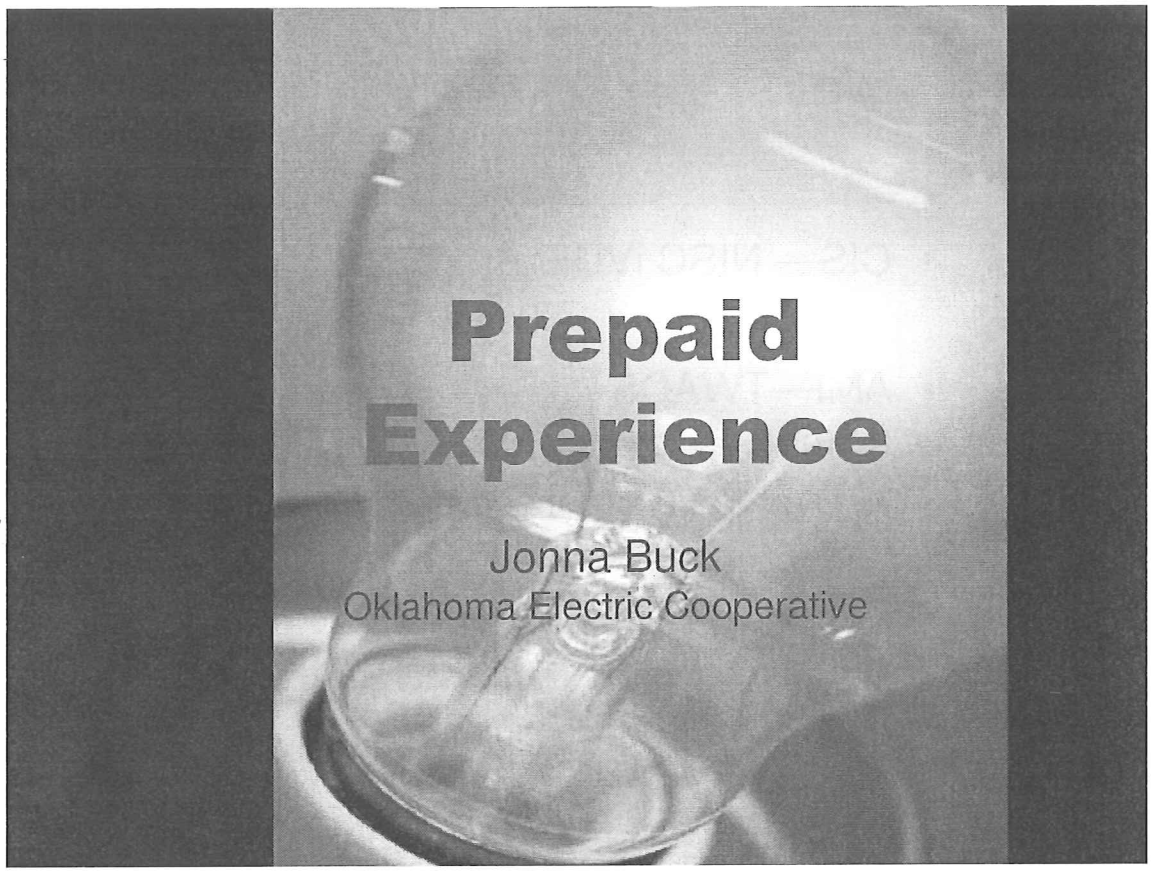
SDG&E Cross Examination Exhibit 20
A.11-10-002
October 22, 2012
Witnesses: Cheng

San Diego Gas & Electric
Cross Exhibit
SDG&E – 20, “Cheng Prepay Documents”

Studies Cited in the Revised Prepared Direct Testimony of David W. Cheng

- *Prepaid Experience* - Jonna Buck , Oklahoma Electric Cooperative
- *A Review of Pre-Pay Programs for Electricity Service* – Chris Villarreal and Marzia Zafar, CPUC Policy and Planning Division
- *Status of Energy Utility Service Disconnections in California* – Division of Ratepayer Advocates
- *Paying Upfront: A Review of Salt River Project's M-Power Prepaid Program* – Electric Power Research Institute
- *M-Power: a Better Way to Keep Customers in Power* – Jennie King, Salt River Project
- *Rethinking Prepaid Utility Service (Customers at Risk)* – National Consumer Law Center
- *Prepaid Electric Service* – R.W. Beck
- *Is Prepay the Way? (Consumer Perceptions of Prepay in the Utility Sector)* – Jamie Wimberly, EcoAlign



OEC Background

- Located in Central Oklahoma
- 47,000 Meters
- Urban and Rural—5,000 + apartments and other rental locations
- Not regulated by Public Utility Commission
- High deposits
- High late charges/disconnect fees

OEC Background

- CIS— NISC iVUE
- AMI—TWACS
  - 100% Residential AMI
  - Over 3,500 disconnect collars installed
- Prepaid—Exceleron PAMS
  - 1,620 Members Participating
  - 307 Usage Monitoring

Reasons to Offer PAMS

- Reduce charge offs
- Reduce % of angry members
- No home device required
- Use existing TWACS and NISC system
- Use existing payment methods
- PAMS is optional

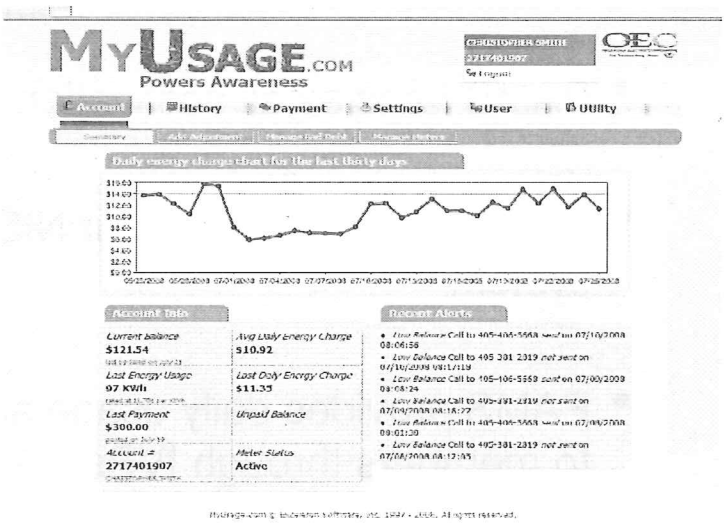
Benefits

- PAMS handles all notifications
- PAMS is reconciled to our NISC billing system
- PAMS provides daily usage and billing info to members through IVRs and Internet

OEC Implementation

- Software based/Data exchange through integration
  - Payments/charges in CIS
  - MultiSpeak® Interface with Optimum
- Member chooses desired alerts
  - IVR/email/text message/myusage.com
- No paper bill
- Disconnect collars for each account

Account Self-Management



Survey Results

Q.3 Please indicate how you would rate your overall satisfaction with OEC Prepaid. MORE DETAILS

Answer	Count
Somewhat dissatisfied	8 (5%)
Very satisfied	70 (45%)
Satisfied	63 (40%)
Very dissatisfied	6 (4%)
Neither satisfied or unsatisfied	10 (6%)
People who answered question:	**157** (100%)
People who skipped question:	**0** (%)

Q.4 Would you recommend OEC Prepaid to others? MORE DETAILS

Answer	Count
Maybe	22 (14%)
No	15 (10%)
Yes	120 (76%)
People who answered question:	**157** (100%)
People who skipped question:	**0** (%)

Survey

Q.10 Do you feel you are more conscientious and conservative about your use of electricity on Prepaid? MORE DETAILS

Answer	Count
Somewhat	8 (5%)
No	15 (10%)
Yes	134 (85%)
People who answered question:	157 (100%)
People who skipped question:	0 (%)

- *"I appreciate customer service recommending prepaid to us when we was in a bind. It has helped us to understand how much electricity we really use and to help us maintain a lower bill then being surprised when a monthly bill comes."*

Unforeseen Benefits

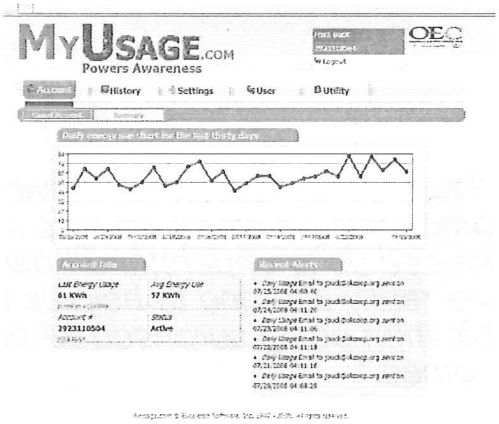
Q.11 Has your usage monitoring led to dollar savings? (Consider over a 30 day period.) MORE DETAILS

Answer	Count
Yes	79 (50%)
No	40 (25%)
Somewhat	38 (24%)
People who answered question:	157 (100%)
People who skipped question:	0 (%)

- Prepaid customers used 13% less electricity than when they were on our standard residential rate

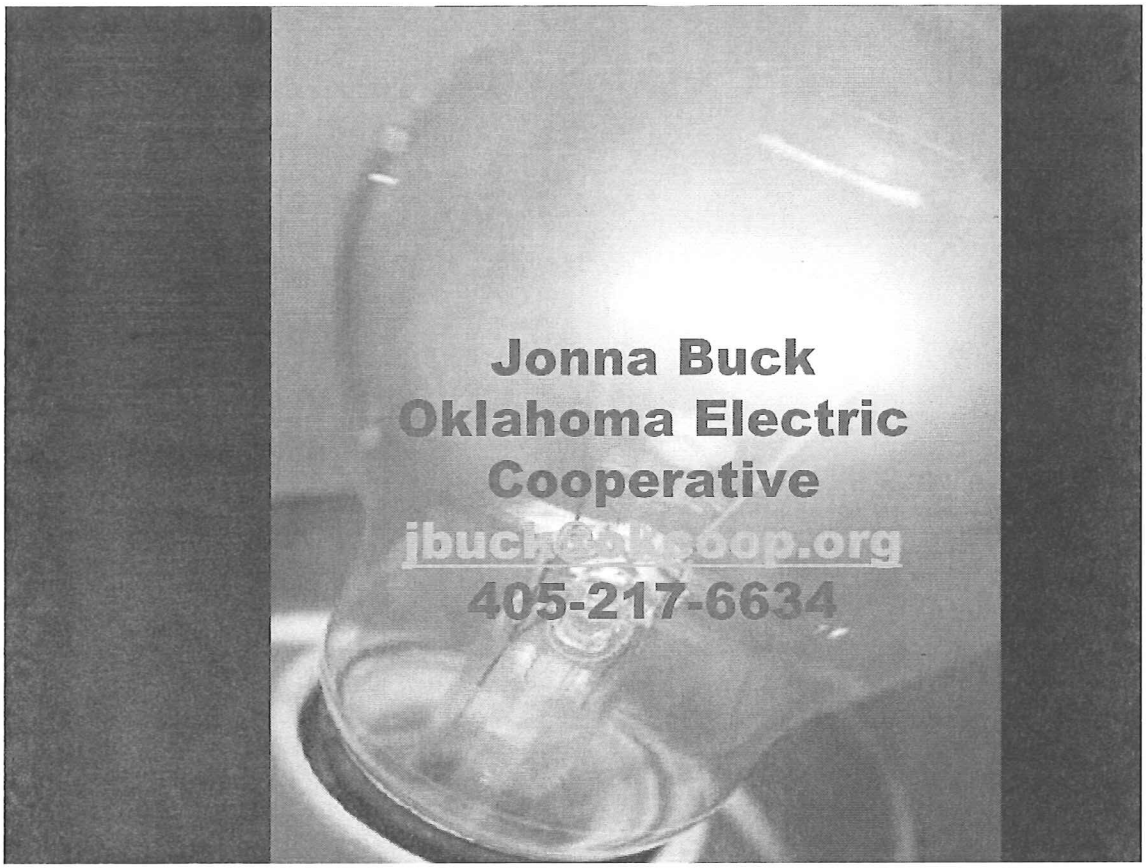
Usage Monitoring

- Usage monitoring offered free to all residential prepaid accounts



Comments

"I have talked to others using the pre paid service and they are like myself and we like it better than the original service. We save lots of money. We wish we would have done it earlier. We are very Thankful to the representative who shared the information with us."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California Public Utilities Commission

A Review of Pre-Pay Programs for Electricity Service

POLICY AND PLANNING DIVISION POLICY PAPER

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July 26, 2012

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

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[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]

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[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]

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[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

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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.

DIVISION OF RATEPAYER ADVOCATES

Status of Energy Utility Service Disconnections in California

March 2011

The Voice of Consumers, Making a Difference!

ABOUT DRA

The Division of Ratepayer Advocates (DRA) is an independent organization housed within the California Public Utilities Commission (CPUC) that represents the customers of California's investor-owned utilities. DRA's statutory mission is to obtain the lowest possible rates for utility service consistent with safe and reliable service levels.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

While California ended 2010 with energy utility service disconnections of residential electric and gas customers at historic lows, the most vulnerable customers still disproportionately face the risk of disconnection. Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SoCalGas) made 586,000 disconnections for non-payment of energy bills in 2010, down from 758,000 in 2009. These numbers represent 5.5 % of low-income customers, compared with only 2.9% of non-low-income customers.

Yet in 2010, $1.8 billion -- a record high amount -- was distributed to low-income customers through California's main energy assistance programs. California's pledge of energy affordability for all households is well established, but it is not being met.

This is the Division of Ratepayer Advocates' (DRA) second report on the *Status of Energy Utility Service Disconnections in California.*[1] Following the first report in November 2009, the California Public Utilities Commission (CPUC) issued new disconnection protection rules that are reflected in the improvements in 2010. Unfortunately, pressure on California's low-income households continues despite lower disconnection rates and high funding for energy assistance.

- Low-income customers with unpaid bills of two months or older total $55 million, double what was owed at the same time one year ago.
- For half of the low-income disconnects, the customer owes less than $315.
- 33,000 disconnected low-income customers did not reconnect service in 2010. Some portion of these permanently disconnected households improvise hazardous methods of lighting or heating their in dwelling.

[1] DRA's first report on the *Status of Energy Utility Service Disconnections in California* was released November 2009 and is available at http://www.dra.ca.gov/NR/rdonlyres/2A0C5457-56FC-4821-8C4D-457F4CF204D1/0/20091119_DRAdisconnectionstatusreport.pdf .

Fewer disconnections alone are not enough to help the most vulnerable customers. Furthermore, these reductions may not be sustainable for PG&E and SCE customers. The CPUC requirement for PG&E and SCE to offer disconnection protections is set to expire at the end of 2011. SDG&E and SoCalGas, through 2013, voluntarily locked-in low disconnection rates for both low-income and non-low-income customers, suspended disconnections during extreme weather, and implemented additional new protections.

DRA believes that a better distribution of assistance funds would make bills more reasonable for more customers. Once bills are better linked to a customer's degree of poverty, the utilities should then offer program features that encourage customers to make regular payments on their energy bills. Specifically, DRA recommends the CPUC take the following steps:

- Modify energy assistance to reflect degrees of poverty and customers' varying energy bill burdens.
- Develop energy assistance program features to help customers manage their utility bill debt, and to make monthly bill amounts stable and predictable.
- Drive disconnections down via benchmarks for low-income disconnections of 5% (PG&E) and 6% (SCE).
- Make a contingency plan for customers chronically without electric and gas service.

INTRODUCTION

In the "Background" section of this report, DRA describes the creation of the CARE (California Alternate Rates for Energy) rate discount program and the program's expansion over the years. DRA summarizes the other major energy assistance programs and funds currently distributed to low-income households in California. This year, DRA broadens the context of the report by incorporating findings from external research on energy poverty and energy program assistance. We rely primarily on Roger Colton's annual Home Energy Affordability Gap[2] (Affordability Gap) analysis to estimate the dollars needed to make energy service affordable to all Californians. The second section of the report, "Progress Made in 2010," presents data showing disconnections are down and payment arrangements are up. This section also describes the consumer protections implemented by the four utilities in 2010. The third section of the report, "Problems Persist," warns that energy costs are still unmanageable for some low-income households. In the "Recommendations" section, DRA encourages the CPUC to explore creative modifications to current assistance programs. DRA also recommends identifying and tracking households that can no longer afford to be utility customers. Finally, in the "Conclusion," DRA reminds readers that the positive conditions of 2010 are unlikely to continue without further intervention, and urges the CPUC to act promptly.

This report utilizes publicly reported customer payment and low-income program data provided by California's largest investor-owned energy utility companies: Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SoCalGas). DRA does not include municipal or small and multi-jurisdictional utilities in its analysis or in this report. DRA supplements the disconnection and payment data from publicly available reports with data provided by the utilities at DRA's request. For purposes of this report, households enrolled in the CARE program are considered low-income customers. All other residential customers are considered non-low-income customers.

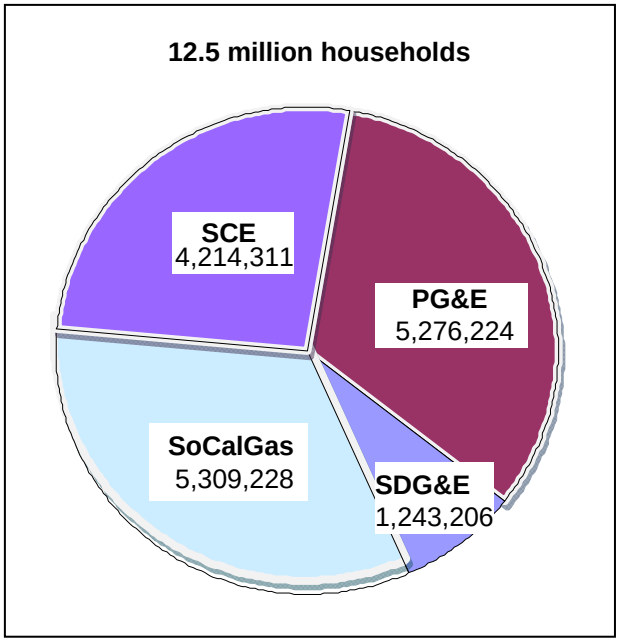
[2] The 2010 Home Energy Affordability Gap, released February 2011, is conducted by Roger Colton of Fisher, Sheehan & Colton. Multiple local, state and the federal agencies have relied upon his studies and evaluations of home energy affordability issues to design and implement programs.

BACKGROUND

California electric and gas customers' service disconnections peaked in 2009, spurring DRA to devote concentrated attention to the problems of utility customers unable to pay their bills. Subsequently in early 2010, the CPUC directed the PG&E, SCE, SDG&E, and SoCalGas to provide relief to utility customers struggling in the bad economy. Beginning February 4, 2010, these utilities were required to waive credit deposits usually triggered by late payments and disconnections. These utilities were also required to extend minimum terms of three months over which customers could pay past-due bills.[3] Additionally, DRA, the CPUC, and the utilities worked collaboratively to secure federal American Resource and Recovery Act matching funds, which doubled the emergency cash grants distributed by the four utilities for energy assistance in 2010.

Ninety-nine percent of all California customers receive either electricity or gas service from PG&E, SCE, SDG&E or SoCalGas.[4] Together, these four utilities serve 12.5 million households. The total customer count of the four utilities presented in Figure 1 is much greater than 12. 5 million, as utility service territories overlap, and some households receive gas service from one utility and electric service from another. In the case of utility service, a customer equals an entire household.

Figure 1: Number of Households Served by Investor-Owned Utilities
Average Customers Served 2010



1. California's Commitment to Energy Affordability

In 1975, California enshrined in state law the importance of energy affordability with the Miller-Warren Lifeline Energy Act: "Light and heat are basic human rights and must be made available to all the people at low cost for basic minimum quantities."[5] Then, California accomplished this goal simply by keeping rates low for basic quantities of energy. In 1989, the CPUC was faced with balancing the need for basic quantities of affordable energy *and* for rates that would encourage conservation. Thus, the CPUC allowed

[3] CPUC Order Instituting Rulemaking (R.) 10-02-005 of February 4, 2010, pp. 1-2, Ordering Paragraph (OP) 3.

[4] Data as of November 30, 2010, found in Attachment A of the *Joint Utilities 2010 CARE Eligibility Estimates* filing of December 30, 2010, in proceeding A.08-05-022 et. al.

[5] Chapter 1010, Stats. 1975, Miller-Warren Energy Lifeline Act, sec. 1(a), cf., Stats. 1982, ch. 1541, section 1(d); also see California Public Utilities Code, Section 739(c)(2).

utilities to raise rates for the lowest amounts of energy usage and also created alternate rates to shield low-income households from the increase.[6] That is how California's primary program to make energy affordable, the rate discount known as CARE, was born.

The CPUC designed the CARE program with simplicity,[7] consistency, and fairness in mind. When establishing the eligibility limit for households, the CPUC copied the telephone assistance program eligibility limit, which was 150% of the Federal Poverty Level in 1989.[8] When establishing the amount of discount, the CPUC settled upon a 15% discount as sufficient to be meaningful to participating customers but within what non-participating customers could bear.[9]

The California Legislature and the CPUC have continued to protect low-income households by expanding the size and scope of the CARE program especially during times of high bills and energy crises. In response to the California energy crisis of 2000, state law prohibited rate increases for all residential usage (including CARE rates) at the two lowest levels of usage.[10] CARE customers were therefore exempted from paying the energy surcharges enacted in 2001 that were necessitated by the crisis.[11] Also in 2001, the CPUC increased the CARE eligibility limit to 175% of the Federal Poverty Level and the rate discount from 15% to 20% of non-CARE residential rates.[12]

To mitigate high gas prices in winter 2005 - 2006, the CPUC increased CARE eligibility to 200% of the Federal Poverty Level and placed a temporary moratorium on CARE disconnections.[13] In the last ten years, the CARE program has grown from reducing the bills of 2.5 million households by $287 million in 2001 to reducing the bills of 4.8 million households by $1.4 billion in 2010.[14]

2. How Much Help Do Households Need?

Continual expansion of the CARE subsidy has very likely prevented many temporary and permanent service disconnections by filling in the gap between what California customers are charged for energy and what they can afford. Nationally, and many states individually, define affordable energy around 6% of a household's annual

[6] Decision (D.) 89-072-062 and D.89-02-027 established LIRA (Low Income Rate Assistance), currently known as CARE, pursuant to Senate Bill 987 amending Public Utilities Code 739, and major expansions in eligibility and benefit amounts.
[7] D.89-09-027, Section II.A.1 (p.7).
[8] D.89-07-062, Finding of Fact 11, Conclusion of Law 1.
[9] D.89-07-062, Finding of Fact 3-8, Conclusion of Law 1 and D.89-09-027 Section II.A.1. 1 "Mr. Florio testified for TURN that bill impacts of up to 3% per month are acceptable for the non-participating customer."
[10] Assembly Bill 1X, enacted in 2001 via PU Code Section 731.1(b)(2), prohibited rate increases for all residential customers up to 130% of baseline usage. The first, or lowest level of residential usage, is known as baseline usage or Tier 1. The next level of usage is known as 100-130% of usage or Tier 2.
[11] The surcharges added to energy bills in response to the 2000 energy crisis were enacted in D. 01-05-064.
[12] D.01-05-033 and D.01-06-010.
[13] D.05-10-044.
[14] Joint Utilities Annual LIEE, CARE, and FERA charts filed February 1, 2011 in A.08-05-022; also see PG&E, SCE, SDG&E and SoCalGas December 2010 monthly CARE reports filed in A.08-05-022; also see PG&E, SCE, SDG&E, and SoCalGas 2001 Annual CARE reports.

income. A multi-state study of energy assistance programs by two of the leading national experts on ratepayer-funded energy assistance programs provides the basis for the 6% figure: assuming 30% of income is reasonable to pay for shelter, and that 1/5 of the shelter cost is assumed to be reasonable to pay for home energy. [15] So 6% is derived from taking 1/5 of 30%.

Affordability Gap

For 2010, the Affordability Gap analysis estimated $2.1 billion ($592/household) as the amount that would be required to resolve the affordability problem in California (i.e., reduce energy costs to 6% of household income) for low-income customers.[16]

California energy assistance programs distributed $1.8 billion in 2010. Of the $1.8 billion, $1.4 billion was distributed through CARE and the remainder through other ratepayer-funded, federally funded, and utility-funded energy bill discount and grant programs. Not all of the assistance programs distributed cash to reduce bills; an important source of savings comes from usage reduction stimulated by the free home energy efficiency retrofits and energy education given through the Low Income Energy Efficiency (LIEE) program[17] and the federal weatherization programs.[18]

Figure 2: Dollars Distributed by Energy Assistance Programs 2010[19]

Programs Funded by	Bill Discounts/ Grants	Energy Efficiency Improvements
Ratepayers	$1,400,146,300	$275,814,410
Federal Agencies	$63,482,461	$77,218,366
Utility Shareholders, Employees and Customer Donations	$3,548,549	
Subtotals	$1,467,177,310	$353,032,776
TOTAL	**$1,820,210,086**	

The main difference between the Affordability Gap estimate and what California actually spends is that the Affordability Gap estimate is based on fewer households than California includes in its programs. The Affordability Gap estimate of $2.1 billion

[15] Multi-Sponsor Study of Ratepayer Funded Low-Income Programs by APPRISE and Fisher, Sheehan, & Colton, *Ratepayer Funded Low-Income Energy Programs: Performance and Possibilities,* July 2007, Executive Summary p. iv at http://www.appriseinc.org/multi_sponsor_study.htm .
Sponsors of the study included AARP, agencies from five states, and results were presented at the National Low Income Energy Consortium.

[16] The amounts estimated to make energy affordable each year change, because the energy costs used in the analysis change, although the estimated population remains the same. Over the years 2006-2010 the estimated amount per household to make energy affordable to low-income Californians ranges from $550 to $765.

[17] The utility-run weatherization and energy efficiency for low-income customers called Low Income Energy Efficiency (LIEE) was enacted in 1987 by PU Codes 2790. The CPUC in 2011 is planning to announce a new name for the program: Energy Savings Assistance Program.

[18] For a comprehensive list of all energy assistance programs in California, including small and multi-jurisdictional utilities, municipal utilities and private programs, see the U.S Department of Health and Human Services LIHEAP clearinghouse website at http://liheap.ncat.org/profiles/California.htm .

[19] This table includes assistance programs for customers at or below 200% of Federal Poverty Level (the state-authorized utility program standard) and assistance programs for customers at or below 75% of the state median income (the federal program standard). For a detailed description of these programs and additional assistance programs available to California customers, see Appendix A.

would be enough meet the needs of 3.5 million low-income households (at 185% Federal Poverty Level or below). California's $1.8 billion in assistance funds was distributed among 4.1 million low-income households (at 200% Federal Poverty Level or below). Because of the different number of households in the estimate and California actual, the most appropriate comparison is dollars per household. The Affordability Gap's estimate of average need per household per year is $592. California's actual average benefit is $375.

Needs Assessment

The CPUC has authorized various California-specific studies expanding on low-income customer needs. KEMA's California Low-Income Needs Assessment[20] (Needs Assessment) began in 1999 and was concluded in 2007. It characterized low-income issues based on a representative sample of 1,500 homes visited and surveyed in late 2003-2004, and attributed these characteristics to the entire low-income population. The Needs Assessment affirms the importance of assessing energy costs as a percentage of energy burden.[21] From its representative sample, KEMA projects that 43% of customers below 200% Federal Poverty Level have an average energy burden of 8.4%, even after receiving the CARE discount.[22] DRA believes that using income and bill data from the whole universe of customers will produce more reliable estimates of need at different poverty levels. Ultimately, the Needs Assessment's main recommendation regarding improving energy affordability is to increase participation in the CARE program.

Impact Evaluation

Another CPUC-authorized periodic evaluation of low-income energy use, conservation behavior, and need sheds light on how California's usage-based pricing may impact low-income customers. The West Hill Impact Evaluation[23] (Impact Evaluation) uses two years of monthly utility bills from 40,000 low-income California households. The study compares bills before and after households received service in 2005 from the LIEE program that provides energy efficiency retrofits. This study supports annual CARE program data showing that households enrolled in CARE use less energy than other residential households. The Impact Evaluation also recommends that "non-energy benefits" accruing to the household from energy efficiency upgrades (such as improved health, comfort, and safety) be taken into greater consideration.[24]

[20] For utility and other parties' responses to the Needs Assessment, see Comments filed October 16, 2007 and October 26, 2007 in CPUC Rulemaking 07-01-042 available at http://docs.cpuc.ca.gov/published/proceedings/R0701042_doc.htm .

[21] California Public Utilities CPUC, Phase II Low-Income Needs Assessment, Final Report, September 7, 2007, pp. 3-26 and 3-27.

[22] *Ibid.,* p. 5-12. The sample of homes surveyed includes CARE beneficiaries in proportion to the CARE enrollment rate at the time of the survey, so the average energy burden reported already reflects the CARE discount for the majority of customers.

[23] *Impact Evaluation of the 2005 California Low-Income Energy Efficiency Program*, Final Report, West Hill Energy & Computing, Inc., December 19, 2007, revised January 10, 2008.

[24] Usage reduction is an important and well-funded part of California low-income assistance. For purposes of this report we assume that household

3. CARE Program Reaches Nearly All Eligible Customers

California's main energy assistance program, the CARE rate discount, sets an eligibility limit. In the 2010 Affordability Gap's comparison of households below 185% of the Federal Poverty Level, California ranks thirteenth.[25] However, studies on poverty in California explain that the Federal Poverty Level undercounts poverty in California, as the Federal Poverty Level does not account for differences in housing costs.[26] When adjusted for these costs, California's poverty rates would rank third, behind New York and Washington, D.C.[27]

The CPUC's current eligibility limit for customers who need help paying energy bills is all households living at or below 200% of the Federal Poverty Level.[28] In 2010, for a 4-person household, 200% of the Federal Poverty Level equaled an annual income of $44,400 or less.

Over four million households were estimated in 2010 to be living below 200% of the Federal Poverty Level, which is about 34% of all California households.[29] This percentage of households qualifying for CARE has increased about one percent each year over the last few years.[30]

By the end of 2010, for all utilities combined, 29% of all residential households were enrolled in the CARE program. PG&E, SCE, and SoCalGas have all enrolled more than 90% of its eligible customers in CARE. SCE leads the way with 97% of eligible customer enrolled. Together, this is a 15% increase over the previous year. CARE outreach was highly emphasized in 2009 and 2010. The CPUC's opening of the

benefits equal the home retrofit and weatherization benefits equal non-administrative spending on these programs. However, spending does not translate 1:1 to bill reduction. If non-energy benefits are better quantified, then more benefits to the household, in addition to bill reductions, will be accounted for.

[25] The Affordability Gap's ranking is consistent with the overall poverty rankings based on the federal threshold, according to Deborah Reed, *Poverty In California, Moving Beyond The Federal Measure,* Public Policy Institute of California, May 2006.

[26] Additional problems with utilizing one threshold statewide, even if adjusting for California's increased housing costs, is that cost-of-living within California varies enough that an annual income that may be adequate in some of the less metropolitan parts of California is not adequate in San Francisco or Los Angeles. California Budget Project, *Making Ends Meet: How Much Does It Cost To Raise A Family In California?,*June 2010.

[27] *Poverty In California, Moving Beyond The Federal Measure,* Deborah Reed, Public Policy Institute of California, May 2006, p.21.

[28] California also makes provision for customers living at or below 250% of the Federal Poverty Level with a minimum of three people in the household. This program is called the FERA (Family Electric Rate Assistance program. These households are eligible for a smaller discount on higher usage. In 2010, for a 4-person household, 250% of the Federal Poverty Level equaled an annual income of $55,600 or less. FERA customers are negligible for the analysis presented in this report; only 0.1% of residential customers are on FERA.

[29] The utilities annually contract with Athens Research to estimate the number of households at different poverty levels to make sure utility assistance programs are reaching as many of these households as possible. The 5.2 million estimate double-counts some households served by more than one utility. When eliminating the double-counting, the estimate is 4.1 million. Attachment A of the Joint Utilities 2010 CARE Eligibility Estimates filing of December 30, 2010 filed in A.08-05-022 et al.

[30] The CPUC requires utilities to estimate annually on October 15 the number of low-income households in their service territory for that year. As the current year estimate is not available until the year is nearly over, utilities utilize the prior year estimate to report progress in enrolling customers in the low-income program. Therefore, eligible population estimates generally lag by one year.

disconnection proceeding likely contributed to great efforts to enroll all eligible customers in CARE.[31]

CARE

What does CARE actually provide? The CARE program discount is uncapped, so it can serve all qualifying customers with no limit on how many customers enroll. The benefit reduces bills by a minimum of 20%, but this increases as customers use progressively more energy during the month. For customers that use the most energy, the benefit can be in excess of 50% of the bill. The 20% discount is applied to residential rates for basic amounts of usage (called Tier 1) and for the next blocks of usage above basic (called Tiers 2 and 3). Usage at the higher levels (Tiers 4 and 5) is billed to CARE customers at Tier 3 rates.

Because the CARE discount is tied to California's tiered rate structure, the practical effect is that the highest usage households receive the greatest CARE discount. Besides the obvious that single person households use less energy, the Impact Evaluation identifies other types of households that use less energy (and therefore receive a smaller discount): renters, those in multi-family dwellings, and those with incomes at the lowest end of the income scale.[32]

Figure 3: CARE Assistance Funds Distributed 2010

	All	PG&E	SCE	SDG&E	SoCalGas
Overall (in millions)	$1,400 mil	$824 mil	$353 mil	$86 mil	$135 mil
Per Household, Per Year	$286	$550	$256	$294	$79

[31] Comments of PG&E, SCE, SDG&E, and SoCalGas in R.10-02-005 assert the importance of increasing CARE enrollment as a strategy to reduce disconnections.

[32] Impact Evaluation of the 2005 California Low-Income Energy Efficiency Program, Final Report, West Hill Energy & Computing, Inc., December 19, 2007, revised January 10, 2008, Section 4.5, pp. 40-43.

PROGRESS MADE IN 2010

Disconnections of all residential customers dropped to historic lows in 2010. Despite PG&E's implementation of remote disconnection via Smart Meters, PG&E's disconnection rates decreased. In November and December 2010, 90% of PG&E residential disconnects were done remotely. Finally, customer assistance arrangements are at all time highs, showing that utilities are more accommodating of customer requests to pay debt over time.

1. Disconnections at Historic Lows; Non-Low-Income Customers Benefit More

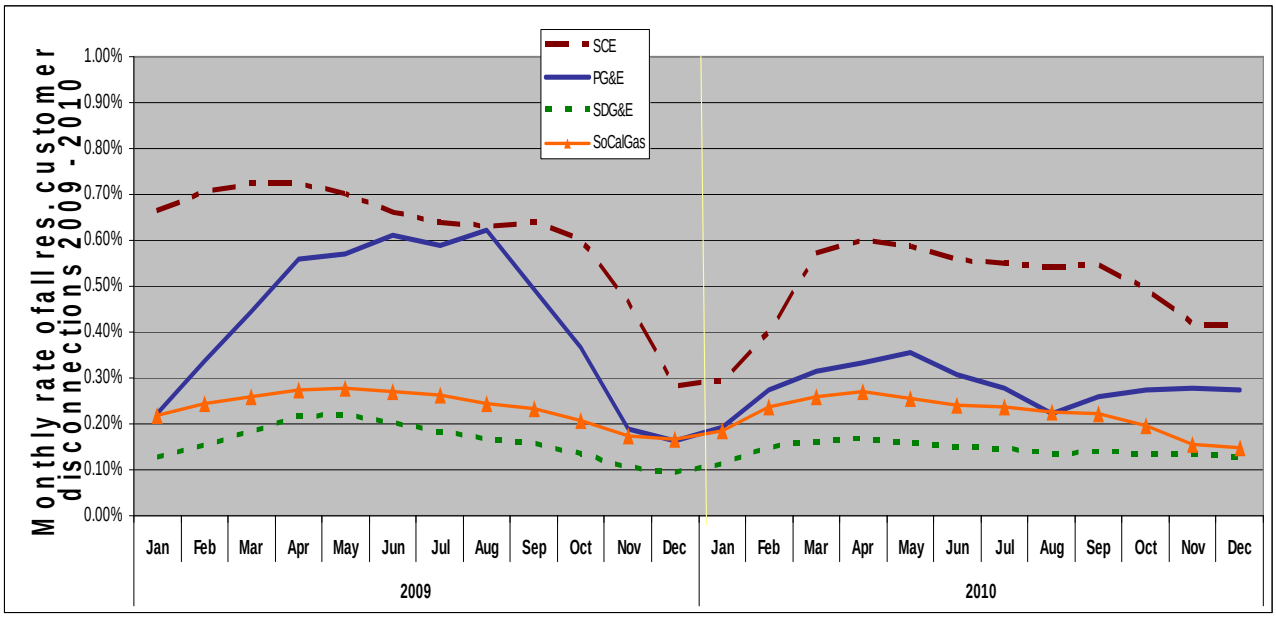
Residential disconnection rates in 2010 were at an all-time low for the four utilities, although disconnection rates still vary among them.

Figure 4: Residential Disconnections Rates 2007-2010

	All	PGE	SCE	SDG&E	SoCalGas
2007	4.54%	4.00%	7.28%	2.13%	3.45%
2008	4.92%	4.40%	7.89%	2.10%	3.75%
2009	4.75%	5.15%	7.50%	1.92%	2.81%
2010	3.65%	3.39%	5.83%	1.70%	2.63%

Figure 5 shows that PG&E made the most significant improvement in 2010, reversing its 2009 trend of rising disconnections. Although SCE's disconnection rate has dropped overall in 2010, part of the improvement can be attributed to SCE's suspension of disconnections in January 2010. In the following months of March-December 2010, SCE shows improvement over 2009, but not enough to bring it in line with the other utilities.

Figure 5: Residential Disconnection Rates by Utility 2009-2010, Monthly Basis



SDG&E's disconnection rate in 2010 slightly declined from its already low 2009 rate. Similarly, SoCalGas's 2010 disconnections are consistent with its already low 2009 rate.

Non-low-income disconnections dropped slightly more than low-income customers from 2009 to 2010.

Figure 6: Decrease in Disconnections, Low-income vs. Non-low-income, 2009-2010[33]

	PGE	SCE	SDG&E	SoCalGas
Low-income	-34%	-18%	-11%	-3%
Non-low-income	-38%	-27%	-16%	-12%

2. Customers Protected Only Through 2011

2011 has solid protections in place for customers. PG&E and SCE are governed by the CPUC's July 2010 Disconnection Decision.[34] This decision extended the CPUC's February 2010 rules to waive credit deposits and extend longer terms for re-payment of bills. SDG&E and SoCalGas also implemented these rules in 2010. However, beginning in 2011, SDG&E and SoCalGas are governed instead by a settlement agreement entered into with consumer advocacy groups,[35] including DRA, and approved by the CPUC.[36] The central feature of the settlement agreement are disconnection benchmarks (#3 in Figure 7). SDG&E agreed to keep its residential disconnection rate below about 2% of customers annually, and SoCalGas agreed to keep its disconnection rate below 3.3% annually. In the event SDG&E or SoCalGas disconnection rates exceed the benchmark, the utility will then return to implementing credit deposit waivers and offer mandatory 3 month terms of payment plans. The settlement agreement also provides that disconnects will be suspended during temperature highs and lows (#4 in Figure 7). SDG&E and SoCalGas agreed to suspend disconnections when the temperature in a household's area is 32 degrees or below, or 100 degrees or higher. Among additional protections, SDG&E agreed to a one-year delay in implementing the remote disconnection

Figure 7: Disconnection Protections in Effect 2011, by Utility

	1. Credit Deposit Waivers	2. Mandatory Offer of 3 Month Payment Plan	3.Disconnection Benchmark (Limit)	4. Disconnects Suspended During Temperature Highs/Lows	5. Remote Disconnection Delay & Protections
PG&E	●	●	No provision	No provision	No provision
SCE	●	●	No provision	No provision	No provision
SDG&E	If above benchmark	If above benchmark	●	●	●
SoCalGas	If above benchmark	If above benchmark	●	●	●

[33] These decreases are adjusted to account for changes in the low-income and non-low-income populations.

[34] CPUC Decision 10-07-048.

[35] Settling Parties are SDG&E, SoCalGas, DRA, The Utility Reform Network (TURN), Greenlining, Disability Rights Advocates, and The National Consumer Law Center (NCLC).

[36] Settlement adopted by CPUC in D.10-12-051.

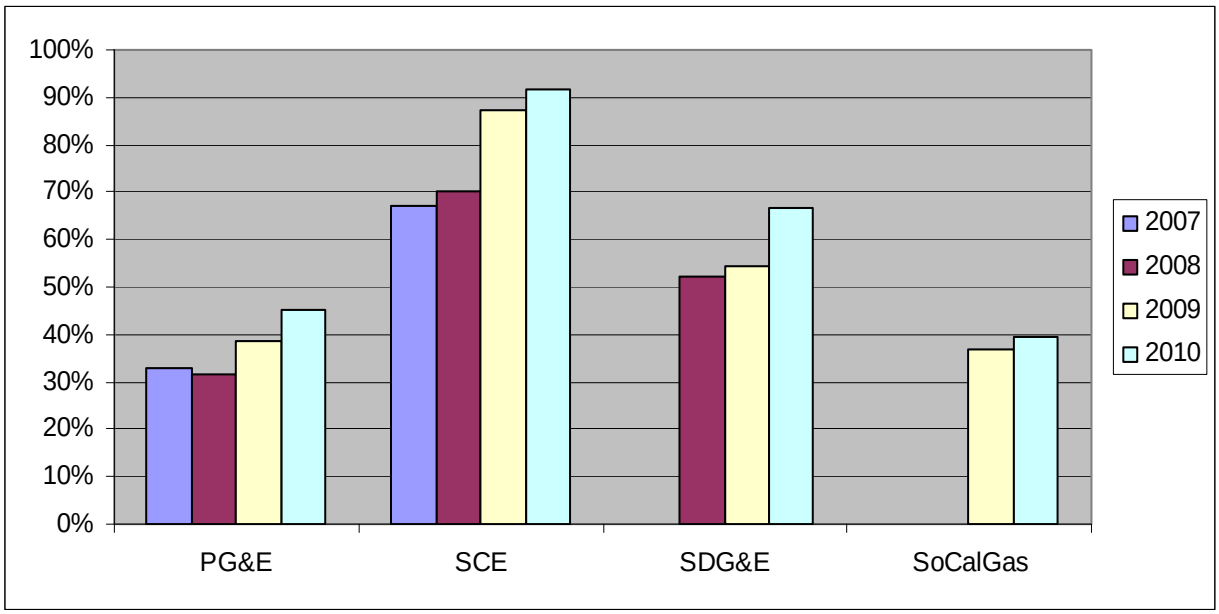
function after installation of the new advanced technology meter (also known as “Smart Meters"). SDG&E further agreed not to remotely disconnect its elderly, disabled, and medically vulnerable customers (#5 in Figure 7).

The CPUC’s rules applicable to PG&E and SCE will expire at the end of 2011, while the protections of the settlement agreement, governing SDG&E and SoCalGas, will remain in effect until 2014.

3. More Payment Arrangements Offered in 2011

All four utilities offer households extra time to pay their utility bill either before or after missing the due date, and often up until the moment of disconnection. Utilities typically offer one-time payment extensions or amortization agreements to pay off debt regularly with installment payments. As long as a household has formalized an arrangement with the utility to pay past-due bills over time, the utility is not allowed to disconnect the household.[37] If a household fails to make one of the agreed upon payments, the default immediately triggers a 48-hour notice regardless if the household’s other bills are current. As noted above, longer payment terms was one of the two policy changes implemented in 2010. The increases in payment arrangement initiated, shown in Figure 8, can be partially attributed to the CPUC’s new rules in 2010, requiring the utilities to actively promote payment arrangements.

Figure 8: Total Residential Payment Arrangements 2007-2010, Annual Basis



[37] California Public Utilities Code sections 779(b)(2-3) and (e), and 779.1 (f).

Among the four utilities, SDG&E shows the most significant increase in payment arrangements granted, beginning in the early months of 2010 and continuing to rise steadily. Both relative to customers facing a threat of disconnection, and as a percentage of all customers, SDG&E arranged steadily more payment arrangements throughout 2010.

PG&E's payment arrangements increased most significantly during the first six months of 2010. PG&E has simultaneously taken pressure off its customers by changing the past-due bill amounts triggering a 48-hour disconnect notice from $50 to $150. SCE's increase in payment arrangements started earlier than PG&E and SDG&E, in the winter of 2009-2010, and since spring 2010 the number of arrangements is close to what it was in earlier years (although arrangements for low-income customers remain higher). SoCalGas's number of payment arrangements is consistent with the prior year, and relative to 48-hour notices, is decreasing.

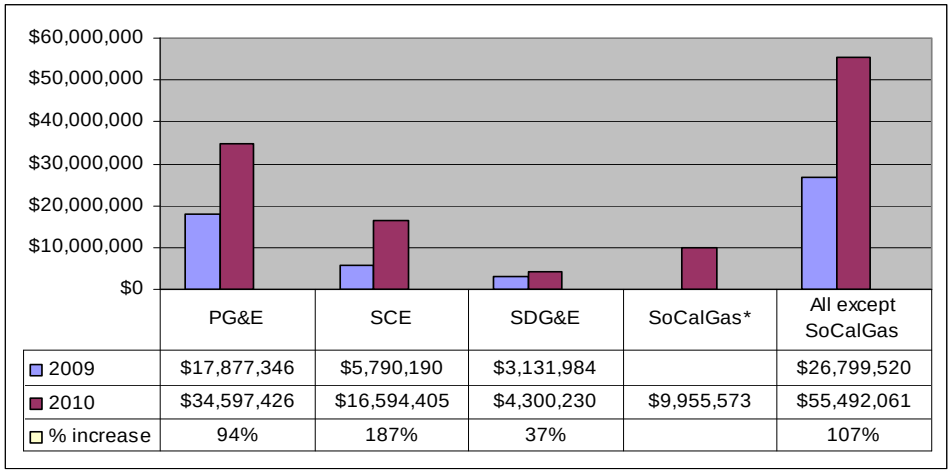
PROBLEMS PERSIST

1. Deferred Payments Loom

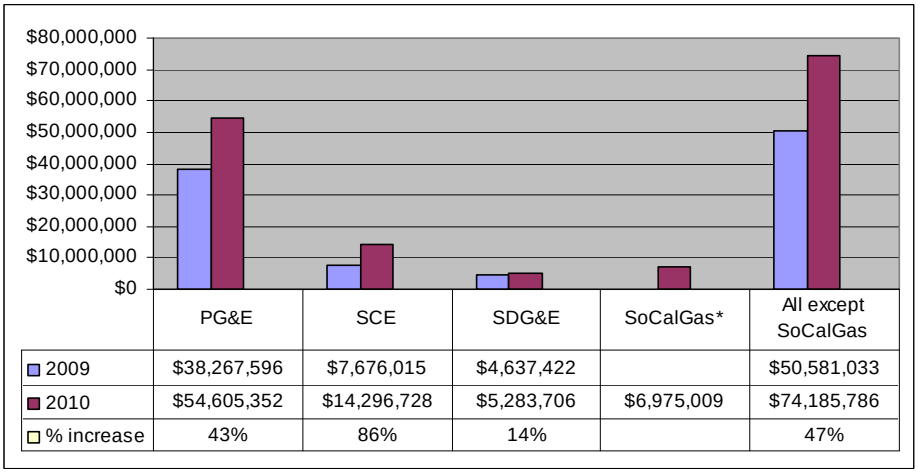
Among the four utilities, past-due payments started to accumulate in mid-2010, and payment data in 2011 shows debt continues a slow but steady rise. At some point in time, this increased debt could cause disconnects to rise again, unless the utilities and the CPUC implement strategies that help customers manage and pay down their past-due balances.

