and flexibility." EcoAlign at 2.

[53] EPRI Report at 5-10. See also, *e.g.*, "Salt River Project: Delivering Leadership on Smarter Technology & Rates," Institute for Energy and the Environment, Vermont Law School, at 18.

[54] *In the Matter of the Application of Arizona Public Service Company for Approval of a Residential Demand Response Pilot Program*, Arizona Corporation Commission, Decision No. 72214 (dated March 3, 2011).

date of disconnection, at various levels of frequency. This constant notification availability is very different from the context in which the original consumer protection rules were written. Prior to these advanced technologies, a customer's meter was read once a month and a customer only knew about their usage from their monthly utility bill. In that context, it made sense to have shut-off warnings mailed weeks in advance; however, with the widespread use of email, the availability of Advanced Meters, and the near ubiquity of cell phones, new and faster ways of communication are available to utilities and customers. These should be used to develop new and innovative services and rate designs, such as Pre-Pay.

Even with the best designed Pre-Pay program, disconnection rates may remain a problem. However, with advanced technologies and advanced billing practices, the reduced length of disconnections should be taken into consideration. Prior to AMI, the utility would send a truck to turn off power, and then turn the power back on; with AMI, disconnects and re-connects can happen within minutes. There is little need to rely on potentially out-dated requirements to drive customer protection initiatives in the face of technology and communication advances. That is not to say the protections themselves are not necessary; rather, the requirements around mailings and in-person visits need to reflect the changing nature of electricity service and customer technology.

The final issue is related to rates. The question of what rate to charge customers who enroll in a Pre-Pay program is not necessarily all that straightforward. In order to make Pre-Pay service beneficial to customers, the rate must be easy to understand; unfortunately, in California, the opposite is the case. Existing statutes require that rates be tiered and be based on location, ostensibly to encourage conservation. Forcing these requirements onto a Pre-Pay rate would be extremely confusing to the customer, likely resulting in a poor experience with the program. Another concern with the rate is to ensure that it encompasses the goals of the state to shift usage to off-peak hours and reduce total consumption; an open question is whether the Pre-Pay rate should differ from the standard residential tariff. Again, with the increased usage of advanced technologies, it is possible for utilities and devices to monitor total usage, monitor when usage occurred and monitor available balance.

Recommendations

Pre-Pay electricity service offers a potentially beneficial program to customers that are able to meet the obligations of the service, and utilities the potential to facilitate benefits from AMI investment and provide additional services. Similar to the already existing service of automatic payments, Pre-Pay can leverage already existing services to enhance the customer experience to be more pro-active in their consumption patterns. Pre-Pay is not for all customers, especially those on special medical tariffs and additional protections may need to be in place for low income customers (i.e. those customers who are eligible for the California Alternate Rates for Energy, (CARE)). However, Pre-Pay, as shown in existing programs, can provide benefits to the customer through increased awareness, ability to prioritize and budget appropriately, and reduction in fees and penalties. For example, college students (or their parents) may find Pre-Pay service to be a more convenient means of paying their utility bill. Nevertheless, the need to revise or update existing customer protection rules call for Commission action. The most appropriate means by which to address these needs is through a Rulemaking proceeding. This proceeding can develop a record to determine the availability of Pre-Pay for customers, and, if so, whether any modifications to existing rules needed to support a Pre-Pay option for customers, including the creation of new rules to protect customers who participate in a Pre-Pay program. Several customer protections are suggested that will help maintain an acceptable level of service and service quality for Pre-Pay customers:

- Pre-Pay should be a voluntary opt-in option available to all customers, except those on medical baseline accounts;
- For low income CARE customers additional protections should be in place to provide support and assistance to those customers should they enroll in a Pre-Pay program;
- Where feasible, “real time” balances should be available to consumers via the Internet, mobile phones, or other means to support consumer awareness;

- Customers should have access to their cost and usage information of electricity via the prepay system, online, or through other means to afford customers more options to better manage consumption;
- Customers must provide the utility with at least two means of communication, including email or text message;
- Service should not be shut-off during non-business hours, during a declared CAISO System Emergency day, when temperatures reach 95 degrees at (some location TBD) or is below 40 degrees at (some location TBD);
- Customers should be allowed an extended grace period during the week of up to 4 business days before electricity is shut-off to allow customers the opportunity to bring their accounts up-to-date;
- Any customer usage that occurs during a non-shut-off period or grace period that leads to a negative balance in excess of $50 should be deferred over a period of payment cycles to be determined by the customer and utility;
- No fees to the customers should be associated with Pre-Pay service, with limited exceptions;
- Customers should be allowed to pay through a variety of means, including online, over the phone, and at identified locations throughout the service territory on a 24 hours a day, 7 days a week basis;
- Notification about usage and low balance warnings should be provided to customers on a continual basis, either via online web portal, via email, or through an activated Home Area Network, subject to a customer's preference;
- Upon payment to the utility, a customer's balance should be updated within 5 minutes, and should payment be made to re-connect service, electricity service should be re-connected within 60 minutes of payment; and,
- Customers should be able to easily revert back to a post-paid account if they so desire.

These suggested policies are not exhaustive as it is likely that additional customer protection requirements may be necessary to alleviate concerns about potential negative customer impacts from Pre-Pay service.

Existing disconnection metrics should also be modified. As explained previously, the length of a disconnection is an important metric in addition to the total number of disconnections. In order to monitor utility performance, and the impact of Pre-Pay on customers, utilities should report on the number of disconnections, the duration of disconnections (by day, hour and on average), and the geographic breakdown of disconnections (climate zone, zip code or some other grouping). By providing this data, the Commission can better understand the performance of Pre-Pay for customers.

As proposed earlier, the Pre-Pay rate should reflect existing state and Commission policies on electricity consumption and encourage conservation and peak reduction. To support this goal, it should be examined whether the standard electricity tariff or an alternative tariff can best meet these goals. The availability of interval data from AMI should be used to measure and charge customers appropriately.

Pre-Pay enables customers to have more control and interest in their energy usage, reduces the potential fees a customer may pay to have electricity service, have more convenient and flexible ways to make payments and typically use less energy. It is clear that interest in making Pre-Pay available to customers is increasing across the country; California should not be left behind.

DISCLAIMER

This White Paper was prepared by California Public Utilities Commission (CPUC) staff. It does not necessarily represent the views of the CPUC, its Commissioners, or the State of California. The CPUC, the State of California, its employees, contractors, and subcontractors make no warrant, express or implied, and assume no legal liability for the information in this White Paper. This White Paper has not been approved or disapproved by the CPUC, nor has the CPUC passed upon the accuracy or adequacy of the information in this White Paper.