The most recent data showing dollars in debt is from September 2010.[38] Together for PG&E, SCE, and SDG&E,[39] all residential past-due amounts over 60 days old are $130 million, 68% higher than September 2009. For just low-income households, past-due amounts over 60 days old are 107% higher, at $55 million.

Figure 9: Low-income Customer Unpaid Amounts Over 60 Days Old, September



	PG&E	SCE	SDG&E	SoCalGas*	All except SoCalGas
2009	$17,877,346	$5,790,190	$3,131,984		$26,799,520
2010	$34,597,426	$16,594,405	$4,300,230	$9,955,573	$55,492,061
% increase	94%	187%	37%		107%



	PG&E	SCE	SDG&E	SoCalGas*	All except SoCalGas
2009	$38,267,596	$7,676,015	$4,637,422		$50,581,033
2010	$54,605,352	$14,296,728	$5,283,706	$6,975,009	$74,185,786
% increase	43%	86%	14%		47%

Figure 10: Non-low-income Customer Unpaid Amounts Over 60 Days Old, September

[38] / * Utilities delay reporting of the dollars in arrears until after they make their quarterly 10K filings to the Securities and Exchange CPUC. Monthly dollars in arrears data for October, November, and December 2010 will be provided in the utilities' March disconnection reports.

[39] SoCalGas did not begin providing past-due data until October 2009; therefore, no comparison is yet publicly available.

Most utilities did not report past-due amounts prior to 2009. Therefore DRA cannot present historical data of outstanding billed amounts. The increase of customer debt shown in Figures 9 and 10 is a comparison of outstanding debt as of September in the years 2009 and 2010. September 2010 is the most recent data available to the CPUC, as utilities delay for several months the release of data on dollars in arrears. Of course, past-due balances over 60 days old are from accounts that started to default several months earlier, so this data reflects unpaid bills from approximately the first six months of 2010.[40]

The utilities also report monthly the number of accounts paying 100%, 50-99%, and less than 50% of bills. This payment amount data shows more recent payment behavior, from December 2010. Fewer accounts in December 2010 paid 100% of bills than one year ago, and more accounts paid less than 50% of their bills.

2. Large Portion of Low-income Customers Risk Disconnection Regularly

California state law requires all utilities to provide to households that are in default on their bills a written notice or personal contact at least 48 hours prior to disconnection.[41] Each utility sets a threshold amount that a customer must owe before adding the household to the disconnection list. The thresholds are currently:

PG&E	$100
SCE	$25
SDG&E	$250
SoCalGas	$60

Only a fraction of customers who receive disconnection notices are disconnected. For example, one month about 5% of all customers received disconnect notices, 1.5% still had not paid by the time the notice expired, and less than 0.5% (76,000) of all customers were ultimately disconnected that month.[42] However, receiving the notice means a household is at risk for disconnection. The term for this is energy insecurity.

Energy Insecurity

Over one-third of PG&E and nearly one-half of SCE low-income customers can be considered energy insecure. These low-income customers receive three or four 48-hour notices of disconnection on average each year.[43] Many fewer SDG&E

[40] Dollars and accounts in arrears are key indicators because they could warn of an upcoming wave of disconnections. However, because this data is limited, and increases are likely caused in part by the CPUC's new policies, DRA cannot give a conclusive interpretation. The CPUC's new policy in 2010 of mandatory minimum terms for payment arrangements will mean more accounts will show an increase in unpaid bills, but these unpaid amounts could be part of an ongoing payment arrangement. The data reported to the CPUC does not segregate past-due accounts that are in a payment arrangement (therefore preventing collection actions) from past-due accounts with no payment arrangements.

[41] California Public Utilities Code section 779.1 (b).

[42] Data from September 2009.

[43] Another statewide characterization can be found in the KEMA Low-Income Needs Assessment (2007), which deems 66% of all low-income households energy insecure (p.5-22). The Needs Assessment also states that 22% of its 1,500 low-income homes surveyed had been threatened with disconnection and 5% had been disconnected (p.5-17).

and SoCalGas low-income households receive 48-hour notices during the year. For those that do, SDG&E customers receive on average three notices and SoCalGas customers receive on average two notices each.[44]

3. Low-Income Disconnection Disparity Worsens

Low-income customer disconnects are significantly more frequent than non-low-income customer disconnects, equating to 5.5% of low-income customers annually but only 2.9% of on-low-income customers. The data presented in Figures 11 and 12 indicate that this disparity is getting worse over time.

Figure 11: Four Utilities, Low-income Disconnection Rate vs. Non-low-income Disconnection Rate July 2008 – July 2010, Monthly (9 Month Rolling Average)

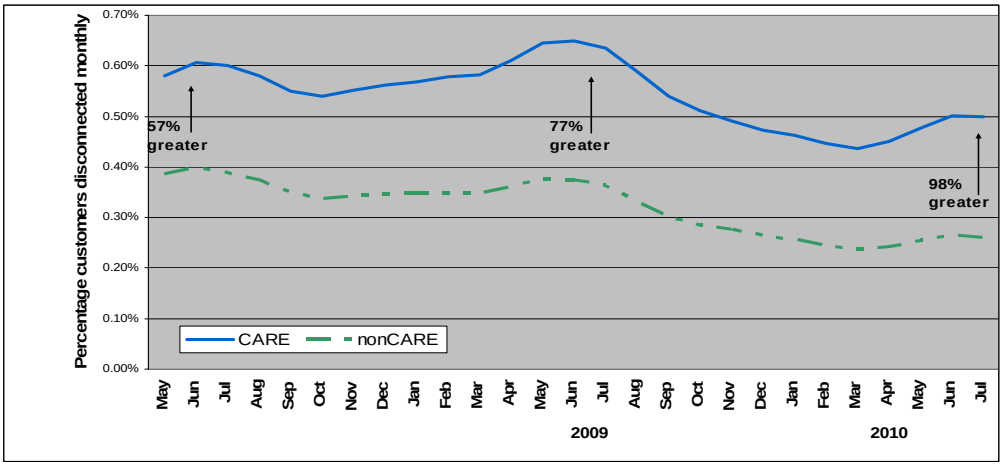
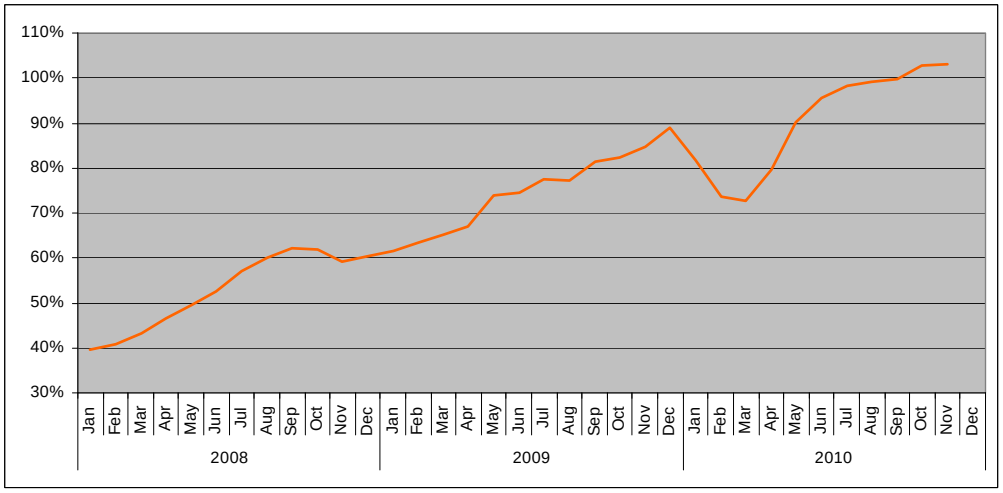


Figure 12: Four Utilities, Percentage Greater Low-income Disconnection Rate than Non-low-income Disconnection Rate, 2008-2010, Monthly Basis



[44] Because of the way the data is collected and reported, this data assumes that the customer's CARE status remains the same for the entire calendar year and the following month in which the data is run. Although this is not actually the case, because some customers will either enroll in or leave CARE during the year, the mismatches do not invalidate the analysis. DRA determines that the analysis is valid by comparing the "all residential" rates to the rates separated by "CARE/all except CARE," and by comparing this "account level" data to the "all occurrences" data. See Appendix C for further explanation.

Until relatively recently, utilities may not have monitored customer disconnections by income, and therefore may not have been aware of this trend. However, this trend is now impossible to ignore and utilities must address this troubling outcome. Even though the CPUC's disconnection protection rules helped all customers in 2010, non-low-income customers were helped more, causing the gap in disconnection rates to widen. The disparity is further evidence that affordability must be addressed in order to manage disconnection rates, and that the CPUC's current disconnection protection rules alone are not sufficient. the last few months alone, fatal accidents occurred in households where service had been disconnected and unsafe alternatives were used for heating and lighting.

Half of the low-income customers who are disconnected owe less than $315. Losing access to gas and electric service is a grave consequence for debt of this amount. Utilities reported the amounts owed by households at the time of disconnection, for a sampling of months in 2010. By utility, half of the disconnected low-income customers owed less than:

PG&E	$315
SCE	$226
SDG&E	$152
SoCalGas	$100

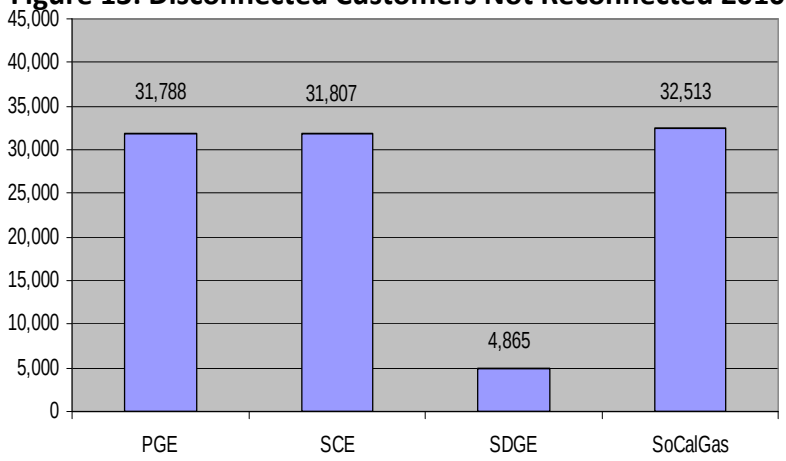
- January 2011: 4 die in Oakhurst using gas generator to heat home[45]
- January 2011: 2 die in Willowbrook using their oven to heat their home[46]
- December 2010: 4 die in Oakland fire caused by extension cords run from neighboring dwelling[47]

4. Dwellings Chronically Without Service Pose Great Safety Risk

Not all disconnected customers are reconnected. Some portions of these customers live without electricity or natural gas because they cannot afford to reconnect service. These customers need extensive help to get access to electricity and gas. The utilities have the ability distinguish to between customers who cannot afford to reconnect and customers who have moved or no longer require service.

Households may not initiate service if they cannot afford it, or if they cannot amass the deposit to start service. Given that energy affordability is a high priority, California needs an accurate count of how many dwellings are in this situation. In

Figure 13: Disconnected Customers Not Reconnected 2010



[45] http://www.fresnobee.com/2011/01/17/2236465/blocked-vent-led-to-4-oakhurst.html# downloaded January 20, 2011.

[46] http://www.fdnntv.com/2-Women-Willowbrook-Fatally-Poisoned-Carbon-Monoxide downloaded February 9, 2011.

[47] http://articles.sfgate.com/2010-12-31/news/26352717_1_downstairs-apartment-upstairs-unit-apartment-building downloaded January 1, 2011.

RECOMMENDATIONS

The CPUC's new rules in the 2010 Disconnection Decision, and the utilities' aggressive implementation of the new rules, mitigated the effects of the California recession. Waiving credit deposits and extending the terms of payment plans relieved low-income, payment-troubled households from the final consequence of credit and collections actions: disconnections. These protective credit and collections policies do not include a mechanism to resolve the unpaid utility debt that is accumulating for those for whom energy is unaffordable. However, the CPUC has two proceedings scheduled for 2011 to more precisely address the affordability problem.

1. Make Improvements via Two CPUC Proceedings Open in 2011

Every three years, the CPUC reviews and re-authorizes utility plans for low-income energy assistance in California.[48] The utilities are the program administrators of CARE and LIEE. As program administrations, the utilities present program plans to the CPUC for public review and input. This year, the program plans for 2012-2014 will be presented in utility applications to be filed with the CPUC by May 15, 2011. The CPUC typically takes four to six months to review and consider input.

The CPUC's disconnection proceeding remains open but has stalled with several issues still pending.[49] Consumer groups including DRA are advocating that the CPUC require the utilities to allow payment-troubled customers to choose their billing date, in order to better align timing of paychecks with utility bills. DRA's benchmark recommendation (#5 below) for PG&E and SCE is also slated for consideration in this proceeding.

2. Assess Energy Costs as a Percentage of Income

DRA's first recommendation is to target the assistance dollars to better reach those customers for whom, even with the CARE discount, energy is still unaffordable. Those targeted are likely to be many of the disconnected CARE customers. The CPUC could potentially achieve a great impact by more carefully targeting the same subsidy amount rather than increasing the total amount. Rather than its current one-size-fits-all discount, the CARE program should start to reflect the varying degrees of poverty among CARE customers. The *Needs Assessment* speculated that the CARE program had "enrolled a significantly larger share of households in the lowest energy burden category," and concluded "In the end, this might not be the best strategy for meeting needs and providing maximum benefits."[50] Several states, including Illinois, New Jersey, Ohio, and New Hampshire distribute

[48] Applications 08-05-022 (PG&E); 08-05-024 (SoCalGas); 08-05-025 (SDG&E); 08-05-026 (SCE).

[49] Rulemaking 10-02-005, Phase II *Administrative Law Judge's Ruling Providing Opportunity For Comments And Addressing Other Phase II Issues,* August 26, 2010.

[50] Needs Assessment, pp. 7-8 and 7-9.

energy assistance dollars as a percentage of household income.[51]

3. Develop New Features of Energy Assistance

The first step is making a household's energy bill a reasonable portion of the household income. Then, improving the payment behavior of the household becomes possible. Together, these two steps should produce desirable outcomes for all parties. The low-income household retains access to an essential service, the utility records less bad debt, and less bad debt flows into the calculation of all customers' rates.

Studies With California Examples

In addition to the studies identified in the Background section in this report, DRA reviewed a wealth of research available from other states and the federal energy assistance program to identify potential changes to CARE.[52] Two studies include California programs: the multi-state sponsored study *Ratepayer Funded Low-Income Energy Programs Performance and Possibilities Final Report*[53] and *PacifiCorp's Low-Income Arrearage Study*.[54]

Based on DRA's review of the research, features of energy assistance programs likely to improve customer payment behavior are:

- Programs that keep monthly bill payments level
- Addressing past-due burdens as well as current bill amounts (known as arrearage management)

Making bills predictable has been shown to improve customer payment patterns.[55] Utility credit and collection departments offer a program that keeps monthly payments level, known as "balanced payment" or "level pay" plans. However, the utilities' current rules make this program largely unavailable to payment troubled households because all past-due amounts must be paid in order to enroll in this program. If the utilities' program assistance departments were to work together with the credit and collections departments, they may be able to design program rules that solicit the participation of the payment-troubled customers who most need such a program.

Arrearage Management

This leads to the subject of arrearage management programs. TURN (The Utility Reform Network) filed a Petition asking the CPUC to consider arrearage management in June 2009,[56] but the

[51] For Ohio, see http://development.ohio.gov/community/ocs/EnergyHelp.htm ;
For Illinois, see http://liheap.ncat.org/dereg/states/illinois.htm .

[52] See Appendix B for list of program assistance evaluations from which recommendations are derived.

[53] Apprise and Roger Colton, *Ratepayer Funded Low-Income Energy Programs Performance and Possibilities Final Report*, July 2007 at http://www.appriseinc.org/multi_sponsor_study.htm .

[54] *Low-Income Arrearage Study* prepared for PacifiCorp March 20, 2007 by M. Sami Khawaja, Kevin Monte de Ramos, Anne West, Doug Bruchs, Quantec LLC, in association with Roger Colton.

[55] Apprise and Roger Colton, *Ratepayer Funded Low-Income Energy Programs Performance and Possibilities Final Report*, July 2007, Executive Summary, xiii.

[56] See June 16, 2009 *Petition* 09-06-22 *of The Utility Reform Network to Adopt, Amend or Repeal*

CPUC declined to do so. However, the research from other states makes the case that help with managing past-due bills is a critical feature of assistance programs. The proposals raised in the TURN Petition, with its extensive list of other states' experience with arrearage management, is an excellent starting point for CARE program administrators.

DRA also recommends smaller adjustments to the CARE program or for CARE customers, such as adjusting bill due dates to coincide with paychecks. This particular recommendation is currently pending before the CPUC, and the CPUC should adopt this low cost option.[57]

The CPUC has a perfect example of testing a creative new feature of CARE. The CPUC's Consumer Services and Information Division, and the utilities, launched CHANGES (Consumer Help and Awareness with Natural Gas and Electricity Services) in January 2011.[58] Using CARE funding, CHANGES adds a "case management" approach to energy assistance, providing comprehensive bill counseling and help for limited and non-English speaking customers. Several multiple language–speaking, community-based organizations statewide will be paid to assist these customers to better understand their energy bills, access the bill discount and home retrofit benefits, and advocate for the customer if needed. The utilities should report the difference in disconnection rates for these customers before and after they participate in CHANGES, and show if these customers ultimately have fewer disconnections after such assistance.

4. Identify and Consider Those Chronically Without Service

This recommendation captures those whose energy poverty is too great for CARE to fix. We recommend utilities simply report the location of these households annually to appropriate social welfare agencies. New York,[59] Pennsylvania,[60] and Ohio[61] are among the states with this simple requirement. Although these are cold-weather states, living without utility service is hazardous regardless.

Additionally, DRA recommends a count of these households be included for the CPUC's consideration of the CARE and LIEE programs for 2012-2014. Furthermore, utility customers who move frequently need to be specially considered next time around. Transient low-income households have generally been excluded from studies such as the Needs Assessment and Impact Evaluation because these studies rely on before and after comparisons to determine changes from the programs. Transient households by definition are

Regulation Pursuant To Pub. Utilities Code Section 1708.5 Related To Arrearage Management And Shutoff Prevention For Residential Customers Of The Major Jurisdictional Electric And Gas Utilities.

[57] See CPUC Ruling Implementing Phase II of Rulemaking 10-02-005, and all parties' Comments filed September 15, 2010; all parties' Reply Comments filed September 24, 2010.

[58] CPUC Resolution CSID-004 approved November 19, 2010.

[59] *See* New York NYCRR16 Part 11: Home Energy Fair Practices Act And Energy Consumer Protection Act -- Rules http://www3.dps.state.ny.us/N/nycrr16.nsf/Parts/6CAA329B4A1945F485256FC7004CFBA3?OpenDocument .

[60] See 52 Pennsylvania Code § 56.100.

[61] See Ohio Revised Code 4933.123.

not in the same location long enough to be included in before and after comparisons. Some of the most vulnerable households, since they can no longer afford to be utility customers or because they move frequently, become invisible when energy affordability analysis relies upon utility customer data. Because California is serious about energy affordability, as demonstrated by word and deed, the CPUC has an obligation to understand the depth of energy poverty in California.

5. Benchmark Low-Income Disconnections

Finally, DRA recommends the CPUC set benchmarks for PG&E and SCE disconnection of its low-income customers. SDG&E and SoCalGas already voluntarily put benchmarks in effect through 2013. SDG&E's all residential benchmark is 2.08%. Its low-income benchmark is 3.44%. SoCalGas' all residential benchmark is 3.36%. Its low-income benchmark is 4.32%. DRA recommends the following additional limits on low-income disconnections: [62]

PG&E: 5% or fewer low-income customers disconnected annually

SCE: 6% or fewer low-income customers disconnected annually

Benchmarks motivate cooperation between utilities' credit and collections departments and low-income assistance departments. DRA is particularly encouraged by the success of the CARE goal the CPUC set for utilities in its 2008 decision authorizing the program. With no penalties or incentives (other than positive public relations), three of the four utilities (all except SDG&E) have exceeded the CARE program penetration goal of 90%.

[62] DRA's recommended low-income benchmarks are based partially on PG&E's and SCE's overall historical disconnection rates, in order to accommodate differences in geography, demographics, and electricity and/or gas. For PG&E, DRA has determined that its current overall disconnection rate is acceptable and designed the benchmark to keep rates at this level. For SCE, DRA believes disconnection rates still exceed acceptable levels and designed the benchmark to continue to drive down rates. DRA then calculated a low-income disconnection rate no greater than one-and-a-half times a reasonable non-low-income rate. Though DRA's recommended benchmark still does not achieve equal low-income and non-low-income rates, it would move rates closer to the desired goal at a pace that allows utilities to make the necessary adjustments to their collections processes.

CONCLUSION

Another positive outcome of the CPUC's 2010 Disconnection Decision is its requirement for the utilities to regularly report disconnection data. DRA urges the CPUC to use this data to track how low-income disconnection rates change relative to disconnection rates of the rest of residential customers. DRA believes that the difference in disconnection rates between low-income and non-low-income customer groups represents the volume of disconnections due to unaffordability. "An effective EA [Energy Assistance], or a portfolio of EA actions, should provide adequate funding to cover all customers applying for assistance that would allow them to stay on the utility system."[63] By using the non-low-income disconnection rate as a guide, the CPUC can gauge when California has accomplished the goal of making electric and gas service accessible and affordable for all California households.

The disconnection outlook for 2011 is positive because utility and regulatory consumer protections are in place, but only for 2011. The disconnection protections required by the CPUC for PG&E and SCE customers will expire at the end of this year. The utilities are preparing to put into effect new, higher rates.[64] The overall distribution of energy assistance through the CARE discount will likely be less overall, as CARE rates begin increasing annually for the first time since 2001. Rates will increase even further as the cost of carbon emission reductions hit customers' bills and customers face variable pricing structures designed to drive conservation and reduce carbon emissions.

Low-income utility customers will be least equipped to absorb these costs and risks. The CPUC must pre-emptively call for creative program approaches to energy assistance. DRA's recommendations outlined in this report will go a long way in addressing many of the underlying issues that lead to energy service disconnection. California must be extra vigilant to make sure energy becomes more, not less, affordable.

[63] Ken Costello, *How To Determine The Effectiveness of Energy Assistance Programs, And Why It's Important,* National Regulatory Research Institute, December 2009, p. 22.

[64] SCE Application (A.) 10-11-015, SDG&E A. 10-12-005, and SoCalGas A. 10-12-006 have requested the CPUC authorize new rates for implementation in 2012. The CPUC authorized higher rates for PG&E in 2010 (Application 10-03-014) and implementation of these new rates is pending for 2011.

INDEX OF FIGURES AND TABLES

DIVISION OF RATEPAYER ADVOCATES

Appendices

Status of Energy Utility Service Disconnections in California

March 2011

The Voice of Consumers, Making a Difference!

APPENDIX A: RESIDENTIAL ENERGY ASSISTANCE PROGRAMS

Residential Energy Assistance Programs in California

Program	Description	Available To:
Bill Discounts and Grants:		
California Alternative Rates for Energy (CARE)	20% discount on energy rates for lowest usage, >20% discount on energy rates for higher usage	Low-income households at or below 200% Federal Poverty Level
Family Electric Rate Assistance (FERA)	Rate discount for increased usage	Large lower-middle income households at 200-250% Federal Poverty Level
U.S. Department of Health & Human Service: Low Income Home Energy Assistance Program (LIHEAP)	Partial bill payment, crisis grants to avoid disconnection	Low-income households at or below 75% State Median Income
PG&E's Relief for Energy Assistance through Community Help (REACH), SDG&E's Neighbor-to-Neighbor, SoCalGas' Gas Assistance Fund (GAF), SCE's Energy Assistance Fund (EAF)	Crisis grants to avoid disconnection	Households demonstrating extreme hardship, in some cases restricted to low-income households, criteria varies
Medical Baseline	Charges higher energy usage at the lowest possible rate to accommodate medical equipment that relies upon electricity	Customers on life-support or with special medical needs
Usage Reduction:		
California's Low-Income Energy Efficiency (LIEE)	Free energy efficiency home retrofit	Low-income households
U.S. Department of Energy: Weatherization Assistance Program (WAP)	Free energy efficiency home retrofit	Low-income households
Energy Efficiency and conservation programs	Variety of programs: Appliance rebates, home energy surveys.	All
Demand Response programs	Payments to turn off air conditioning during rare periods of peak demand	Households with air conditioning
Payment Management:		
Payment Extensions and Installment Plans	Extensions of time to pay deposits and bills	All
Level Pay/Balanced Pay	Bill is the same amount each month	All
Third Party Notification	Customer can designate an additional person to receive past-due and disconnection notices	All

APPENDIX B: RESEARCH ON LOW-INCOME PROGRAM ASSISTANCE IMPACTS

Poverty

California Budget Project, *Making Ends Meet: How Much Does It Cost To Raise A Family In California?*, June 2010.

California Budget Project, *A Generation Of Widening Inequality, The State of Working California 1976-2006,* August 2007

Deborah Reed, *Poverty In California, Moving Beyond The Federal Measure,* Public Policy Institute of California, May 2006.

California: Low-Income Energy Costs, Needs, Assistance Programs

APPRISE and Roger Colton, *Ratepayer Funded Low-Income Energy Programs Performance and Possibilities Final Report,* July 2007.

Roger Colton, Home Energy Affordability Gap, Fisher, Sheehan & Colton,April 2006, 2007, 2008, 2009, 2010, February 2011.

KEMA, *Final Report on Phase 2 Low Income Needs Assessment,* prepared for the California Public Utilities Commission, September 2007.

M. Sami Khawaja, Kevin Monte de Ramos, Anne West, Doug Bruchs, Quantec LLC, in association with Roger Colton, *Low-Income Arrearage Study* prepared for PacifiCorp March 20, 2007.

West Hill Energy & Computing, Inc., *Impact Evaluation of the 2005 California Low-Income Energy Efficiency Program*, Final Report,. December 19, 2007 revised January 10, 2008.

Other States' Low-Income Program Assistance Impact On Bills

APPRISE, *Allegheny Power Universal Service Programs*, Final Evaluation Report, July 2008

Jacqueline Berger and David Carroll, APPRISE, *Energy Affordability Program Design Options*, January 2007

Roger D. Colton, *The Impact of Indiana's Low-Income Utility Affordability Programs on Nonpayment Disconnections*, Sept. 3, 2007.

Roger D. Colton, *An Outcome Evaluation of Indiana's Low-Income Rate Affordability Programs*, 2008/2009 Report, August 2009.

Ken Costello, *How To Determine The Effectiveness of Energy Assistance Programs, And Why It's Important,* National Regulatory Research Institute, December 2009.

John Howat, Jerry McKim, Charlie Harak and Olivia Wein, *Tracking the Home Energy Needs of Low-Income Households Through Trend Data on Arrearages and Disconnections*, National Energy Assistance Director's Association, May 2004

Rick Kunkle, *Washington State Low-Income Weatherization Program Evaluation Report For 2006*, Washington State University Extension Energy Program, March 2008 (see Table B-5 on page B-3).

PA Consulting Group, *Maryland Public Service Commission, Electric Universal Service Program Evaluation, Final Evaluation Report*, May 11, 2007

H. Gil Peach & Associates and Smith & Lehmann, prepared for the State of Nevada, *SFY2009 Evaluation: Energy and Weatherization Assistance Programs*, December 28, 2009

APPENDIX C: DISCONNECTION DATA BY UTILITY

Disconnection data from 2010 is publicly available at http://docs.cpuc.ca.gov/published/proceedings/R1002005.htm

Blank cells in the tables indicate the utility was not able to provide the historical data.

Because utility bills, payment patterns, and disconnection events are seasonal, it is best to compare the same months from year to year. Therefore the annual totals in the tables below only compare data from months in which data is available in both 2009 and 2010.

PG&E All Residential Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	5,311,524	5,260,162	147,708	254,208	12,060	11,368	7,681	8,509	66,661	104,980	221,454	201,024	$112,065,045	$61,639,224
Feb	5,304,466	5,266,663	172,279	299,941	15,197	14,194	9,655	10,891	67,308	111,877	256,090	241,382	$110,853,359	$69,290,895
Mar	5,305,894	5,274,437	233,753	353,043	26,352	17,717	16,081	14,220	77,869	125,318	289,164	248,232	$117,247,562	$76,064,001
Apr	5,310,880	5,273,082	255,404	319,277	29,363	17,776	19,751	14,629	78,885	113,873	284,273	242,276	$113,502,753	$78,119,684
May	5,314,573	5,271,601	203,242	267,345	33,158	17,201	23,594	14,075	72,257	97,242	278,067	264,030	$108,634,601	$82,240,484
Jun	5,326,342	5,276,785	232,276	316,157	28,331	21,179	19,354	16,768	77,721	102,346	269,618	266,437	$101,547,763	$82,773,742
Jul	5,252,091	5,273,856	231,316	138,088	35,641	10,518	24,296	7,494	82,089	77,113	192,230	258,418	$54,193,870	$80,178,177
Aug	5,245,190	5,285,558	238,168	113,564	29,331	12,251	20,171	8,096	89,632	78,783	204,819	276,336	$51,001,462	$85,052,048
Sep	5,249,540	5,280,541	275,643	150,851	33,243	12,542	23,163	9,047	94,492	92,506	221,784	246,569	$56,144,942	$89,202,778
Oct	5,257,410	5,282,066	271,343	191,182	14,985	16,296	13,284	12,729	91,791	96,017	91,766	[65]	$61,768,478	[1]
Nov	5,257,512	5,282,721	190,937	196,679	9,835	14,562	7,932	11,946	76,127	94,370	104,182		$64,115,100	
Dec	5,258,060	5,287,220	250,507	217,266	4,720	13,467	4,101	11,178	91,048	104,317	100,674		$64,471,515	
ANNUAL TOTAL	5,282,790	5,276,224	2,702,576	2,817,601	272,216	179,071	189,063	139,582	965,880	1,198,742	209,510	249,412	$84,628,871	$78,284,559
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average Jan-Sep)		(average Jan-Sep)	

[65] Utilities delay reporting the dollars and accounts past-due until after they make their quarterly performance public. Monthly dollars in arrears data for October, November and December 2010 will be provided on March 25, 2011 in the utilities' March disconnection reports.

PG&E Residential CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	1,137,916	1,367,674	38,851	114,342	4,355	5,001	2,991	3,825	32,114	55,923	78,468	88,892	$27,738,392	$20,893,989
Feb	1,145,358	1,399,757	46,191	134,925	5,106	6,173	3,629	4,895	31,978	58,753	92,433	106,740	$28,994,205	$23,893,045
Mar	1,159,954	1,430,889	68,032	155,689	8,531	7,497	5,516	6,153	37,339	68,190	105,597	109,191	$33,495,972	$26,278,822
Apr	1,176,257	1,441,926	82,709	141,714	10,320	7,652	7,441	6,380	40,081	63,282	102,295	105,238	$33,182,405	$27,346,666
May	1,191,719	1,448,955	66,213	119,260	11,732	7,364	8,943	6,141	35,577	54,250	99,352	114,102	$32,432,768	$29,000,637
Jun	1,207,722	1,463,197	82,557	142,387	10,474	9,216	7,513	7,414	34,947	57,628	98,424	115,578	$30,880,452	$29,548,128
Jul	1,223,447	1,460,731	85,129	57,600	12,825	4,152	9,282	2,945	39,122	40,579	76,048	115,578	$17,397,545	$29,011,753
Aug	1,245,640	1,473,872	95,615	45,391	11,236	4,892	8,091	3,227	43,731	40,310	85,926	125,075	$17,228,916	$32,296,408
Sep	1,272,837	1,479,574	112,249	64,342	12,515	5,256	9,381	3,752	46,109	50,553	89,729	111,583	$17,877,346	$34,597,426
Oct	1,297,145	1,490,404	112,771	85,877	6,087	7,251	5,354	5,621	44,928	53,691	91,766	[1]	$19,534,199	[1]
Nov	1,320,082	1,490,577	77,896	90,303	4,201	7,022	3,329	5,740	38,581	54,379	104,182		$21,577,620	
Dec	1,351,415	1,499,942	113,324	97,819	2,141	6,281	1,811	5,246	48,488	59,905	100,674		$21,504,152	
ANNUAL TOTAL	1,227,458	1,453,958	981,537	1,249,649	99,523	77,757	73,281	61,339	472,995	657,443	92,030	110,220	$26,580,889	$28,096,319
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average Jan-Sep)		(average Jan-Sep)	

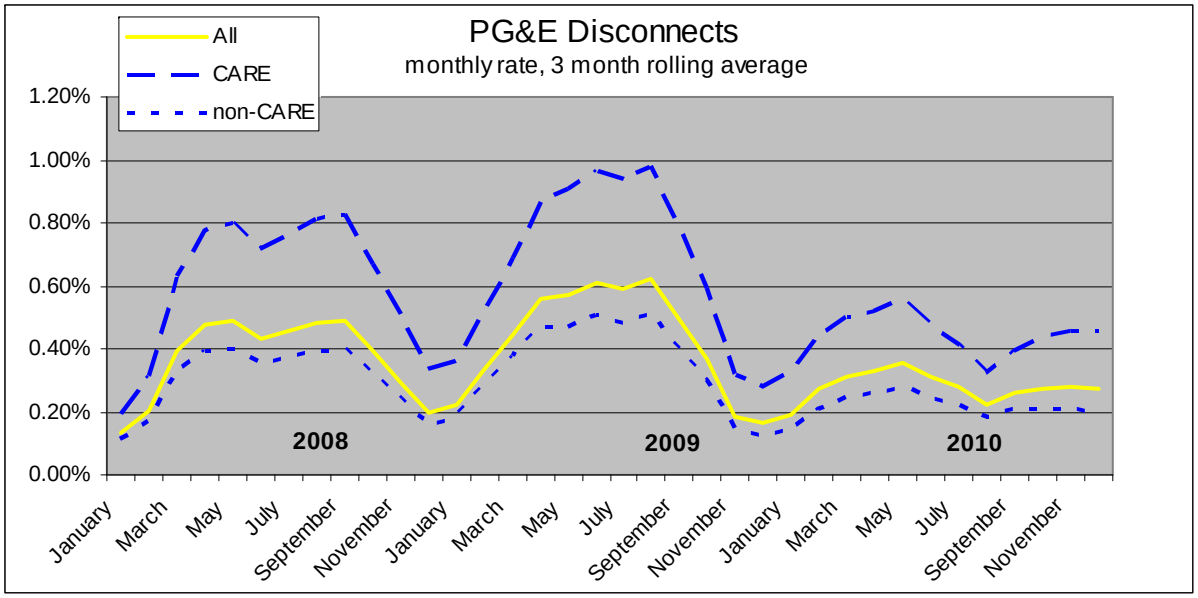
[1] Utilities delay reporting the dollars and accounts past-due until after they make their quarterly performance public. Monthly dollars in arrears data for October, November and December 2010 will be provided on March 25, 2011 in the utilities' March disconnection reports.

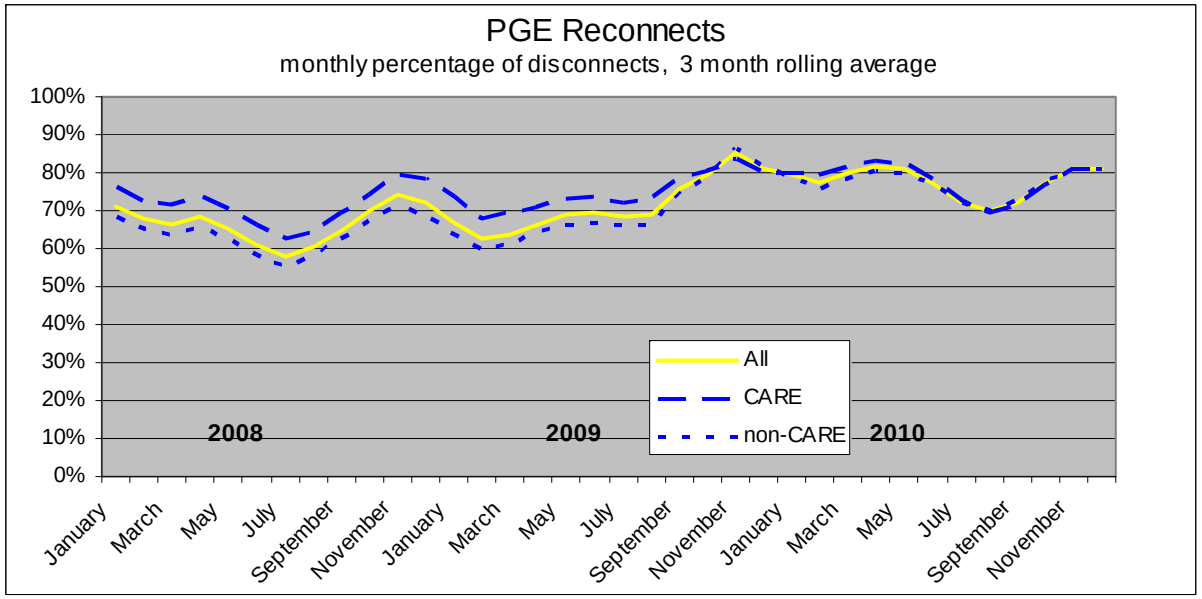
PG&E Residential Except CARE Customer Data

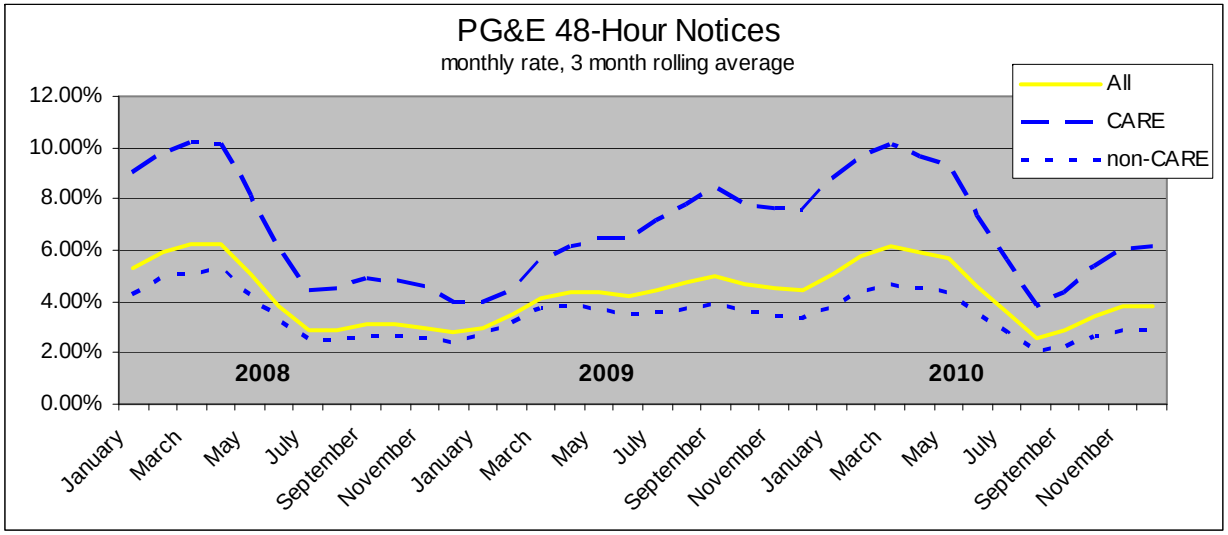
This table counts number of occurrences. One customer account may experience multiple occurrences.

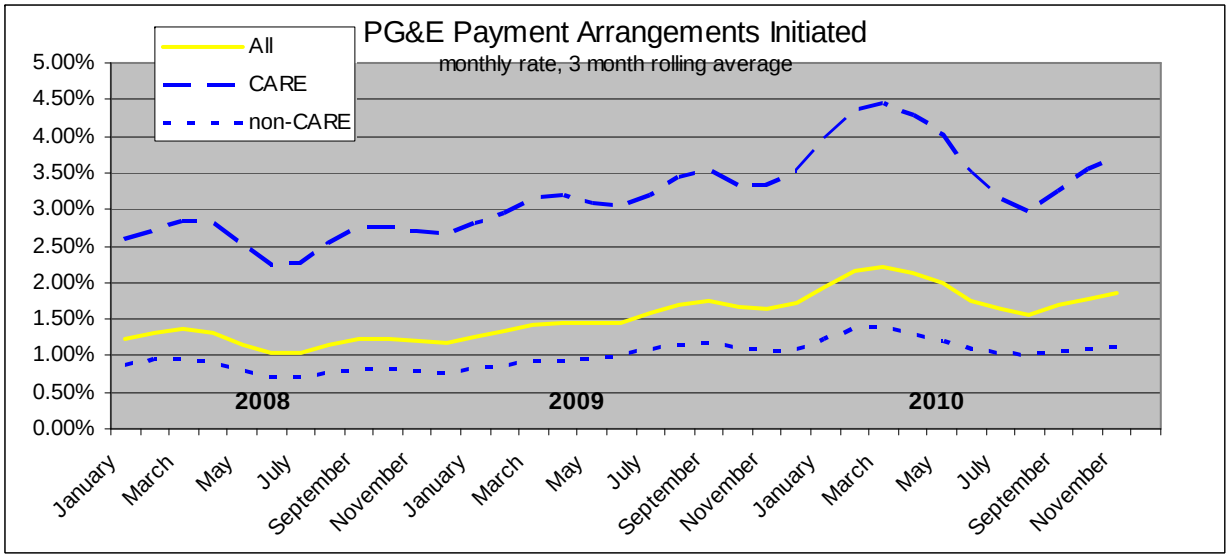
Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	4,173,608	3,892,488	108,857	139,866	7,705	6,367	4,690	4,684	34,547	49,057	142,986	112,132	$84,326,653	$40,745,235
Feb	4,159,108	3,866,906	126,088	165,016	10,091	8,021	6,026	5,996	35,330	53,124	163,657	134,642	$81,859,154	$45,397,850
Mar	4,145,940	3,843,548	165,721	197,354	17,821	10,220	10,565	8,067	40,530	57,128	183,567	139,041	$83,751,590	$49,785,179
Apr	4,134,623	3,831,156	172,695	177,563	19,043	10,124	12,310	8,249	38,804	50,591	181,978	137,038	$80,320,348	$50,773,018
May	4,122,854	3,822,646	137,029	148,085	21,426	9,837	14,651	7,934	36,680	42,992	178,715	149,928	$76,201,834	$53,239,847
Jun	4,118,620	3,813,588	149,719	173,770	17,857	11,963	11,841	9,354	42,774	44,718	171,194	150,859	$70,667,311	$53,225,614
Jul	4,028,644	3,813,125	146,187	80,488	22,816	6,366	15,014	4,549	42,967	36,534	116,182	142,840	$36,796,325	$51,166,424
Aug	3,999,550	3,811,686	142,553	68,173	18,095	7,359	12,080	4,869	45,901	38,473	118,893	151,261	$33,772,546	$52,755,640
Sep	3,976,703	3,800,967	163,394	86,509	20,728	7,286	13,782	5,295	48,383	41,953	132,055	134,986	$38,267,596	$54,605,352
Oct	3,960,265	3,791,662	158,572	105,305	8,898	9,045	7,930	7,108	46,863	42,326		[1]	$42,234,279	[1]
Nov	3,937,430	3,792,144	113,041	106,376	5,634	7,540	4,603	6,206	37,546	39,991			$42,537,480	
Dec	3,906,645	3,787,278	137,183	119,447	2,579	7,186	2,290	5,932	42,560	44,412			$42,967,363	
ANNUAL TOTAL	4,055,333	3,822,266	1,721,039	1,567,952	172,693	101,314	115,782	78,243	492,885	541,299	154,359	139,192	$65,107,040	$50,188,240
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average Jan-Sep)		(average Jan-Sep)	

[1] Utilities delay reporting the dollars and accounts past-due until after they make their quarterly performance public. Monthly dollars in arrears data for October, November and December 2010 will be provided on March 25, 2011 in the utilities' March disconnection reports.


PG&E Disconnects
monthly rate, 3 month rolling average
All
CARE
non-CARE
1.20%
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
2008
2009
2010
January
March
May
July
September
November


PGE Reconnects
monthly percentage of disconnects, 3 month rolling average
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
All
CARE
non-CARE
2008
2009
2010
January
March
May
July
September
November


PG&E 48-Hour Notices
monthly rate, 3 month rolling average
All
CARE
non-CARE
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
2008
2009
2010
January
March
May
July
September
November


PG&E Payment Arrangements Initiated
monthly rate, 3 month rolling average
All
CARE
non-CARE
5.00%
4.50%
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
2008
2009
2010
January
March
May
July
September
November

SCE All Residential Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	4,186,350	4,204,205		118,644	29,017	3,640	1,321	2,669	165,974	197,527		90,527		$13,461,324
Feb	4,187,112	4,208,016		232,915	27,273	21,657	1,010	15,632	138,863	171,471		68,881		$11,146,023
Mar	4,188,205	4,209,050		479,938	32,247	25,242	1,766	19,294	151,521	171,370		67,153		$11,046,495
Apr	4,189,638	4,211,863		474,024	30,996	25,129	2,367	19,080	139,198	147,673		76,131	$6,516,369	$11,816,752
May	4,191,051	4,214,874		420,511	27,391	25,544	2,027	19,759	139,021	132,913		71,724	$6,722,793	$11,563,467
Jun	4,190,455	4,215,401		417,439	29,489	23,439	1,855	17,595	155,735	143,455		75,647	$5,941,677	$11,706,619
Jul	4,192,472	4,217,851		453,503	26,018	21,458	1,649	16,015	165,570	150,781		73,770	$5,559,777	$11,510,974
Aug	4193059	4,219,657	452,461	451,456	24,546	24,654	1,452	18,316	193,181	176,413	40,225	69,714	$5,359,503	$11,548,381
Sep	4,195,386	4,221,817	518,830	478,851	28,673	22,163	1,409	16,223	209,669	185,596	33,256	73,490	$4,587,452	$12,750,648
Oct	4,197,501	4223680	557,126	498,489	26,936	22,229	1,315	16,282	212,349	169,627	48,343	86,488	$4,070,654	[1]
Nov	4,199,327	4224293	431,033	450,093	20,082	18,015	878	14,984	188,715	157,578	59,871	102,620	$5,799,211	
Dec	4,201,024	4224884	251,702	503,808	11,637	12,707	699	11,064	199,049	165,840	75,525	112,371	$7,223,642	
ANNUAL TOTAL	4,192,632	4,216,299		4,979,671	314,305	245,877	17,748	186,913	2,058,845	1,970,244	51,444	88,937	$5,781,262	$11,816,140
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average Aug-Dec)		(average Apr-Sep)	

[1] Utilities delay reporting the dollars and accounts past-due until after they make their quarterly performance public. Monthly dollars in arrears data for October, November and December 2010 will be provided on March 25, 2011 in the utilities' March disconnection reports.

SCE Residential CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

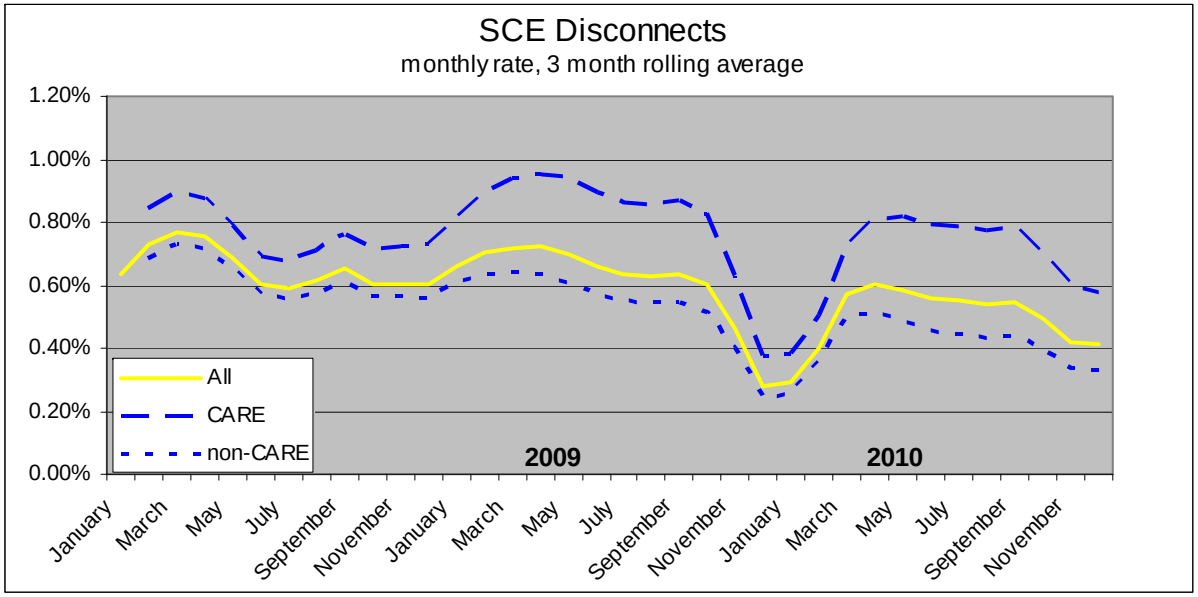
Month	Customers[66]		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	1,102,274	1,202,227		50,288	9,240	1,520	6,748	1,233		119,726		95,059		$11,469,181
Feb	1,104,863	1,216,743		94,833	9,247	7,875	7,028	6,207		103,303		83,567		$10,048,566
Mar	1,101,691	1,232,620		200,050	11057	9,097	8,245	7,268		105,003		110,503	$5,862,803	$12,220,097
Apr	1,116,348	1,253,213		198,487	10936	10,168	9,419	7,830	64,925	90,188		109,171	$5,040,786	$12,630,247
May	1,120,197	1,268,839		181,344	9,809	10,943	8,350	8,646	66,021	80,967		98,695	$4,930,972	$11,606,715
Jun	1,128,681	1,276,317		183,051	11,019	10,004	9,103	7,721	74,853	87,028		98,788	$5,672,057	$11,054,785
Jul	1,139,652	1,289,444		203,671	9,452	9,454	7,977	7,215	80,949	89,577		92,331	$5,824,186	$11,014,237
Aug	1,151,535	1,300,327	177,027	207,345	8,966	11,038	7,269	8,316	92850	99,875	57,929	101,170	$4,904,950	$12,157,180
Sep	1,157,083	1,307,988	209,909	222,805	11,145	9,785	8,813	7,306	104,680	107,561	59,434	130,953	$5,790,190	$16,594,405
Oct	1,162,900	1,320,277	224,418	233,215	10,189	9,908	8,476	7,380	106,178	97,489	76,295	121,313	$8,562,507	
Nov	1,176,716	1,331,941	174,206	212,303	7,453	8,130	5,952	6,885	94,696	91,569	86,615	127,718	$10,740,852	
Dec	1,187,835	1,335,597	103,803	235,264	4,417	5,631	3,621	5,045	101,875	96,829	110,833	144,849	$12,060,944	
ANNUAL TOTAL	1,137,481	1,277,961		2,222,656	112,930	103,553	91,001	81,052		1,169,115	78,221	125,201	$5,432,278	$12,468,238
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average of Aug-Dec)		(average of Mar-Sep)	

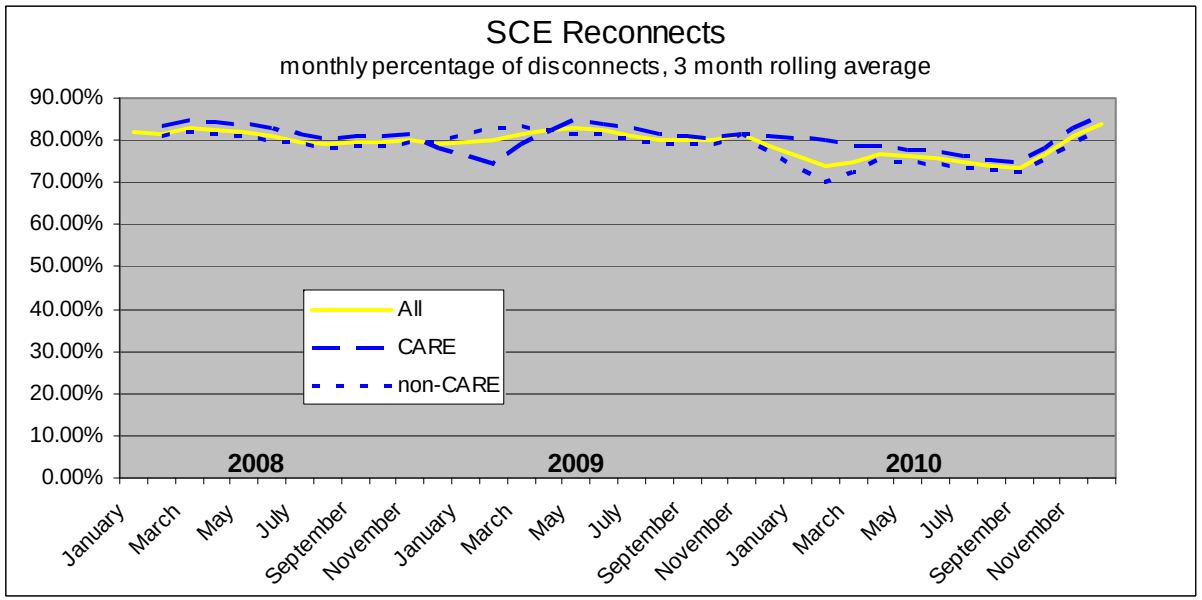
[66] SCE includes in its CARE customer count reported monthly CARE submetered customers. DRA adjusted the SCE CARE customer count to remove an estimate of submetered customers for a more even comparison between CARE-nonCARE data and among the four utilities.

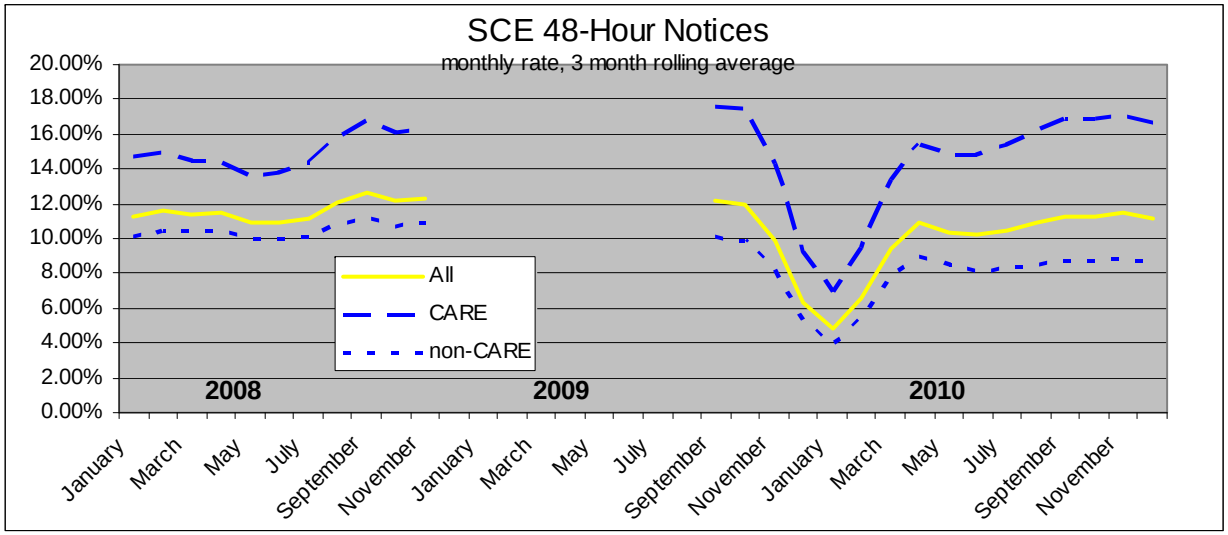
SCE Residential Except CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

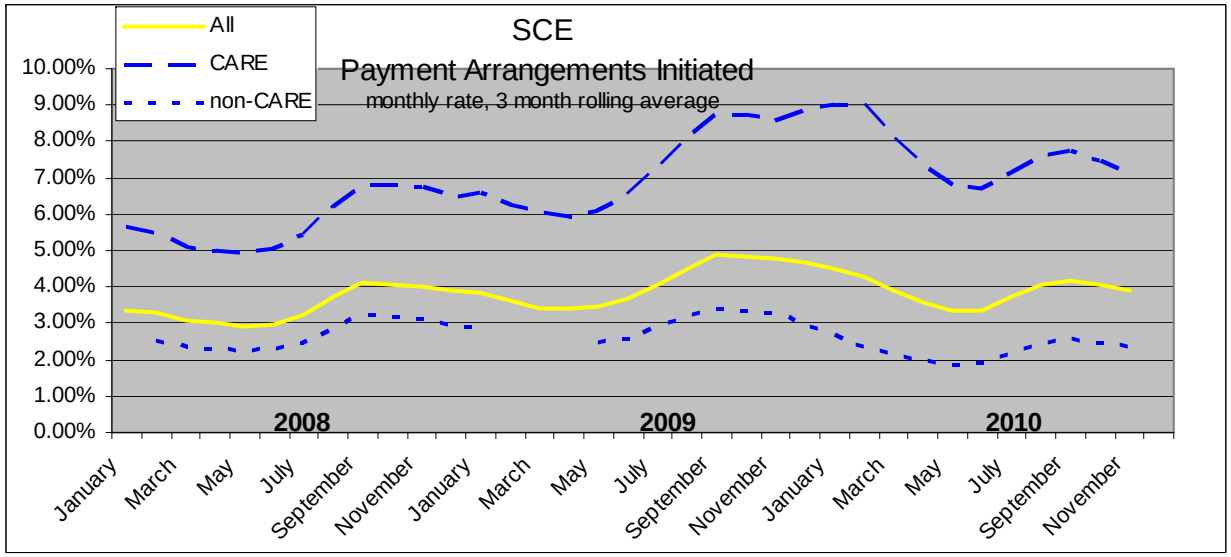
Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	3,084,076	3,001,978		68,356	19,777	2,120	15999	1,436	92,289	77801		41,085		$13,637,489
Feb	3,082,249	2,991,273		138,082	18,026	13,782	15200	9,425	77,484	68168		31,111		$11,633,945
Mar	3,086,514	2,976,430		279,888	21,190	16,145	17536	12,026		66367		28,440	$9,753,568	$13,092,991
Apr	3,073,290	2,958,650		275,537	20,060	14,961	16518	11,250	74273	57485		30,105	$7,755,717	$12,025,971
May	3,070,854	2,946,035		239,167	17,582	14,601	14541	11,113	73000	51946		26,953	$7,880,932	$10,011,188
Jun	3,061,774	2,939,084		234,388	18,470	13,435	14753	9,874	80882	56427		28,497	$7,845,183	$9,813,499
Jul	3,052,820	2,928,407		249,832	16,566	12,004	13486	8,800	84621	61204		26,720	$7,908,215	$9,090,381
Aug	3,041,524	2,919,330	275,434	244,111	15,580	13,616	12247	10,000	100331	76538	18,682	25,173	$6,228,718	$10,011,726
Sep	3,038,303	2,913,829	308,921	256,046	17,528	12,378	13,536	8,917	104989	78035	15,934	26,936	$7,676,015	$14,296,728
Oct	3,034,601	2,903,403	332,708	265,274	16,747	12,321	13,672	8,902	106171	72138	22,249	30,655	$10,341,427	
Nov	3,022,611	2,892,352	256,827	237,790	12,629	9,885	9,983	8,099	94019	66009	27,436	37,028	$13,327,986	
Dec	3,013,189	2,889,287	147,899	268,544	7,220	7,076	6,029	6,019	97174	69011	33,994	39,853	$14,769,360	
ANNUAL TOTAL	3,055,150	2,938,338		2,757,015	201,375	142,324	163,500	105,861		801,129	23,659	31,929	$7,864,050	$11,191,783
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average of Aug-Dec)		(average of Mar-Sep)	


SCE Disconnects
monthly rate, 3 month rolling average
1.20%
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
All
CARE
non-CARE
2009
2010
January
March
May
July
September
November


SCE Reconnects
monthly percentage of disconnects, 3 month rolling average
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
All
CARE
non-CARE
2008
2009
2010
January
March
May
July
September
November



[67]



[67] Break in chart due to the utility's inability to provide historical data

SDG&E All Residential Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers[68]		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	1,229,000	1,239,341	23,820	19,977	1,832	1,342	1,321	912	5,723	8,214		115,192		$8,083,247
Feb	1,229,738	1,239,465	19,062	21,703	1,394	1,893	1,010	1,409	5,214	11,052		107,639		$8,014,710
Mar	1,230,069	1,240,574	25,333	28,250	2,324	2,207	1,766	1,637	5,870	18,020		114,609	$8,629,018	$9,613,115
Apr	1,231,053	1,241,636	24,572	28,531	3,042	1,891	2,367	1,392	6,025	16,692		117,359	$8,437,603	$10,144,748
May	1,231,728	1,242,359	21,892	23,799	2,547	2,117	2,027	1,601	5,618	14,734		113,533	$8,183,056	$10,355,866
Jun	1,232,501	1,242,664	22,015	23,929	2,511	1,837	1,855	1,319	4,832	15,070	119,284	122,089	$8,256,890	$10,742,219
Jul	1,233,982	1,243,809	23,840	23,332	2,270	1,568	1,649	1,148	5,219	15,584	112,808	114,940	$7,921,897	$10,686,290
Aug	1,235,100	1,244,304	24,771	25,230	1,963	2,000	1,452	1,462	5,474	17,002		106,940		$10,539,060
Sep	1,235,390	1,244,463	23,640	22,014	1,959	1,357	1,409	1,033	7,365	16,273	109,016	112,148	$7,769,406	$9,583,936
Oct	1,236,917	1,246,186	22,910	19,954	1,822	1,803	1,315	1,305	7,608	15,953	115,773	105,183	$7,398,638	
Nov	1,237,695	1,246,622	20,700	19,481	1,191	1,795	878	1,319	7,172	16,942	118,151		$8,002,295	
Dec	1,238,148	1,247,045	24,371	19,462	874	1,318	699	1,051	7,666	16,613	122,564		$8,433,977	
ANNUAL TOTAL	1,233,443	1,243,206	276,926	275,662	23,729	21,128	17,748	15,588	73,786	182,149	113,703	116,392	$8,199,645	$10,187,696
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average of Jun, Jul, Sep)		(average of Mar-Jul, Sep)	

[68] SDG&E did not provide customer counts for its nonCARE customers for January and February 2009 so DRA estimated these counts based on SDG&E's previous data submission of active meters.

SDG&E Residential CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

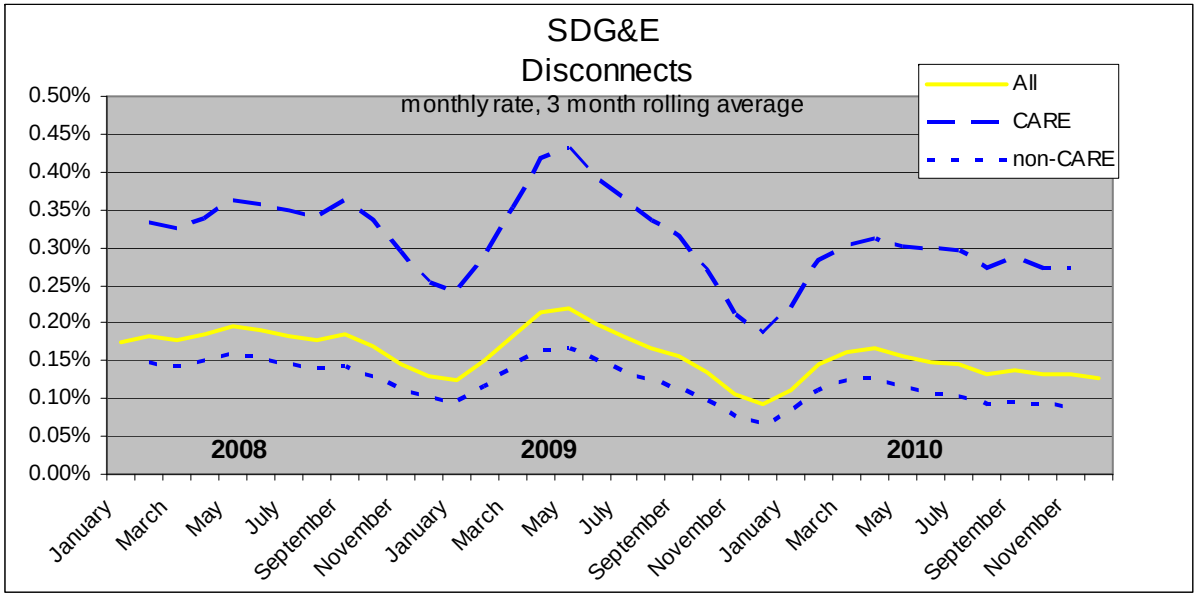
Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	232,357	260,428	7,687	7,629	673	566	516	405	2,701	4,164		51,092		$3,390,084
Feb	234,755	261,033	5,870	7,739	520	784	415	620	2,368	5,636		47,146		$3,335,391
Mar	236,993	261,005	8,326	10,601	861	861	692	694	2,822	9,273		50,841	$3,119,558	$4,064,763
Apr	239,826	262,404	8,116	10,706	1,133	710	941	556	2,924	8,857		52,386	$3,128,307	$4,266,948
May	242,878	263,947	7,339	8,677	1,010	883	855	683	2,805	7,889		51,955	$3,062,836	$4,446,038
Jun	244,314	265,108	7,554	9,124	994	802	751	634	2,382	8,186	169,954	56,281	$3,107,868	$4,669,003
Jul	245,831	272,209	8,343	9,410	870	712	659	539	2,688	8,766	172,861	53,624	$3,035,541	$4,709,547
Aug	247,928	273,854	9,114	10,222	825	895	626	689	2,685	9,506		50,028		$4,766,063
Sep	250,909	276,823	8,543	9,082	810	634	615	529	3,642	9,415	146,553	52,140	$3,131,984	$4,300,230
Oct	255,313	280,121	8,174	8,269	746	833	568	649	3,717	9,109	149,490		$2,977,624	
Nov	257,205	283,103	7,514	8,085	508	818	395	630	3,642	9,598	157,093		$3,240,506	
Dec	261,023	283,428	9,350	8,418	370	644	310	538	3,961	9,456	166,681		$3,520,685	
ANNUAL TOTAL	245,778	270,289	95,930	107,962	9,320	9,142	7,343	7,166	36,337	99,855	163,123	54,015	$3,097,682	$4,409,421
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average of Jun, Jul, Sep)		(average of Mar-Jul, Sep)	

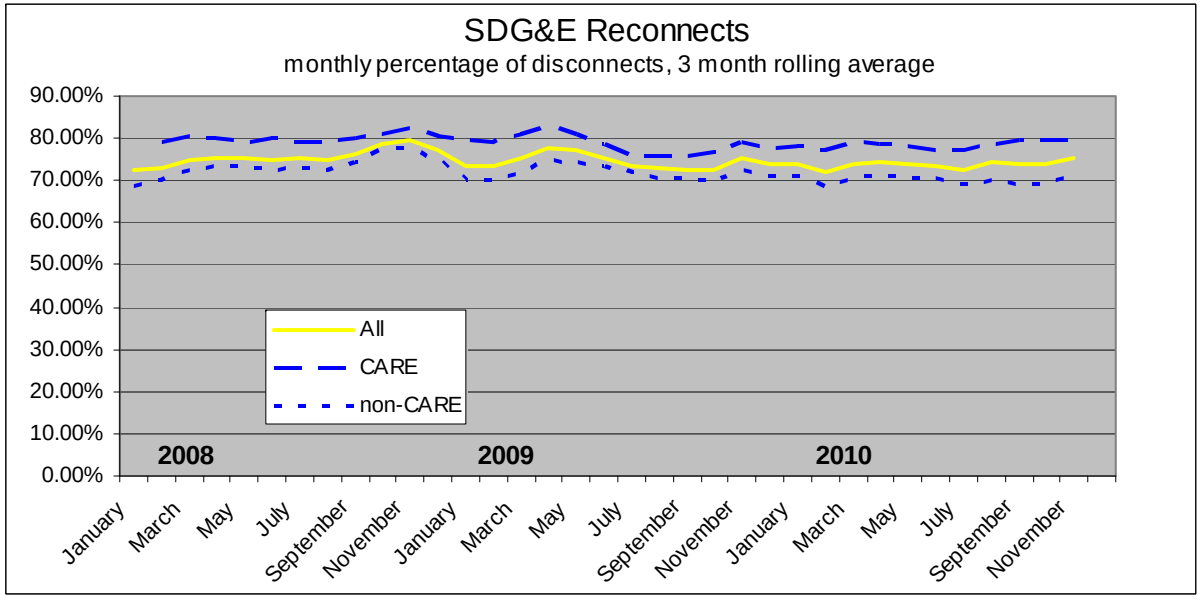
SDG&E Residential Except CARE Customer Data

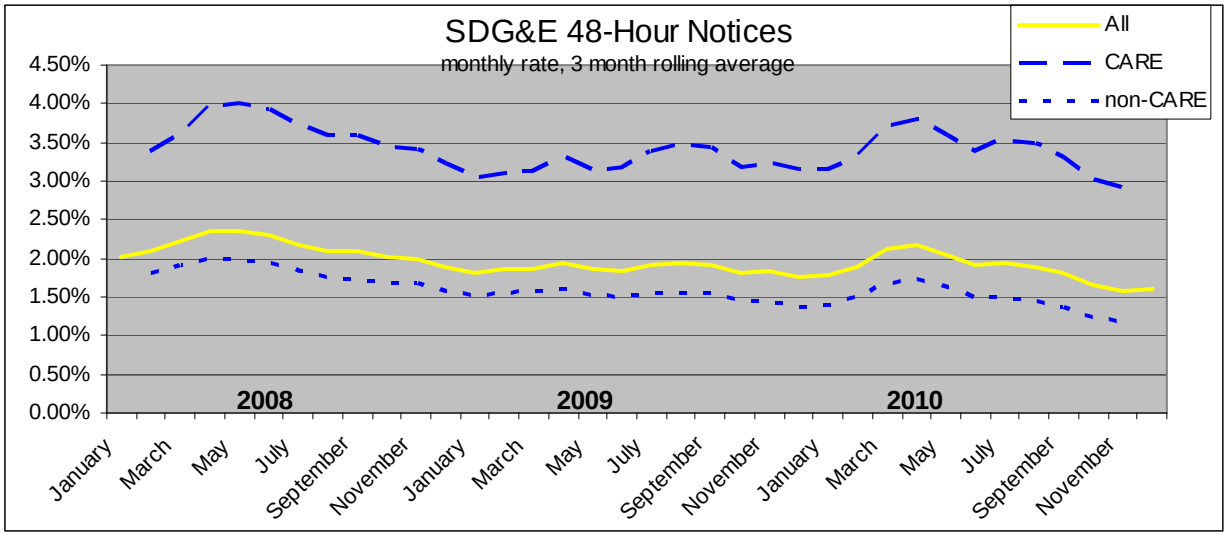
This table counts number of occurrences. One customer account may experience multiple occurrences.

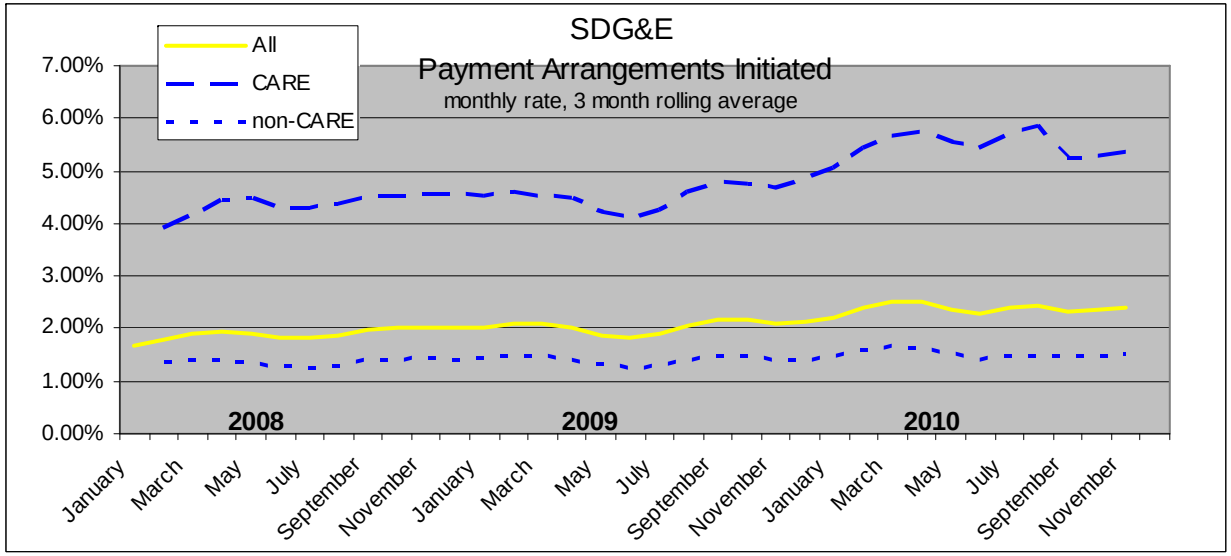
Month	Customers[69]		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	996,643	978,913	16,133	12,348	1,159	776	805	507	3,022	4,050		64,100		$4,693,163
Feb	994,983	978,432	13,192	13,964	874	1,109	595	789	2,846	5,416		60,493		$4,679,319
Mar	993,076	979,569	17,007	17,649	1,463	1,346	1,074	943	3,048	8,747		63,768	$5,509,460	$5,548,352
Apr	991,227	979,232	16,456	17,825	1,909	1,181	1,426	836	3,101	7,835		64,973	$5,309,296	$5,877,801
May	988,850	978,412	14,553	15,122	1,537	1,234	1,172	918	2,813	6,845		61,578	$5,120,220	$5,909,828
Jun	988,187	977,556	14,461	14,805	1,517	1,035	1,104	685	2,450	6,884	69,525	65,808	$5,149,023	$6,073,217
Jul	988,151	971,600	15,497	13,922	1,400	856	990	609	2,531	6,818	65,607	61,316	$4,886,356	$5,976,743
Aug	987,172	970,450	15,657	15,008	1,138	1,105	826	773	2,789	7,496		56,912		$5,772,997
Sep	984,481	967,640	15,097	12,932	1,149	723	794	504	3,723	6,858	63,171	60,008	$4,637,422	$5,283,706
Oct	981,604	966,065	14,736	11,685	1,076	970	747	656	3,891	6,844	66,906	55,998	$4,421,014	
Nov	980,490	963,519	13,186	11,396	683	977	483	689	3,530	7,344	68,385		$4,761,789	
Dec	977,125	963,617	15,021	11,044	504	674	389	513	3,705	7,157	69,454		$4,913,292	
ANNUAL TOTAL	987,666	972,917	180,996	167,700	14,409	11,986	10,405	8,422	37,449	82,294	66,101	62,377	$5,101,963	$5,778,274
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		(average of Jun, Jul, Sep)		(average of Mar-Jul, Sep)	

[69] SDG&E did not provide customer counts for its nonCARE customers for January and February 2009 so DRA estimated these counts based on SDG&E's previous data submission of active meters.


SDG&E
Disconnects
monthly rate, 3 month rolling average
All
CARE
non-CARE
0.50%
0.45%
0.40%
0.35%
0.30%
0.25%
0.20%
0.15%
0.10%
0.05%
0.00%
2008
2009
2010
January
March
May
July
September
November


SDG&E Reconnects
monthly percentage of disconnects, 3 month rolling average
All
CARE
non-CARE
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2008
2009
2010
January
March
May
July
September
November


SDG&E 48-Hour Notices
monthly rate, 3 month rolling average
All
CARE
non-CARE
4.50%
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
2008
2009
2010
January
March
May
July
September
November


SDG&E
Payment Arrangements Initiated
monthly rate, 3 month rolling average
All
CARE
non-CARE
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
2008
2009
2010
January
March
May
July
September
November

SoCalGas All Residential Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	5,264,867	5,291,641	58,018	93,854	12,217	10,686	8,230	6,462	109,529	111,867		458,381		$14,667,727
Feb	5,268,729	5,297,836	125,555	105,858	11,565	11,745	8,976	8,456	114,630	115,635		406,244		$18,116,193
Mar	5,272,227	5,302,707	107,004	140,804	14,726	14,931	10,658	10,618	131,957	143,152		500,341		$29,234,256
Apr	5,274,035	5,306,324	118,772	136,120	14,557	14,346	10,408	10,559	120,250	129,503		533,794		$33,126,392
May	5,272,936	5,308,749	107,878	113,858	14,012	13,748	9,704	10,204	104,457	107,261		564,745		$31,286,777
Jun	5,270,004	5,308,796	99,380	135,822	15,121	12,839	10,274	8,928	95,030	111,092		570,747		$28,017,837
Jul	5,265,457	5,307,405	99,020	140,366	13,687	11,898	8,390	8,228	91,821	108,559		555,396		$24,376,883
Aug	5,264,838	5,309,138	88,800	136,935	12,934	12,761	8,855	8,702	85,913	102,007		536,248		$19,727,424
Sep	5,265,525	5,312,337	80,033	121,066	11,914	11,596	8,308	8,620	76,592	92,255		552,254		$16,930,583
Oct	5,269,281	5,316,811	77,440	117,900	11,942	11,003	9,120	9,066	77,874	92,356	542,381		$9,160,720	
Nov	5,275,335	5,321,585	68,605	101,985	8,688	8,475	7,503	7,002	75,091	81,784	541,708		$8,965,921	
Dec	5,282,847	5,327,408	80,842	123,865	6,814	5,410	6,360	5,732	88,537	104,673	588,477		$13,726,958	
ANNUAL TOTAL	5,270,507	5,309,228	1,111,347	1,468,433	148,177	139,438	106,786	102,577	1,171,681	1,300,144				
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		no comparable months yet		no comparable months yet	

SoCalGas Residential CARE Customer Data

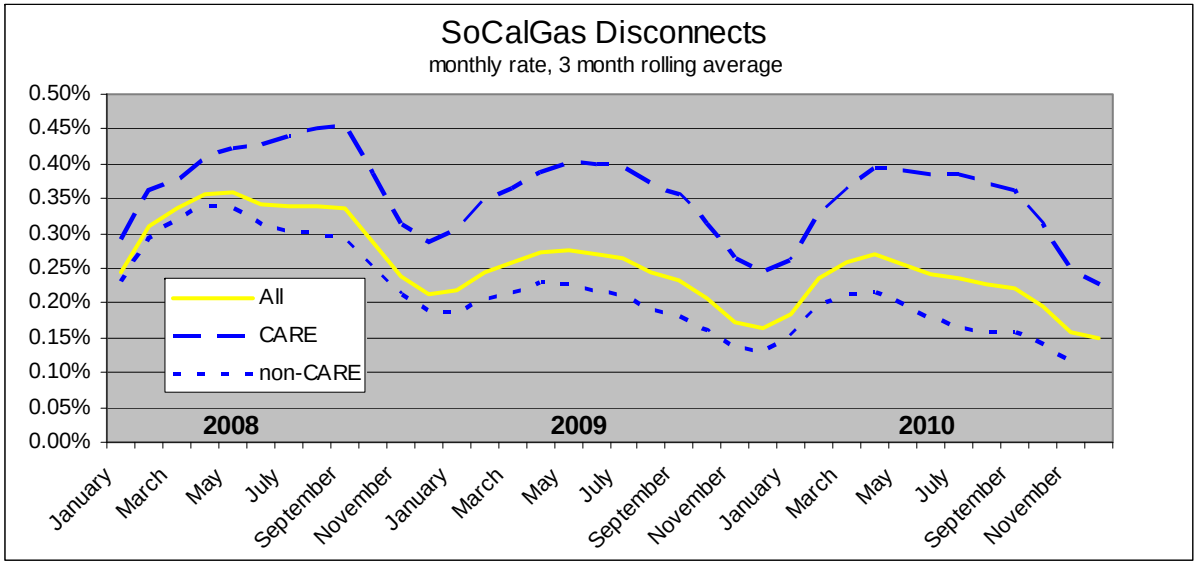
This table counts number of occurrences. One customer account may experience multiple occurrences.

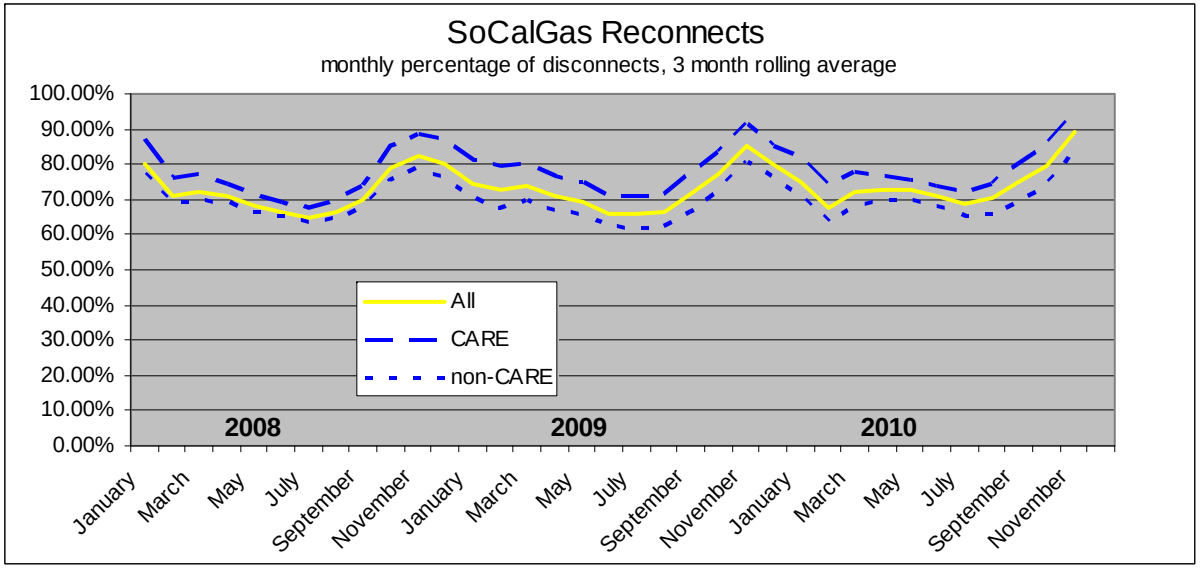
Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	1,441,382	1,571,380	40,433	40,658	4,932	4,546	3,658	2,972	50,917	54,566		212,652		$7,353,022
Feb	1,450,810	1,573,709	42,578	44,631	4,614	4,750	3,907	3,841	50,682	53,950		186,981		$8,217,845
Mar	1,458,525	1,584,793	49,209	59,158	5,636	6,233	4,494	4,684	56,871	64,700		234,890		$13,062,433
Apr	1,481,315	1,614,136	47,000	58,370	5,831	6,334	4,460	4,886	54,734	61,539		256,165		$15,369,725
May	1,493,227	1,633,528	42,911	52,348	5,717	6,438	4,250	4,980	48,829	53,196		272,758		$15,161,907
Jun	1,494,052	1,656,356	40,086	66,100	6,375	6,433	4,697	4,599	44,828	58,143		275,041		$13,937,416
Jul	1,510,316	1,676,643	41,735	70,369	5,881	6,201	3,848	4,534	45,232	58,711		268,614		$12,658,915
Aug	1,520,244	1,689,241	37,999	68,359	5,720	6,671	4,210	4,785	43,064	55,183		264,021		$11,003,708
Sep	1,531,174	1,685,144	34,087	61,675	5,323	6,063	4,034	4,807	38,655	50,499		271,561		$9,955,573
Oct	1,534,382	1,697,404	33,242	58,034	5,325	5,604	4,421	4,992	37,757	49,983	240,309	273,924	$5,892,268	
Nov	1,542,309	1,707,036	29,550	49,889	3,843	4,263	3,519	3,734	36,704	44,165	243,313		$5,884,919	
Dec	1,560,543	1,714,044	34,990	60,417	3,015	2,705	2,992	2,936	43,268	56,230	269,757		$7,473,433	
ANNUAL TOTAL	1,501,523	1,650,285	473,820	690,008	62,212	66,241	48,490	51,750	551,541	660,865				
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		no comparable months yet		no comparable months yet	

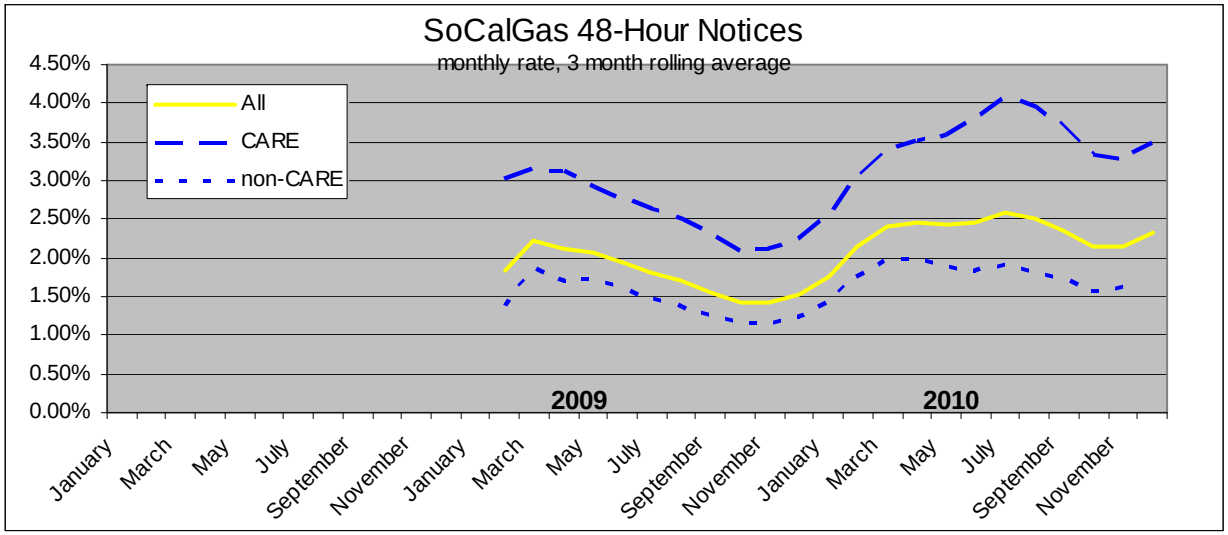
SoCalGas Residential Except CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

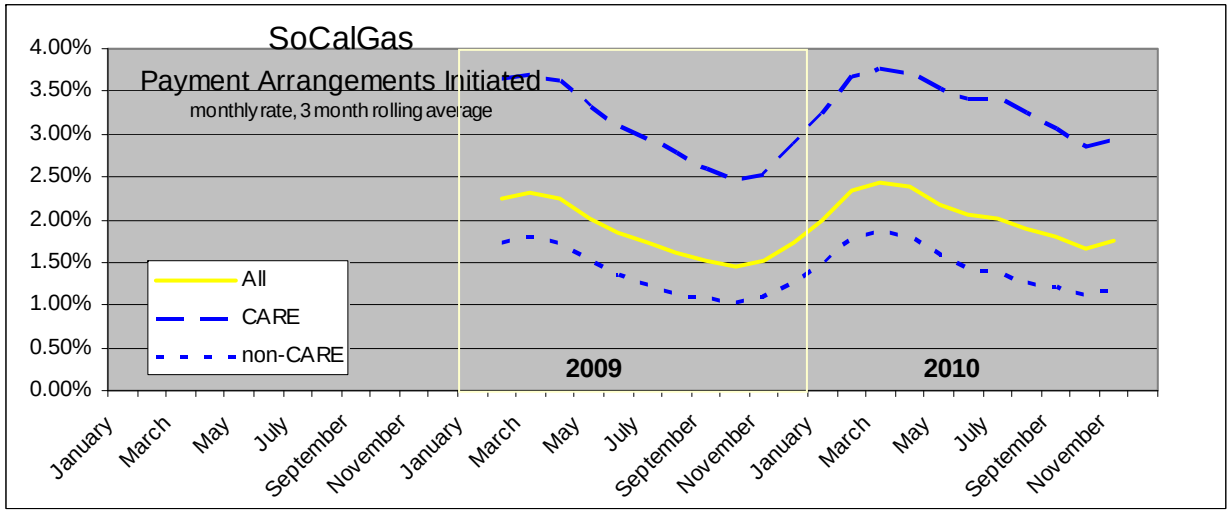
Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	3,823,485	3,720,261	53,196	17,585	7,285	6,140	4,572	3,490	58,612	57,301		245,729		$7,314,705
Feb	3,817,919	3,724,127	61,227	82,977	6,951	6,995	5,069	4,615	63,948	61,685		219,263		$9,898,348
Mar	3,813,702	3,717,914	81,646	57,795	9,090	8,698	6,164	5,934	75,086	78,452		265,451		$16,171,822
Apr	3,792,720	3,692,188	77,750	71,772	8,726	8,012	5,948	5,673	65,516	67,964		277,629		$17,756,667
May	3,779,709	3,675,221	61,510	64,967	8,295	7,310	5,454	5,224	55,628	54,065		291,987		$16,124,871
Jun	3,775,952	3,652,440	69,722	59,294	8,746	6,406	5,577	4,329	50,202	52,949		295,706		$14,080,421
Jul	3,755,141	3,630,762	69,997	57,285	7,806	5,697	4,542	3,694	46,589	49,848		286,782		$11,717,968
Aug	3,744,594	3,619,897	68,576	50,801	7,214	6,090	4,645	3,917	42,849	46,824		272,227		$8,723,716
Sep	3,734,351	3,627,193	59,391	45,946	6,591	5,533	4,274	3813	37,937	41,756		280,693		$6,975,009
Oct	3,734,899	3,619,407	59,866	44,198	6,617	5,399	4,699	4074	40,117	42,373	302,072		$3,268,452	
Nov	3,733,026	3,614,549	52,096	39,055	4,845	4,212	3,984	3268	38,387	37,619	298,395		$3,081,002	
Dec	3,722,304	3,613,364	63,448	45,852	3,799	2,705	3,368	2796	45,269	48,443	318,720		$6,253,526	
ANNUAL TOTAL	3,768,984	3,658,944	778,425	637,527	85,965	73,197	58,296	50,827	620,140	639,279				
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		no comparable months yet		no comparable months yet	


SoCalGas Disconnects
monthly rate, 3 month rolling average
0.50%
0.45%
0.40%
0.35%
0.30%
0.25%
0.20%
0.15%
0.10%
0.05%
0.00%
All
CARE
non-CARE
2008
2009
2010
January
March
May
July
September
November


SoCalGas Reconnects
monthly percentage of disconnects, 3 month rolling average
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
All
CARE
non-CARE
2008
2009
2010
January
March
May
July
September
November



[70]



[70] Break in chart due to the utility's inability to provide historical data

APPENDIX D: COMPARATIVE DISCONNECTION DATA 2007-2010, BY UTILITY AND FOUR UTILITIES COMBINED

PG&E, SCE, SDG&E and SoCalGas All Residential Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	15,991,741	15,995,349		486,683	55,126	27,036	39,979	18,552	347,887	422,588		955,162		$109,496,868
Feb	15,990,045	16,011,980		660,417	55,429	49,489	41,869	36,388	326,015	410,035		913,041		$117,104,309
Mar	15,996,395	16,026,768		1,002,035	75,649	60,097	54,286	45,769		457,860		1,064,912		$140,224,460
Apr	16,005,606	16,032,905		957,952	77,958	59,142	58,463	45,660	344,358	407,741		1,082,796		$146,047,042
May	16,010,288	16,037,583		825,513	77,108	58,610	58,216	45,639	321,353	352,150		1,107,153		$145,501,030
Jun	16,019,302	16,043,646		893,347	75,452	59,294	55,339	44,610	333,318	371,963		1,123,967		$142,402,082
Jul	15,944,002	16,042,921		755,289	77,616	45,442	55,798	32,885	344,699	352,037		1,079,519		$135,345,968
Aug	15,938,187	16,058,657	804,200	727,185	68,774	51,666	49,994	36,576	374,200	374,205		1,083,783		$137,487,437
Sep	15,945,841	16,059,158	898,146	772,782	75,789	47,658	55,229	34,923	388,118	386,630		1,127,940		$146,608,430
Oct	15,961,109	16,068,743	928,819	827,525	55,685	51,331	45,867	39,382	389,622	373,953	892,991		$86,413,999	
Nov	15,969,869	16,075,221	711,275	768,238	39,796	42,847	32,248	35,251	347,105	350,674	930,171		$92,071,038	
Dec	15,980,079	16,086,557	607,422	864,401	24,045	32,902	20,810	29,025	386,300	391,443	1,020,652		$100,713,594	
ANNUAL TOTAL	15,979,372	16,044,957	3,949,862	9,541,367	758,427	585,514	568,098	444,660	3,902,975	4,651,279				
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		no comparable months yet		no comparable months yet	

PG&E, SCE, SDG&E and SoCalGas Residential CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	3,913,929	4,401,709		212,917	19,200	11,633	13,913	8,435		234,379		447,695		$43,106,276
Feb	3,935,786	4,451,242		282,128	19,487	19,582	14,979	15,563		221,642		424,434		$45,494,846
Mar	3,957,163	4,509,307		425,498	26,085	23,688	18,947	18,799		247,166		505,425		$55,626,115
Apr	4,013,746	4,571,679		409,277	28,220	24,864	22,261	19,652		223,866		522,960		$59,613,585
May	4,048,021	4,615,269		361,629	28,268	25,628	22,398	20,450		196,302		537,510		$60,215,296
Jun	4,074,769	4,660,978		400,662	28,862	26,455	22,064	20,368		210,985		545,688		$59,209,332
Jul	4,119,246	4,699,027		341,050	29,028	20,519	21,766	15,233		197,633		530,147		$57,394,452
Aug	4,165,347	4,737,294		331,317	26,747	23,496	20,196	17,017		204,874		540,294		$60,223,358
Sep	4,212,003	4,749,529	364,788	357,904	29,793	21,738	22,843	16,394	193,086	218,028		566,237		$65,447,635
Oct	4,249,740	4,788,206	378,605	385,395	22,347	23,596	18,819	18,642	192,580	210,272	457,237		$36,966,598	
Nov	4,296,312	4,812,657	289,166	360,580	16,005	20,233	13,195	16,989	173,623	199,711	483,876		$41,443,897	
Dec	4,360,816	4,833,011	261,467	401,918	9,943	15,261	8,734	13,765	197,592	222,420	534,374		$44,559,214	
ANNUAL TOTAL	4,112,240	4,652,492	1,294,026	4,270,275	283,985	256,693	220,115	201,307	756,881	2,587,278				
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		no comparable months yet		no comparable months yet	

PG&E, SCE, SDG&E and SoCalGas Residential Except CARE Customer Data

This table counts number of occurrences. One customer account may experience multiple occurrences.

Month	Customers		Disconnect Notices		Disconnects		Reconnects		Payment Arrangements		Accounts With Arrears 61-90 Days		Amount Owed From Bills 60 Days and Older	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Jan	12,077,812	11,593,640		273,766	35,926	15,403	26,066	10,117		188,209		507,467		$66,390,592
Feb	12,054,259	11,560,738		378,289	35,942	29,907	26,890	20,825		188,393		488,607		$71,609,462
Mar	12,039,232	11,517,461		576,537	49,564	36,409	35,339	26,970		210,694		559,487		$84,598,345
Apr	11,991,860	11,461,226		548,675	49,738	34,278	36,202	26,008		183,875		559,836		$86,433,457
May	11,962,267	11,422,314		463,884	48,840	32,982	35,818	25,189		155,848		569,643		$85,285,734
Jun	11,944,533	11,382,668		492,685	46,590	32,839	33,275	24,242		160,978		578,279		$83,192,751
Jul	11,824,756	11,343,894		414,239	48,588	24,923	34,032	17,652		154,404		549,372		$77,951,516
Aug	11,772,840	11,321,363		395,868	42,027	28,170	29,798	19,559		169,331		543,489		$77,264,079
Sep	11,733,838	11,309,629	533,358	414,878	45,996	25,920	32,386	18,529	195,032	168,602		561,703		$81,161,079
Oct	11,711,369	11,280,537	550,214	442,130	33,338	27,735	27,048	20,740	197,042	163,681	435,754		$60,265,173	
Nov	11,673,557	11,262,564	422,109	407,658	23,791	22,614	19,053	18,262	173,482	150,963	446,295		$63,708,256	
Dec	11,619,263	11,253,546	345,955	462,483	14,102	17,641	12,076	15,260	188,708	169,023	486,278		$68,903,541	
ANNUAL TOTAL	11,867,132	11,392,465	1,851,636	5,271,092	474,442	328,821	347,983	243,353	754,264	2,064,001				
	(average all months)		(sum all months)		(sum all months)		(sum all months)		(sum all months)		no comparable months yet		no comparable months yet	

The tables below compare rates of disconnection events using two sets of data. The first set of data, the basis for the tables below labeled "All Occurrences, As % of Accounts" counts each occurrence during the year (one customer account may experience multiple occurrences) and presents the rate as a percentage of accounts. It is conventional in other state and national disconnection analyses to present the rate this way, despite the fact that the multiple occurrences make the rate appear to affect a greater percentage of the customer base than are actually affected.

The second set of data, the basis for the tables below labeled "Accounts With One or More Occurrence, as % of Accounts," counts only the customer accounts affected one or more times during the year, and thus reflects the percentage of the customer base actually affected, with the following caveat:

*Note regarding data tables "Accounts With One Or More Occurrence" broken down by CARE and All Residential Except CARE: In order to present this data separated by CARE status, we must assume the customer's CARE status remains the same for the entire calendar year and the following month in which the CARE status data is run. Because the account status data is captured at a different time than the disconnection occurrence data, this is not actually the case. The data for the All Residential table does not have this problem. Because net CARE churn is an overall small percentage of total customers enrolled in CARE, DRA believes the tables separated by CARE and All Residential Except CARE still provide much-needed insight into how much of the customer base is affected by the events.

	48-HOUR NOTICES OF DISCONNECTION (All Occurrences, As % of Accounts)																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		63%	138%	23%				106%	179%					51%	125%		
2008		50%	141%	26%				81%	182%	43%				42%	126%	22%	
2009		51%		22%	21%			79%		39%	32%			42%		18%	17%
2010	59%	54%	112%	23%	26%		92%	86%	173%	40%	42%		46%	41%	94%	17%	21%

	48-HOUR NOTICES OF DISCONNECTION (Accounts With One or More Occurrence, As % of Accounts)*																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		22%	36%	8%				34%						19%			
2008		19%	36%	9%				26%		14%				17%		7%	
2009		19%	35%	8%				31%		14%				15%		6%	
2010	19%	19%	32%	8%	12%		31%	31%	48%	15%	20%		13%	15%	18%	6%	9%

	48-HOUR NOTICE OF DISCONNECTION (Average Occurrence Per Account Receiving 2-Day Notice)*																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		2.87	3.88	2.92				3.11		2.95				2.75		2.90	
2008		2.67	3.87	2.99				3.11		2.99				2.50		2.98	
2009		2.68		2.86				2.56		2.49				2.75		2.92	
2010	3.08	2.76	3.67	2.74	2.38		2.97	2.73	3.63	2.64	2.10		3.11	2.79	3.70	2.80	2.37

	DISCONNECTIONS (All Occurrences, As % of Accounts)															
	All Residential					CARE					All Residential Except CARE					
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	
2007	4.54%	4.00%	7.28%	2.13%	3.45%		5.69%			4.14%		3.52%			3.22%	
2008	4.92%	4.40%	7.89%	2.10%	3.75%	6.67%	7.28%	9.19%	4.00%	4.65%	4.38%	3.64%	7.44%	1.68%	3.42%	
2009	4.75%	5.15%	7.50%	1.92%	2.81%	6.94%	8.17%	9.96%	3.81%	4.15%	3.99%	4.24%	6.58%	1.46%	2.28%	
2010	3.65%	3.39%	5.83%	1.70%	2.63%	5.52%	5.35%	8.08%	3.39%	4.02%	2.89%	2.65%	4.84%	1.23%	2.00%	

	DISCONNECTIONS (Accounts With One or More Occurrence, As % of Accounts)*															
	All Residential					CARE					All Residential Except CARE					
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	
2007		3.17%	5.56%	1.73%			4.50%					2.79%				
2008		3.95%	6.25%	1.72%			6.15%		3.30%			3.37%		1.37%		
2009	3.87%	4.11%	6.02%	1.57%	2.46%		5.36%		3.12%	3.66%		3.73%		1.19%	1.98%	
2010	3.04%	2.85%	4.65%	1.44%	2.32%	4.70%	4.03%	7.29%	2.90%	3.57%	2.12%	2.40%	2.44%	1.03%	1.76%	

	DISCONNECTIONS (Average Occurrence Per Account Disconnected)*															
	All Residential					CARE					All Residential Except CARE					
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	
2007		1.26	1.31	1.23			1.27		1.23			1.26		1.24		
2008		1.11	1.26	1.22			1.19		1.21			1.08		1.23		
2009	1.23	1.25	1.25	1.22	1.14		1.51		1.21	1.13		1.14		1.23	1.15	
2010	1.20	1.19	1.25	1.18	1.13	1.17	1.33	1.11	1.17	1.12	1.22	1.11	1.39	1.19	1.14	

	RECONNECTIONS (All Occurrences, As % of Disconnections)															
	All Residential					CARE					All Residential Except CARE					
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	
2007		72%	82%	75%	74%		77%			79%		70%			72%	
2008	74%	67%	81%	76%	72%	77%	72%	82%	80%	76%	72%	64%	80%	73%	70%	
2009	76%	71%	81%	75%	73%	78%	75%	81%	79%	79%	75%	70%	81%	72%	69%	
2010	76%	77%	76%	74%	75%	79%	78%	79%	78%	80%	74%	77%	74%	70%	71%	

	RECONNECTIONS (Accounts With One or More Occurrence, As % of Accounts)*															
	All Residential					CARE					All Residential Except CARE					
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	4 IOUs	PG&E	SCE	SDG&E	SoCalGas	
2007		2.31%	4.60%	1.24%			3.50%					1.98%				
2008		2.73%	5.05%	1.25%			4.56%		2.56%			2.25%		0.96%		
2009	2.97%	3.02%	4.93%	1.14%	1.78%		4.98%		2.40%	2.86%		2.43%		0.82%	1.35%	
2010	2.41%	2.24%	3.89%	1.05%	1.71%	3.98%	3.56%	6.36%	2.25%	2.79%	1.59%	1.74%	1.96%	0.71%	1.22%	

	RECONNECTIONS (Average Occurrence Per Account Reconnected)*																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		1.23	1.30	1.29				1.23		1.27				1.23		1.30	
2008		1.05	1.26	1.27				1.12		1.24				1.02		1.29	
2009	1.20	1.18	1.23	1.26	1.14			1.20		1.24	1.13			1.18		1.28	1.15
2010	1.28	1.60	1.14	1.20	1.13		1.09	1.19	1.00	1.18	1.12		1.21	1.17	1.28	1.21	1.14

	DIFFERENCES BETWEEN DISCONNECTIONS AND RECONNECTIONS (Accounts With One or More Occurrence)*																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		0.85%	0.95%	0.49%				1.00%						0.81%			
2008		1.22%	1.20%	0.47%				1.59%		0.74%				1.12%		0.41%	
2009	1%	1.09%	1.09%	0.44%	0.68%			0.38%		0.72%	0.81%			1.31%		0.37%	0.63%
2010	1%	0.60%	0.75%	0.39%	0.61%		0.72%	0.47%	0.93%	0.65%	0.78%		0.53%	0.65%	0.47%	0.32%	0.54%

	PAYMENT PLANS ESTABLISHED (All Occurrences, As % of Accounts)																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		16%	40%	20%	0%			33%	67%	0%	0%			0%			
2008		14%	42%	23%	0%			31%	70%	11%	0%						
2009		18%	49%	24%	22%			38%	87%	15%	37%						
2010		23%	47%	29%	24%			45%	92%	37%	40%						

	PAYMENT PLANS ESTABLISHED (Accounts With One or More Occurrence, As % of Accounts)*																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		10%	24%	3%				20%						8%			
2008		9%	24%	3%				19%		5%				7%		1%	
2009	16%	11%	27%	4%	16%			24%		7%	24%			7%		2%	12%
2010		12%	20%					24%	36%					8%	9%		

	PAYMENT PLANS ESTABLISHED (Average Occurrence Per Account With Payment Plan Established)*																
	All Residential						CARE						All Residential Except CARE				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas
2007		1.51	1.69	1.27				1.63		2.51				1.42		2.63	
2008		1.54	1.73	1.32				1.65		2.28				1.45		2.43	
2009	1.65	1.63	1.85	1.36	1.41			1.58		2.11	1.50			1.67		2.22	1.34
2010		1.86	2.35					1.91	2.51					1.79	2.14		

	UNCOLLECTIBLES (Bad Debt Written Off)															
	Authorized Uncollectible Rate					Actual Uncollectible Rate					Uncollectible (millions $)					
		PG&E	SCE	SDG&E	SoCalGas		PG&E	SCE	SDG&E	SoCalGas		PG&E	SCE	SDG&E	SoCalGas	
2007		0.2586%	0.2250 %	0.0000%			0.2803%		0.1600%	0.2250%		41.05	17.3	4.36	9.83	
2008		0.2586%	0.2250%	0.1410%	0.2380%		0.3678%		0.1830%	0.3380%		55.80	20.8	4.94	14.62	
2009		0.2586%	0.2400%	0.1410%	0.2380%		0.4913%	0.2420%	0.2230%	0.3730%		70.82	23.3	6.31	12.86	
2010		0.2586%	0.2400%	0.1410%	0.2380%		not available until March 2011					not available until March 2011				
2011		0.3105%	0.2400%	0.1410%	0.2380%											
2012		0.3105	0.227%[71]	0.174 %[72]	0.278%[73]											

[71] Requested in SCE Application 10-11-015.
[72] Requested in SDG&E Application 10-12-005.
[73] Requested in SoCalGas Application 10-12-006.

APPENDIX E: ENERGY ASSISTANCE PROGRAM DATA 2007-2010, BY UTILITY AND FOUR UTILITIES COMBINED

CARE (California Alternate Rates for Energy) data and Low Income Energy Assistance (LIEE) data is publicly available at http://www.liob.org/resultsqv.cfm?doctypes=10.

Temporary Energy Assistance for Families (TEAF) American Resource and Recovery Act (ARRA) grant data was provided via utility data request and will be publicly reported in utilities' annual CARE and LIEE reports forthcoming on May 1, 2011.

Federal Program Data: Low Income Home Energy Assistance Program (LIHEAP) Energy Assistance, LIHEAP Weatherization (Wx) and Department of Energy's Weatherization Assistance Program (WAP) was provided by the State of California's Department of Community Services and Development in emails of February 14, 2011 and February 16, 2011.

REACH (Relief for Energy Assistance through Community Help) is PG&E's charitable assistance program
EAF (Energy Assistance Fund) is SCE's charitable assistance program
NTN (Neighbor-to-Neighbor) is SDG&E's charitable assistance program
GAF (Gas Assistance Fund) is SoCalGas' charitable assistance program

	DOLLARS DISTRIBUTED - ENERGY ASSISTANCE (DISCOUNT & GRANT) PROGRAMS 2010															
	Total $ Amount						Number of Households						$ Per Household Per Year			
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs	PG&E	SCE	SDG&E	SoCalGas		4 IOUs[74]	PG&E	SCE	SDG&E	SoCalGas
CARE	1,399,283,851	824,812,578	353,320,166	86,398,899	134,752,208		4,888,533	1,499,942	1,381,109	293,438	1,714,044		$286	$550	$256	$294	$79
LIHEAP	60,032,666	33,328,778	16,623,305	5,024,637	5,055,946		176,170	94,881	49,570	14,622	17,097		$341	$351	$335	$344	$296
TEAF (ARRA GRANT)_	4,312,244	3,082,160	873,830	151,555	204,698		14,115	8,399	3,301	461	1,954		$306	$367	$265	$329	$105
REACH NTN GAF EAF	3,548,549	1,631,189	991,420	228,689	697,251		26,532	6,203	10,945	1,174	8,210		$134	$263	$91	$195	$85

[74] SCG and SCE joint customers may receive assistance from both companies

	DOLLARS SPENT HOME RETROFIT/WEATHERIZATION 2010																
	Total $ Amount						Number of Households						$ Per Household Per Year				
	4 IOUs	PG&E	SCE	SDG&E	SoCalGas			PG&E	SCE	SDG&E	SoCalGas			PG&E	SCE	SDG&E	SoCalGas
LIEE	275,814,410	135,337,734	58,975,023	16,179,817	65,321,836		383,623	129,856	121,868	21,603	110,296		$719	$1,042	$484	$749	$592
Wx/WAP	77,218,366						46,924						$1,646				

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Paying Upfront: A Review of Salt River Project's M-Power Prepaid Program

1020260

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Technical Update, October 2010

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ABSTRACT

Arizona's Salt River Project (SRP) has operated M-Power, the largest electricity prepayment program in the United States, since 1993. The customer population has grown to about 100,000 (approximately 12% of all residences served by SRP), and it has expanded from the initial target population—consumers with arrears facing service terminations and low-income customers—to include consumers with different expectations from M-Power service. The in-home portion of the SRP prepay configuration consists of a user display terminal (UDT) that communicates with the customer's meter. The purchasing component of the M-Power program is the self-service kiosk, known as a PayCenter, accessed via a Smart Card, which is also the conduit through which electricity consumption information is transferred back to SRP.

The constant aspects of the M-Power experience have been a high level of customer satisfaction and an overall conservation effect reported by SRP of approximately 12%. SRP attributes the conservation effect to a variety of factors, noting that M-Power requires consumers to pay attention to when and how they use electricity, allowing them to make immediate adjustments in usage to lower their bills.

This report provides an overview of how the M-Power program works along with an examination of the technology, systems, and costs associated with the program. The overview is followed by an analysis of customer perceptions of the program as well as a discussion of the program's potential conservation effect. The report concludes with a discussion of impact studies needed to answer several outstanding research questions, including the effect of various types of payment options on conservation as well as whether SRP's experience is transferrable to other markets, climates, customer circumstances, and supply conditions.

Keywords
Salt River Project (SRP)
M-Power Prepaid Metering Program
Energy Efficiency
Energy Consumption Information
Consumer Behavior
Residential
Consumers

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1
INTRODUCTION

As the largest electricity prepayment program in the United States with over 100,000 customers at the time of publication, Salt River Project's award-winning[1] M-Power program provides a potential wealth of experience for other utilities who are considering their own prepayment programs.

SRP personnel respond to frequent inquiries from other utilities about their program, and given that it combines a form of electricity-use feedback with a unique payment approach, the newly reinvigorated interest in behavior change-inducing feedback programs are also spurring interest in the program. Indeed, it was in response to this widespread industry interest that the idea for this report emerged. Its purpose is to capture in one report the details of the M-Power program that would be of use to other utilities considering similar endeavors. This includes an overview of how the M-Power program works (Section 2), the technology, systems, and costs associated with the program (Section 3), an examination of customer perceptions of the program (Section 4), and finally, an examination of impact analysis studies which have reported a significant conservation effect attributable to the program, and a discussion of additional impact studies that would be of use going forward to answer some outstanding research questions (Section 5).

To begin, some historical context will now be provided as a foundation for the report, including the impetus for the M-Power program and the chronological details of its inception, as outlined in Figure 1-1.

The M-Power Story[2]

The M-Power program began in 1993 when the Arizona state legislature proposed the development of programs aimed to assist low income consumers with bill payment. At the time, SRP sought input from various community organizations to learn what programs, in addition to federally funded weatherization programs, could be implemented to aid low income customers in saving energy—prepayment was one component of the pilot that was developed.

The prepay component began with a 100-home pilot, and one of the key findings was resounding customer support for the concept, which came as somewhat of a surprise. SRP found that customers felt that, for the first time, *they* were in control of their electricity bill, not SRP. After the pilot completion, the program expanded to other regions of SRP's service territory, and was no longer limited to low income customers.

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[1] The M-Power program won the National Energy Resources Organization (NERO) first place award for energy efficiency. NERO is a non-profit organization that recognizes organizations active in the promotion of energy efficiency.

[2] The content for this section is based on Personal communication, Mike Lowe, Customer Services Manager, SRP, September 17, 2009; Traasdahl (2009); and Personal communication, Karen Smith, Measurement and Evaluation Manager, May 29, 2010 (forwarded email from Bonnie Temme).

From the beginning, the in-home portion of the SRP prepay configuration consisted of an in-home display, referred to at SRP as an User Display Terminal (UDT), which communicates with the customer's meter; the initial vendor of the meter and UDT was CIC Global. As with any new program there were bugs, and in the early days, the technical difficulties made it necessary to hard wire the meter to the in-home UDT, which was an expensive configuration. Nonetheless, it was in this configuration that enrollment in the program grew to 1,600.

In 1999, Motorola became the provider of both the UDT and meter, and the new configuration employed power line carrier (PLC) communication between the two. Although this configuration was an improvement, there were still communication issues in some instances when other devices in the home prevented communication between the UDT and the meter (e.g., lamps, pool pumps).

Motorola exited the business in 2002, although SRP had purchased the rights to manufacture both the meters and the UDTs. AMPY Metering Limited, a UK-based company that is now part of Landys+Gyr, was the new vendor that was eventually selected.[3] In 2005 the AMPY technology was rolled out to M-Power customers, and a dual frequency approach was employed that solved the PLC performance issues. AMPY (now Landis+Gyr UK, Ltd) remains the provider of both the meter and UDT today.

Another technology component of the M-Power program is the self-service kiosk, known as a PayCenter. These are similar in nature to automated teller machines (ATMs) used by banks, and are located throughout the Phoenix area. The idea for the PayCenters was proposed early on as a cost-effective way of dealing with high volumes of power purchases—M-Power customers generally buy small quantities of power, but relatively frequently (see Section 4 for more details). Customers purchase electricity at the PayCenters through the use of a card, known as a Smart Card. The card is then inserted into the UDT at the home. As will be explained in more detail below, the Smart Card is also the conduit through which electricity consumption information is transferred back to SRP.

In the late-1990s, the first PayCenters were purchased from Diebold Incorporated, which at the time was working with Duke Power on payment machine applications for banked customers. The PayCenters were initially purchased for bill-paying customers, but SRP worked with Diebold to retrofit them to accept the M-Power Smart Cards. This configuration worked well, and enabled SRP to reduce costs by eliminating over-the-counter customer transactions altogether.

This arrangement continued until Diebold exited the business in 2000, at which time SRP contracted with AllKiosk, a division of GECO Incorporated, an Arizona-based engineering house, to develop their own PayCenters. They also used this opportunity to address the issues they had had with the Diebold design, and the result was a less costly and more reliable system. AlKiosk is now licensed to sell the PayCenter design to others as well.

As of April 2010, there were over 100,000 customers enrolled in the M-Power program, with 95 PayCenters in the SRP customer territory.

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[3] Prepayment systems are prevalent in the UK, and much of their early technology was coin operated. However, rising electricity prices in the 1980s led to increased instances of home break-ins to steal the coins, and this precipitated the invention of an electronic version of prepay.

Lessons Learned—30,000 Feet

As with any new program, mistakes were made. Likely the biggest one relates to fact that SRP tried for years to treat the M-Power program like any other rate program, by forcing the back office systems to "make" monthly bills for revenue recognition purposes. Utilities and their employees are used to thinking in terms of a billing cycle, and so it was initially difficult to think of the M-Power program using a different mindset. It took quite a bit to change this mindset, and it has just been since 2007 that the system has changed to cash-based revenue recognition, rather than trying to force M-Power program accounts into the standard billing cycle.

Another lesson learned early on was that customers on the M-Power program buy power frequently. Indeed, the utility industry has forced customers to pay on a monthly basis when in fact most customers are paid weekly or bi-weekly. On average, M-Power customers purchase power in the $20 range approximately four times a month in the winter, and seven times a month in the summer. Vending also peaks on Friday nights, likely coinciding with payday for many customers.

From a customer experience perspective, another lesson learned is to work in partnership with potential program critics to get to the root of any concerns. SRP worked directly with customer advocacy groups who were initially opposed to the idea of a prepay program due to concerns that it might unfairly force low income customers into power outage situations. SRP partnered with one such group, the Arizona Community Action Association, to design market research to assess their concerns. The ACAA is now an advocate of the M-Power program.

As technology continues to evolve, so likely will the M-Power program. Having considered the historical context of the program, the following section will now provide an overview of how M-Power works in its present-day configuration.

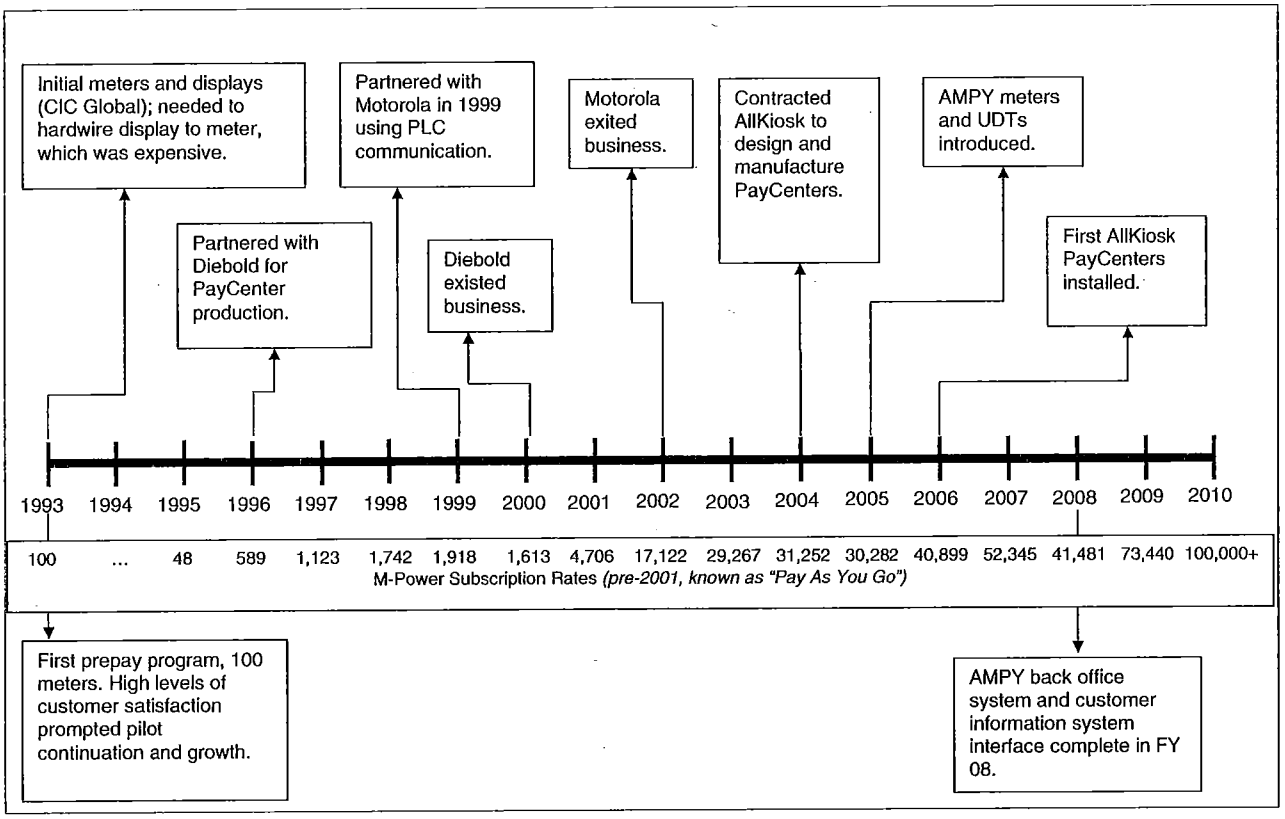

Figure 1-1
M-Power Program Chronology

2
THE M-POWER PROGRAM—AN OVERVIEW

This section builds on the previous inception story by providing an overview of the basic system functionality in its current configuration. Figure 2-1 provides a high-level illustration of system components.

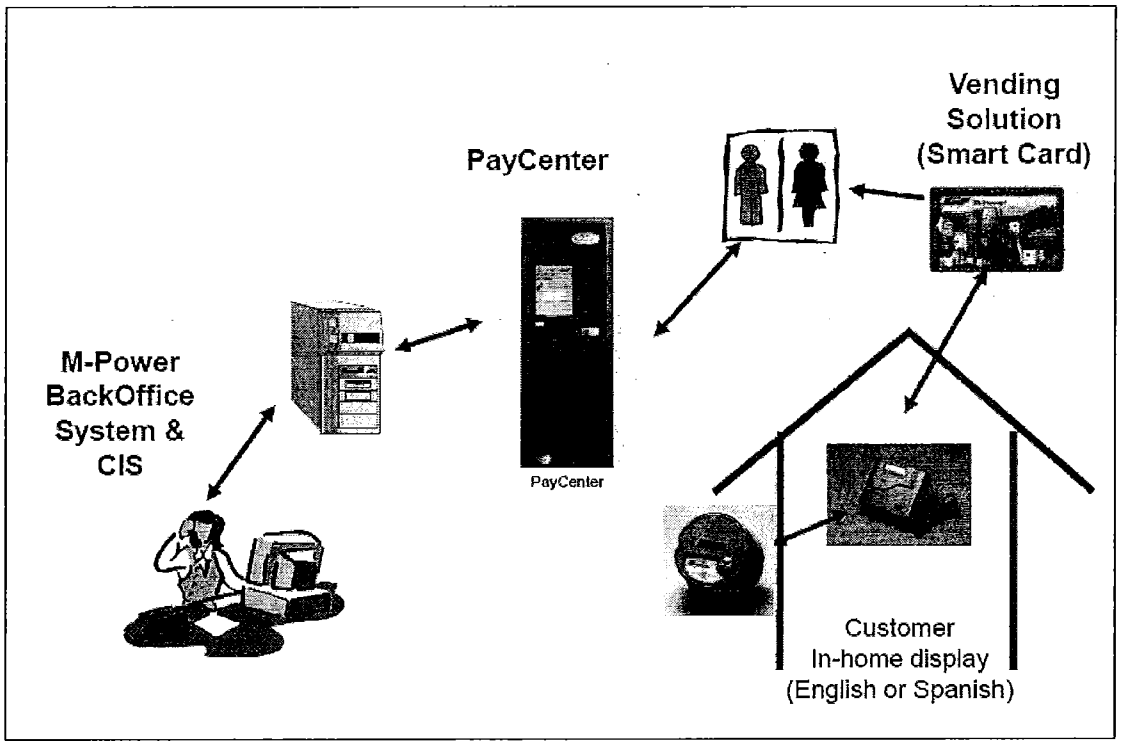

Figure 2-1
M-Power Overview (Source: Pyle, 2009)

A customer can learn about the M-Power program through a number of channels—SRP markets M-Power through direct mail, bill inserts, via email and through their web page, and through Customer Service Representative scripting upon customer call in. The general process by which a customer becomes an M-Power account, and the subsequent business process at SRP, is outlined as follows:

Initial Set-Up

- Customer calls SRP and asks to be on M-Power
- The customer pays a $99 deposit for the UDT, $87.50 of which is refundable upon the return of the device (this is in comparison to the $275 deposit that is required to set up a standard SRP residential account). The customer also pays a $28 (plus tax) service establishment fee.

- SRP back office will write two Smart Cards for the customer, one of which will be loaded with a $30 credit.
- The credit, equipment deposit, and service establishment fee, as well as any other arrears a customer may have from their previous account, is transferred to the prepay account, so that they can be automatically paid off over time at a rate of 40% each time the customer makes an electricity purchase.
- A field order will be created to deliver the meter and UDT to the customer; the meter and the UDT need to be married.
- The meter is installed by an SRP technician, but the UDT and a Start-Up Packet (containing a UDT User's Manual,[4] a Quick Start Guide,[5] and a map[6] listing all the PayCenter locations in Phoenix) are left with the customer—the technician does not enter the home. No conservation tips are provided with the Start-Up Packet, although tips are available on the SRP website, as well as the M-Power microsite (www.mysrpmpower.com) and various other communications pieces.
- The UDT is plugged in, the card loaded with the $30 credit is inserted into it, and the UDT and meter are "married" (a one-time event); the system is then ready to go.
- When the card is inserted into the UDT, the full amount of credit that was on the card is transferred through the UDT to the meter, and the card balance goes to zero. At the same time, the meter consumption level at that time is transferred to the card, so that it may be transferred to SRP via the PayCenter the next time electricity is purchased.

Purchasing Electricity

- Electricity is purchased at any of the 95 automated PayCenters located throughout Phoenix (these PayCenters can also be used to pay non-M-Power customers' bills)
- PayCenters are located in grocery and convenience stores, some of which are accessible 24 hours a day, seven days a week. These PayCenters can be good for store business as well, as SRP's market research findings indicate that many customers report also purchasing store goods at the time of their electricity purchase.
- PayCenters take cash and "e-Chex", an electronic checking service.
- Phone purchases can be made using credit cards and e-Chex, although credit cards can take up to three days to post to an account, and the customer must still have the credits transferred to their card by visiting a PayCenter and inserting $1 (the minimum amount).
- Although rare, some customers pay by mailed check. When these checks are received by SRP they are input into the back office system as credit.
- The customer inserts one of their Smart Cards, and makes a payment (as low as $1, as high as $2,001). The customer is then issued a receipt that outlines the payment made, and any arrears deducted, and the total electricity purchased. See Figure 2-2 for receipt examples.

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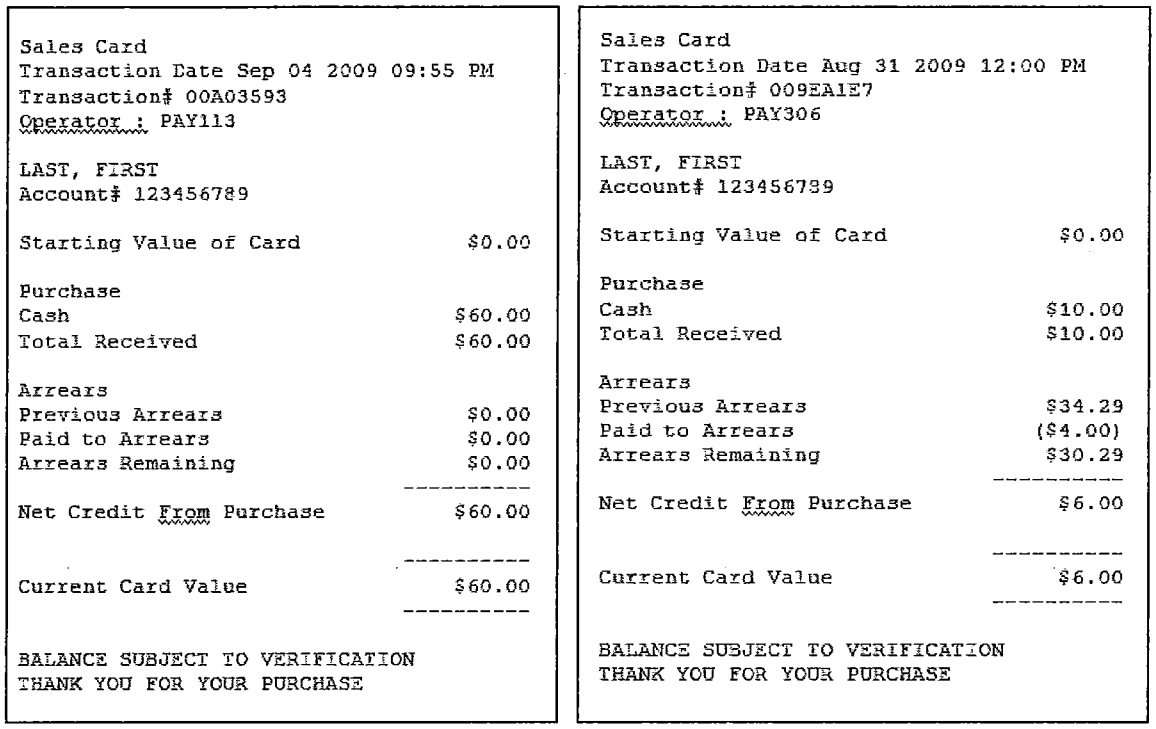
[4] http://www.mysrpmpower.com/pdfx/MPowerUserManual.pdf

[5] http://www.mysrpmpower.com/pdfx/quickstartguide.pdf

[6] http://myaccount.srpnet.com/paymentlocations/

- SRP occasionally uses the PayCenters to broadcast information to customers (e.g., notification of a planned outage)



```
Sales Card
Transaction Date Sep 04 2009 09:55 PM
Transaction# 00A03593
Operator : PAY113

LAST, FIRST
Account# 123456789

Starting Value of Card                $0.00

Purchase
Cash                                 $60.00
Total Received                       $60.00

Arrears
Previous Arrears                      $0.00
Paid to Arrears                       $0.00
Arrears Remaining                     $0.00
                                    ---------
Net Credit From Purchase             $60.00

                                    ---------
Current Card Value                   $60.00
                                    ---------

BALANCE SUBJECT TO VERIFICATION
THANK YOU FOR YOUR PURCHASE
```

```
Sales Card
Transaction Date Aug 31 2009 12:00 PM
Transaction# 009EA1E7
Operator : PAY306

LAST, FIRST
Account# 123456789

Starting Value of Card                $0.00

Purchase
Cash                                 $10.00
Total Received                       $10.00

Arrears
Previous Arrears                     $34.29
Paid to Arrears                     ($4.00)
Arrears Remaining                    $30.29
                                    ---------
Net Credit From Purchase              $6.00

                                    ---------
Current Card Value                    $6.00
                                    ---------

BALANCE SUBJECT TO VERIFICATION
THANK YOU FOR YOUR PURCHASE
```

Figure 2-2
Example of Customer Credit Purchase Receipts (Left: no arrears, Right: arrears)

Other M-Power Features

- Friendly Credit: The system can be programmed such that a customer can have power even if their credit goes negative during certain periods of time—in SRP's case this is between the hours of 6 p.m. and 6 a.m., seven days a week. The customer must purchase more electricity by 6:00 a.m. the following day to avoid a disconnect. The friendly credit used will be added to the arrears balance, to be paid off gradually with each subsequent purchase transaction.
- Disconnects: When a customer's account goes negative outside the Friendly Credit hours, the meter will disconnect the power source to the home. To reconnect the power, the customer must purchase credit at a PayCenter (or call to invoke Emergency Credit – see below). Once credits are purchased and the card is inserted into the UDT, the customer's power automatically reconnects. There is no disconnection/reconnection fee involved (for a standard residential account, the disconnection/reconnection fee is in the $60-$100 range, and requires a utility truck-roll).
- Emergency Credit: SRP may grant emergency credit over the phone by inputting a code to reconnect the customer's meter. This feature was added to address concerns regarding the loss of electricity in situations where a shutdown of the overall SRP communications network prevented customers from purchasing electricity.
- M-Power customers receive no monthly bill and pay no late fees. They do, however, receive annual letters summarizing their monthly electricity use for the previous year for information

purposes only (standard rate customers receive these reports as well). These reports are also available online.

Back-Office Processes

M-Power customer meters are not read like standard program meters (unless a customer requests this in specific situations). As such, the Smart Card is the conduit through which SRP has access to M-Power customers' consumption information.

- As previously mentioned, when the card is inserted into the UDT, the full amount of credit that was on the card is transferred to the meter through the UDT, and the card balance goes to zero. At the same time, the meter consumption level at that time is transferred to the card, so that it may be transferred to SRP via the PayCenter the next time electricity credits are purchased.
- When a customer purchases electricity credits at a PayCenter, the following information is transferred from the SmartCard to SRP's back office system:
  - Meter read (cumulative kWh and max kW)
  - Reading date/time: that is, when the card was last read by the UDT
  - Cash purchase amount
  - Transaction date/time: that is, time stamp at PayCenter when the customer made a purchase, and therefore different than the "reading date/time"
  - Status date: that is, when the card is inserted into and read by the UDT (some time after the transaction date/time)
  - A code indicating whether a disconnect occurred (i.e., the customer ran out of power)
  - Also the remaining credit on the UDT is recorded; if this is negative, this is another method of knowing if a disconnect occurred
  - Any Friendly Credit used (and corresponding date/time stamps)
- During the same transaction, data are pulled from the back office to the PayCenter in real-time, and recorded on the customer's transaction receipt:
  - Any Emergency Credit that was required (and corresponding date/time stamp): this will be added on to the arrears balance.
  - Arrears owing, arrears payment, updated arrears balance: the system accesses how much the customer owes in arrears and takes 40% of the cash purchase value to apply to that amount; the remaining 60% is used to purchase electricity credits.
  - Confirmation number if paid by e-Chex
- PayFirst: SRP can use this function to input any additional debts the customer may have, which must be paid off first at a rate of 40% before the funds can be used to purchase electricity (e.g., covering any fees and amount owing from previous NSF checks)
- GiveFirst: SRP can use this field to input funds they may owe the customer (e.g., if they have paid by mailed check the value is input in this field, if they are owed any customer service rebates)
- Other information that is transferred to the UDT from the back office via the Smart Card:
  - Rates

  - Holiday dates
  - Configuration changes (e.g., display changes, credit limit changes)
  - Messages to customers
- Given each account has at least two Smart Cards, there may be instances when a card is used that has not been used in a long time, and therefore contains "old" meter read information; these are called "stale reads", and they are tracked and taken into account using both the "reading date/time" stamp and the "transaction date/time" stamp. Once the card is finally used again, the consumption information is automatically re-sequenced in the back office system.
- In cases where the card or UDT becomes corrupt, the meter can be physically probed to obtain the latest consumption reading. Corruption does not affect overall revenue reporting to any extent given the infrequency of such occurrences.

This section has provided a high-level of overview of the systems and general processes by which the M-Power program functions in its current configuration. The following section will examine the technology and business processes that have been developed in more detail.

3
M-POWER TECHNOLOGY, SYSTEMS, AND COSTS

Technology

As described in Section 1, the technologies involved in the M-Power program have evolved over the years. Each component of the technology is now examined in more detail to highlight its functionality and interconnection with the overall M-Power system. Information regarding the costs to the customers is also included, although SRP's technology cost information has not been included as it is protected under non-discloser agreements with the vendors. The meter, UDT, and Smart Cards are illustrated in Figure 3-1.

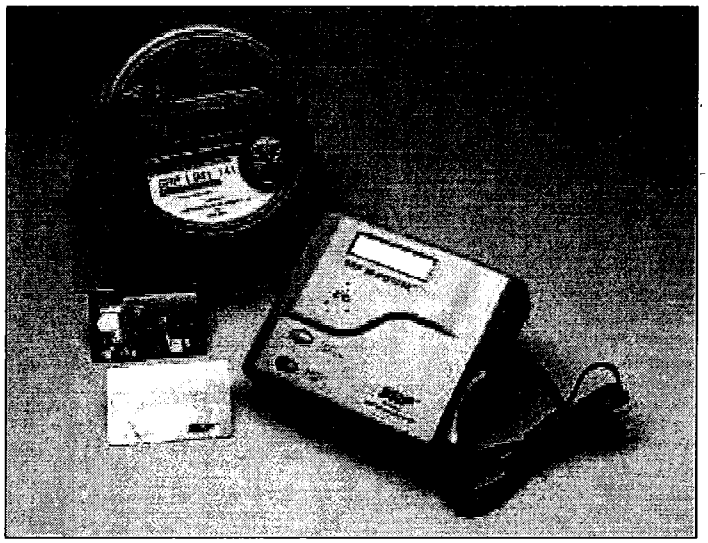


Figure 3-1
M-Power Meter, UDT, and Two Smart Cards

User Display Terminal (UDT) or In-home Display (IHD)

The UDT currently in use at SRP has not substantially changed since 2005. Its trade name is the *ecoMeter*, and it is manufactured by Landis+Gyr UK, Ltd. (formerly known as AMPY Metering Limited). Table 3-1 provides an overview of its functionality.

Table 3-1
UDT Features

Information Displayed **(Customer toggles through screens using the "Display Cycle" button)**	Current rate per hour is $0.XX Rate Y charge is $0.XXXX/kWh Cost today is $X.XX Cost yesterday was $X.XX Cost this month is $X.XX Cost last month was $X.XX Enough credit for XX days Remaining credit is $XX.XX
Languages	English and Spanish
Communications with Meter	Powerline carrier (PLC)
Real-time Display Update Rate	~3 seconds
Installation	By customer (once meter has been installed by SRP)
Power Source	UDT plugs into a standard 110V outlet. Also a battery back-up for power outage situations.
Manufacturer	Landis+Gyr UK, Ltd.
Model	A version of the ecoMeter (industry name)
Cost to Customer	$99 deposit (87.50 of which is refundable upon return of the UDT to SRP)
Customer Support Options	Customer service telephone support Trouble shooting tips on mysrpmpower.com, and in the Quick Start Card and User's Manual

Meter

The meter is very similar in functionality to a "smart meter", and also has disconnection capability. One main distinction from today's smart meters which are a part of advanced metering infrastructure is that there is no real-time communication capability between the meter and the utility; as previously described, this is accomplished via the Smart Card instead.

Table 3-2
Meter Features

Manufacturer	Landis+Gyr UK, Ltd.
Model	5252 (latest model)
Communications with UDT	Powerline carrier (PLC)
Installation	By SRP. Must marry with specific UDT intended for the residence.
Cost to Customer	None

PayCenters (Self-service Kiosks)

As of September 2009, SRP had 95 PayCenters located throughout the Phoenix area. PayCenter attributes are listed in Table 3-3.

Table 3-3
PayCenter Features

Manufacturer	AllKiosk
Languages	English and Spanish
Payment Methods	Cash and e-Chex Non-M-Power customers can pay bills via the PayCenter as well
Communications with M-Power Network	Real-time connection to the SRP back office system (the AMPY server), PayCenter maintenance, iNovah interface (point-of-sale software), and the e-Chex server (see Figure 3-2)
Installation	By SRP; must marry with specific UDT intended for the residence
PayCenter Support	Dedicated maintenance team PayCenters can be swapped out on the spot for faster recovery time

M-Power Business Systems

Customer Information and Back Office Systems

Multiple systems are used to support M-Power, including the back office system, known as the AMPY Management System or AMS, the Customer Information System (CIS), called Phoenix, and iNovah, which is the PayCenter server. The interrelation of these systems as well as the e-Chex server (the interface with the electronic checking system) and the PayCenter support and maintenance system are illustrated in Figure 3-2.

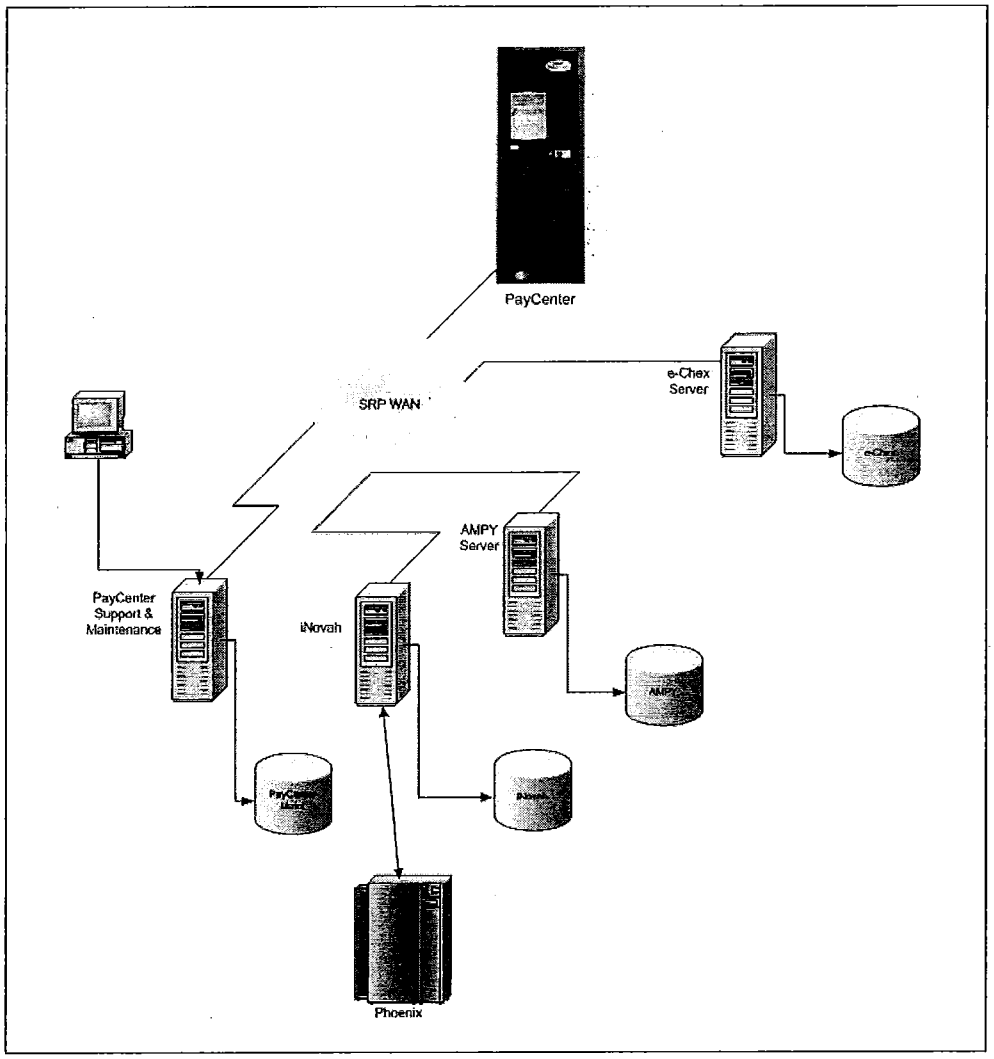


Figure 3-2
PayCenter Interfaces (Source: SRP, 2009)

Phoenix, the CIS, is now the system of record for M-Power customers, as it is for all other residential and commercial customers at SRP. All M-Power customer accounts are set up through Phoenix, and all customer information is housed in the system, including addresses, locations within the service territory, programs the customers are involved in, financial information including customer credit history, as well as records of customer interactions with SRP's customer service center. The Phoenix system was developed in-house by SRP with contractor support.

The back office system (AMS) was developed by AMPY and configured for the SRP M-Power program. It allows for the tracking of customer accounting details including customer service area and billing information, overall transaction history, arrears history, meter read details, meter credit status, and self-disconnection history. See Appendix B for various screen shots of the back office software.

The CIS (Phoenix) and the back office system (AMS) were originally completely separate systems in the early days of the M-Power program. Using this configuration, SRP would use the back office system to enroll M-Power customers, but would then need to enroll the customers in the CIS as well. This configuration entailed a lot of manual labor to ensure the two systems were reconciled and accounts were not out of balance. As M-Power customer numbers grew, so did the motivation to merge the systems. The process was complicated, taking approximately five years to complete. However, as of March 2008, the systems were synchronized, and Phoenix is now used to enroll customers, and any arrears owed by new M-Power customers on prior accounts flow into the back office system. The systems are also synchronized to reconcile when payments are made, etc. A report is run every night to reconcile the two systems, and although there are still some manual adjustments required to keep the systems synchronized, they have decreased dramatically since the initial synchronization in March 2008, and continue to decrease.

> Lesson learned: use one integrated system from the beginning. The integration of the customer information and back office system took several years to develop and debug.

Revenue Reporting

Although M-Power customers do not receive bills, the systems were originally used to essentially "make" a monthly bill for M-Power accounts, so they could be "forced" into a billing cycle such that they would be consistent with the other residential accounts for revenue and tax reporting purposes, energy efficiency reporting, etc. While such a set-up was manageable when M-Power electricity purchase volumes were relatively low, recent enrollment rates have necessitated the need for an alternative approach. In the 2008 fiscal year (May 2007 through April 2008), the accounting methodology has switched to cash-based revenue recognition (i.e., revenue is recognized based on cash purchases) rather than the conventional billing cycle approach. For load forecasting purposes, the cash value is transferred back to an energy quantity. It is felt that this method of revenue recognition is much more accurate than the previous "forced billing cycle" approach. This new approach is also tied more closely to the synchronized business systems previously described as well.

M-Power Costs

Customer Costs

M-Power Start-Up Costs

As previously described, for initial M-Power account set-up, customers pay a $99 deposit for the equipment ($87.50 of which is refundable upon return of the UDT), as well as a $28 (plus tax) service establishment fee. In addition, a $30 electricity credit is placed on one card. This total amount, known as a "pay-down balance", is uploaded as an arrears balance that the customer will pay off gradually with each subsequent purchase transaction.

M-Power Electricity Rates

M-Power customers pay a per-kWh flat rate, which varies seasonally, and is comprised of various adjustment charges. In addition, there is a monthly service charge of $15, which is collected either through hourly or periodic deductions from the account balance. The charges

effective November 2009 are listed in Table 3-4, and are compared against the standard residential price plan (also referred to as E-23). On average, in the summer months the M-Power rates generally result in slightly lower electricity bills compared to the Standard rate beyond a threshold consumption level. In the winter months, the M-Power rate is always more expensive than the Standard rate. Using average seasonal consumption levels for M-Power customers, M-Power customers may actually pay $38 more on an annual basis. It is, however, difficult to compare the two rates using the same consumption levels, as it is possible that a conservation effect induced through the M-Power program may result in lower overall consumption levels.

Table 3-4
M-Power per-kWh Charges (Effective November 2009)

Charge Component	Summer (May-June and September-October)		Peak Summer (July-August)		Winter (November-April)	
	M-Power*	Standard (E-23)**	M-Power	Standard (E-23)	M-Power	Standard (E-23)
Total per-kWh	$0.0984 per kWh	$0.1019 per kWh (≤2,000 kWh) $0.1061 per kWh (>2,000 kWh)	$0.1030 per kWh	$0.1073 per kWh (≤2,000 kWh) $0.1119 per kWh (>2,000 kWh)	$0.0872 per kWh	$0.0879 per kWh (≤400 kWh) $0.0688 per kWh (>400 kWh)
Monthly Service Charge	$15 per month	$12 per month	$15 per month	$12 per month	$15 per month	$12 per month
Estimated Monthly Rates	**Assuming 1,069 kWh/month*** **		**Assuming 1,539 kWh/month*** **		**Assuming 697 kWh/month*** **	
(excl. taxes)	$120 per month	$121 per month	$174 per month	$177 per month	$76 per month	$68 per month
M-Power cheaper at: (excl. taxes)	> 857 kWh/month		> 697 kWh/month		Never (Standard always less expensive)	

Sources:

* http://www.srpnet.com/payment/mpower/pdfx/MPowerE24Nov2009.pdf

** http://www.srpnet.com/prices/pdfx/BasicPlan1009.pdf

*** Based on average M-Power customer usage for FY10

SRP Cost-Benefit of M-Power

Table 3-5 provides an overview of the 2010 benefit-cost calculations for the common energy efficiency screening tests.

Table 3-5
M-Power per-kWh Charges (Effective November 2009)

	Benefits (NPV)	Costs (NPV)	Net Benefits	Benefit/Cost Ratio	Cost of Conserved
Total Resource (TRC)	$10,960,736	$5,574,298	$5,386,438	1.97	$0.037
Utility (UCT) / Program Administrator Cost Test (PACT)	$10,960,736	$5,574,298	$5,386,438	1.97	$0.037
Participant (PCT)	$15,844,237	--	$15,844,237	--	
Ratepayer Impact (RIM)	$10,960,736	$21,418,535	-$10,457,799	0.51	$0.144
Societal Cost (SCT)	$10,960,736	$5,574,298	$5,386,438	1.97	$0.037

The benefits in terms of electricity savings are derived using a 12% value for the conservation effect of the M-Power program, which SRP assessed through by three different conservation impact studies (see Section 5 for more details). To attribute kWh savings, SRP applies the conservation effect savings percentage to the load of current year subscribers. In a departure from conventional energy efficiency program evaluation methods, SRP does not attribute any impact beyond the current year. This is partly to ensure a conservative estimate of savings, but also because the impact studies were not constructed to resolve whether the behaviors undertaken by M-Power subscribers would persist into the future if the customer remained on M-Power, or if that customer migrated to another SRP rate. All tests pass the benefit/cost test except the Ratepayer Impact Model, which includes customer bill savings as a cost, given the savings represents a revenue shortfall. It is rare that an energy efficiency program that elicits a bill savings will pass the Rate Impact Test. The estimated program Societal Test benefit/cost ratio for 2010 is 1.97, which places it above many conventional energy efficiency programs.

This section has provided a high-level overview of the basics of the M-Power program in terms of the technologies and systems that support it and the resulting costs. Building on this information, as well as how the systems work together to provide the M-Power service to customers as outlined in Section 2, the following section outlines the results of several SRP-commissioned studies aimed at understanding customer perceptions of the M-Power program.

4
THE CUSTOMER EXPERIENCE

Past Study Overviews and Findings

SRP has dedicated significant resources to understanding what customers think about the M-Power program. This is partly in response to critics who are concerned that prepay programs may be unfairly forcing low income customers into power outage situations. Some of the initial market research studies were in partnership with the Arizona Community Action Association (ACAA), a low income advocacy group, to jointly investigate such concerns. As a result of some of the early findings that suggested high levels of customer satisfaction, and even "increased self-esteem"[7] due to perceived financial benefits and feelings of self-efficacy in relation to bill payment, the ACAA now publicly supports the M-Power program.[8]

Many of the various studies that were performed are outlined in Table 4-1, and a more detailed review of the results can be found in Appendix C. Considering the results of these studies, some themes emerge.

Table 4-1
Past M-Power Market Research Studies

Reference	Study Title	Study Period	Subject
SRP, 2009b	CCTS M-Power Quarterly Scorecard	May-Jul 2009 (performed every quarter)	Summary presentation of telephone survey results from M-Power customer who visit the PayCenter kiosk to purchase power
PRIZM, 2009	PRIZM Analysis	Jul 2009	PRISM analysis/marketing
Traasdahl, 2009		2009	Overview presentation of program
WestGroup Research, Inc., 2007	SRP M-Power Materials Survey: Topline Report, November 2007	Oct 2007	Telephone interviews to assess salience of updated communications materials; 201 M-Power customers
WestGroup Research, Inc., 2006a	SRP M-Power Communications Focus Group Research	Nov 2006	Focus group report, 3FGs, opinions on M- Power, the Starter Kit and different M-Power communications materials; customers randomly selected from M-Power population who meet desired criteria (e.g., on M-Power for at least two months)

[7] Personal communication, Betty Pruitt, M-Power Marketing, September 16, 2009

[8] Anecdotally, Ms. Pruitt is a former ACAA employee who was initially a critic of the M-Power program. She was convinced through customer testimonials of its benefits, and is now an SRP employee working on M-Power Marketing.

Table 4-1 (continued)
Past M-Power Market Research Studies

Reference	Study Title	Study Period	Subject
SRP, 2006	SRP M-Power Shadow Project September 2006 – Executive Summary	Sep 2006	Executive summary of the SRP M-Power Shadow Project, which involved 8 in-depth, in-home interviews from customers from a range of credit codes, length of time on program, language, income and housing type
WestGroup Research, Inc., 2006b	SRP M-Power/AMPY Benchmark Study 2006	Mar 2006	Telephone survey results, 402 M-Power customers; purpose was to obtain baseline data on attitudes towards M-Power, with emphasis on PayCenter machines, as new machines were to be installed starting in April 2006.
Reiley & Johnson, 2006	What Determines M-Power Customer Satisfaction: How SRP Can Attract and Retain M-Power Customers	2006	University of Arizona Assessment, telephone survey conducted by WestGroup of 401 M-Power customers that had been on the program for 18 months or more. Goal was to assess customer satisfaction with the aim of understanding what would make customers stay on M-Power so as to reduce turnover rates; another goal was to understand traits of long-term M-Power customers.
WestGroup Research, Inc., 2002	SRP M-Power PayCenter Research: Summary of Findings	Nov 2002	Telephone interviews regarding convenience of PayCenters in Circle Ks (convenience store); 214 M-Power customers; interviewees had been on program for at least 2 months and had a telephone number on file.
WestGroup Research, Inc., 2001	SRP M-Power Focus Group Report—June 2001	May 2001	Focus group report, 4 focus groups, opinions on areas of process and operational improvement. One focus group was comprised of people who had left the M-Power program.
WestGroup Research, Inc., 1999a	Pay As You Go Focus Group Report	Aug 1999	Focus group report, 2 focus groups, joint between SRP and Arizona Community Action Association, opinions on M-Power program
WestGroup Research, Inc., 1999b	SRP/ACAA Pay As You Go Study	Sep 1999	Telephone survey report, 179 Pay as You Go customer (precursor to M-Power program); joint study between SRP and Arizona Community Action Association (ACAA), opinions on M-Power program.

Overall Satisfaction Levels

One obvious finding, which is consistent with every customer study, is that M-Power customers are very fond of the program. This finding was first found with the 100-home pilot discussed in Section 1, with the oldest studies reviewed for this report (circa 1999), and with the most recent studies reviewed, in the form of the Customer Contact Tracking Study (CCTS). This is an ongoing quarterly customer service market research report, which as of 2007 began to include M-Power-specific questions. For the M-Power section of the CCTS, the respondents are chosen randomly from M-Power customers who use PayCenters to purchase power, i.e., the vast

majority of M-Power customers. From the range of data available, the percent of customers who are satisfied or very satisfied with M-Power ranges from 83% to 96% (SRP, 2009b).

Overall satisfaction of M-Power customers with SRP is generally favorable as well. In the three surveys performed prior to the start of the CCTS, those who rated SRP's performance as very good or excellent ranged from 70 to 73%. When the CCTS began, the question changed somewhat, but CCTS data from FY07 to FY10 suggest M-Power customers who were satisfied or very satisfied with SRP ranged between 85 and 89%.[9]

Given the high importance SRP places on the customer satisfaction ratings it receives from its M-Power customers, it is instructive to consider how this satisfaction with the utility compares between M-Power and non-M-Power customers. As illustrated in Table 4-2, "overall performance" ratings are comparable, but statistically more M-Power customers perceive high overall value in the service SRP provides compared to non-M-Power customers. Statistically fewer M-Power customers gave SRP top ratings for "overall experience". Therefore, by some metrics M-Power customers are generally happier with SRP, but not by all metrics.

Table 4-2
SRP Ratings: Comparing M-Power and Non-M-Power Customers (FY2010)[10]

Percent 9/10 Rating (Out of 10)	M-Power N=337	Non-M-Power (all other rates) N=3574
Overall Performance as an Electric Company: A service quality metric, and SRP's core business measure	66%	63%
Overall Value: Value received from SRP considering amount you pay for services	46%*	37%
Overall Experience: Broad measure of service received, impressions of the company, customer experience	44%	50%*

* Statistical difference between groups

Perceived Customer Benefits of M-Power

Most of the survey and focus group reports have similar findings in terms of what M-Power customers perceive to be the advantages of the program.

One of the main advantages reported is the educational and awareness aspect of the program: the UDT provides each customer with real-time consumption information about their home (update rate of 3 seconds) allowing householders to see the electricity consumption effect of their household behaviors. Some reports included mention of extending the education to other household members, including children.

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[9] Personal communication, Dena Emary, Senior Analyst, SRP, August 16, 2010.

[10] Data are from SRP's FY2010 "Customer Perspectives" survey, a marketing study that includes questions intended to track overall opinions of SRP, and include representation of all residential sectors.

Indeed, there have been several studies that report conservation effects by providing this sort of electricity use feedback in non-prepaid conditions.[11] In the case of the M-Power program, one can hypothesize that customers are more likely to use the UDT to educate themselves about their unique usage patterns, as the consequences are more severe if they do not do so: they are more likely to have their electricity shut off unexpectedly.

> "I tell all my friends that it was the best teacher for me to teach me how to use electricity efficiently." WestGroup Research, Inc., 2001, p. 4.
>
> "Because I live paycheck to paycheck, it makes me more conscious of how much I'm using. I don't let my daughters open the refrigerator because I know it's using more electricity. It makes me more aware of what I'm using and where it's being wasted." WestGroup Research, Inc., 2001, p. 3.
>
> "I found out how much my dishwasher runs, if I have to use it in the summer time, it's cheaper to just hand wash my dishes and dry them in the sink, rather than have my air conditioning catch up for that dishwasher." WestGroup Research, Inc., 1999a, p. 4.

Perhaps a consequence of the knowledge gained regarding a household's electricity usage patterns, another advantage that is often reported is the sense of control the M-Power program provides customers. This includes the ability for customers to monitor their power usage, to pay for power at their own pace (e.g., daily or weekly instead of monthly), and even the ability know and be ready for a disconnection if necessary.

> "It allows me to budget. Being able to see what I spent last month allows me to break it down into pay periods so I can put money aside that I know I'm going to put on the card. You don't have that bill coming. I wish there was a way that we could refill the card over the phone because sometimes I'm going "Oh man, I've got to put money in, it's late, and I've got a four year old so I am pulling him out of bed to go fill the card because of forgetting." WestGroup Research, Inc., 2006a, p. 17.
>
> "Actually for me it's a lot better than getting a bill at the end of the month especially in summer. It's a lot easier to pay $40 a week because the end of the month is when all the rest of my bills are due so I'm flat broke." WestGroup Research, Inc., 2006a, p. 17.
>
> "You have control over how much power you are using. There might be reasons for the spikes like leaving on the air conditioning while you were gone that day and things like that. You have more control over it." WestGroup Research, Inc., 2001, p. 3.
>
> "You can plan your usage better." WestGroup Research, Inc., 1999a, p. 5.

The other main advantage often reported by M-Power customers is the perception that the program saves them money. As illustrated in Section 3, kilowatt for kilowatt, the M-Power program can actually be more expensive than the standard program. However, many customers reported that their increased knowledge of consumption patterns makes them more likely to be able to use less electricity, thus resulting in an overall monetary savings as well. In addition, as reviewed in Section 3, start-up costs are less for the customers. Finally, given there are no late

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[11] Studies involving an in-home display (IHD) in non-prepaid conditions have reported conservation savings in the 0 to 7% range.

fees or disconnection charges, this can be another source of monetary savings for customers who previously had to pay these charges through the standard program.

> "An advantage is that it saves you money and you can put like $2 if you have to, if you're low on cash or whatever. You don't have to worry about your lights going out." WestGroup Research, Inc., 1999a, p. 4.

Other benefits that were reported included:

- The provision of an alternative to the hassle and sometimes embarrassment of going through the conventional program's disconnection/reconnection process
- The elimination of the fear of not knowing how much a monthly bill will be

Perceived Disadvantages

Most of the M-Power disadvantages reported relate to the PayCenters. A qualitative study from 2006 found that more payment options at PayCenters would be preferred by customers, as well as the ability to pay by phone or online; also, there were complaints about the working order of the PayCenters (WestGroup Research, Inc., 2006a). Quantitative research from this era found that 71% reported encountering a PayCenter machine that was not working in the previous year (WestGroup Research, Inc., 2006b). In addition, satisfaction with PayCenters decreases the longer customers are on the program (choices ranged from <1 year to 2+ years). Another study from the same era found that 49% of survey respondents reported having had a problem with the M-Power program. Of the 401 respondents, the top complaints were the PayCenters being out of order (44%), that money sometimes does not successfully transfer to the card (14%), and that they have to go too far to get to a PayCenter (10%) (Reiley & Johnson, 2006). Somewhat inconsistently, the same study also indicates that 76% of customers had experienced an out-of-order PayCenter, and that 24% stated the PayCenter locations were inconvenient. From CCTS data, M-Power customers who are "satisfied" or "very satisfied" with the "PayCenter process" have varied between 80 and 90% since fiscal year 2007.[12] For fiscal year 2010, 84% reported this level of satisfaction. Also, 24% of all surveyed customers (not just M-Power customers) indicated experiencing PayCenters not working in the past 30 days.[13] Although some of the 2006 findings are somewhat inconsistent and the CCTS question wording is different than the 2006 study, the indication is that the overall PayCenter problem rate has declined since 2006.

Several studies recommend addressing these disadvantages by increasing the payment options available to M-Power customers. While customers can now pay with a credit card via the telephone, they still must visit a PayCenter to have that value transferred to their Smart Card. Of course, for unbanked and/or credit-challenged customers, the M-Power configuration remains the only viable prepaid option.

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[12] Personal communication, Dena Emary, Senior Analyst, SRP, July 14, 2010

[13] Personal communication, Jennie King, Manager, SRP Market Research & Info, SRP, August 25, 2010. Note that the 24% value is not directly comparable to the others cited, as it represents all customers, not just M-Power customers; given that M-Power customers are much higher users of the PayCenters than the other customers, it is possible that the value could be higher than 24% for M-Power customers only. Also, the question wording asks for problems in the 'last 30 days', whereas the 2006 study asked for problems in the 'last year'.

M-Power Customer Characteristics

SRP has analyzed their residential customer base using Claritas, Inc.'s commercially available PRIZM tool, which uses address and zip code data to segment customers into different income, age, and life stage (e.g., "single" versus "family") categories. From a 2009 PRIZM analysis, M-Power customers compared to all other residential customers were more likely to be relatively young, have families, be relatively low-income, be low electricity consumers, live in apartments, have been SRP customers for less than five years, and have unsatisfactory or "new" credit ratings (PRIZM, 2009).

Table 4-3 provides an overview of some M-Power customer demographics. The latest demographic data for the 2010 fiscal year indicate that M-Power household heads tend to be relatively young (average age 36 years), low-income (average income $24,400), and predominantly Hispanic.

Table 4-3
M-Power Customer Demographic Trends

	1999	2006	FY07	FY08	FY09	FY10
Data Source	Phone Survey	Phone Survey	CCTS (Quarterly Phone Survey)	CCTS (Quarterly Phone Survey)	CCTS (Quarterly Phone Survey)	CCTS (Quarterly Phone Survey)
Reference	WestGroup Research Inc., 1999b	WestGroup Research Inc., 2006b	*	*	*	*
Average Age	NA	NA	35	36	36	36
Median Age	NA	NA	33	33	33	35
18-34 age range	NA	NA	54%	53%	52%	50%
Average Income	$31,400	$32,586	$33,200	$29,600	$25,800	$24,400
Median Income	NA	NA	$27,600	$19,500	$18,300	$17,900
Income <$30,000	64% (<35K)	67% (<40K)	54%	71%	80%	82%
Ethnicity						
Hispanic	22%	23%	45%	48%	43%	41%
African American	24%	14%	11%	11%	13%	14%
Caucasian	50%	53%	31%	31%	29%	34%

* Personal communication, Jennie King, Manager, SRP Market Research & Info, August 25 2010. Summary of CCTS data.

When more recent CCTS data are compared to older phone survey data, the M-Power customer traits appear to have changed substantially over the years. Considering income statistics, 64% and 67% of respondents reported incomes of $35,000 and $40,000 or less for 1999 and 2006 respectively, as compared to 82% reporting incomes of $30,000 or less from the CCTS data for FY10. Considering ethnicity, 22% and 23% of respondents were Hispanic as compared to 41 to 48% from the more recent CCTS data. While there is some concern in comparing the 1999/2006

studies to the more recent CCTS surveys, the overall trends suggest the make-up of M-Power customers has shifted between 2006 and 2007. Considering the more comparable CCTS data between FY07 and FY10, it appears the average income of M-Power customers is declining, the average age is increasing, and relatively fewer Hispanics and more Caucasians and African Americans are enrolling in M-Power on average. It is possible that these demographic changes are due to the economic recession and that they will change again as the economy recovers.

Customer Purchase Behavior

Table 4-4 contains a summary of some of the findings relating to average customer purchase amounts. While an older quantitative study indicates average purchase amounts are in the $50 range, more recent data suggests purchases in the $20 range. Also, the more recent data suggest customers may purchase roughly the same dollar amount during high use periods (i.e., the summer), but will make the purchases more frequently.

Table 4-4
Electricity Purchase Amount and Frequency Information

Study	Ave no. of purchases per month	Ave amount per purchase
Traadahl, 2009	Summer = 7.1 Winter = 3.6	Summer = $24 Winter = $21
WestGroup Research, Inc., 2006b	3.0	Not reported
WestGroup Research, Inc., 2002	3.0	Not reported
WestGroup Research, Inc., 2001 (focus group, not quantitative)	Ranges reported from twice a week to once a month, but generally associated with receipt of paycheck	Ranges reported between $10 and $100
WestGroup Research, Inc., 1999a (focus group, not quantitative)	Not reported	Amount spent per purchase between $50 and $100, and customers will buy more if they can
WestGroup Research, Inc., 1999b	3.7	$56.70

Customer Retention

While survey results indicate high levels of satisfaction with the M-Power program and that customers would prefer to continue to remain on the program, the turnover rate of the M-Power program is relatively high. CCTS respondents were on the M-Power program for an average of 20 months (less than two years) as of July 2009, consistent with other CCTS data that has been hovering around the two-year mark since early 2008.

Part of this relates to the fact that, due to the very nature of the program and its minimal start-up costs for the customer, it likely attracts customers that anticipate a short-term stay in their residence in the first place. However, one study was commissioned to expressly understand how to decrease the turnover rate of M-Power customers, as this represents cost to SRP (Reily & Johnson, 2006). They report that of approximately 40,000 customers, only 11,200 had been on

the program longer than 18 months as of February 2006. Using the assumption that those customers who reported being "very satisfied" with the program would be more likely to continue on the program, they determine what customer and program traits correlated with a very satisfied customer. They found that very satisfied customers had also reported that PayCenters were conveniently located; perceived their bill would be higher on the standard rate (or that they would save money on M-Power); were between 35 and 55 (20% more likely) or older than 55 (33% more likely); or live in certain cities (Apache Junction, Glendale, Mesa, Phoenix). The probability of a customer answering that they were "very satisfied" with the program decreased for customers reporting experience with out-of-order PayCenters, who did not believe they consumed differently on M-Power compared to the standard rate, who required more frequent card refills each month, or who were African American. Traits not found to influence the probability of answering "very satisfied" included income, consumption level, number of months on program, whether the customers was Hispanic, household size, occupation, or whether the customer was a college graduate.

This section has attempted to paint a portrait of the M-Power customer and their experience with the program. Customer satisfaction is high, owing to the perceived sense of control the program offers, as well as the awareness and educational aspects relating to household electricity consumption patterns. Related to both of these is the perception that consumers are saving money on their electricity costs. The main disadvantages relate to the PayCenters: customers would like more of them, and would like them in better working order, although more recent research findings (FY10) indicate machine performance has improved for customers. M-Power customers tend to be relatively young, be relatively low income, and are predominantly Hispanic. However, customer demographics appear to have changed in recent years, likely due to the economic downturn—the program is attracting customers who are somewhat older and slightly lower income still; more Caucasian and African-American customers are becoming customers as well. Recent electric purchase behavior data suggest people make purchases in the $20-$25 range, and do so with a frequency that varies based on usage, about three times per month in the winter and up to seven times per month in the summer. Finally, while customers express that they are very satisfied with the M-Power program, the turnover rate is still relatively high, likely due somewhat in part to the program's appeal to customers who intend a short-term stay. While there is a net growth rate of 10,000 customers per year on the program, the average M-Power customer stays on the program for roughly two to five years.

In addition to obtaining the above self-reported information regarding customer perceptions of the M-Power program, including perceived energy savings, SRP has also performed various savings impact evaluations of the program, which will now be examined in more detail.

5
INFLUENCE OF M-POWER ON ELECTRICITY USAGE

M-Power turns conventional electric service on its head. Instead of paying an invoice issued by the utility for recorded energy usage, the customer is responsible for making sure that there is sufficient credit in the UDT to meet his or her upcoming electric service needs. M-Power requires that consumers pay attention to when and how they use electricity.

The UDT anticipates the need for such awareness and displays the cash credit left and indicates when, under usual circumstances, the customer can expect that the device will shut service off. The service was initially intended as a way to help customers gradually work off arrears without losing electric service. Over time, M-Power has gained a wider following, and some new SRP customers, for example, choose M-Power over the conventional service because they can initiate electric service without paying the standard a cash deposit.

The most striking result that SRP reports from its M-Power experience is the reduction in overall electricity use that it associates with M-Power participation. The so-called conservation effect is substantial—SRP reports an average annual household annual reduction of almost 12%. That exceeds the reduction that many energy efficiency programs or portfolios report. Accordingly, a close examination of the M-Power conservation effect is warranted to provide others with insight into the behavioral mechanisms at work so that these findings can be extended to other circumstances.[14]

Many Reasons for a Conservation Effect

M-Power is fundamentally different from traditional electric service whereby consumers are billed periodically (typically monthly) for the energy (kWh) they used. M-Power is a prepaid service that requires the consumer to anticipate its rate of electricity consumption (aided by the UDT) and take action to keep the on-board balance positive. The preventative action involves a trip to a PayCenter to purchase power and then return home to transfer that balance to the meter through the UDT. Each customer decides how much to purchase at each transaction, balancing expected electricity needs with other budget imperatives. Smaller purchases require more trips to the PayCenters, but tie up less cash. As previously described, M-Power reports that the number of PayCenter transactions increases in the summer, but the amount of such purchases is only slightly higher, which suggests that careful cash management is a defining benefit.

Additionally, some consumers enroll in M-Power to avoid a service termination due to an excessive level of unpaid arrears. Because M-Power requires a heightened awareness of when and how electricity is used, some consumers may be attracted to it because it enables reducing usage and lowering the level of expenditures. Some may be more inclined because lowering

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[14] The discussion that follows is based on the results of analyses provided to EPRI that were undertaken by SRP analysts. EPRI did not conduct an independent assessment of the electric consumption impact of M-Power on its participants, nor did it attempt to reproduce the results of the studies conducted by SRP.

electricity consumption reduces environmental emissions to which they impute a high level of intrinsic benefit.

These dramatic changes in electric service provisions, or the perception thereof, would be expected to result in changes in how consumers use electricity. The extent and nature of those changes depend on how and to what extent they influence consumer behavior. Although the behavioral mechanisms are varied, a plausible hypothesis is that the majority of these influences will likely result in reduced energy consumption. The discussion that follows explores these influences, culminating in a discussion of how SRP has striven to quantify M-Power's influence on the level of electricity use of its subscribers.

Managing What You can Measure

A prominent feature of M-Power is that it allows customers to purchase electricity on a cash-and-carry basis. With conventional electric services, consumers benefit from periodically (after the fact) invoiced services because it transfers the working capital obligation to the service provider. But, that benefit comes at the expense of a temporal and spatial disconnect between the rate of consumption and the ultimate payment obligation. Customers may not be aware that they are consuming an abnormally high amount of electricity until they receive the bill; the immediate budget consequences are unavoidable. Making adjustments in consumption going forward, to avoid the consequences, is challenging under conventional invoicing service because the consumers can not associate specific coincident usage with the cost.

M-Power's prepayment service involves the customer continuously; it requires monitoring the available service balance, thereby providing constant feedback on the rate of electricity consumption. If the rate at which new purchases are required changes, or the level of routine purchases increases, the consumer is immediately alerted to the situation, and associating electricity usage with these circumstances involves looking back over just a few days, or at most a week or so. Was the increase due to special circumstances, like additional people in the household or weather? Was it due to a lapse of diligence in practicing conservation measures? These circumstances can more easily be diagnosed, and if warranted, corrected. M-Power facilitates drawing such associations and taking the appropriate remedial consumption change, if one is warranted.

The same sequencing of diagnosis and remedial action applies if the consumer discovers that electricity payments at current levels cannot be sustained. Changes in income or other expenditure obligations can obligate altering the allocation of income across expenditure categories. M-Power facilitates making a reduction in electricity use and payments when conditions warrant doing so. Again, the temporal connection between usage and cost is accentuated when payments are made frequently (every few days) rather that periodically and routinely (paying a monthly invoice).

Alternatively, the consumer's understanding of how it uses electricity, through M-Power enrollment, may result in an increase in consumption for specific end uses. The consumers may have adopted behaviors based on erroneous understanding of what a specific and discretionary service costs, for example air conditioning. Discovering the actual cost may cause the consumer to conclude that this service is a good buy, and increase usage up to the point the marginal value of consumption is equated to the corresponding cost.

Deposit Avoidance

M-Power requires a substantially lower deposit to initiate service than what SRP requires for its conventional residential services. The M-Power deposit of $99 secures the UDT device—no provision for non-payment, as is the case with conventional residential electric service, is required. This feature may be especially attractive to people operating under budget limitations and lower income families. Students (and their parents) may be attracted to the lower cash outlay that comes when they already face several substantial cash outlays for rent deposits, books, and tuition.

The importance of this aspect of M-Power service is underscored with SRP's experience in administering the service over the past 10 years. It reports that changing the level of the M-Power deposit relative to the deposit for standard post-pay service measurably alters the subscription rate and level.[15] Apparently, customers that are primarily, or perhaps solely, attracted to the deposit avoidance feature, and recognize that it comes at the price of some inconvenience (going to a kiosk to refresh the UDT balance) are quite sensitive to the level of that benefit. As the deposit rises, M-Power enrollment is less attractive.

Accommodating Particular Circumstances

Some customers may have subscribed to M-Power due to the circumstances of their living arrangements. As cited above, one report suggests M-Power is popular in rental housing (PRIZM, 2009), perhaps because it facilitates a smooth transition from tenant to tenant, while keeping electric service on continuously for safety and security reasons. Some of these circumstances are discussed below.

Pay-as-You Go Household Accounting

Pre-paid service has attractive features to people that do not have ready access to, or prefer to avoid, paying through checking accounts. Cash counting forces budget discipline that some customers require to make ends meet. Others value it because it gives them control over what they spend on electricity (budget-conscience), or how much electricity they use (environmentally concerned). Another important factor is that electricity must be purchased at the PayCenters; this apparent inconvenience for some may be a desired feature as it acts as another force of discipline.

Arrears Financing Through a Rate Differential

Customers that go on M-Power to avert a service disconnect pay back the outstanding arrears incrementally. Each time they purchase electricity at a PayCenter, 40% of what they pay goes to buy-down the arrears, and the rest becomes a debit balance on the card that is subsequently transferred to the customer's UDT as a positive balance. This 40% larger payment may raise the perceived cost of electricity to the M-Power consumer. This perception will be influenced by the information on actual cost provided by the UDT, however, it is not known to what extent the UDT information overrides the perception of larger payments. To some extent, it could be expected that larger payments would result in reduced electricity usage. The extent to which this results depends on each customer's price elasticity of demand for electricity. The discussion that

[15] Personal communication, Mike Lowe, Customer Services Manager, September 23, 2010

follows is illustrative of how price elasticity would predict electricity consumption if consumers respond to the actual price they pay (the cost per kWh purchased) rather than the posted (at purchase) tariff rate.

Price elasticity, in this case the own-price elasticity, establishes a link between price changes and consumption levels. As the price of electricity goes up, customers readjust their budget to accommodate the fact that something has to give: electricity use goes down. Price elasticity indicates the percentage change in electricity usage that results from a one-percent change in electricity price, providing a simple way to convert price changes in consumption adjustments. For example, if the price elasticity is negative 0.10, then a doubling (100% increase) in price results in a 10% reduction in electricity usage. Studies of household electricity usage, under uniform electricity rates, report that the price elasticity of demand (expressed as absolute value percentage) is in the range of five to 10%.[16] The level of price elasticity may vary by region and climate owning to greater ability to modify controllable and discretionary end uses.

How much of an adjustment in electricity use under M-Power would price response account for? Assume a customer in arrears routinely pays $20 at a PayCenter, and receives $12 in energy given that 40%, or $8, applies to the arrears. This larger payment raises the effective price of electricity by 67%.[17]

Figure 5-1 illustrates the impact on electricity consumption at different levels of price elasticity. It plots out the percentage reduction in electricity associated with different price elasticity levels. A 5% reduction is expected based on the range of price response cited above. If an M-Power customer in an arrears situation is more price elastic, then even larger reductions in usage would be undertaken. Many uses of electricity that most households take for granted may become discretionary under severe budget pressure, which is manifest as high price elasticity, and more sharply reduce usage as long as arrear payments are being made.

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[16] EPRI, 2008; Faruqui, Hladek, and Sergici, 2010. Changes in the pattern and level of electricity use may be induced by time-varying rates such as time-of-use and real-time pricing owning to a more poignant incentive to modify controllable and discretionary end uses. Since M-Power accentuates awareness of the cost and price of consumption, participants may indeed be more price elastic than their conventional rate counterparts.

[17] Assume that the uniform rate under M-Power is about $0.11/kWh. A $20 purchase would buy 181 kWh under the base tariff. If only $12 goes toward energy, only 109 kWh are debited to the Smart Card and as a result the effective price of purchased electricity is approximately $0.18/kWh.

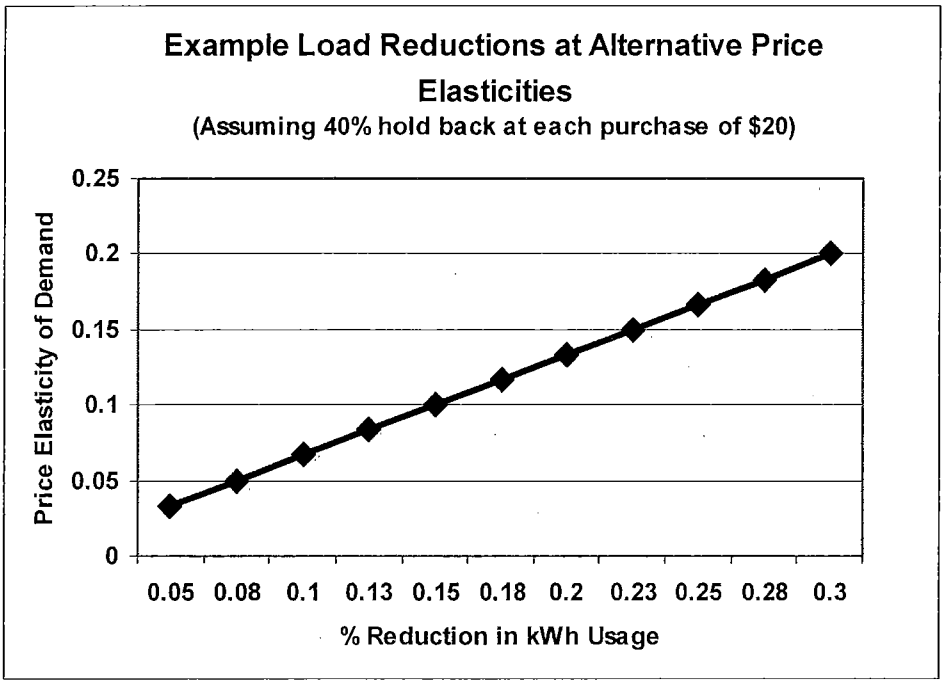

Figure 5-1
Example Price Elasticity

The price elasticity explanation is less compelling for customers that elect M-Power to avoid paying a larger cash deposit. They start M-Power service with a relatively small arrears balance (the cost of the $99 deposit, the $28 service establishment fee plus tax, and the $30 electricity credit), so the higher effective price they pay per kWh is only a temporary phenomenon. However, other factors may come into play that result in lower energy usage, which will now be discussed.

Conservation Ethic

Some consumers may be drawn to M-Power because they associate the service with promoting the conservation of resources through parsimonious electricity usage. SRP's M-Power marketing efforts are specifically designed to instill this attitude and convince prospective participants that M-Power is a tool to help them to achieve a specific objective: reduce energy use. In effect, this represents a conservation ethic that embodies several of the influences discussed above.

Summary of Potential Influences

Table 5-1 summarizes the M-Power influence according to which aspects of electricity consumption are influenced along with a speculative estimate of the degree of that influence. While some of the influences are either indeterminate or may result in increased usage, overall M-Power seems to be tilted toward reduced consumption, or a conservation effect.

Table 5-1
Potential Influences of the M-Power Program on Consumption

Influence	Character of Impact on Electricity Usage	Degree of Impact
Manage what you can measure	Decrease or increase kWh and kW	Depends on the extent to which the perceived value of electricity diverged from the value realized through information
Deposit avoidance	Indeterminate, but reduced kWh and kW seem likely for pay-as-you-go feature	A lower deposit may be the attractant, but pay-as-you go comes with the bargain
Particular circumstances	Indeterminate	Agency issue: if the landlord makes the M-Power decision-does the tenant adopt
Pay-as-you-go	Decrease kWh and kW	Seems more likely that the predominant effect is that consumers discover ways to save
Arrears financing through price	Decrease kWh and kW	Price effect may be small, but its influence reduces usage
Conservation ethic	Decrease kWh and kW	Self-fulfilling outcome

SRP Impact Assessment

SRP conducts a wide range of studies to track customer satisfaction with M-Power, as reported in Section 4. SRP has also undertaken directive studies to quantify the conservation effect attributable to the M-Power program. If M-Power does demonstratively result in reduced electricity consumption, then those savings produce benefits beyond the lower bills subscribers enjoy. They lower utility supply and administrative collection costs that result in savings to all SRP customers, in the same manner and level as equivalent reductions attributed to the energy efficiency programs SRP undertakes.

SRP has undertaken three studies, designed and executed by staff analysts, to quantify the conservation effect attributable to M-Power. The first two studies, using post-treatment data from 2002/2003 and 2003/2004, produced similar results. M-Power subscribers were found to use approximately 11% and 13% less electricity respectively than their counterparts on the standard default price plan, known as E-23 (Kirkeide, 2009). The third study, completed in 2007 using post-treatment data from 2005/2006, found a similar effect of 12% (ibid). This study employed the same methodology as the other two, so a description of its design and execution serves as a foundation for understanding the results of all three.

Characterizing the Conservation Effect

Assessing how M-Power influences consumption is a particularly vexing analytical challenge, because by design and character, it appeals to several different consumer groups with different objectives or expectations. The challenge is to define a control group that includes those that are similarly inclined to subscribe, or are compelled do so because of circumstances, to serve as the counterfactual (i.e., what would have been but for the M-Power treatment) against which usage of subscribers are compared.

M-Power subscription is voluntary, selectively marketed, and attractive to consumers for a variety of reasons owing to different sources of potential benefits. This creates challenges for constructing a comparison group whose usage can be compared to that of M-Power participants. The most robust approach would be to assign customers to M-Power or standard service randomly, the conventional approach to establishing statistical inference. In cases where that is not feasible or practical, quasi-experimental protocols have been devised to develop compelling estimates of the influence.

To attribute an effect to a treatment, in this case M-Power, with a high degree of certitude requires eliminating all other possible explanations.[18] This is difficult to do systematically since there are many factors that could have intervened: changes in lifestyles while on M-Power; differential weather influences; dramatic changes in economic circumstances; and unobserved factors like social influences, publicity about SRP or energy use, and level and type of M-Power marketing efforts undertaken by SRP.

One approach to establishing the M-Power effect on consumption is to construct an experiment whereby the treatment is provided to customers randomly, that is, some get it and others serve as controls, so that every customer is equally likely to have been selected for the treatment. This neutralizes, to the extent possible, all other influences on electricity consumption, and the treatment (M-Power) effect can be quantified using the differences-in-difference method; the subtraction of the difference between control customers before and during the experiment from that difference from treatment customers.[19] This randomized sampling produces robust results—they have intrinsic credibility as characterized by the sampling properties (significance) and they can be validly extended to the population of customers to which the experiment was directed. However, this approach is not always practically viable in a utility's business environment.

In the case of M-Power, SRP did not find it feasible to conduct a randomly designed experiment, for a variety of reasons.[20] First, the program was initially offered to help a specific group of customers, those in arrears and facing shut-off of electric service. Assigning some applicants to a control group whereby they were denied M-Power service, and presumably would have had their service shut off, would have been counterproductive to the program's intent.

Second, M-Power started as a program targeted to a specific population, which had fewer than 30,000 customers at the time of the first study (Figure 5-2), which is about 3% of all residential customers. SRP determined that it needed to characterize how these customers were reacting to the service, retrospectively, in order to assess whether there were any impacts outside of improved customer service, and reduced nonpayment and write-offs. It did not anticipate in those early years that the program would grow as large as it has, with enrollment spreading to other segments of the residential customer base. Improved technology over time offered improvements

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[18] This discussion draws heavily from EPRI, 2010.

[19] Campbell and Stanley (1963) caution that it is impossible to assure that the control and treatment groups were equal before the treatments, but conclude: "Nonetheless, the most adequate, all-purpose assurance of the lack of initial biases between groups is randomization", p. 25.

[20] The narrative description of the evaluation of the M-Power program was constructed from interviews with SRP staff. The assessment of the programs performance, specifically the conservation effect, was constructed using analysis materials prepared by SRP. EPRI did not undertake an independent assessment of any of the data collected for the three studies or collect any new data to support a subsequent analysis.

in scale and cost effectiveness in all facets of the program. The charter given to the program analysts was to produce an estimate of the how M-Power had affected the electricity usage of current enrollees.

Subsequent analysis in 2003/2004, when M-Power had grown to about 30,000 subscribers, was influenced by the same factors. The primary focus was to understand the sales revenue implications to support forecasting, and evaluate the business case for continuing the service. The third study, which used 2005/2006 post-treatment data, was chartered in 2007 to see if there were changes relative to the previous studies, and employed same basic methodology. However, it sought to enrich the findings by characterizing the impacts across subpopulations of M-Power subscribers and determine if the relative load reduction effects were seasonally uniform. The essence of this study's methods is described below, followed by a discussion of the findings.

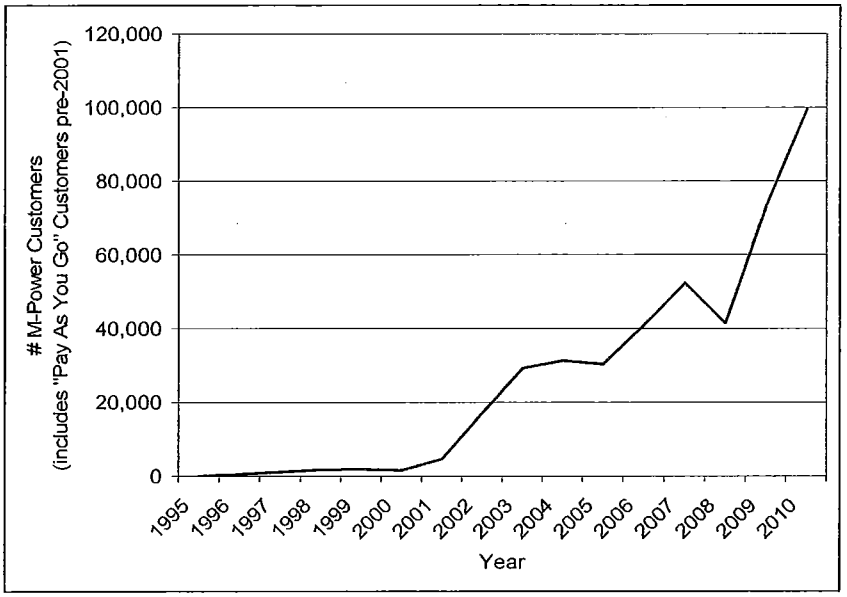

Figure 5-2
M-Power Program Size

Research Design

A retrospective, case matching methodology was undertaken in 2007 to characterize how M-Power subscribers were responding to the price, feedback, and the energy purchase aspect of the program. The population of interest was the current subscriber base. The focus was estimating how electricity usage (kWh) of M-Power subscribers differed from that of E-23 residences (standard residential service), to support sales and revenue forecasting, and to estimate the relative benefits of the program using the cost/benefit tests SRP applied to screen energy efficiency programs.

The M-Power analysis consisted of several steps:

1. A study period was selected that allowed establishing electricity usage for a treatment period (subscription to M-Power) and for a period prior to that time period when treatment customers were still on E-23. This facilitates a difference-in-difference calculation of the impacts using data from treatment and control customers.

2. Because of the possibility that the effect of M-Power on usage would vary seasonally, the study (treatment period) was defined as sequential summer and winter periods. To accommodate the seasonal design, the study period was October 2004 through October 2006, as illustrated in Figure 5-3.

3. A set of treatment customers was randomly selected from the population of all subscribers. A principle selection criterion was that for each treatment billing history could be constructed that would conform to the monthly definitions that comprise the seasons. As previously mentioned, M-Power service does not involve a typical bill issued routinely (monthly) based on metered usage, as is the case with E-23 residential service. Subscribers add to their account by making a purchase at a PayCenter. Hence, the SRP analyst had to construct equivalent monthly billing amounts (kWh) which could be compared to the equivalent usage of E-23 control customers.

4. Billing data were retrieved for treatment customers to correspond to the same periods as for the control customers. Data for the winter 2004-5 and the summer of 2005 provided a baseline for measuring changes after these customers subscribed to M-Power. The latter winter and summer billing quantities were actual usage under M-Power.

5. A control group was selected to establish the counterfactual, the level of usage that M-Power subscribers would have used but for M-Power subscription. Controls were selected as follows:

   a) Customers located in the neighborhood of each treatment M-Power subscriber were identified.

   b) These were then reduced to those that had M-Power billing data available to match the billing cycle they had when on E-23 billing cycles that were approximated corresponding to calendar months. This was done to avoid using data from periods that were two to three weeks before the season started and/or data for two to three week after the season period ended.[21]

   c) Finally, a single control (E-23) customer was selected as a match to each treatment (M-Power) customer based on which of the eligible control customers had usage levels (kWh) most closely aligned with that of the treatments. Control customers matched the billing cycles of the treatment customers, since each treatment customer had a control customer in the same neighborhood with very similar energy usage.

6. E-23 control customer usage (monthly kWh) was accumulated from billing records for the winter for 2004-5 and winter of 2005-6 to establish a control baseline. Billing data was also

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[21] Utilities typically divide residences into 21 or 22 batches that correspond to days of the month. The May Batch 1 customer meters are read the first work day of the month of June (June 1) and the customers are billed on the previous 30 or 31 days' usage. For them, the May bill corresponds almost exactly with the previous calendar month (the month of May). The second batch of meters are read on the second day of June and billed issue accordingly, and so on through the 20 working days of the month. Each subsequent read batch results in an accommodation to the correspondence of the may bill month and the month for which the billing applies. The last May bill batch is read and billed in June on June 30, is mostly comprised of June usage. To prevent using data that do not correspond to the calendar months, which might inject systematic weather effect bias, control customers were selected that had batch reads that correspond to calendar months.

accumulated for the summer of 2005 and the summer of 2006, again to establish the counterfactual.

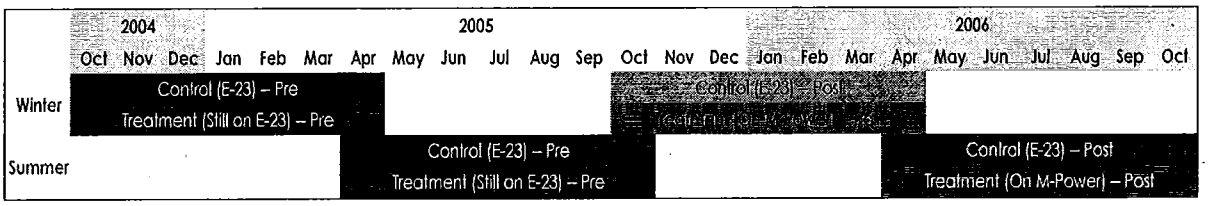

Figure 5-3
2005/2006 M-Power Impact Analysis Timeline

There were 463 treatment customers selected for the 2005/2006 study: 272 treatment customers in the summer period and 191 different treatment customers in the winter period. Each treatment customer was matched with a single control customer, aligned seasonally, to establish the counterfactual. The conservation effect was estimated by constructing difference-in-differences and then applying conventional analysis of variance (ANOVA) statistical tests to ascertain if the calculated differences were significant.

The findings from the 2005/2006 study were that usage, on average, by M-Power customers was 12% less than that of the control customers, and that the difference was highly significant (Kirkeide, 2009). Separating out the differencing process, M-Power customers reduced usage, on average, 8% and control customers' usage, on average, grew 4%. Additional tests using construction for segments from the control and treatment customers indicated that the difference was not influenced by the amount of energy consumed per month (which ranged from a low of 200 kWh/month in winter months to a high of over 3,000 kWh/month in summer months) or by season.

The level of the conservation effect estimated in the 2005/2006 study for the M-Power population, which was about 40,000 in 2006, was very close to that estimated in the earlier studies (approximately 11% and 13% respectively--Kirkeide, 2009), when subscription was about 30,000.

Measuring the Potential of M-Power

Learning from Experience

SRP conducted a series of analyses to understand how electricity consumption behavior changes under M-Power service. The initial study indicated that M-Power subscribers reduced their consumption. The program was designed to help customers work off arrears balances while continuing to have electric service at their premises. As discussed above, M-Power's features provide a variety of encouragements and incentives to watch electricity consumption closely and husband its usage. Also, M-Power marketing and program materials are designed to promote these actions.

A commonly used evaluation protocol was employed to quantify the impact, matching customers with M-Power experience with others with apparently similar financial and living circumstances to establish the counterfactual. This methodology was repeated subsequently and produced consistent results—a conservation effect of about 12%.

The use of a case-matching protocol, applied retrospectively, seems prudent in light of what SRP intended at the time to learn, and how those findings were to be used. A purely randomized experimental design was determined by SRP to be impractical. It would have required denying some applicants access to M-Power to create a rigorous control group. SRP had gone to great lengths to provide an alternative to having to cut service off to customers in financial distress. Denying some that resource could have had adverse consequences not just for those customers.

Case-matching averted the need to deny service to those that M-Power was intended to help. It involved establishing control customers by finding a match for each treatment customer that would in effect serve to negate other factors that might influence electricity use, and thereby reveal the treatment (M-Power) effect (Campbell & Stanley, 1963). It is part of a class of quasi-experimental designs that were widely used at the time in circumstances where fielding a true experiment was infeasible, but nonetheless there was a need to establish, to the best extent possible, the impact of a treatment.

The character of M-Power subscriber has changed substantially since the last impact assessment, which involves customers taking service in 2004-6. As of April 2010 it has approximately 100,000 subscribers, about one in eight SRP residential customers; over twice as many as at the time of the previous study.

The character of subscribers has changed also. It still includes a core of those that chose M-Power as a means of working off an excessive arrears balance. But, SRP attributes most of the growth to customers that are attracted by the absence of a cash deposit (primarily new customers to SRP, rental premises that have a high turn-over rate), and customers that want the feedback and conservation inducement that M-Power provides. It would be reasonable to presume that the impact on consumption might differ from that of credit stressed customers, but presumptuous to accept that premise without substantiation.

A more robust approach might more fully characterize how customers with diverse circumstances, expectations, and capabilities to adjust load responded to M-Power. Several methods have been devised over the past few years that address the possible shortcomings of the conventional quasi-experimental designs. In particular, the randomized encouragement design (RED) might be conducive to characterizing how M-Power influences participants' electricity consumption level and patterns.[22]

They will not, however, provide a definitive verification of the results of past studies, because the methods used can not be applied retrospectively. The goal of undertaking a new study with a new approach is to guide the future design and administration of the program. A full discussion of issues to be taken into consideration in designing such studies can be found in EPRI's Feedback Protocols (EPRI, 2010).

[22] A proposed application of a randomized encouragement design is found in Fowlie & Wolfam, 2009.

6
CONCLUSIONS AND RECOMMENDATIONS

SRP has operated a prepaid electric service, M-Power, since 1993. The technology used has undergone several transformations to take advantage of new service delivery options and fulfill the participants' requirements and expectations that experience revealed. The M-Power customer population has grown to about 100,000 (approximately 12% of all residences served by SRP), expanding from the initial target population, consumers with arrears facing service terminations, to include consumers with different expectations from M-Power service.

The constant aspects of the M-Power experience have been a high level of customer satisfaction and an overall reduction in electricity use (of about 12%) reported by SRP compared to customers served on the standard residential service, despite nearly identical nominal $/kWh rates on the two services. SRP attributes the conservation effect to a variety of factors, including the increased awareness of when and how electricity is consumed that the program has created, as well as its focus on marketing M-Power as enabling and encouraging reduced electricity usage.

The scale of M-Power participation, along with the magnitude of the change in consumer behavior (the conservation effect) that SRP attributes to the M-Power program warrant attention. This is especially so given that the M-Power delivery technology, while effective, is quaint compared to what can be accomplished with a smart meter system combined with web portal-based information delivery and payment system. Removing the inconvenience of going to a PayCenter may make prepaid service attractive to a larger number of consumers. Moreover, it may reduce attrition among those that enroll initially due to one factor or circumstance (e.g., arrears payback, avoidance of a service initiation deposit), but whose situation changes.

Because smart meter deployment is expanding, and virtually every utility is at least undertaking a comprehensive business case, it seems prudent to acknowledge the SRP experience as presenting the possibility that prepaid service will become a staple in utility service portfolios. The cost of adding the functional capabilities required to support various levels of prepaid services are most easily determined in the context of a larger smart meter business case study. Moreover, such a study provides the means for characterizing how prepaid service influences and affects consumer behavior, and for quantifying the attributable impacts.

But, if prepaid becomes very convenient -- payments can be made electronically, account balance information is available on the web or from a mobile phone -- will that undermine some of the very behavioral forces that are assumed to induce the conservation effect? Prepaid has worked well in and for SRP's circumstances, but is that experience transferrable to other markets, climates, customer circumstances, and supply conditions? These are research questions that must be addressed systematically and thoroughly in order to evaluate the costs and benefits associated with various prepaid service program designs.

A comprehensive research agenda regarding prepaid service costs and benefits would include answering the following questions:

- Consumer behavior influences
  - How does prepaid service influence consumer behavior in the short run? In the long run?
  - Does that influence vary according to customer expectations or circumstances, and if so, by how much?
  - How do those behaviors translate into kW and kWh changes?
  - Is prepaid service compatible with energy efficiency goals? With demand response program objectives? Net Zero Energy Home designs?
  - Is prepaid service compatible with diversified residential services such as on-site generation and storage? Home electric vehicle charging?
- Technology function capabilities
  - What additional measurement, communications, and computation capabilities are required in a smart metering system to support prepaid services?
  - What institutional arrangements are required to accommodate prepaid service transactions?
  - How are prepaid accounts integrated into those that follow a traditional meter-read cycle structure to support financial accounting, regulatory reporting, forecasting, energy efficiency and demand response program participation, etc.?
  - Is prepaid compatible with smart grid technologies such as home area networks?
- Overall market impacts
  - What are the amount and distribution of the benefits attributed to prepaid service?
  - How do the impacts affect wholesale market operations? Retail market operations?
  - Can prepaid service be provided by a third party (technology vendor or commodity provider) through commercial channels?

Obtaining answers to these fundamental research issues will facilitate estimating the net benefits under almost all market circumstances. It is knowledge that will be costly to obtain, but with high public value and only relatively limited corresponding private value (i.e., to an individual utility). In other words, resolving how prepaid service influences and affects consumer electricity consumption behavior is a public or collective good. Some utilities may see sufficient value to undertake some of the research, but probably not the full array of understanding and solid characterizations. An obvious solution is collaboration that spreads the cost among many parties that stand to gain and distribute the finding to everyone.

A
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B

M-POWER BACK OFFICE SOFTWARE SCREEN SHOTS

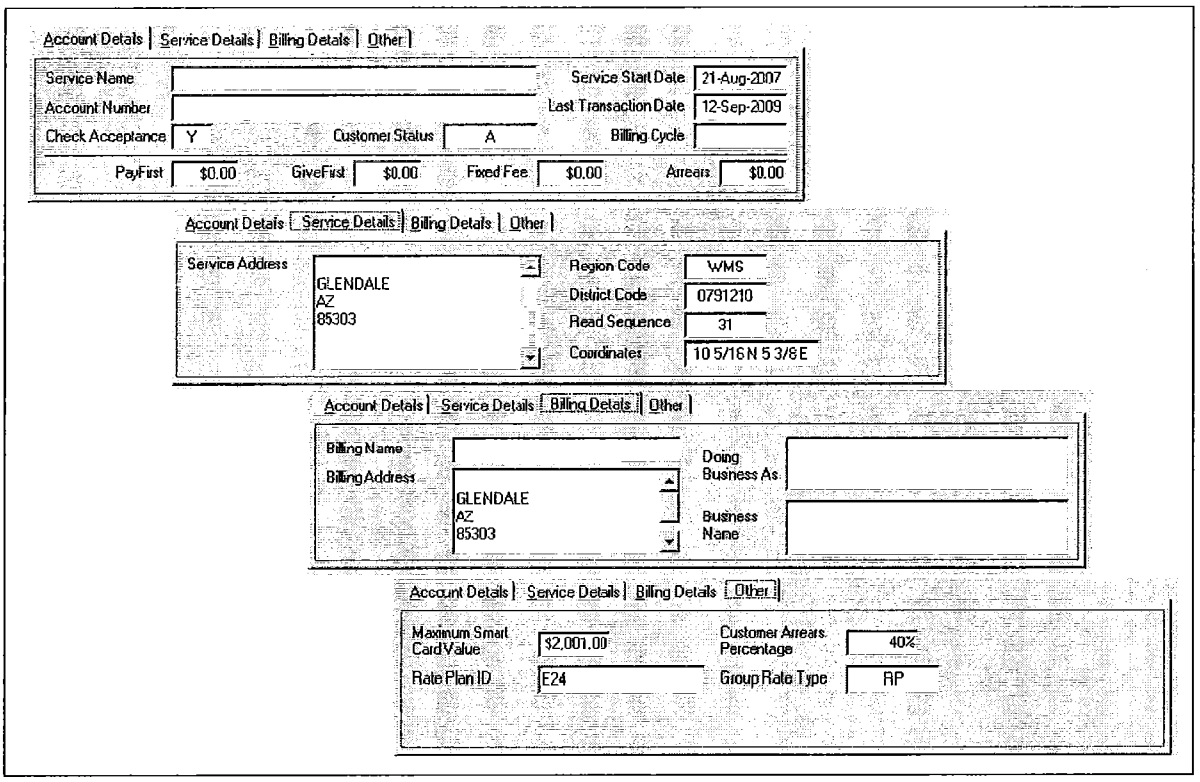


Figure B-1
Account Details Screens

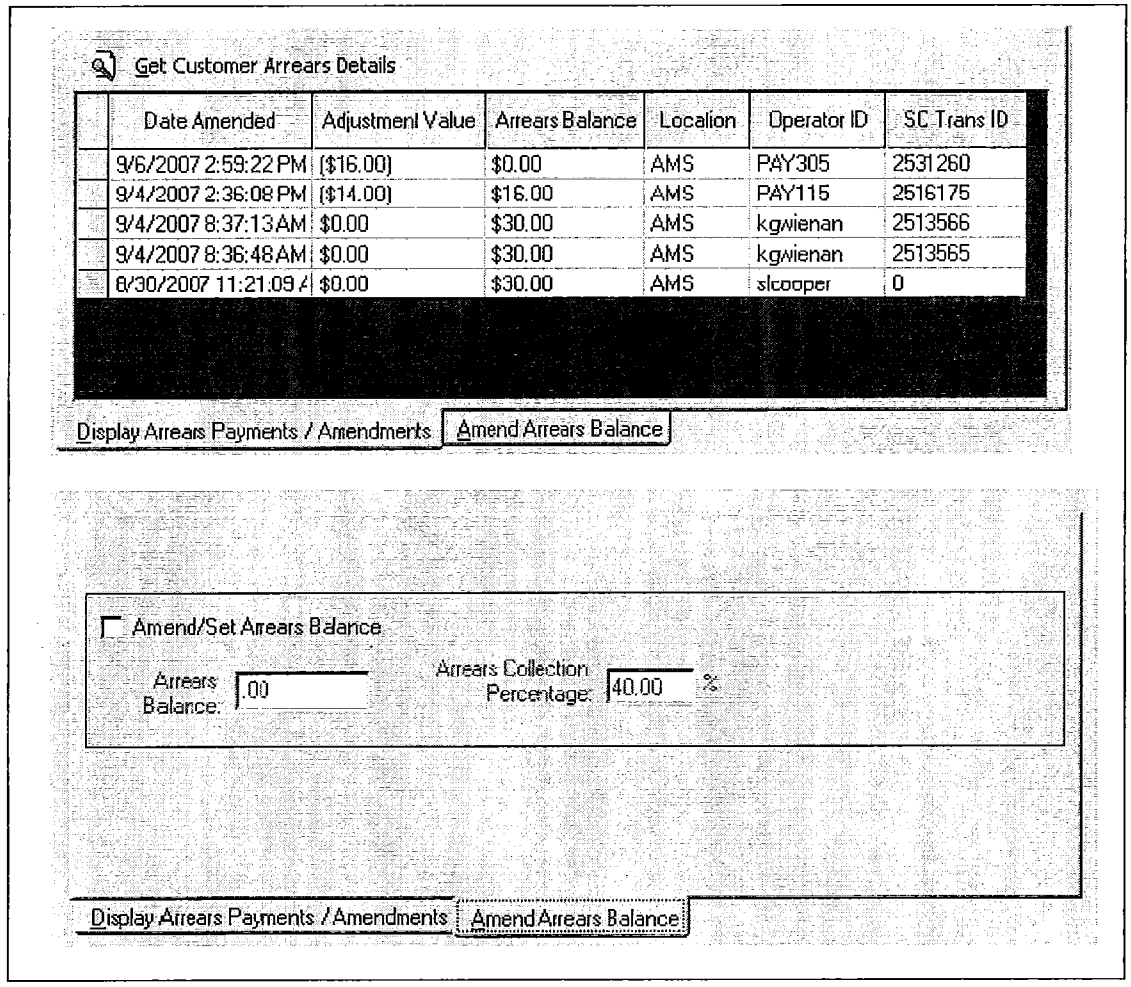


Figure B-2
Arrears Details Screens

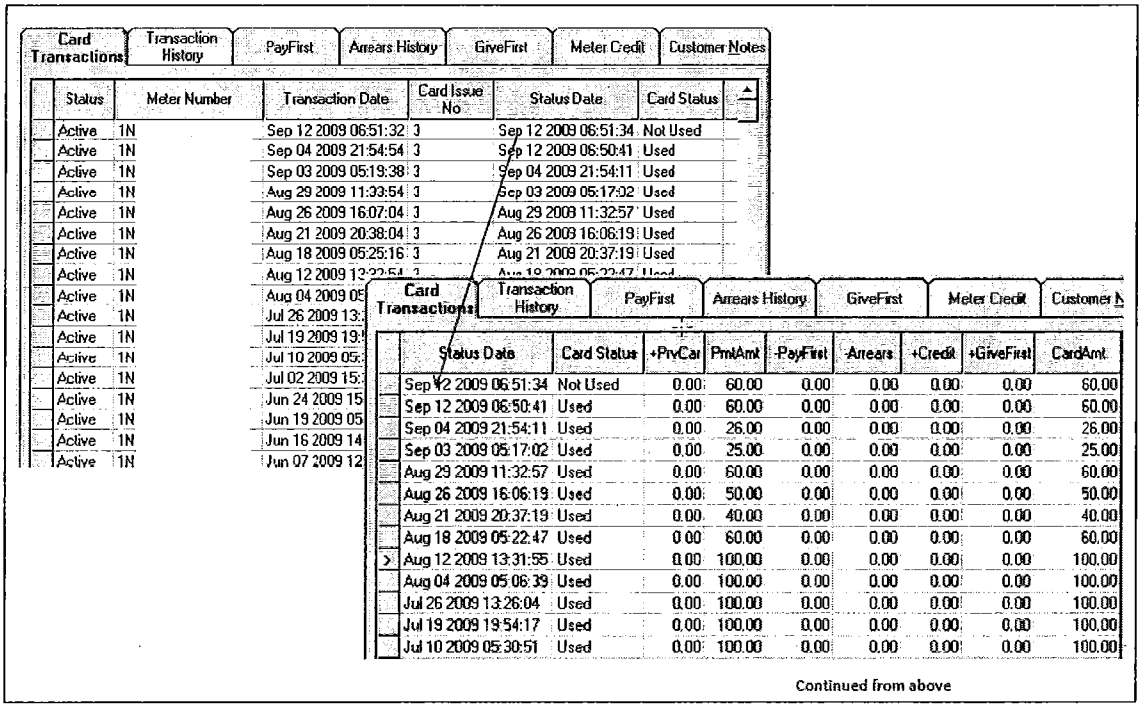


Figure B-3
Transaction History Details

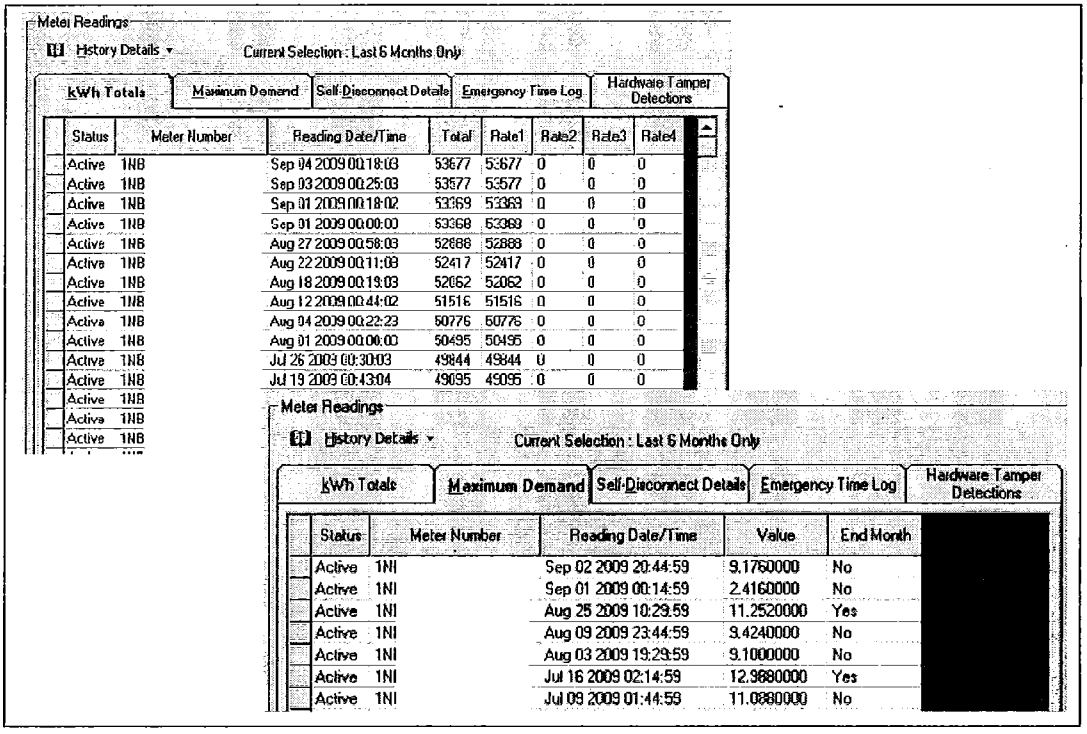
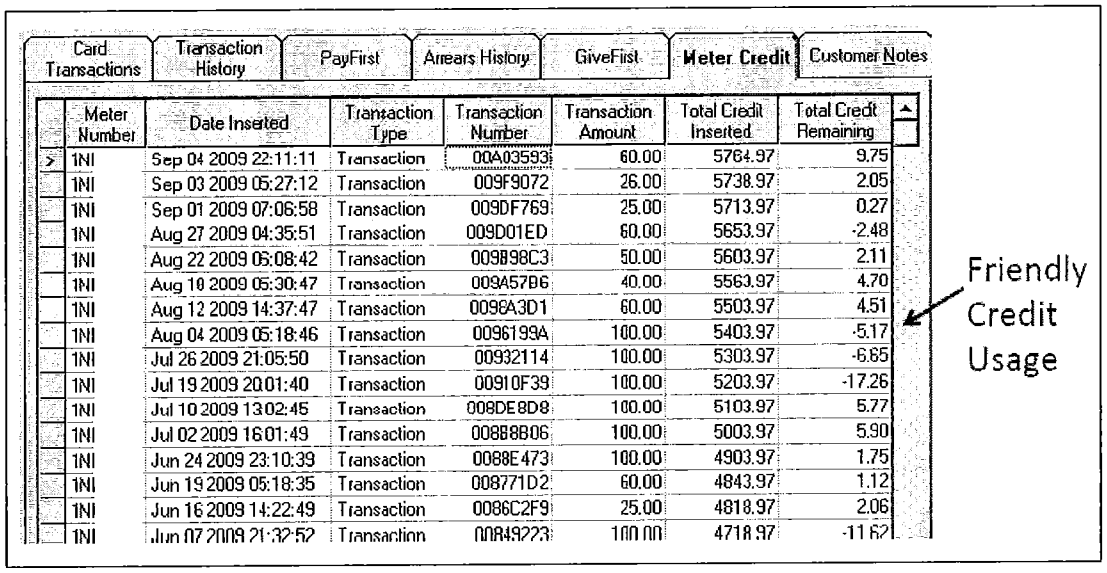
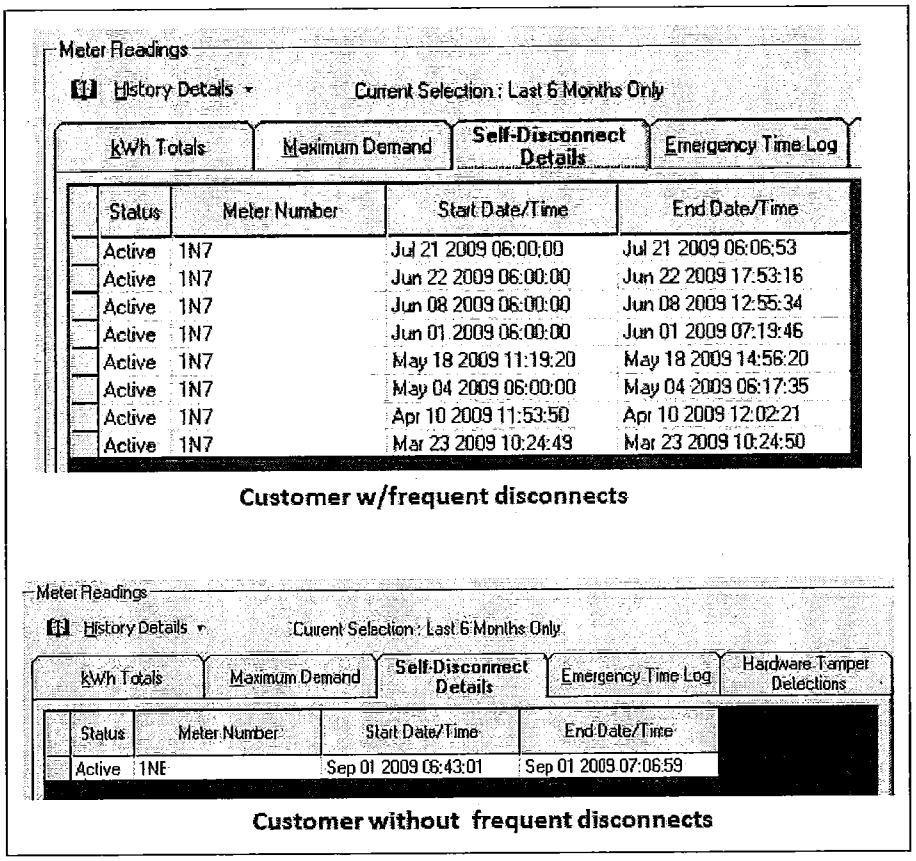


Figure B-4
Meter Read Data



Meter Number	Date Inserted	Transaction Type	Transaction Number	Transaction Amount	Total Credit Inserted	Total Credit Remaining
1NI	Sep 04 2009 22:11:11	Transaction	00A03593	60.00	5764.97	9.75
1NI	Sep 03 2009 05:27:12	Transaction	009F9072	26.00	5738.97	2.05
1NI	Sep 01 2009 07:06:58	Transaction	009DF769	25.00	5713.97	0.27
1NI	Aug 27 2009 04:35:51	Transaction	009D01ED	60.00	5653.97	-2.48
1NI	Aug 22 2009 05:08:42	Transaction	009898C3	50.00	5603.97	2.11
1NI	Aug 18 2009 05:30:47	Transaction	009A57B6	40.00	5563.97	4.70
1NI	Aug 12 2009 14:37:47	Transaction	0096A3D1	60.00	5503.97	4.51
1NI	Aug 04 2009 05:18:46	Transaction	0096199A	100.00	5403.97	-5.17
1NI	Jul 26 2009 21:05:50	Transaction	00932114	100.00	5303.97	-6.65
1NI	Jul 19 2009 20:01:40	Transaction	00910F39	100.00	5203.97	-17.26
1NI	Jul 10 2009 13:02:45	Transaction	008DE8D8	100.00	5103.97	5.77
1NI	Jul 02 2009 16:01:49	Transaction	00888B06	100.00	5003.97	5.90
1NI	Jun 24 2009 23:10:39	Transaction	0088E473	100.00	4903.97	1.75
1NI	Jun 19 2009 05:18:35	Transaction	008771D2	60.00	4843.97	1.12
1NI	Jun 16 2009 14:22:49	Transaction	0086C2F9	25.00	4818.97	2.06
1NI	Jun 07 2009 21:32:52	Transaction	00849223	100.00	4718.97	-11.62

Figure B-5
Meter Credit Status



Status	Meter Number	Start Date/Time	End Date/Time
Active	1N7	Jul 21 2009 06:00:00	Jul 21 2009 06:06:53
Active	1N7	Jun 22 2009 06:00:00	Jun 22 2009 17:53:16
Active	1N7	Jun 08 2009 06:00:00	Jun 08 2009 12:55:34
Active	1N7	Jun 01 2009 06:00:00	Jun 01 2009 07:19:46
Active	1N7	May 18 2009 11:19:20	May 18 2009 14:56:20
Active	1N7	May 04 2009 06:00:00	May 04 2009 06:17:35
Active	1N7	Apr 10 2009 11:53:50	Apr 10 2009 12:02:21
Active	1N7	Mar 23 2009 10:24:49	Mar 23 2009 10:24:50

Status	Meter Number	Start Date/Time	End Date/Time
Active	1NE	Sep 01 2009 06:43:01	Sep 01 2009 07:06:59

Figure B-6
Self-Disconnection History

C
MARKET RESEARCH STUDY DETAILS

Table C-1
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
SRP, 2009b	CCTS M-Power Quarterly Scorecard	May-Jul 2009 (performed every quarter)	Telephone survey results from M-Power customer who use the customer service call center	87% satisfied or very satisfied with M-Power program (through July 2009) Top reason for signing up: - 72%: gives me control over electricity - 63%: avoid late fees - 60%: reduced deposit, affordable way to start Percent agree or strongly agree: - 97%: M-Power could help a lot of people - 91%: use electricity more wisely
PRIZM, 2009	PRISM Analysis	Jul 2009	Prism analysis/marketing	M-Power customers: - are more likely to live in apartments, less likely to live in single family homes (compared to Standard and TOU customers) - are newer - just over 50% have "slow" credit, unsatisfactory credit, or new customer credit ratings - ~15$ receive a Spanish-language bill (more than any other rate type); most are English-speaking - tend to be lower energy users - are generally younger households

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
Traasdahl, 2009		2009	Overview presentation of program	Largest prepay program in the US Took stats from a week in August 2009, found most purchases on Friday between 4pm and 10pm (likely corresponding to payday), and most purchases in the $11 to $20 range. Average no of purchases per month: summer = 7.1; winter = 3.6 Average $ amount per purchase: summer = $24; winter = $21 Average # of customers who disconnect per month: 20% Of the 20%, average # of disconnects per month: 2
WestGroup Research, Inc., 2007	SRP M-Power Materials Survey: Topline Report, November 2007	Oct 2007	Telephone interviews to assess salience of updated communications materials; 201 M-Power customers	Low recall of some materials, although ratings were fairly positive
WestGroup Research, Inc., 2006a	SRP M-Power Communications Focus Group Research	Nov 2006	Focus group report, 3FGs, opinions on M-Power, the Starter Kit and different M-Power communications materials; not known how FG members were recruited	Most participants believed the sign-up and start-up processes were relatively easy. Most preferred the idea of having newsletter delivered quarterly and tailored to them. Most liked the M-Power program and thought its main benefit was its educational quality. Those in difficult financial situations (most of the group) liked that SRP provided M-Power as an option. Areas for improvement included having more payment options at the PayCenters, as well as over the phone and internet. Poor working order of some PayCenters was also expressed. English speaking customers felt information included in starter kit was "overwhelming and redundant". A recommendation was to make the information provided more concise.

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
SRP, 2006	SRP M-Power Shadow Project September 2006 – Executive Summary	Sep 2006	Executive summary of the SRP M-Power Shadow Project, which involved 8 in-depth, in-home interviews from customers from a range of credit codes, length of time on program, language, income and housing type	People generally thought of SRP and M-Power positively, and authors were surprised at the wide range of households visited (i.e., not just low income). Three had run out of power once, although this was not perceived as a serious issue. Sense is that most households visited are conservation-minded.
WestGroup Research, Inc., 2006b	SRP M-Power/AMPY Benchmark Study 2006	Mar 2006	Telephone survey results, 402 M-Power customers; purpose was to obtain baseline data on attitudes towards M-Power, with emphasis on PayCenter machines, as new machines were to be installed starting in April 2006.	Seven in 10 rated SRP's performance as excellent or very good 90% were very satisfied or satisfied with the M-Power program Reasons for satisfaction were reported as (starting from most frequently reported): the ability to pay for power at customers' own pace, having ability to monitor energy use/more aware of energy use, perception that it was cheaper/saved energy, allowed for more control, and was more convenient in general Satisfaction high for IHD (93% very satisfied/satisfied, significantly higher amongst customers with a high school education or less); relatively lower for the PayCenter machines (72% very satisfied/satisfied, with more highly educated customer reporting significantly lower vs./s ratings than those with high school or less). Satisfaction with PayCenter machines decreases the longer customers are on the program (choices ranged from <1 year to 2+ years). SRP performance rated excellent or very good by significantly more lower income and high school (or less) educated. Indication that the longer a customer is on the M-Power program (choices ranged from <1 year to 2+ years), greater likelihood to be very satisfied Significantly more Hispanic customers were likely to rate it very satisfied or satisfied; significantly more high school educated (or less) customers chose very satisfied than more highly educated customers. M-Power customers report purchasing electricity three times a month. High school educated (or less) customers purchase more frequently than more highly educated customers.

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
WestGroup Research, Inc., 2006b... Continued	SRP M-Power/AMPY Benchmark Study 2006	Mar 2006	Telephone survey results, 402 M-Power customers; purpose was to obtain baseline data on attitudes towards M-Power, with emphasis on PayCenter machines, as new machines were to be installed starting in April 2006. Customers were contacted randomly from SRP M-Power account list.	Cash most popular form of payment (choices at the time were cash, check or money order). Seventy-one percent reported encountering a PayCenter machine that was not working in the previous year. Of these respondents, the average number of problems over the year was 3.9. PayCenter machines located in grocery stores were used the most often (82%), followed by the SRP office (15%), convenience stores (2%), and the mall (1%). Ninety percent or more agreed or strongly agreed that M-Power could benefit others, learned a lot about their usage, use electricity wisely, prefer M-Power over other programs, and that helps them manage their finances. Twenty five percent were concerned about the meter shutting the electricity off, 22% felt their lifestyles were inconvenienced, and 18% said it led to household arguments. Demographics of M-Power customers surveyed: female (61%), low to moderate education (51% high school graduate or less; 28% some college), slightly Caucasian majority (51%), low income households (average income $32,586). Last survey of this breadth was 1999

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
Reiley & Johnson, 2006	What Determines M-Power Customer Satisfaction: How SRP Can Attract and Retain M-Power Customers	2006	University of Arizona Assessment, telephone survey conducted by WestGroup of 401 M-Power customers that had been on the program for 18 months or more (sample skewed more towards recent customer, 18-24 months, than entire 'long-term' population). Goal is to assess customer satisfaction with the aim of understanding what would make customers stay on M-Power so as to reduce turnover rates; another goal is to understand traits of long-term M-Power customers. Authors note that surveying those who did drop out would be useful as well.	General conclusions: improve PayCenter quality and locations; use marketing messages such as "Take control of electricity usage." And "Save money by using less electricity"; consider providing a display with other non-M-power programs, as customers attributed benefits to it Turnover rate relatively high: as of Feb 2006, 11,200 of approximately 40,000 had been on for 18 months or less. 88% satisfied or very satisfied with M-Power 73% rate SRP as excellent or very good 92% prefer to stay on M-Power compared to E-23 Reasons for wanting to stay on: easier to manage bills, cheaper, can monitor energy usage 83% would want to keep the display 49% say they stay on M-Power as it is too much trouble to switch back ("inertia") 49% report having trouble with M-Power, although 73% have had a problem with an out of order PayCenter Biggest complaints: PayCenters out of order, money doesn't get transferred to card, have to go too far to get to a PayCenter (or not enough of them) Logistic regression analysis results: Probability of a customer answering they are "very satisfied" with the M-Power program increases for customers: reporting that PayCenters are conveniently located; that perceived their bill would be higher on E-23 (or that they would save money on M-Power); that are between 35 and 55 (20% more likely) or older than 55 (33% more likely); or that live in certain cities (Apache Junction, Glendale, Mesa, Phoenix). Probability of a customer answering they are "very satisfied" with the M-Power program decreases for customers: reporting experience with out-of-order PayCenters; that don't believe they consume differently on M-Power compared to E-23; that required more frequent card refills each month, that are African American. Traits not found to influence probability of answering "very satisfied": income; consumption level; # of months on program; whether the customers is Hispanic; household size; occupation; whether the customer was a college graduate.

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
WestGroup Research, Inc., 2002	SRP M-Power PayCenter Research: Summary of Findings	Nov 2002	Telephone interviews regarding convenience of PayCenters in Circle Ks (convenience store); 214 M-Power customers; interviewees had been on program for at least 2 months and had a telephone number on file. "Customers interviewed were M-Power participants who were on the program at least two months and had an available telephone number Customers were randomly selected and filtered based on desired criteria.	87% were very satisfied or satisfied with the M-Power program On average, customers buy power 3 times a month Customers drive 2-3 miles to purchase power, 5-7 minute one-way trips. 72% satisfied with PayCenter locations Liked idea of buying power at Circle Ks; if service fees charged for this, likelihood of buying power there dropped; at $1, less than 50% said they'd buy there; for those that would they'd do so if at Circle K anyway (convenience) or if standard PayCenter was down Estimated that approximately 25% of users might use Circle Ks. Those who are positive towards Circle K approach: those who frequently Circle Ks often, Hispanics (versus non-Hispanics), Number of miles to Circle K or regular PayCenter not a factor in choosing one over the other Conclusions: customers are satisfied with current PayCenter locations and like the Circle K idea for emergencies; the fee would be a deterrent for some.

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
WestGroup Research Inc., 2001	SRP M-Power Focus Group Report—June 2001	May 2001	Focus group report, 4 focus groups, opinions on areas of process and operational improvement. One focus group was comprised of people who left the M-Power program.	Most customers are very happy with all aspects of the M-Power program (e.g., sign-up through equipment installation), with the only exception relating to the PayCenters. Customers identified concerns with malfunctioning equipment, the inability of some machines to take forms of payment other than checks, and the lack of machines in close proximity to their homes For those who had left the M-Power program, the main categories of reasons were "concern about running out of power, machine/equipment problems, and the expense of the program and difficulty managing the program"; some also felt that the customer service representatives were "rude", or uncaring of their monetary situation. Some did not understand how the program worked at sign-up, and were surprised when their power went off; suggestions as to what would have encouraged them to remain on the program included a 24-hour phone line where you could purchase credits M-Power generally customers tend to be strong advocates of the program, and the study recommends marketing methods such as "refer-a-friend" Retention of customers is reported to depend on how well educated customers become regarding the program, and how it can affect their energy usage Although an "easy sell" to credit-challenged customers, the study indicates the UDT and the lower energy bills are what "hooks" the customers. The study raises the concern that M-Power could become labeled as a "low income" program, potentially acting as a deterrent for non-low income customers.

Table C-1 (continued)
M-Power Market Research-related Studies Performed

Reference	Study Title	Study Period	Subject	Overall Findings
WestGroup Research, Inc., 1999a	Pay As You Go Focus Group Report	Aug 1999	Focus group report, 2 focus groups, joint between SRP and Arizona Community Action Association, opinions on M-Power program	Customer very positive toward the program, which they believed gave them a sense of control. Participants also expressed it made them more aware of their electricity use patterns, and lowest instances of argument over the bill. Most had reported incidences when their power was shut off. Participants also liked that the program gave them an alternative to the "embarrassing" situation of having to go through the disconnect/reconnect process with SRP (on the standard program). The biggest negative trait expressed was the lack of payment machines that were in working order. Self-reported usage traits: power purchased when approximately one day of power left, one-way trip to payment machines approximately one to five miles, amount spent per purchase between $50 and $100, and customers will buy more if they can. Most customers do not store credits on their spare card for emergency purposes (advised by SRP to do so). "Pay As You Go customers felt that the program has significantly helped them manage their electric usage, save money, and would be helpful to a lot of other SRP customers". Most participants said they preferred it to the traditional program and would stay with it in the future.

Table C-1 (continued)
M-Power Market Research-related Studies Performed

<table>
<tr><th>Reference</th><th>Study Title</th><th>Study Period</th><th>Subject</th><th>Overall Findings</th></tr>
<tr><td>WestGroup Research, Inc., 1999b</td><td>SRP/ACAA Pay As You Go Study</td><td>Sep 1999</td><td>Telephone survey report, 179 Pay as You Go customer (precursor to M-Power program); joint study between SRP and Arizona Community Action Association (ACAA), opinions on M-Power program. List of 1,023 current users was provided by SRP, and had been screened to ensure they had been on the program at least one year. 160 more customers were removed for other screening (changed telephone numbers, worked for the utility, no longer a Pay As You Go customer, etc.). "The sample of 179 customers has a margin of error of +/- 6.5% at the 95% level of confidence (with finite population of 863)."</td><td>Overall, Pay As You Go customers were found to be satisfied with the program, with the biggest opportunity for improvement relating to the PayCenters.

73% of Pay As You Go customers rate SRP's performance as excellent or very good

Problems cited included not enough machines and machines out of service, although 29% reported no disadvantages with the program

Approximately one third had applied for "utility assistance" prior to being on the program, and only 7% had applied since being on the program

"Fewer customers recall being disconnected from their electric service since participating in the program."

Those who did have their service disconnected felt, for the most part, that their cases were handled well by the customer service representatives. Seventy-one and 69% agreed that the disconnection was handled "fairly" and "with respect" respectively, and 50% felt their case was handled with comparison.

Fifty-eight percent would rather purchase power from a PayCenter rather than a customer service representative.

Self-reported program statistics include 3.7 purchases per month, power purchased when 4.3 days of power on average left, average one-way trip approximately 5.6 miles, average amount spent per purchase approximately $56.70.

Other self-reported stats
<table>
<tr><td>Ave # times machine broken</td><td>1.1</td><td>(48% reported no machine problems)</td></tr>
<tr><td>Ave # times needed to drive 5+miles</td><td>3.0</td><td>(45% reported never having to)</td></tr>
<tr><td>Ave # of times having to buy power in dangerous neighborhood</td><td>1.2</td><td>(77% reported never having to)</td></tr>
<tr><td>Ave # of times office was closed</td><td>1.2</td><td>(58% reported never experiencing this)</td></tr>
<tr><td>Ave # of times having to write more than one check</td><td>0.3</td><td>(83% reported never having to)</td></tr>
</table>
</td></tr>
</table>

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M-Power: A Better Way to Keep Customers in Power

1.19.07 *Jennie King, Principal Planning Analyst, Salt River Project*

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There is a well-known saying that knowledge is power. For many customers of Phoenix-based Salt River Project (SRP), it's becoming increasing clear that knowledge also results in saving power.

Those customers are enrolled in SRP's M-Power program – the largest residential pre-pay metering program in North America. For 15 years, SRP has offered a prepayment program for its residential customers. What began as a service primarily targeted for low-income or credit-challenged customers is now quickly expanding across SRP's residential customer base.

The public power utility envisioned the M-Power program initially as an additional alternative for its credit-challenged customers. The product was unique and offered an effective way to help this customer segment. However, first generation prepay equipment was costly and difficult to install.

Technological advances have made it more affordable and easier to use, but the company did not envision how popular this program would become.

Customers enjoy the convenience of purchasing power according to their budget (no more monthly bills, late fees or collection letters) and SRP benefits from increased customer satisfaction and improved cash flow (prepay customers are allowed to paydown past due amounts that accumulated under credit tariffs). Without prepay, these past due amounts would have been subject to standard collection processes or write off.

Customers are attracted to the M-Power program because they have the option to pay at their own pace and they have the ability to monitor and control their electric use. Studies indicate that M-Power customers are, on average, reducing their annual electricity usage by 12.8 percent.

In surveys, 90 percent of customers report being very satisfied with M-Power. And 95 percent believe they have more control over the electricity they consume.

Growth Temporarily Stalled

Currently, SRP has more than 50,000 customers enrolled in the residential prepayment program. Approximately 10,000 customers are added to the program each year, and SRP hopes to have 80,000 participating in M-Power by 2010.

While those numbers alone appear impressive, they might have been even larger had indoor pre-pay equipment been more readily available. Vendors that originally provided the meters, user display terminals (UDTs) and automatic pay centers for M-Power were out of the pre-pay metering business by 2003 and SRP was left searching for an alternative.

Fortunately, Ampy Metering Inc., a British-based technology company, was able to step up to the plate. By working with Ampy to develop in-home metering technology, SRP was able to once again begin expanding its popular program.

The special M-Power in-home UDTs are plugged directly into an ordinary electrical socket where they can communicate directly with the primary electric meter. The devices keep track of how much energy the customer is using in kilowatt-hours and in dollars. The display also is able to remind customers if it's necessary to make a new purchase. Data on their display units allows customers to monitor their energy use and modify it accordingly to save electricity and money.

To make electricity purchases, M-Power customers are given two smart cards similar to telephone calling cards. The cards are credited with electricity purchases at SRP PayCenters located around the Phoenix metropolitan area. The card is then run through the in-home UDT, which sends the information to the electric meter. SRP currently offers 52 of the PayCenters, some of which are located in 24-hour or extended hour locations, and has a corporate goal of providing a PayCenter within a four-mile radius of all its M-Power-equipped customers.

In an effort to minimize potential self-disconnects after business hours, SRP has programmed the UDTs to provide a so-called "friendly credit" over the weekends. From 10 p.m. Friday until 6 a.m. Monday, M-Power meters will go into credit mode rather than disconnect a customer who might have exhausted their electricity credits.

Minimal Fees Imposed

Because M-Power is a pre-pay program, there are no late fees, disconnect fees or additional security deposits. M-Power requires a $99 deposit to cover the cost of the UDT. Traditional SRP electric rate customers are charged with a $200 security deposit.

These features, along with the recognized energy savings, have caught the eye of several community-based organizations that have become enthusiastic supporters of the M-Power program. Because customers are more in charge of their energy use, they are able to better budget their electricity funds and avoid turn-offs that on a regular electric plan frequently lead to costly disconnection fees. This allows community-based assistance programs to provide increased services by stretching their relief funds.

"If a customer is out for disconnection, he or she can apply their deposit money to their bill and get started on M-Power," says City of Phoenix caseworker Marcie Widmer. "This opportunity lets a percent go to the old bill and the rest for usage. It's a useful tool to help the client become stable."

SRP has also taken note of the program's contribution to its ongoing conservation efforts. M-Power is having a significant impact on the company's Sustainable Energy Portfolio. The average 12.8 percent energy reduction that pre-pay customers are experiencing is reducing overall energy usage and assisting the company in meeting its Sustainable Portfolio goals. M-Power also addresses a number of sections of the recently approved federal Energy Policy Act that promote conservation for residential electricity consumers.

While M-Power is clearly becoming an institution at SRP, the company is hoping

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that other utilities take notice of the advantages of residential prepayment program and initiate their own offerings. The equipment currently purchased is reasonably priced, but economies of scale could lead to even better pricing in the future. When other utilities start their own pre-pay programs and purchase the technology necessary, they all may see significant decreases in these costs.

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Do you agree or disagree with this article? Send in your own article.

Readers Comments

Date	Comment
Bob Amorosi *2.12.07*	Consider a relatively low-cost real-time in-home portable energy display device that communicates directly both ways with a Time-Of-Use Smart Meter by wireless radio. Consider also the Time-Of-Use Smart Meter is connected to the utility company through an AMI channel that is two-way, used for meter reading but also capable of carrying messages and utility data back to the home-owner through the meter to the display in real time. I suggest this type of device would be a technology solution that simultaneously addresses affordable masse deployment of real-time in-home displays, education of consumers about electricity use and conservation, instant access to accurate bill tracking and present and historical energy use, the ability for utilities to send alert messages and implement effective dynamic pricing, and permit consumers to actively feedback acknowlegments of receiving messages. If the display device uses a radio communication networking standard, such as the modern "Zigbee" protocol, it allows for relatively easy future expansion of its capabilities to adapt the display device to water meters, gas meters, load-shedding thermostats and controls, and Zigbee radio-equipped consumer appliances. This adaptation could be easily performed by simple firmware downloads to the display device throught the meter's AMI channel. Prepaid metering can also be addressed using this display device to actively purchase more energy without having to call in a new purchase over a phone using a credit card. The utility company could receive purchase orders from the consumer for an amount specified by the consumer keying it into the display, and then bill their bank account or credit card automatically. The meter manufacturer Elster Electricity is engaged in the development of this technology in partnership with another company, 4C Energy Solutions. The AMI channel referred to above is Elster's own Energy Axis Meter Administration System connected by the internet or some other dedicated communications pipe to Elster's collector meter nodes, and then through Elster's own radio LAN to each consumer's Smart Meter. If anyone is interested in more details, I would suggest contacting Elster about it.

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RETHINKING PREPAID UTILITY SERVICE

CUSTOMERS AT RISK

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June 2012

Revised June 19, 2012.

ABOUT THE AUTHORS

John Howat is a senior energy analyst at the National Consumer Law Center (NCLC) with more than 30 years of experience in energy policy. Areas of expertise include: design and analysis of low income energy affordability and efficiency programs, low-income utility consumer protections, prepayment and advanced metering, utility credit reporting and utilization of credit scores, and utility rate design. John has managed a range of regulatory, legislative, and research projects across the country in support of low-income consumers' access to affordable energy and utility services. He has represented public agencies and non-profit organizations in a range of capacities in 27 states and as an expert witness in proceedings before state utility regulatory commissions in 11 states. John is author of numerous publications, including co-author of NCLC's *Access to Utility Service*. He has a Master's Degree from Tufts University's Graduate Department of Urban and Environmental Policy.

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ABOUT THE NATIONAL CONSUMER LAW CENTER

Since 1969, the nonprofit National Consumer Law Center® (NCLC®) has used its expertise in consumer law and energy policy to work for consumer justice and economic security for low-income and other disadvantaged people, including older adults, in the United States. NCLC's expertise includes policy analysis and advocacy; consumer law and energy publications; litigation; expert witness services, and training and advice for advocates. NCLC works with nonprofit and legal services organizations, private attorneys, policymakers, and federal and state government and courts across the nation to stop exploitive practices, help financially stressed families build and retain wealth, and advance economic fairness.

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RETHINKING PREPAID UTILITY SERVICE

CUSTOMERS AT RISK

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Electric and natural gas utilities in numerous states have sought to replace traditional "credit-based service" with "prepaid service" delivered through prepayment meters or advanced, digital meters with remote disconnection and reconnection capabilities. (See map of the United States on page 6 identifying currently-operating prepaid service programs.) Traditionally in the U.S., electric and natural gas service has been billed on a post-paid basis where a utility company tracks a customer's usage during the previous monthly or quarterly period and then mails a bill to the customer based on that usage. The customer is then required to make payment within a predetermined time frame or face disconnection procedures. In most states a utility must offer a customer facing disconnection a payment plan to pay down an arrearage over a period of months while retaining access to service.

Prepaid service, as the name implies, requires customers to pay in advance for their service with prepaid account balances decreasing as service is delivered. In most instances, service is automatically suspended when account balances are depleted. While consumers using prepaid service may receive electronic notification that billing credits are running low, there is no obligation on the part of the utility to deliver shutoff notification securely through the mail, to continue providing service for some period of time (e.g., days or weeks) after credits are exhausted, or to work with payment-challenged customers by offering reasonable payment plans or other means of retaining access to basic utility service.

The movement to prepayment allows companies to sidestep critical consumer protections that have evolved over decades while altering the utility's incentives to interact creatively and constructively with payment-troubled customers. State legislators and utility regulators have long recognized that utility service is a necessity of modern life and that loss of service poses a threat to health and safety. Toward this end, they have adopted important utility consumer protections regarding bill payment timeframes, and secure, reliable notification by mail prior to disconnection of service. Many states help to ensure utility bill affordability through discounted rate structures and "arrearage management" programs. In some states, consumer protections include prohibitions or limitations on residential customer late payment fees and security deposits. The movement to prepayment effectively guts these important consumer protections.

Experience in the United Kingdom and the United States demonstrates that prepaid metering and billing is targeted toward and concentrated among low- or moderate-income consumers, particularly those who are facing unaffordable security deposit requirements or disconnection for nonpayment under traditional service. In the largest prepayment program operating in the United States (Arizona's Salt River Project's M-Power program), prepaid electric service is increasingly concentrated among racial minorities. Additionally, prepayment results in more frequent service disconnections or interruptions (a 1997 customer service survey conducted by Centre for Sustainable Energy National Right to Fuel Campaign found that 28 percent of prepayment

customers in Great Britain were disconnected from service over the past year). Also, customers sometimes pay higher rates than they would under traditional credit-based service. Low-income customers using prepaid utility service tend to make numerous, small payments on a monthly basis to retain electricity or natural gas service, often incurring transaction fees that add to the customer's total cost for basic service.

Households with the least means are trapped under prepayment, often paying higher costs and transaction fees while experiencing more frequent, disruptive, and dangerous loss of service. Such a system creates a two-tiered system, favoring wealthier, credit-paying households.

Increased disconnections of gas and electric service that come with prepayment threaten the health and safety of customers, particularly the elderly, disabled, and low-income families with children. Disconnecting natural gas or electric service has caused house fires and extreme indoor temperatures, which can result in illness and death. Implementing prepaid utility service, with the increased rates of service disconnection that result, increases the risk that such tragedies will occur.

With prepaid utility service, low-income customers who struggle to pay their bills often end up paying more for second-class utility service. Access to essential service, delivered by regulated, franchised monopoly utility companies, should not be compromised by a service model that leads to the forfeiture of regulatory consumer protections. **Rather, payment issues related to the inability of some households to afford a basic level of uninterrupted utility service should be addressed through delivery of comprehensive, effective low-income energy efficiency programs, bill payment assistance and "arrearage management" programs, reductions of burdensome late payment fees and security deposits, and implementation of deferred payment agreements that are truly reasonable and based on a household's actual income and expense circumstances.**

The advent of advanced metering infrastructure (AMI) and digital meters, commonly called "smart meters," dramatically increases the potential for new utility prepayment programs. Advanced meters—which include remote disconnection and real-time communication capabilities—obviate the need for utility companies to invest in "standalone" prepayment meters, and reduce the related upfront capital investment required to implement a new prepayment program. The recommendations that follow are based in large measure on provisions of a resolution adopted by the National Association of State Utility Consumer Advocates on June 11, 2011.

Recommendations

The National Consumer Law Center opposes prepaid electric and gas services. However, if a company is allowed to implement prepaid service, state regulatory commissions should require each of the following provisions.

1. **Regulatory consumer protections and programs should be maintained or enhanced.** These include existing limitations or prohibitions on disconnection of service, advance notice of disconnection, availability of payment plans, availability of bill payment assistance or arrearage forgiveness, and the right to dispute bills.
2. **Health and safety risks must be reduced.** When the billing credits of a customer receiving prepaid residential electric or natural gas service are exhausted, the customer must be given a five-day disconnection grace period, after which the customer must be restored to traditional, credit-based service, subject to all rules and customer protections applicable to such service. Prepayment customers should be allowed to return to credit-based service at no higher cost than the cost at which new customers can obtain service.
3. **Vulnerable populations must be protected.** Prepayment service should not be offered to low-income households or households that include any person who is elderly, disabled, or who has a serious illness. Households with young children should also not be eligible to enroll in prepayment service.
4. **Marketing of service should be voluntary.** Prepaid service should only be marketed as a voluntary service and should not be marketed to customers facing disconnection for non-payment. Conditioning service on the method of payment is not marketing—it's coercion.
5. **Payment assistance and arrearage management programs must be adopted or maintained.** Utilities offering prepaid service to low-income customers must also offer effective bill payment assistance and arrearage management programs to those customers.
6. **Rates for prepaid service should be lower than rates for comparable credit-based service.** This lower rate reflects the lower costs associated with reduced carrying costs, collection costs, uncollectible accounts, and shareholder risk.
7. **Costs should be transparent.** Prior to implementation, utilities should demonstrate the cost effectiveness of any proposed prepaid service program and reveal how costs will be allocated among various classes of customers.
8. **Transaction and other junk fees should be eliminated.** Prepayment customers should not pay security deposits or additional fees that traditional customers are not required to pay. Examples of such fees include initiation fees, equipment charges, or transaction fees to purchase billing credits, or frequent payment fees.
9. **Initiate "on demand" service.** Utilities must ensure there are readily available means for prepayment customers to purchase service credits on a 24-hour a day, seven-day a week basis to prevent potential health and safety risks.

10. **Tracking and reporting should be monitored and disclosed.** Prepaid service programs should be monitored to ensure there is not an increased rate of service disconnections for non-payment. Utilities implementing prepaid service programs should track and report to the state regulatory commission on a monthly basis the following data ***separately for credit-based and prepayment residential customers***:
    - Number of customers
    - Number of customers with arrears of 30 days or more
    - Dollar value of arrears
    - Number of disconnection notices sent
    - Number of service disconnections for non-payment
    - Number of service reconnections after disconnection for non-payment
    - Number of new payment agreements entered
    - Number of payment agreements successfully completed
    - Number of failed payment agreements
11. **States should proactively plan for customer protections in case of company default.** States must have adequate financial mechanisms to guarantee that funds prepaid by customers are returned to customers if a company becomes insolvent, goes out of business or is otherwise unable to provide the services for which the funds were prepaid.

Conclusion

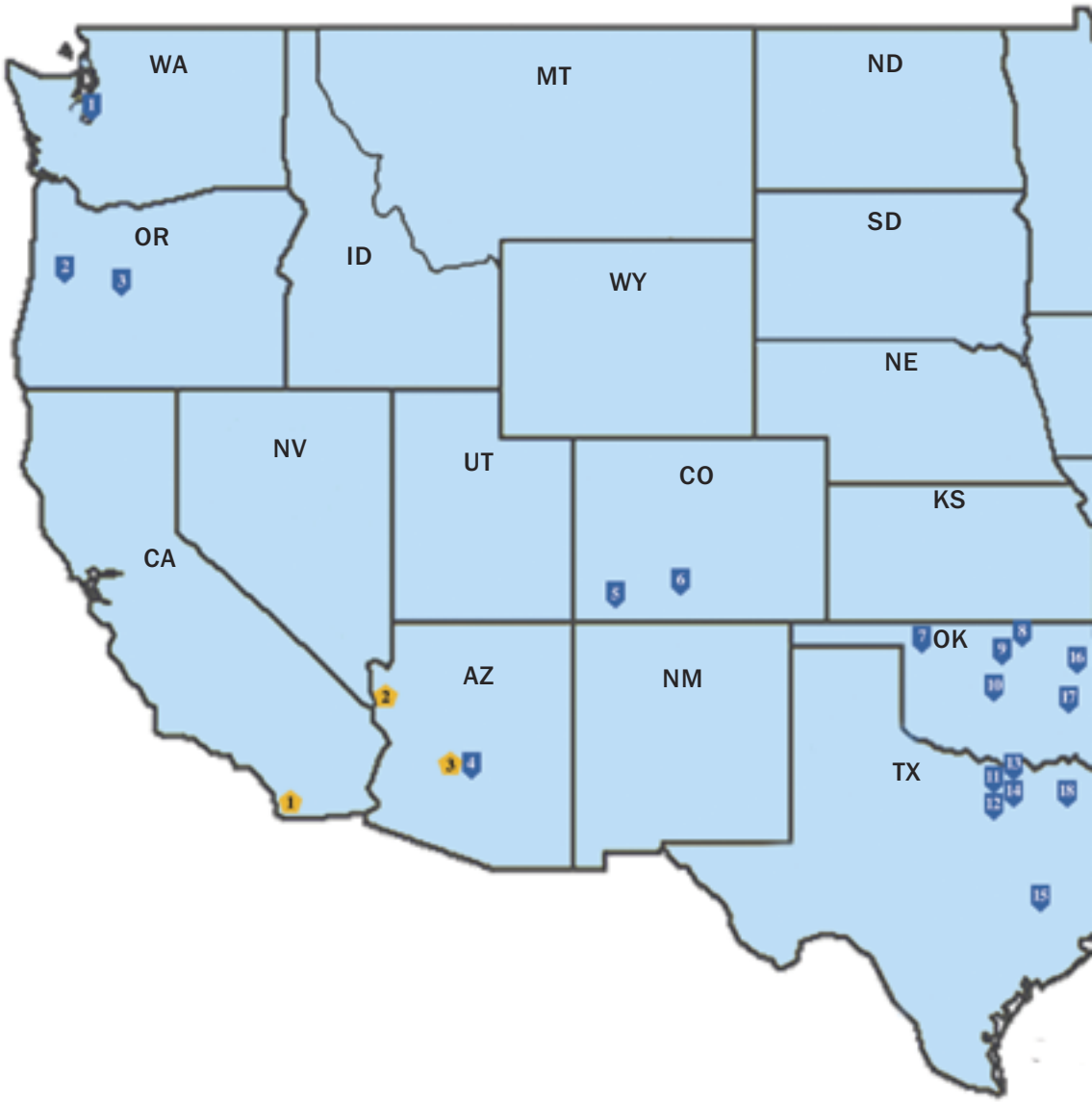
In service territories where prepaid service is already implemented, the implementing utility should answer a series of customer service questions on an annual basis. A list of those questions may be found in Appendix A (page 27).

With prepaid utility service as it currently operates, low-income customers who struggle the most to pay bills often end up paying the most while receiving second-class utility service. Access to essential life-supporting service, delivered by regulated, franchised monopoly utility companies, *should not* be compromised by a service model that allows companies to sidestep important consumer protections that were implemented for health and safety reasons. Instead, payment issues should be addressed through delivery of comprehensive, effective programs and policies that account for a household's actual income and expenses, rather than a punitive prepaid program.

If a utility company is allowed to roll out a prepayment program, it is critical that state governing bodies enact provisions that will not put customers' lives at risk and avoid setting up a two-tiered system which targets low-income and minority customers.

CURRENT AND PROPOSED PREPAID

(current as of

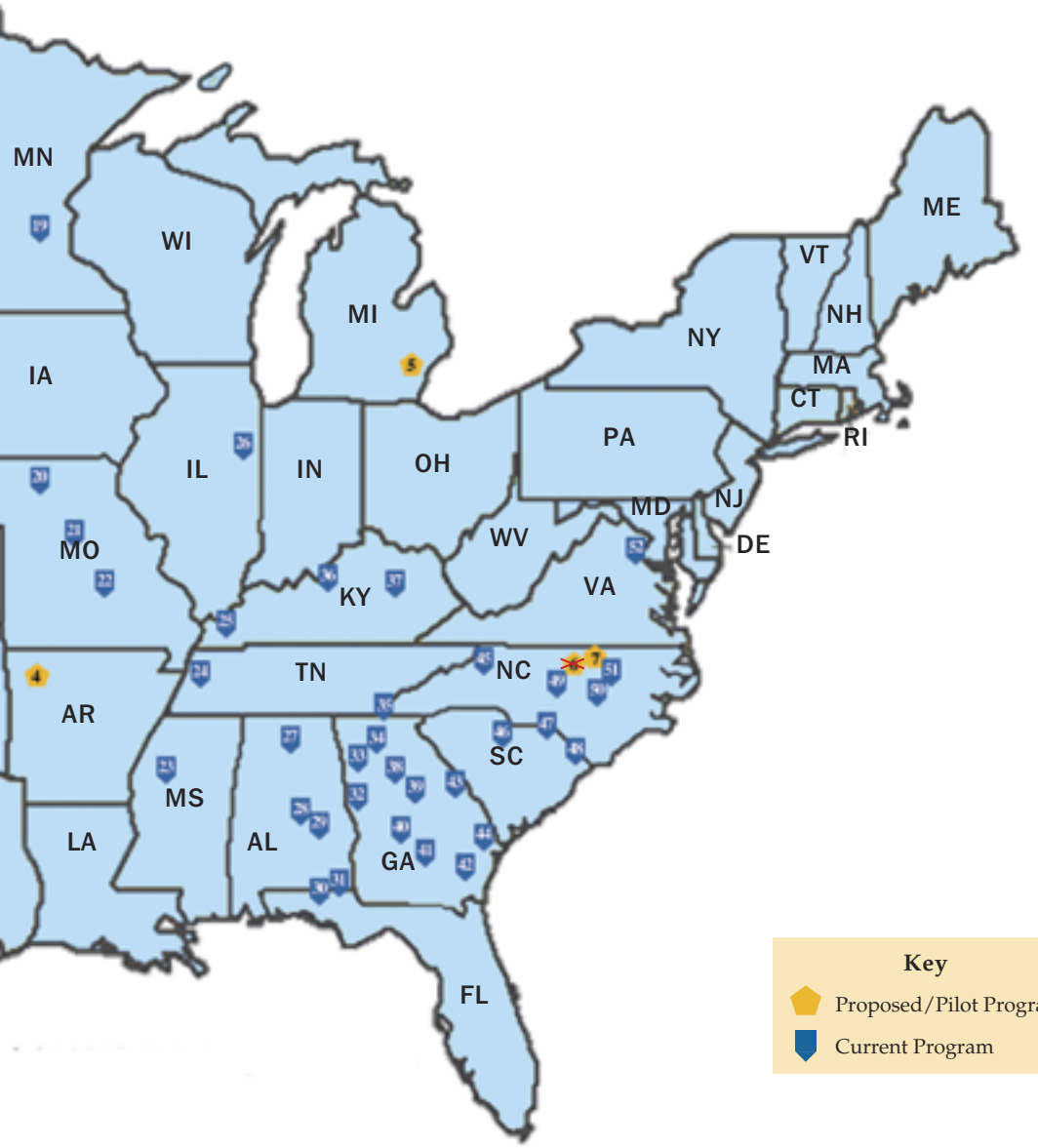


Current Programs

1. Tacoma Public Utilities
2. Lane Electric Cooperative
3. Midstate Electric Cooperative
4. Salt River Project
5. La Plata Electric Cooperative
6. San Luis Valley Rural Electric Cooperative
7. Northwestern Electric Cooperative
8. Indian Electric Cooperative
9. Central Rural Electric Cooperative
10. Oklahoma Electric Cooperative
11. Payless Power
12. United Cooperative Services
13. First Choice Power
14. Direct Energy
15. Mid-South Synergy
16. Lake Region Electric Cooperative
17. Kiamichi Electric Cooperative
18. Wood County Electric Cooperative
19. Minnesota Valley Electric Cooperative
20. Farmers' Electric Cooperative
21. Co-Mo Electric Cooperative
22. Intercounty Electric Cooperative
23. Delta Electric Power Association
24. Southwest Tennessee EMC
25. City of Mayfield
26. Eastern Illini Electric Cooperative
27. Cullman Electric Cooperative
28. Central Alabama Electric Cooperative
29. Dixie Electric Cooperative
30. Choctawhatchee Electric Cooperative
31. West Florida Electric Cooperative
32. Diverse Power Incorporated
33. Caroll EMC

ELECTRIC PROGRAMS IN THE U.S.

March 31, 2012)



34. Greystone Power Corp.
35. Tri-State EMC
36. Nolin Rural Electric Cooperative
37. Jackson Energy Cooperative
38. Central Georgia EMC
39. Tri-County EMC
40. Middle Georgia EMC
41. Irwin EMC
42. Okefenoke Rural Electric Cooperative
43. Jefferson Energy Cooperative
44. Coastal Electric Cooperative
45. Blueridge EMC
46. Fairfield Electric Cooperative
47. Pee Dee Electric Cooperative
48. Hory Electric Cooperative
49. Central EMC
50. South River EMC
51. Town of Selma
52. Rappahanock Electric Cooperative

Proposed/Pilot Programs

1. San Diego Gas & Electric Company
2. Mohave Electric Corp.
3. Arizona Public Service Company
4. Ozarks Electric Cooperative
5. Detroit Edison
6. Progress Energy* Program rejected by North Carolina Utility Commission, June 13, 2012.
7. Wake Forest Power

I. INTRODUCTION: PREPAID UTILITY SERVICE CAN POSE GRAVE RISKS FOR CUSTOMERS, ESPECIALLY LOW INCOME, CHILDREN, ELDERLY AND SERIOUSLY ILL PEOPLE

Prepaid service results in customers experiencing disconnection of service once any billing credits they have paid expire. This poses grave risks for low-income households, households with children, the elderly and seriously ill. Sudden loss of utility service can result in the customer's home becoming dangerously hot or cold, the inoperability of medical equipment, loss of refrigeration of food and medicines, loss of lighting, and loss of the ability to cook food.

> Increased remote service disconnections of gas and electric service as the result of prepaid service threaten the health and safety of customers, especially the elderly, disabled, and low-income families with children. Disconnecting natural gas or electricity service can cause house fires or lead to extreme indoor temperatures, resulting in illness and/ or death. Prepaid utility service increases the rate of remote service disconnection, and the risk that such tragedies will occur.

Generally, utilities that are regulated by state commissions must seek permission when proposing to implement prepaid service to eliminate critical consumer protections, including those related to bill payment timeframes, notification of disconnection, and establishment of payment plans. Such protections were initially established for an important reason: electric and natural gas services are essential to customers' health and safety. Proponents of prepaid service seek to work around these vital consumer protections. In Iowa, for example, legislation was recently introduced that would have allowed for automated, remote disconnection of service if the prepaid account balance ran out by defining it as a "voluntary termination."[1] Prepayment should never undermine the consumer protections that have developed over decades.

The proliferation of advanced meters with remote disconnection capabilities improves the utility business case for prepaid service delivery. With advanced metering infrastructure, relatively minor additional software and communications system upgrades are needed to implement prepaid service. Further, because service terminates automatically as soon as billing credits are exhausted, companies implementing prepaid service do not have any incentives to negotiate effective, reasonable payment agreements or to implement programs to assist low- and moderate-income consumers with costly utility bills. Such solutions help low- and moderate-income customers pay utility bills in a timely manner while staying connected to utilities that provide needed heat, cooling, and power.

Finally, electric service delivery companies in at least one state have gone out of business after receiving prepayment funds from customers, resulting in large unpaid fines and customers losing money paid in advance for service.[2] Companies implementing prepaid service, particularly in states where utility distribution services are "unbundled" from distribution and transmission functions, should be required to post a bond or

Safety Matters in Michigan

Marvin Schur, a 93-year-old Michigan man, had a "limiter" device on his home's electric meter. Similar to a prepayment meter or advanced meter with remote disconnection capabilities, a "limiter" device caps the use of electricity at an individual's home. Once consumption exceeds a level set by the limiter, power is disconnected. In January 2009, a neighbor found Schur's body in his home; he froze to death after his electricity was shut off by the "limiter." On Schur's table was cash clipped to his electric bills.[3]

other assurance to protect prepaid customers' funds. This action helps to level the playing field with traditional credit-based customers who would not experience such a loss.

II. UTILITY CONSUMER PROTECTIONS

Basic energy and utility service is a life necessity. Yet, the circumstances of lower income households often make that service unaffordable. Many states recognize this principle explicitly in their utility laws.[4] Indeed, in most cases utility payment difficulties stem from affordability problems. While prepaid service may allow some customers to avoid certain deposit charges in the short term, it does not enhance the long-term affordability of service.

As noted, each state has adopted critical utility regulatory consumer protections that are intended to shield vulnerable utility customers from loss of essential service. While provisions vary from state to state, virtually every state has adopted laws that require regulated monopoly utility companies to notify consumers by mail of impending service disconnection, to allow a specified number of days after a bill becomes due before disconnection occurs, and to offer payment plans to customers as an alternative to disconnection. However, consumers who enroll in prepaid electric or natural gas service must surrender these basic consumer protections. When prepaid billing credits are exhausted, service is disconnected remotely and automatically without the benefit of the mailed notifications or the offer of a deferred payment agreement that apply to traditional, credit-based customers.

This consumer protection framework has evolved over decades in many states and is intended to prevent disconnecting vital home energy service, particularly where there is financial hardship and where loss of service poses a threat to human health and safety. Prepaid utility service is designed to allow utility companies to sidestep this critical life-saving customer protection blueprint.

A. Bill Payment Timeframes

All states require that, before a payment is considered past due, companies provide customers with a fixed number of days to make payment. Some states require payment in as few as 10 days after a bill is postmarked.[5] Other states allow as many as 45 days to expire before a bill is considered past due.[6] Payment due dates are important because they have direct bearing on the amount of time which must expire before a customer faces the possibility of disconnection. Since there are no bills rendered under a prepayment structure, prepay customers lose these important payment provisions which credit-based customers receive.

Prepaid utility service is designed to allow utility companies to sidestep the critical lifesaving customer protection blueprint.

B. Notification of Disconnection by Mail

Regulations require secure, reliable notification by mail if disconnection for nonpayment is pending. Similar to variations in bill payment timeframes, states have adopted a range of provisions regarding the timing of delivery of mailed disconnection notices. In Arizona, for example, notices must be sent five days prior to actual disconnection of service.[7] Ohio requires a 14-day notice.[8] Prepaid utility customers do not receive notification by mail prior to disconnection. Instead, notification is delivered through less secure, less reliable electronic means.

C. Establishment of Payment Plans

Most states have adopted rules that require utility companies to offer customers special payment agreements as an alternative to disconnecting service or to restore service. Access to reasonable payment plans is key to protect utility customers, but is lost when a customer accepts prepaid service.

In Iowa, for example, customers who have received a disconnection notice are offered a payment plan of at least 12 months. Should the initial payment plan fail after the customer has demonstrated a good-faith effort to make timely payments, a subsequent payment plan of equal or greater duration must be offered.[9] This rule is based on the assumption that most customers want to remain current on their utility bills, but that difficult financial circumstances often lead to payment troubles. The basic right to a reasonable payment plan in Iowa and other states would be lost to customers participating in a prepaid utility program.

III. PREPAYMENT DOES NOT ENHANCE AFFORDABILITY OF UTILITY SERVICE, PROVIDE CUSTOMERS WITH ADDED CONTROL, OR ENHANCE ENERGY EFFICIENCY

Despite claims of proponents, prepayment does not enhance the affordability of utility service, but instead results in added fees, more frequent loss of service, and forfeiture of basic regulatory consumer protections. Further, features of prepaid service that lead

proponents to claim that the service provides participants with added control over their usage and payments—features such as real-time consumption and expenditure information and the option to make numerous, small payments over a monthly periods—are not unique to prepaid service. Such features may be provided to customers without the threat of immediate loss of service that comes with prepaid service, and may often be provided more cost-effectively than prepayment. Finally, while some proponents cite conservation and energy efficiency gains that come through implementation of the service, there is currently little or no compelling evidence that reductions in usage among prepayment participants are not attributable to deprivation (e.g., sacrifice of other necessities or disconnections that come automatically when billing credits are used up).

A. Claims of Affordability

Given that prepaid service customers must pay in advance while facing heightened risk of disconnection, prepayment customers should arguably pay less than credit-based customers. Yet this is not the case as prepaid service rates are in all cases in the U.S. equal to or higher than those paid by similarly-situated credit-based customers. In addition, although proponents of prepayment point to the prospect of foregone security deposits and late payment fees, companies often charge prepaid customers higher rates, equipment deposits and a range of new service fees. For example, utilities in at least one state impose additional fees on prepayment customers who make payments more frequently than once a month. These fees gouge financially strapped customers and do not enhance affordability of utility service. (Information about rates, charges and fees associated with specific prepayment programs is provided further in this report.)

With respect to the claim that prepaid service allows customers to avoid security deposits, it should be noted that some states simply prohibit utilities from charging residential customers any security deposits or late payment fees. In Massachusetts, for example, no electric or natural gas utility company under the jurisdiction of the state utility regulator may require a security deposit of a residential customer as a condition of providing service.[10] Clearly, imposing prepaid service is not the sole means of addressing the difficulty some customers face in paying security deposits and late fees.

Further, prepaid service does not enhance affordability by decreasing or writing down any arrearages (past due utility bills) that may have accrued. For low-income households, utility arrearages are attributable primarily to inability to afford monthly utility bills, household and living expenses. While prepayment allows utilities to avoid dealing with customers' payment difficulties, it does nothing to change the fact that for many households, there simply is insufficient income to pay for monthly utility service and other necessities of life.[11]

Data from the United Kingdom (U.K.) shows that prepayment customers with arrears pay higher weekly repayment amounts than similar customers using the credit system.[12] Ofgem, the UK energy regulator, noted: "We are concerned by this given that PPM (prepayment meter) customers are more likely to be on low incomes."[13] A 2010 study by Consumer Focus explains the disparity. Only half of prepaid customers surveyed agreed that their repayment rate was mutually acceptable.[14] Thirty percent of those surveyed said they had minimal or no consultation with the supplier about the rate and 14 percent

said the supplier set a rate higher than they were comfortable with.[15] The report notes this trend despite a law stating that suppliers "are required, when setting debt repayment levels, to establish the consumer's ability to repay."[16] Surveys of prepayment customers in Northern Ireland reveal a similar tendency. Eleven percent of households with debt reported that their repayment rate was determined by the energy company without consulting the customer.[17] Thus, unless prepayment of current bills is coupled with an "arrearage forgiveness" feature or an arrearage repayment component that is reasonable and affordable to the customer, it does not enhance the ability of customers to retire back bills.

Rather than introducing prepaid service or other punitive means of changing payment patterns, utilities should address problems with customer arrearages and payment difficulties using incentives.

Prepayment does not enhance affordability of utility service. Rather than introducing prepaid service or other punitive means of changing payment patterns, utilities should address problems with customer arrearages and payment difficulties using incentives. Examples include comprehensive, effective energy efficiency programs; bill payment assistance and arrearage management programs; reductions or elimination of burdensome security deposits and late payment charges; and implementation of deferred payment agreements that are reasonable and based on a household's actual income and expense circumstances.

B. Claims of Added Control

Proponents of prepaid service claim that it provides customers with increased control over their utility bills, that customers reduce consumption, and that as a result utility service is made more affordable for low-income customers. These claims are often misleading and require further scrutiny. For example, the claim regarding greater control over utility bills is often based on the notion that prepayment customers have access to energy consumption and billing information on a real-time basis, and are therefore more likely to reduce consumption and not be surprised by large monthly bills that must be paid after consumption occurs. The claim also hinges on the ability of customers to make payments—large or small—at any time. However, these benefits are not unique or limited to prepaid service delivery. Advanced meters and other "consumer feedback" mechanisms can provide real-time information to customers about the cost of the utility services they are using whether the customer is on a prepaid program or a traditional credit-based service plan. Further, nothing prevents a utility from accepting payments throughout the month from customers who are not on a prepayment program that disconnects service as soon as billing credits expire.

Further, while prepaid service proponents claim that the programs help payment-troubled customers manage their energy budgets, it removes incentives that exist under the credit-based system that encourage a mutual negotiation of payment plans, particularly for customers with conditions or circumstances that entitle them to special protections. If a credit-based customer accrues a debt, it's in the utility company's interest to develop an affordable payment plan to collect on the past due balance. Under prepayment arrearages do not accrue. Therefore, utilities can skip the negotiation and mandate

payment under a flat rate that fails to account for household circumstances or ability to pay. This sets up an inequitable, two-tiered system of service delivery to customers.

C. Claims of Energy Efficiency and Conservation

The claim that prepayment customers use less energy, save money on utility service, and therefore have more affordable utility service must be examined carefully. At least one utility company has proposed a prepayment program as part of its demand response program portfolio (used to reduce use of electricity during peak usage times to reduce strain on the power supply).[18] While there are reports of a "conservation effect" of prepayment,[19] proponents argue that the effect is due, at least in part to the fact that prepayment "requires consumers to pay attention to when and how, they use electricity, *allowing* them to make immediate adjustments in usage to lower their bills."[20] (emphasis added) However, the extent to which this "conservation effect" is attributable to forced usage reduction to avoid complete loss of light, cooling and heat, or even from reduced usage that occurs after being remotely disconnected is not clear. There is currently no conclusive evidence demonstrating the source of any usage reductions associated with prepayment. Unlike efficiency measures that generate real energy savings for a consistent level of work (e.g., heating, cooling or light), forced usage reduction or remote disconnection of service simply cannot be considered an enhancement to the quality or affordability of utility service.

D. Utility and Shareholder Advantages

While customers face grave risks from prepaid service, utility companies reap substantial benefits from placing lower-income customers on prepaid service. With prepayment, utilities may reduce or eliminate paper billing and notification of impending service loss. In addition, customer arrears are eliminated or dramatically reduced. Similarly, the risk that uncollectible accounts of prepayment customers will have to be written off is eliminated. Finally, prepayment allows companies to dramatically reduce short-term capital costs, such as those associated with carrying arrears, credit and collection costs associated with billing and notification of disconnection, and costs associated with customer service representatives and call centers.

Because it allows utility companies to simply disconnect customers before they fall behind on their bills, prepayment is the ultimate *utility arrearage management tool*. No longer do companies need to try to collect from customers in debt, nor do companies need to worry about escalating uncollectible accounts. In estimating the utility's return on investment in purchasing prepayment software, the biggest savings by far to the utility are bad debt savings. According to PayGo, a prepaid service software company, bad debt savings comprise nearly 80 percent of the estimated savings if utilities adopt prepayment:[21]

As PayGo's estimates show, prepayment serves as an extraordinarily effective collection tool. In contrast to credit meters, prepayment customers cannot accumulate debt if their electric service is unaffordable. They are simply cut off from service. Not only are customers automatically disconnected if they cannot pay, but prepayment guarantees that customers with past arrearages are steadily paying their debt off. Most programs

Table 1: **PAYGO PROJECTIONS OF UTILITY SYSTEM BENEFITS OF PREPAID SERVICE**

	Year 1[22]	Year 2	Year 3	Year 4	Year 5	
Number of Customers	2,000	4,000	9,000	12,000	15,000	
Number of Truck Rolls	—	—	—	—	—	
Truck Roll Savings	—	—	—	—	—	
Support Service Savings	$48,000	$48,000	$48,000	$48,000	$48,000	0.9%
CSR Savings	$139,200	$278,400	$626,400	$835,200	$1,044,000	19.5%
Bad Debt Savings	$568,000	$1,136,000	$2,556,000	$3,408,000	$4,260,000	79.6%
						100.0%

Table Modified from PayGo

will automatically allocate a percentage of a customer's electric payments toward paying down past debt. The Minnesota Valley Electric Cooperative assesses a 50 percent repayment rate if a customer enrolls in prepayment and has a past arrearage, meaning that if a customer pays $1, the customer gets only 50 cents worth of electric credit.[23] Arizona's M-Power program dedicates 40 percent of a customer's payment to past due debts.[24]

In short, with prepayment, the costs and challenges associated with low-income customers' payment difficulties are no longer the concern of the utility company; they rest solely with the low-income customer. But, as discussed previously, low-income customers bear the added health and safety risks when universal access to basic utility service is denied.

IV. RATES, CHARGES, AND FEES

As previously described, proponents of prepayment often describe the service as a customer budgeting tool, but the reality is that many low-income customers end up paying more for their electricity bills than credit-based customers. So customers with the least means pay the most for an essential service. While some prepayment customers may avoid traditional security deposits, they rarely, if ever, pay lower rates for prepaid service, even though it brings numerous advantages for utility companies. For example, customers enrolled in the Arizona-based M-Power Prepaid Program with average usage will pay $38 more than credit customers each year.[25]

Another prepaid program, offered by the Choctawhatchee Electric Cooperative (CHELCO) in Florida, also results in higher costs. CHELCO charges prepaid customers a higher fixed rate for service than it does for credit customers. Over the course of a year, CHELCO prepaid customers will pay an extra $127.75 in fixed costs than the utility's

credit-based customers.[26] The increased cost comes from two sources: a contract with an outside company to manage the daily calculations on prepayment accounts and equipment that can remotely disconnect accounts. Customers with prepaid service pay an extra $54.75 a year to give the utility the ability to seamlessly terminate their power.[27] While the company touts the lower deposit requirement for prepaid customers, other costs quickly erode any cost advantage that prepayment provides.[28]

Prepayment programs often include burdensome junk fees, including transaction fees, monthly program fees, and reconnection fees. The Horry Electric Cooperative in South Carolina, for example, charges prepayment customers a $12 monthly equipment charge.[29] Customers avoid the $200 deposit required on other residential accounts, but they pay an extra $144 annually for prepayment service. Unlike credit customers, they will pay this amount every year whereas customers only need to pay a deposit once.[30]

In the deregulated Texas retail electricity market, numerous Retail Electric Providers (REPs) offer prepaid electric service. The prices, terms and conditions of these products vary, but many involve the imposition of substantial fees on customers. The REP Smart Prepaid, for example, charges a $2.95 payment processing fee each time a customer refills a prepaid account balance, an enrollment fee, and a variable disconnection fee.[31,32]

While some prepayment customers may avoid traditional security deposits, they rarely, if ever, pay lower rates for prepaid service, even though it brings numerous advantages for utility companies.

The West Florida Electric Cooperative charges a $2 transaction fee every time a prepayment customer purchases electricity.[33] Prepayment proponents argue that frequent payments help families budget and conserve electricity but transaction fees quickly inflate the cost of prepayment.

V. PREPAYMENT EXPERIENCE IN THE UNITED KINGDOM AND THE UNITED STATES

Experience in the United Kingdom (U.K.) and the United States (U.S.) demonstrates that prepaid metering and billing is concentrated among low or moderate income customers, many of whom are facing service disconnections for nonpayment. Prepayment results in frequent service disconnections or interruptions, and it is sometimes delivered at a higher rate than traditional credit-based service. In general, prepaid service is offered to customers on what is termed a voluntary basis. Further, when a prepayment customer experiences a service disconnection, it is referred to among many in the prepaid service industry as a "self-disconnection" or "voluntary disconnection." However, a customer who is facing imminent loss of essential service—often with devastating consequences—may surrender consumer protections and access to a reasonable payment agreement to keep service in the short term.

A. United Kingdom

In the western world, the United Kingdom (U.K.) took the lead in prepaid electric service, approving prepayment as a billing option in the 1980s. Prepayment meters are now common in Great Britain, which began deregulation of its utility industries even earlier than experiments in the U.S. began. By 1989, about 3.7 million electricity customers and 1.1 million natural gas customers in Great Britain used prepayment meters to pay for utility service. The number of customers using the systems nearly doubled between 1990 and 1997.[34] Currently, about 6.2 million residential natural gas and electric utility customers in Great Britain use prepayment meters, representing about 13 percent of all installed residential meters.

Table 2 **Surveying Great Britain Prepayment Customers**

54%	Used "emergency credit" to retain utility service
45%	Cut back their energy use
22%	Gave up other necessities (e.g. food) to stay connected
16%	Had "self-disconnected" at least once over the previous year

Source: "Cutting back, cutting down, cutting off: Self-disconnection among prepayment meter users" by Hannah Mummery and Holly Reilly, *Consumer Focus* July 2010, page 17.

Historically, a vast majority of prepayment meter users in Great Britain were low-income customers.[35] Utility companies there target marketing of prepayment meters to low-income households in arrears, even though they charge substantially more for service delivered under prepayment than for service paid for by traditional billing means or through direct debit.[36]

Not surprisingly, many utility companies have reported a significant decline in the rate of traditional, utility-initiated disconnections since the proliferation of prepayment meters in low-income households. However, there has been a steep increase in the number of "self-disconnections," which occur when a customer's credit balance is depleted. (For more information on rates of service disconnections, see Section D on page 20.)

In short, utility deregulation in Great Britain has coincided with the proliferation of prepaid service in low-income households. Utility companies have turned to the technology as a means of managing arrearages (past due bills). Prepayment customers pay the highest rates for service. The highest utility rates in Great Britain were paid by those least able to afford them, and a relatively high proportion of customers using prepaid service are disconnected at least once per year.

Prepayment meters in Great Britain are still concentrated disproportionately in lower-income households. Sixty percent of electricity and natural gas customers with prepayment meters in 2010 had annual incomes below £17,500 ($27,704). Further, over half of prepayment meter customers received a means-tested benefit, nearly half had an unemployed head of household, and more than a third had one or more household members with a long-term physical or mental illness or disability.

Similar to the Salt River Project in Arizona (see page 17) experience, average income among prepayment customers in Great Britain is declining. In 2008, the average household income for prepaid customers was £16,091 ($27,523). By 2009, the average income fell to

£13,466 ($21,929).[37] The number of customers with disabilities increased from 26 percent to 39 percent.[38]

Northern Ireland's prepayment programs provide the only example of a program that enrolls affluent customers in any significant numbers. The country's program is unique, however, because prepayment customers receive a 2.5 percent discount on energy rates.[39] Nonetheless, low-income individuals comprise 58 percent of the prepayment customer base in Northern Ireland.[40]

Utilities in Great Britain do not report the number of service disconnections experienced by customers using prepayment meters or service. However, disconnections for non-payment among credit-based customers are reported to the Office of Gas and Electricity Markets. Not surprisingly, many utility companies have reported a significant decline in the rate of traditional utility-initiated disconnections since the proliferation of prepayment in low-income households, where disconnections are not reported.

B. United States

At least 52 utilities in 18 states currently operate prepayment electric programs in the United States. Electric cooperatives comprise the majority of utilities that offer prepayment utility service. Implementation of prepaid utility service is concentrated in service territories served by publicly-owned utility systems that are not subject to the full regulatory jurisdiction of state utility commissions.

Salt River Project (SRP) in Arizona through its M-Power program and Oklahoma Electric Cooperative deliver large-scale prepayment programs. In Texas, which has a largely deregulated retail electricity market, at least six Retail Electric Providers deliver prepaid service through advanced meters. Investor-owned or privately-held utilities have proposed or are considering prepayment programs in Arkansas, Arizona, California, Delaware, Florida, Louisiana, North Carolina, and Oklahoma.

A Way to Evade Consumer Protections?

Prepayment should never undermine the consumer protection framework that has developed over many decades. One of the most troubling aspects of prepaid service is the use of the term "voluntary" to describe disconnections and justify the shift from a structure based on consumer protections and regulatory oversight of disconnections to one where loss of service is invisible and undocumented. *The notion that low-income households voluntarily opt to go without service or reduce usage to levels that may have detrimental impacts on well-being is not defensible.*

Most of the prepayment programs in the United States—both existing and proposed programs—are in states where utilities are subject to relatively weak regulatory consumer protection and oversight, with the exception of Iowa and California. (In 2011, a prepayment program was proposed in Iowa but after newspaper accounts raised questions regarding the health and safety risks no action was taken by the legislature.)[41]

Prepaid service proposals that are subject to the jurisdictional authority of state utility regulators must include a petition for permission to bypass, modify, or eliminate consumer protections regarding service disconnection notifications and timelines. Protections that require companies to offer a reasonable payment agreement as an alternative to service disconnection must also be bypassed by prepayment proponents. Protections, adopted in various forms by regulators in *every* state in the U.S., reflect that electric and natural gas services are essential to the health and safety of people.

Iowa proponents of prepaid service sought legislation to work around these important consumer regulations by defining a remote disconnection of service as a 'voluntary termination.' The filed bill stated that an electric utility may install

> a prepaid metering system and equipment that is configured to terminate electric service immediately and automatically when the customer has incurred charges for electric service equal to the customer's prepayments for such service. *The automatic termination of electric service once the customer's prepaid limit has been reached shall be considered a voluntary termination of service by the customer and shall not be considered a disconnection by the utility for purposes of this chapter and applicable rules adopted by the board.*[42] (Emphasis added.)

Thirty-eight percent of electric utilities are exploring prepayment as a billing option and industry research has predicted that eleven percent are likely to implement a prepayment program in the near future.

No investor-owned utilities (IOUs) outside of Arizona, Texas, and Michigan have received approvals to deliver prepaid service. However, state utility regulators are considering IOU pilot proposals in a few states, including California.[43] According to a recent study, 38 percent of electric utilities are exploring prepayment as a billing option. A utility industry research firm has predicted that 11 percent of utilities are likely to implement a prepayment program in the foreseeable future.[44]

Salt River Project (SRP), Arizona's second largest electric utility and the third largest municipally owned utility in the United States, operates the SRP M-Power prepayment meter program, the largest program of its kind in the United States. The program included 100 customers in 1993 but had grown to 20,000 "budget challenged" participants by April 2002. Currently, over 100,000 customers are enrolled in the SRP program.

Lower-income households make up the vast majority of SRP prepayment program participants and the median income of M-Power customers has declined considerably in recent years. In 2007, the median participant income was $27,500. Within a year, it dropped to $19,500. In 2010, the median income fell below the poverty level for a family of three or more to $17,900.[45] In 2010, 82 percent of program participants had household income of less than $30,000.

A study of customers in the M-Power program shows that the proportion of racial minorities enrolled in prepayment service is increasing. Surveys prior to 2010 showed

that Hispanics comprised 22 to 23 percent of customers but in just two years, that percentage has leaped to nearly 50 percent (they comprise 41 to 48 percent).[46] In Phoenix, the largest city served by the Salt River Project, Hispanics account for only 40.8 percent of the population.[47]

A 2009 analysis showed that M-Power customers are "more likely to be relatively young, have families, be relatively low-income, be low electricity consumers, live in apartments, have been SRP customers for less than five years, and have unsatisfactory or "new credit ratings" compared to other residential customers.[48] On average, the head of a household with a prepaid meter is 36 years old, makes an average annual income of $24,400, and is Hispanic.[49]

Salt River Project's M-Power prepayment meter program in Arizona is the largest in the U.S., with more than 100,000 customers. On average, the head of a household with a prepaid meter in this program is 36 years old, makes an average annual income of $24,400, and is Hispanic. What's more, prepayment customers pay a rate that is higher than traditional, credit-based service customers.

Despite the high participation in the SRP program among low-income households, participants pay a rate that is higher than traditional, credit-based service. SRP prepayment customers pay a flat rate per kWh which varies seasonally, plus a monthly service charge of $15, which is collected through periodic deductions from the account balance. While summer prepayment and conventional rates and charges are comparable, SPR charges prepayment customers a higher rate during winter months. Thus, assuming consistent consumption levels, prepayment customers—predominantly of lower incomes—pay more than customers using traditional service.

While there are no late payment fees, SRP prepayment customers must pay a variety of fees and deposits before obtaining service and after service is established. There is an initial $99 deposit for an in-home display box, as well as a $28 (plus tax) service establishment fee. There are additional fees if the in-home display needs to be cleaned or replaced. If there is a credit balance remaining when a customer wishes to discontinue service, a $25 fee is charged to obtain a refund. In addition, there are fees charged to customers to use a remote pay center and for some telephone payment activities. Despite making inquiries to SRP personnel, NCLC was unable to obtain information detailing how much an average prepayment customer pays in fees on an annual basis. Further, SRP does not release data on rates of disconnection among its prepayment customers.

C. Marketing

Many utilities market prepayment service as a customer budgeting tool, describing prepayment as a "pay-as-you-go" plan.[50] Companies highlight the flexibility of smaller, more frequent payments and emphasize that consumers will no longer be surprised by a high bill at the end of the month. First Choice Power, a Texas utility, summarizes a common marketing pitch in their prepayment slogan: "$0 DEPOSIT. NO CONTRACT. NO CREDIT CHECK."[51]

Pee Dee Electric Cooperative (PDEC) in South Carolina stresses that one of the most compelling features about prepayment is that no deposit is required. In a customer information video, PDEC's Vice President of Member Services says they began the program after customers balked at paying high deposits.[52]

Other companies compare prepayment electric service to filling up a gas tank.[53] Rappahannock Electric Cooperative, a Virginia-based municipal utility, discusses its marketing strategy for a proposed prepayment program: "Much like people tend to think about their gas mileage when they fill-up their cars, REC believes that people will think about ways to be more thrifty and conservative in the way they consume electricity when they regularly, at their convenience, elect to add to, or 'fill-up,' their Prepayment Account Balance."[54] Companies emphasize conservation, flexibility, customer control, and increased information.[55]

D. Disconnections

Proponents of prepaid electric service often argue that such service actually decreases the number of customer disconnections, contributing to increased energy security for customers.[56] KEMA, a utility consulting company, praises prepaid service's high penetration rate in the United Kingdom, arguing that the service drastically reduced disconnections due to debt. They report: "There are fewer disconnections in the UK for reasons of debt (only 1,361 in 2003; versus 70,000 in 1990)."[57] Such claims are misleading. British regulators categorize disconnections under prepaid service as "self-disconnections." The change in categorization is responsible for the staggering reduction in disconnections. An independent report observed, "When self-disconnection occurs it is only the people living in the property who know about it. Even energy supply companies remain unaware that one of their customers has self-disconnected."[58]

Customer surveys, however, have helped fill the information gap. Accent, an independent research firm in the UK, surveyed prepaid customers. They found that 9 percent of prepaid electric customers were disconnected in the past 12 months.[59] Credit customers experienced a disconnection rate of about one tenth of one percent during the same time period.[60] Further, a 1997 customer service survey conducted by Centre for Sustainable Energy National Right to Fuel Campaign found that 28 percent of prepayment customers in Great Britain were disconnected from their service over the past year.[61]

Research shows that the rates of disconnection due to lack of funds are increasing in the United Kingdom. Between 2008 and 2009, the number of customers reporting disconnections for lack of funds increased from 21 percent to 39 percent and an increasing number of customers were disconnecting with greater frequency. The duration of disconnection also lengthened, with less than half of customers disconnecting for more than a day in 2008 whereas most customers disconnected for more than a day in 2009.[62] While most customers are disconnected for short periods, the poorest customers are disconnected the longest.[63]

In the United States, newer advanced metering infrastructure (AMI) systems can track disconnections but not all prepaid electric programs use AMI technology. The lack of

transparency on the true effects of prepaid is exacerbated by the fact that all prepaid electric programs in the U.S.are run by cooperatives and municipal utilities. Cooperatives and municipal utilities are typically not required to report their disconnection rates and they usually fall outside the purview of state utility boards.[64] Arizona's Salt River Project's M-Power program, the largest prepaid electric program in the U.S.,[65] refuses to share any data on disconnections with the National Consumer Law Center, although a 2006 SRP study of eight M-Power households shows that three households reported running out of power. If the households were representative and randomly selected, the rate of disconnection would be quite high.[66] The National Consumer Law Center could not obtain disconnection rates for any prepaid programs, although the Oklahoma Electric Cooperative (OEC) reports, "Less than 50 percent of OEC pre-paid accounts have been disconnected."[67]

Even when customers remain connected, many engage in harmful self-rationing. Self-rationing occurs when households reduce spending on certain household expenses in order to pay for energy. Again, the U.K. is the only source of information available. A 2010 study (see Table 2) found that half of prepaid meter customers self-rationed, spending less on food, heat, or medicine. One customer reported that she had stopped vacuuming her house and cut back on laundry to keep the electric meter running.

"Sometimes I am not able to wash my clothes because I can't afford the washing liquid to do it, which is not right because I do like to have clean clothes to wear."[68] Others prioritized energy bills over other financial obligations.[69] One in ten prepaid service customers spent less on other bills and 6 percent of households reported missing payments on their other bills.[70] Customers reported going without heat, eating microwaveable meals, or skipping meals altogether.[71] Despite these measures, those who self-ration are more likely to disconnect.[72]

E. Reported Customer Satisfaction

In studies designed and conducted or commissioned by the SRP in Arizona, prepayment customers generally report a high satisfaction level with the program. However, the same studies show that customers continue to be dissatisfied with aspects of the program, particularly with payment methods. To re-load the meter, customers must travel to a location with a pay center self-service kiosk. Seventy-one percent of customers surveyed in 2006 said they experienced a problem with an inoperable pay center in the previous year. The longer customers remain in the prepayment program, the more dissatisfied they are with the pay centers. When looking at overall experience, SRP's credit customers reported a better overall experience (50 percent) compared to prepayment customers (44 percent) in 2010.

The National Consumer Law Center is not aware of any Salt River Project customer satisfaction survey that asks customers if they would prefer paying arrearages through a reasonable payment agreement versus taking a service option that entails automatic disconnection as billing credits expire.

This may explain in part why the turnover rate for the M-Power program is high, with customers enrolled in the program for 20 months on average. The Electric Power Research Institute (EPRI) speculates that the population that uses M-Power is more transient than its credit customers but the report did not disclose whether such customers switched back to the credit-based system or any other data that would back up its assertion.[73]

SRP's M-Power customer surveys may not fully capture the extent to which customers are aware:

1. That they are paying a higher rate for service,
2. That M-Power prepaid customer disconnections may be considerably higher than those of credit-based customers, or
3. That in other utility service areas, customers may have access to reasonable payment plans and other consumer protections geared toward helping customers with financial hardships retain access to service.

VI. TECHNOLOGY

Since its inception, the technologies enabling utilities to implement prepayment programs have evolved and advanced. However, the fundamental concept and motivations behind the service have not changed over time.

A. Early Technologies

In the United Kingdom, the first prepaid customers loaded credit onto the meter by inserting a coin in a slot on the device.[74] The next generation of meters used tokens, keys and cards to load credit. In the United States, SRP's M-Power program in Arizona initially used a configuration where an in-home display (IHD)—a device that displays customer energy consumption and expenditure information—was hard-wired to the customer's meter. Gradually, the program used a Powerline carrier (PLC) to facilitate communication between the meter and the IHD through existing home electrical wiring; but the fundamentals of the program remain. M-Power customers buy credit at a self-service kiosk called a PayCenter using a Smart Card. The customer then inserts the Smart Card into the in-home display, re-loading the meter.[75] The utility's back office personnel can also process transactions by telephone or by check.[76] The meter has remote disconnection capability and there is real-time bi-directional communication between the utility's back office and the meter.[77] SRP integrated the back office systems and the customer information software over time.[78]

In Great Britain, prepaid meter customers bore the added cost of maintaining a separate system of electric service and the transactional costs of frequent payments. Customers often paid rates that were considerably higher than those paid by credit-based customers.[79] Many utilities in the U.S. have historically resisted prepayment in part because of

the high capital and maintenance costs of the technology.[80] However, most utilities currently considering proposals plan to offer prepayment service as part of their AMI, or "smart meter" programs.[81]

B. "Smart" Meters Advance Prepayment Programs

Advanced or "smart" meters can provide instant communication between the utility company and a customer's meter. Unlike older prepayment technology, these newer systems can easily switch customers from credit to prepayment service, adjust for fluctuations in energy prices, and provide one billing system for all customers.[82] When a prepayment customer's credit becomes depleted, advanced meters may remotely disconnect customers immediately and seamlessly. AMI dramatically increases a utility's economic potential to roll out new utility prepayment programs. Utility companies generally obtain regulatory approval to recover investments in AMI based on assumptions that these investments lead to reduced operating costs or the need to invest in new energy supplies or capacity. AMI avoids the cost to invest in "standalone" prepayment meters, and reduces the upfront capital investment required to implement a new prepayment program. To date, companies have not obtained regulatory approval to proceed with investment in AMI based on plans to roll out prepaid service. However, once approval is granted, the bulk of a utility's cost for implementing prepayment is covered.

By the Numbers

Advanced (smart) meter technology dramatically increases a utility's economic potential to roll out new utility prepayment programs.

Smart meters in the U.S.

As of June 2011	20 million
By 2015*	65 million (almost half of all U.S. households)

*Industry estimate

Source: Institute for Electric Efficiency[83]

The Institute for Electric Efficiency (IEE) has documented that as of June 2011, there were about 20 million smart meters in the U.S. By 2015, it is estimated that over 65 million new advanced meters will be installed, representing nearly half of all U.S. households.[83] Unless consumers, advocates, policymakers, and regulators take a stand against implementation of prepaid electric and gas utility service, the potential for new programs in the U.S. is immense.

VII. RECOMMENDATIONS

The National Consumer Law Center opposes prepaid electric and gas services. However, if a company is allowed to implement prepaid service, state regulatory commissions should require each of the following provisions. The recommendations that follow are based in large measure on provisions of a resolution adopted by the National Association of State Utility Consumer Advocates on June 11, 2011.

1. **Regulatory consumer protections and programs should be maintained or enhanced.** These include existing limitations or prohibitions on disconnection of service, advance notice of disconnection, availability of payment plans, availability of bill payment assistance or arrearage forgiveness, and the right to dispute bills.
2. **Health and safety risks must be reduced.** When the billing credits of a customer receiving prepaid residential electric or natural gas service are exhausted, the customer must be given a five-day disconnection grace period, after which the customer must be restored to traditional, credit-based service, subject to all rules and customer protections applicable to such service. Prepayment customers should be allowed to return to credit-based service at no higher cost than the cost at which new customers can obtain service.
3. **Vulnerable populations must be protected.** Prepayment service should not be offered to low-income households or households that include any person who is elderly, disabled, or who has a serious illness. Households with young children should also not be eligible to enroll in prepayment service.
4. **Marketing of service should be voluntary.** Prepaid service should only be marketed as a voluntary service and should not be marketed to customers facing disconnection for non-payment. Conditioning service on the method of payment is not marketing—it's coercion.
5. **Payment assistance and arrearage management programs must be adopted or maintained.** Utilities offering prepaid service to low-income customers must also offer effective bill payment assistance and arrearage management programs to those customers.
6. **Rates for prepaid service should be lower than rates for comparable credit-based service.** This lower rate reflects the lower costs associated with reduced carrying costs, collection costs, uncollectible accounts, and shareholder risk.
7. **Costs should be transparent.** Prior to implementation, utilities should demonstrate the cost effectiveness of any proposed prepaid service program and reveal how costs will be allocated among various classes of customers.
8. **Transaction and other junk fees should be eliminated.** Prepayment customers should not pay security deposits or additional fees that traditional customers are not required to pay. Examples of such fees include initiation fees, equipment charges, or transaction fees to purchase billing credits, or frequent payment fees.

9. **Initiate "on demand" service.** Utilities must ensure there are readily available means for prepayment customers to purchase service credits on a 24-hour a day, seven-day a week basis to prevent potential health and safety risks.
10. **Tracking and reporting should be monitored and disclosed.** Prepaid service programs should be monitored to ensure there is not an increased rate of service disconnections for non-payment. Utilities implementing prepaid service programs should track and report to the state regulatory commission on a monthly basis the following data ***separately for credit-based and prepayment residential customers***:
    - Number of customers
    - Number of customers with arrears of 30 days or more
    - Dollar value of arrears
    - Number of disconnection notices sent
    - Number of service disconnections for non-payment
    - Number of service reconnections after disconnection for non-payment
    - Number of new payment agreements entered
    - Number of payment agreements successfully completed
    - Number of failed payment agreements
11. **States should proactively plan for customer protections in case of company default.** States must have adequate financial mechanisms to guarantee that funds prepaid by customers are returned to customers if a company becomes insolvent, goes out of business, or is otherwise unable to provide the services for which the funds were prepaid.

In service territories where prepaid service is already implemented, the implementing utility should answer a series of customer service questions on an annual basis. A list of those questions may be found in Appendix A.

VIII. CONCLUSION

With prepaid utility service as it currently operates, low-income customers who struggle the most to pay bills often end up paying the most while receiving second-class utility service. Access to essential life-supporting service, delivered by regulated, franchised monopoly utility companies, *should not* be compromised by a service model that allows companies to sidestep important consumer protections that were implemented for health and safety reasons.

Instead, payment issues should be addressed through delivery of comprehensive, effective low-income energy efficiency programs, bill payment assistance programs and "arrearage management" programs, reductions of burdensome late payment fees and security deposits, and implementation of deferred payment agreements. These are examples of effective programs and policies that account for a household's actual income and expenses.

If a utility company is allowed to roll out a prepayment program, it is critical that state governing bodies enact provisions that will not put customers' lives at risk and avoid setting up a two-tiered system which targets low-income and minority customers.

APPENDIX A

CUSTOMER SERVICE QUESTIONS THAT UTILITIES WITH PREPAID SERVICE PROGRAMS SHOULD BE REQUIRED TO ANSWER ANNUALLY

In utility service territories where prepaid service is already adopted, the following questions should be posed "on the record" annually to implementing utilities.

1. Does the utility plan to replace prepayment meters with advanced meters?
   a. If so, will prepayment rates go down?
2. Does the utility track service disconnections among prepayment customers?
   a. If so, can the utility provide data on
      i. Duration of disconnections
      ii. # of "self-disconnections" by month over the past three years
      iii. Annual and monthly rates of "self-disconnection" (i.e., # residential self-disconnections ÷ # of residential customers)
   b. Has the utility conducted analysis or surveys among customers who self-disconnect to determine
      i. reasons for the disconnections
      ii. income and demographics of customers who self-disconnect?
3. Does the utility track disconnections among customers who post-pay?
   a. If so, can the utility provide data on
      i. Duration of disconnections
      ii. # of "self-disconnections" by month over the past three years
      iii. Annual and monthly rates of "self-disconnection" (i.e., # residential self-disconnections ÷ # of residential customers)
   b. Has the utility conducted analysis or surveys among customers who self-disconnect to determine
      i. reasons for the disconnections
      ii. income and demographics of customers who self-disconnect?
      iii. Will the utility provide survey instruments along with results and analysis?
4. Fees
   a. Does the utility charge prepayment customers fees for
      i. Paying by phone
         1. how much?
         2. how many customers pay by this method?
         3. Percentage of M-Power revenues that come from this payment method
      ii. Paying online
         1. how much?
         2. how many customers pay by this method?
         3. Percentage of prepayment revenues that come from this payment method

iii. Paying at a kiosk
    1. how much?
    2. how many customers pay by this method?
    3. Percentage of prepayment revenues that come from this payment method
iv. Paying a third party
    1. how much?
    2. how many customers pay by this method?
    3. What 3rd party fees are involved with this payment method?
    4. Percentage of M-Power revenues that come from this payment method
v. Other payment method?

5. Does any of the utility's post-paying residential customers use in-home devices to track consumption and expenditures?
    a. If so, how do these devices differ from those used by prepayment customers?
    b. Has the utility studied the energy savings associated with use of in-home devices without prepayment?
    c. If so, please provide results of analysis.
6. Energy savings
    a. What is the average energy savings realized by a prepayment customer?
        i. How is this calculated?
        ii. Is baseline consumption of individual customers used to develop savings estimates?
        iii. Has the utility analyzed the factors to which savings are attributable?
            1. self-disconnection
            2. energy efficiency
            3. energy conservationv
            4. Has the utility studied the extent to which prepayment customers engage in "self-rationing," that is, cutting back on other expenditures, including necessities, to stay connected to their electric service?
7. Customer satisfaction surveys
    a. Will the utility share instruments and results of customer satisfaction surveys conducted over the past five years?
    b. In customer satisfaction surveys, are respondents asked whether they may prefer a long-term payment agreement to prepayment as a means of managing arrearages?
    c. How is sampling conducted?
8. Marketing and Enrollment
    a. Among prepayment customers enrolled over the past three years, what proportion came to the program as
        i. a new the utility customer
        ii. an existing the utility customer
            1. with no outstanding arrearage
            2. with an outstanding arrearage
                a. average vintage
                b. average dollar value
            3. with a pending notice of disconnection
            4. with previous disconnections for non-payment

ENDNOTES

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Prepaid Electric Service

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PREPAID ELECTRIC SERVICE

R. W. Beck White Paper

March 2009

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PREPAID ELECTRIC SERVICE

Worldwide approximately 10 million energy consumers receive prepaid electric service in nearly 40 countries. Countries with high levels of prepaid electric service include South Africa, New Zealand, and the United Kingdom. Evidenced by the estimated 100,000 prepaid service customers currently in the United States (U.S.), deployment has been slow here. While prepaid utility service is very popular in other parts of the world, its usage in North America appears to be poised to take off due to technology advances, including Advanced Metering Infrastructure (AMI) and the push for energy conservation. Chartwell's *Prepaid Metering Report 2008, 5th Edition*, asserts "If AMI is the enabler, electricity conservation is likely the new justification."

Background

Until very recently, prepaid electric service systems were monolithic. That is, they were complete unto themselves and did not readily integrate with other utility automation systems. For example, early prepayment systems assumed that all months had 30 days, making it impossible to reconcile the records for prepaid electric service customers with those of credit customers. Among the many problems this created, it made it difficult to transfer financial credits to prepaid service customers from support agencies that operated on a conventional business calendar. Some systems used special electric meters that were different from the rest of the utility's meter inventory, creating new costs in meter management. The newest prepayment systems are integral to the new generation of AMI and can be fully integrated with utility back office and meter operations.

Resistance to prepaid electric service in the U.S. appears to be two-fold. Prepaid meters have been more expensive than traditional meters and some stakeholders, specifically regulators and consumer advocacy groups, oppose this type of service. Investor Owned Utilities (IOUs) tend to lag other types of utilities in offering prepaid service due to the sensitivity in gaining approval from regulators, especially in regions of the country where utility commissions have policies against disconnection for non-payment under certain weather conditions.

Although prepaid electric service has been offered by several utilities in the U.S. for over a decade, this service is evolving as the technology to offer it becomes more readily available. Chartwell estimates that twenty utilities in North America currently offer prepaid service but also report that many programs have not lasted beyond the initial pilot phase due to back-office software integration issues and low levels of customer participation.

The fact is prepaid electric service can benefit both the consumer and the utility. Prepaid service allows the utility to collect revenue earlier in the 60-day credit cycle typical of credit service, permitting utilities to invest and realize a return on revenue and limit write-offs. Prepaid service also decreases the costs associated with dispatching crews to disconnect and reconnect customers

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with credit problems. It also decreases the number of customer service interactions with customers needing to make payment arrangements. For customers, it allows control over the amount of power they purchase, the timing of their purchases, and their usage. It can also offer customers the financial benefit of forgoing deposits to start service, as well as avoiding penalties and charges associated with late payments and reconnection fees, or allow customers to pay off previously accrued electric bills over time.

Energy conservation is another important aspect of prepaid service. Although energy consumption has declined over the last two years, the number of customers who are not paying their electric bills is on the rise, both at the residential and commercial levels. Previously utilities only offered prepaid service as a means to control bad-debt and limit utility financial losses. However, this service is now perceived as a mechanism for energy conservation, a way to provide increased customer control, and a means to increase customer satisfaction.

"SRP now considers prepaid metering a conservation and customer service tool … the display unit makes electricity tangible" says Martha Clyde senior principal planning analyst at Salt River Project (SRP).

Mechanics

Many prepaid systems use a vending option that allows customers to pay for electricity at point-of-sale outlets or kiosks that are available 24 hours a day, 7 days a week. Over the past 10 years, use of smartcards and magnetic strip cards has been a key component of prepaid electric service in the U.S. Purchases made at kiosks, retail outlets, or at the utility's office are recorded on the card at the same time usage information may be transferred back to the utility. The card is then inserted into the display unit at the customer's home. The display unit provides information to the customer related to rate of consumption and the amount of power/money they have left to use. Some utilities do not provide display units, but offer usage and credit balance information over the phone or via a web interface. Prepaid programs let consumers know when their energy credit is running low, either through warning messages on the display unit or by text or phone notification.

Historically, once the money ran out, the service was disconnected until the customer made an additional purchase with the smartcard and re-loaded the display unit. Newer systems facilitate purchases via the phone or Internet, as well as allowing switching from self-disconnect to credit mode so electric service is extended even after the prepayment funds are exhausted. SRP recently instituted a "credit-friendly" period on weekdays from 6 P.M. to 6 A.M., as well as all day on holidays and weekends so that customers' electric service will not be interrupted at times that may be inconvenient to re-charge their smartcards.

A significant change in the industry has occurred over the last 18 months where AMI systems with service switches integral to the meters has shifted the pre-pay service landscape from the old "prepay meters" to "AMI" technology. Once utilities put AMI in place, prepaid service can be offered using simple and straightforward application programming, and very little

infrastructure. With AMI, the utility has the ability to limit the customer's load to a specified set point, allowing the operation of only a few specific appliances, lights or a predefined or prepaid amount of power as desired by the customer or utility. Additionally, the utility can utilize a single billing system and eliminate "prepay meters". The system used by Oklahoma Electric Cooperative (OEC), an electric provider in Norman, Oklahoma, does not require a special prepay meter or an in-home display; it relies on a software system that integrates with its customer information system and its AMI system. "Chartwell believes this is the direction that many utilities want to move in – to use their present or future AMI meters and network to enable prepaid service. This way, utilities will be able to leverage yet another benefit from their capital AMI investments and count additional value in their business cases."

According to Southern California Edison's (SCE) December 2007 filing with the Public Utility Commission of the State of California, it included prepay as part of its AMI business case. Through the Edison SmartConnect™ deployment, the utility is slated to install nearly five million Itron OpenWay meters. Because of their two-way functionally, embedded Zigbee communications devices and remote service switches, the meters can serve as a platform for prepay. SCE also estimated that more than 8 percent of its residential customers will select the prepaid service.

Ann Graef, project manager for Sacramento Municipal Utility District's (SMUD) prepay program says "… with SMUD's upcoming AMI efforts in motion, we decided that it was time to close our pilot and wait to see what the new generation of prepay technologies would offer for us and our customers."

Northern Ireland Energy, which has over 200,000 prepaid customers, recently combined prepaid service with time of use (TOU) rates. Prepaid customers can opt in to a program called Keypad Powershift, which offers three different TOU rates, with the highest rate occurring between 4 P.M. and 7 P.M. on weekdays.

Consumers

Benefits to customers provided by prepaid electric service include managing their energy related expenses, knowing the cost of energy used (no surprise at end of month), decreased fees for disconnection/ reconnection and late fees, and reduced energy consumption. It provides new customers the opportunity to use the money that would normally be required as a service deposit to purchase electricity. At some utilities, prepaid service is also used to help customers pay off arrearages incurred prior to enrolling in the prepaid program.

Because customers can see how much electricity they are using, this system makes electricity more tangible and consumers can make informed choices on consumption behavior. Some customers have reported they will delay running an appliance, such as a washing machine, until they have the money available to purchase more electricity. However, in addition to delaying usage, numerous utilities have found that prepaid customers actually consume less electricity than credit customers.

Many customers appreciate the prepaid service because they use less electricity, thus spending less money, and also because it gives them information and control that are not currently available to credit customers.

Electric Power Research Institute's (EPRI) *Options for Prepayment Service Accords*, December 2001, provides a financial analysis of the costs of prepayment versus credit service and finds that both the utility and its customers reduce costs with a prepaid electric program achieving a 20 percent market penetration. The expense of the metering equipment increases the utility's overall metering costs; however the savings incurred in dealing with credit-challenged customers reduces the cost of service across its customer base. The analysis also shows that "financially troubled" customers save about 20 percent on their electric service per year, by reducing payments for items such as late fees and service reconnection, as well as reduced consumption. ERPI's analysis even showed a financial advantage for prepaid customers without credit problems due to conservation efforts predicated upon "seeing" their usage of electricity. The equipment for prepayment service is now much less expensive than it was when EPRI did their analysis, which means that the prepayment business case is now even stronger than it was prior. This report was authored on behalf of EPRI by Plexus Research, an R.W. Beck company.

Customer Satisfaction

Customer satisfaction ratings provided by prepaid electric service customers are very favorable. SRP reports that customers participating in its M-Power prepaid program like the service, as it gives them more control over their budget and they do not have to pay fees, such as late fees and disconnection/reconnecting fees. M-Power customers report a high level of customer satisfaction:

- 84 percent are either *very satisfied or satisfied with M-Power*
- 91 percent have *a higher or the same opinion of SRP after using prepaid service*
- 92 percent state their satisfaction is based on *ability to monitor and control electricity usage*

Brunswick Electric Membership Corporation (BEMC), an electric cooperative serving close to 80,000 customers in North Carolina, also reports high levels of satisfaction among customers in its PowerStat Prepaid Power program.

- 86 percent would *definitely or probably stay with PowerStat given opportunity to change to traditional service and bill*
- 83 percent are either *completely satisfied or very satisfied*

As shown below, OEC's satisfaction ratings for prepaid service are also very good.

- 85 percent are either *very satisfied or satisfied with prepaid service*
- 76 percent *would recommend prepaid service to other members*

- 85 percent *believe they are more conscientious about electricity use*

According to the Chartwell report, Ann Graef, project manager for SMUD's prepay program stated "SMUD ran a prepay metering pilot from May 2006 until April 2008. We originally planned for the pilot to last for a year but we did extend it for an additional year as customer satisfaction amongst our pilot participants was high."

These customer satisfaction ratings all point to one conclusion: Customers are pleased with their prepaid service.

Historical Opposition

Some opponents of prepaid electric service argue that prepayment deprives the credit-challenged customer of the financial support available with credit service. After all, if one does not pay the electric bill, it usually takes months for the utility to satisfy all the procedural requirements and disconnect the service. The "support" the customer incurs during that time, at the expense of other customers who pay their bills on time, is what a regulator calls an "implicit" subsidy. That is, the people who are paying the subsidy do not see it identified on their bills; they are not explicitly aware of what the subsidy is when they pay it.

Conventional wisdom is that an "explicit" subsidy is always better (surely, there are many exceptions) than an implicit one because those who pay it know what it is, and this creates motive and (some) means to manage it. Prepaid electric service readily facilitates explicit subsidy to customers who need it by providing energy value in the form of the smartcard (a "token") or other representation. Social service agencies can easily give clients energy credit in a form they understand, while reducing the amount of subsidy needed because disconnect/ reconnect and late fees are eliminated.

Some consumer advocacy groups and regulators view prepaid programs as punitive to lower income groups, and are concerned about power-shutoffs, especially during cold weather, if customers do not have funds available. Several utilities have addressed the perceived inequity issue by applying the same rules to prepaid electric service as are applied to billed customers, by programming the system to run on credit and sending a notification letter in advance of shut-off in the winter. As previously mentioned, SRP has instituted a moratorium period each evening and all day on weekends during which service will not be interrupted. The accounts are switched to credit mode and customers pay for usage incurred on credit the next time they make a payment on their account.

The high levels of customer satisfaction with prepaid service present clear reasons to address the concerns of regulators and advocacy groups. Numerous utilities find that the vast majority of prepaid customers are satisfied with the service, would recommend it to others, and prefer to stay with prepaid service rather than switch back to a credit-based service. Many energy customers perceive prepaid electricity as a highly valued service.

Not all consumer advocacy groups denounce prepaid electric service. Save The Family Foundation of Arizona (STF), a non-profit organization that represents the interests of low-income consumers, reports that SRP's M-Power program provides five benefits to consumers:

1) immediate feedback on electric usage that promotes real-time change in usage and allows families to see the differential costs of energy usage thought the day and week
2) opportunity to learn to budget for utility costs on a monthly basis
3) ability to understand the costs of utilities in their home without the penalty of accumulating large electric bills
4) provide parents the chance to educate their children about energy costs and the benefits of conservation
5) provide incentive to become aware of and develop life-long changes in energy usage strategies

STF further indicates that its families that use M-Power while in the STF program become empowered by the service and frequently request M-Power equipment in their new residences when they leave the STF program.

SRP notes that other consumer advocacy groups in the Phoenix area support the service as well, citing that an organization's financial help can be used to directly pay for electricity and does not need to be spent on re-connection and late fees. Agencies are able to help restore service for a smaller amount, say $25, than is the case for a credit customer who may need several hundred dollars to reinstate electric service.

Utilities Offering Prepaid Service

Cooperative and municipal utilities have been at the forefront of offering this service in the U.S., perhaps partly because of their exemption from state utility commission oversight. SRP, BEMC, OEC, Pee Dee Electric Cooperative, Lake Region Electric Cooperative, and West Florida Electric Cooperative are examples of electric utilities currently offering prepaid electric service. With over 54,000 prepaid customers, SRP is by far the largest player in the U.S. A list of some utilities and their programs is displayed in Table 1.

Table 1
Selected Utility Prepaid Electric Service

Utility Name	Program Name	Approximate No. of Customers
Salt River Project	M-Power	54,000
Brunswick EMC	PowerStat Prepaid Power	6,200
Wood County Electric Cooperative	Smart*Power*	2,200
Oklahoma Electric Cooperative	Prepaid Metering	1,650
Pee Dee Electric Cooperative	Pay It Forward	Not reported
West Florida Electric	EZ Pay Power	Not reported
Lake Region Electric	Prepaid Metering	Not reported
Tacoma Public Utilities	Pay-As-You-Go	Pilot
NIE Energy (Ireland)	Keypad	200,000

While IOUs have typically shied away from prepaid electric service, several state utility commissions have recently revamped their rulemaking governing this type of service. The commissions' favorable reception of prepaid service appears to be based on conservation as well as customer choice.

- In 2007, The Commonwealth of Virginia, State Corporation Commission, included consideration of a prepaid electric service for residential customers among eight programs being analyzed to meet the State's energy policy goals to reduce electric energy consumption.
- Also in 2007, the Public Utility Commission of Texas (PUCT) adopted rules for offering prepaid electric service. In its findings it stated, "the commission wants to encourage new, innovative product offerings, including those that provide customers additional flexibility to choose how frequently to pay for electric service and flexibility to monitor electric consumption in real-time. The benefits of prepaid service using a CPDS (consumer prepayment device or service) are substantial ..."

The PUCT's ruling included the following stipulations regulating interruption of electric service due to non-payment:

1) Does not allow electric service to be interrupted, due to the payment having been exhausted, on a weekend or during any period in which the prepayment mechanisms are not available, or the utility's customer service center is not operating.
2) If an electric assistance provider pledges by sending a letter of intent, purchase order or other notification to the utility that it is forwarding payment to be added to the customer account balance, utility cannot interrupt service.
3) Does not allow customer's electric service to be interrupted because the payment is exhausted if there is an extreme weather emergency in the county of residence.

4) Prepaid service can be provided to a critical care customer only if the customer signs a waiver which states the customer understands the medical risks associated with the fact that electric service can be interrupted.

Conservation

Many utilities report reduced consumption in the 10 to 15 percent range for prepaid customers. La Plata Electric Cooperative (La Plata), which recently discontinued its prepaid service, reported that over 80 percent of its customers had stated that conservation is important to them and prepaid service gives customers the opportunity to save energy. La Plata also indicated that nearly 60 percent of its prepaid customers say they had lowered their electric consumption because the display unit showed them their usage.

SRP states that the prepaid service has reduced customer consumption. Its research indicates that two-thirds (67 percent) of M-Power customers experienced decreased consumption and that the average daily weather-adjusted kilowatt hours (kWh) usage was down 12 percent versus previous usage on the standard rate. Due to this savings, SRP includes M-Power conservation as part of its sustainable portfolio.

Landis+Gyr, an electric metering and communication firm, reports that in one prepaid project it was involved in, close to three quarters (73 percent) of customers indicated that they had decreased their electricity consumption due to the service.

Woodstock Hydro, a utility in Ontario, Canada, that recently suspended its prepaid service due issues with the prepaid metering technology's non-compliance with Ontario's smart meter technology requirements, has indicated that its prepaid customers use a average of 15 percent less electricity than do other customers. Utility Automation magazine has quoted Ross McMillan, acting president and Chief Risk Officer, of Woodstock Hydro as saying "Some customers have indicated to us that the program assists them with their budgeting process, helping them control their costs, in doing so, is an aid to conservation. The thinking toward prepayment, at least to our customers, has drastically changed through the years [from a credit management tool] to more of a conservation effort."

According to Chartwell's *Prepaid Metering Report 2008, 5th Edition,* OEC has seen a 13 percent reduction in electricity usage among prepaid customer in 2008, compared to their weather-adjusted usage in 2007 when they were credit customers. Additionally survey data show that 85 percent of prepaid customers believe they are more conscientious about electricity use.

The Future of Prepaid Electric Service

AMI offers the opportunity for utilities to provide prepaid electric service while forgoing most of the costs traditionally incurred for older prepayment service equipment. Any advanced metering system that includes remote connection/disconnection can be used to offer prepaid service. With

AMI, the utility would likely be able to offer the service without adding complexity in its accounting system and could even do without any type of prepayment facilities if it desired.

In a basic AMI prepayment application, customers deposit money into their utility account and the AMI system tracks usage at a set interval, converts the kWh to a price, and subtracts the price of the electricity used from the customers' account. Customers are then informed of their balances by voice messages, text messages, in home displays, or via a special web-based interface. Customers add money to their accounts as necessary by any method already available to all utility customers (such as credit card payments over the phone or the Internet). If an account reaches a zero balance, the meter automatically disconnects the service. Once money is added to the account, the AMI system remotely reconnects the customer. As previously mentioned, with AMI the utility also has the ability to limit the customer's load to a specified set point, allowing the operation of only a few specific appliances or lights to maintain an appropriate usage level for individual customers.

Utilities can also offer a more capable solution, including some type of third-party or kiosk payment option, similar to what current prepayment programs have in place, to accommodate customers who prefer to pay with cash or do not use credit cards. The system can also be set up so that the customer can run on credit for a limited amount of time, such as during weather emergencies or overnight.

Given that the information on the conservation aspects of prepaid electric service point to the importance of "seeing" electric usage, in-home display units may not be optional. The level of sophistication of display units varies widely and low cost alternatives are becoming available.

Examples of Prepaid Electric Service Offerings

SRP

SRP has offered prepaid electric service for many years, and as such has utilized several generations of technology. In its most recent enhancement, with installation expected to begin in late 2008, SRP will employ a fourth-generation meter that will have two-way radio communication with the utility. With the advent of this service, M-Power customers will be able to purchase electricity over the phone or Internet and have the purchase wirelessly loaded onto their home display, increasing purchase convenience. SRP will also be introducing an optional time-of-use rate for M-Power customers designed to help the utility manage peak loads on its system while giving customers the opportunity to incur their energy costs during lower-price periods.

SRP has approximately 54,000 participants in its M-Power program out of approximately 935,000 total customers (6 percent). SRP's vending option comprises 36 PayCenter locations, seven of which are open 24 hours per day. The other 28 locations stay open to 11 P.M or later. A cash payment option is available at all locations. In 2004, there were 2,000,000 M-Power

transactions, 99 percent of which were conducted at a PayCenter. The average purchase transaction was $18, with purchases made every six days. Use of the PayCenters allows SRP to experience a lower cost per transaction than would be incurred by visits to SRP business offices. The tariff rate for M-Power is comparable with residential Basic price plan, as shown in Table 2.

Table 2
SRP Tariff Rates

	Summer	
	M-Power	Basic
Monthly Service Charge	$15	$12
Price per kWh	9.84¢ per kWh	10.19¢ for first 2000 kWh/ 10.61¢ per kWh over 2000
	Winter	
	M-Power	Basic
Monthly Service Charge	$15	$12
Price per kWh	8.72¢ per kWh	8.79¢ for first 400 kWh/ 6.88¢ per kWh over 400

SRP credits M-Power with improving its company image by offering customers a different way to pay, providing an opportunity for customers to pay overdue balances, and making any service disruptions a private transaction between the customer and SRP (no utility trucks at the home to pull/reset the meter). It touts the program as a benefit to consumers due to avoiding late fees, disconnection fees, and reconnection fees, as well as giving customers an opportunity to pay off previously accrued arrearages over time. It also notes the benefit for social agencies, citing that any financial help provided goes immediately to provide for electricity, not to pay fees.

SRP also credits M-Power with reducing consumption. It reports that 67 percent of M-Power customers experienced decreased consumption and that M-Power customers use 12 percent less electricity.

Additionally, SRP believes the prepaid service provides cost savings for the utility. The revenue cycle for credit customers is 58 days – 30 days of usage, billing, bill due at day 51, service terminated at day 58 if not paid. Instead of getting paid 51 to 57 days after usage, SRP gets paid upfront by M-Power customers, before the consumption occurs. For those customers experiencing difficulties paying SRP, credit service means large deposits, late payments, and extensions, field collections, and disconnections. This is expensive to the company and provides unfavorable interactions with customers that have credit issues, leading to negative company image perceptions among these customers.

In 2005, SRP estimated that prepaid service provided to a credit challenged account saved approximately $300 per year based on the following avoided costs:

- 12 meter reads per year
- 12 bills send per year

- Sending disconnection notice
- Incoming calls to call center to request payment due date extension
- Payments made at business office
- Field collections
- Rolling trucks for disconnection/reconnection
- Write-offs

SRP believes that M-Power reduces the impact of credit-challenged customers on company resources via automation. With prepaid service, these high cost customers become self-sustaining, generate higher margins, and additionally these customers express higher levels of satisfaction with the utility.

Due to challenges presented by prepayment customers' high turnover rate and issues with lost display units, SRP instituted several procedure changes that included:

- $99 deposit on equipment, paid over time and refundable when equipment is returned
- 12-month commitment in M-Power
- Service agreement signed by customer
- Standardized pay down rate on paying off overdue balance - 40 percent of each transaction goes to pay outstanding balance.

BRUNSWICK EMC

BEMC has offered prepaid electric service since 1991. Its customers with the older non-AMI technology use a magnetic stripe card and an in-home terminal. However it recently upgraded its metering system to TWACS, a power line carrier AMI technology, which may allow customers to make payments over the phone or Internet.

BEMC has approximately 6,200 participants out of 79,000 customers (8 percent). Prepaid customers pay $6.00 more than credit customers in the monthly service charge, as well as a $3.00 service charge for each energy purchase transaction at a Bill Payment Terminal (BPT). BEMC has eight BPTs, some of which are available 24 hours a day. Others are open only during the hours of business at that location. BEMC generally has between 20,000 and 25,000 prepaid transactions per month, with customers' typically purchasing four to five times per month with an average transaction of $25.

The utility has conducted customer satisfaction research with its prepaid customers and found that satisfaction is very high. Virtually all its prepaid customers express some level of satisfaction with the service (97 percent) and a large majority (86 percent) would choose to stay with prepaid service over returning to credit service. The following are several questions asked and the response percentages from BEMC's research.

How satisfied have you been with the program:

Completely satisfied	56%
Very satisfied	27%
Somewhat satisfied	14%
Not too satisfied	2%
Not satisfied at all	1%

Given opportunity to change to traditional service and billing would you:

Definitely stay	66%
Probably stay	20%
Probably switch	7%
Definitely switch	3%
Don't know	5%

BEMC indicates that prepaid electric service offers the utility the following advantages:

- Reduction in disconnects/reconnects
- Reduction in write-offs (average reduction of $1,000 - $2,000 per month)
- Customer friendly

BEMC further believes that its prepaid service offers its customer advantages, including:

- Customer control of electricity usage
- Options
- No monthly bill
- Ability to repay debt in small amounts
- No late payments and no deposit

BEMC reports that the new AMI technology offers several benefits with regard to prepaid service customers:

- Allows for demand response notification
- Provides the utility with more information
- Allows for remote override of disconnection
- The tokenless system allows more vending options

Along with the benefits of the new technology, BEMC found that it raises policy issues with regard to prepaid service. Considerations BEMC looked at include:

- Should disconnections be automatic or manual?
- What time of day should disconnections occur?
- At what dollar amount should disconnection occur – zero balance, negative 10 dollars, and negative 30 dollars?
- Should system be used to send price signals to promote load reduction?

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Is Prepay the Way? Consumer Perceptions of Prepay in the Utility Sector

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EcoPinion Survey Report

Is Prepay the Way? Consumer Perceptions of Prepay in the Utility Sector

January 2011

Introduction

EcoAlign, a strategic marketing agency focused on energy and the environment, conducted 1,000 online interviews in November 2010. The sample was balanced to match the U.S. population by age, gender, region and ethnicity.

The primary objective for this ninth EcoPinion Survey Report is to test consumer perceptions and expectations in regard to prepaid services and products and then to examine the potential for voluntary prepay options offered by local utilities to customers. EcoAlign is interested in the convergence of two major developments – the growing use and popularity of prepay as a transaction mechanism, and what prepay may mean as a new voluntary payment option offered to utility consumers and enabled by smart grid.

Deployment of smart grid infrastructure continues apace with millions of Americans soon to have access to smart meters installed at their homes. These provide access to real-time information on personal energy usage and consumption. While the business case for smart grid has largely been built on the operational efficiencies gained on the utility side of the meter, the customer-facing benefits of smart grid remain an open question.

Some now argue that prepay could be the first fruit for consumers and perhaps even the "killer app" of smart grid. Today, consumers get an energy bill at the end of the month with no real linkage between consumption behavior and cost. Prepay allows consumers to pay for energy upfront and then to monitor their usage, account information and energy management options through daily communications with their supplier. Prepay would not only leverage the real-time information coming from smart meters, but

moreover, the information would be transactional allowing the consumer to change consumption patterns if necessary to fit within his/her budget.

There is further potential around consumer benefits tied to a voluntary utility prepay option. For consumers with credit challenges, prepay may be an alternative to security deposits or other requirements to open an account. And specific to the utility sector, prepay has been shown to result in energy conservation at very high levels – 5 to 15 percent energy savings, perhaps more.

What do consumers think of prepay though? Would they like a voluntary prepay option offered by their local utility? What would their needs and expectations be around a voluntary prepay option in the utility sector?

The findings of EcoPinion No. 9 point to a rapid ripening of prepay as a voluntary option which could have a large impact on the utility sector. The top line findings include:

- Prepaid products have gone mainstream with over half of all Americans having purchased or used a prepaid product, and even more Americans planning to do so over the next year.
- Why? Because 75 percent of all Americans are satisfied with their prepaid options and products, with almost half of all Americans who have used prepaid products responding they were "highly satisfied."
- What are the drivers behind satisfaction? Consumers pointed to "ease" and "convenience." This implies that 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. In short, when asked how prepaid products make them feel, many Americans simply responded "happy."
- Yet, prepaid products may not suit all consumers equally. As noted above, there clearly is a generational divide, with younger people being much more likely to be satisfied or highly satisfied with prepaid options. Women also tend to like and use prepaid products more than men. Finally, renters may be more apt to use prepaid products than home owners.
- A core group of consumers (17 percent) are "extremely interested" or "very interested" in a voluntary prepay option offered by their local utility. For most service industries, this level of interest would signal the need to support prepay products and channels. Another 25 percent of consumers indicated that they were "interested" or "somewhat interested," signaling that there is ample room for growth, once utility

prepay options enter the market. Our findings further show that when consumers use prepay, they like the option and are more interested in having the option available for other transactions such as paying utility bills.

- ❖ It is important to note that 46 percent of respondents were "not interested at all" in a voluntary prepay option.

- ❖ Americans increasingly use prepay options and like them. Yet, there is a sizeable number of Americans who are not at all interested in a voluntary prepay option offered by their local utility. Why is that? Another way of asking the question may be: Is it prepay that they are not interested in, or the utility offering prepay? Some possible reasons for the gap may be:

  - Prepay is a new bill paying option for some Americans, so unfamiliarity leads to uncertainty around how it will work for them and the value.
  - A generational transition, with older Americans much more likely to stick to traditional bill pay channels, e.g., writing a paper check and sending it to the utility (with 38 percent of older Americans using that method vs. 24 percent of younger Americans).
  - Distrust and/or skepticism of the utility's motives.
  - Uncertainty with regard to costs vs. benefits, especially if there are fees associated with a utility prepay option (when there are no fees, interest levels in prepay double).
  - Concerns over service disruption and disconnection (62 percent of Americans are "very concerned").
  - The utility has not met consumers' current needs and preferences so they are less keen on trying a new option (see the findings on utility bill payment channel most often used vs. what consumers would prefer to pay bills). If utility customer service is not "smart" from a total service perspective, then new products will do little to change that perception.

- ❖ So, given the above, what might make consumers more interested in a voluntary prepay option offered by the local utility? The short answer is discounts and lower bills. As our EcoPinion survey findings have pointed to time and again, consumers largely see their utility service as a commodity and so everything gets calculated as payback in dollars and cents. Almost one-half of all Americans responded that their interest level in a voluntary prepay option would be increased with a discount of 10 percent or more off their utility bills.

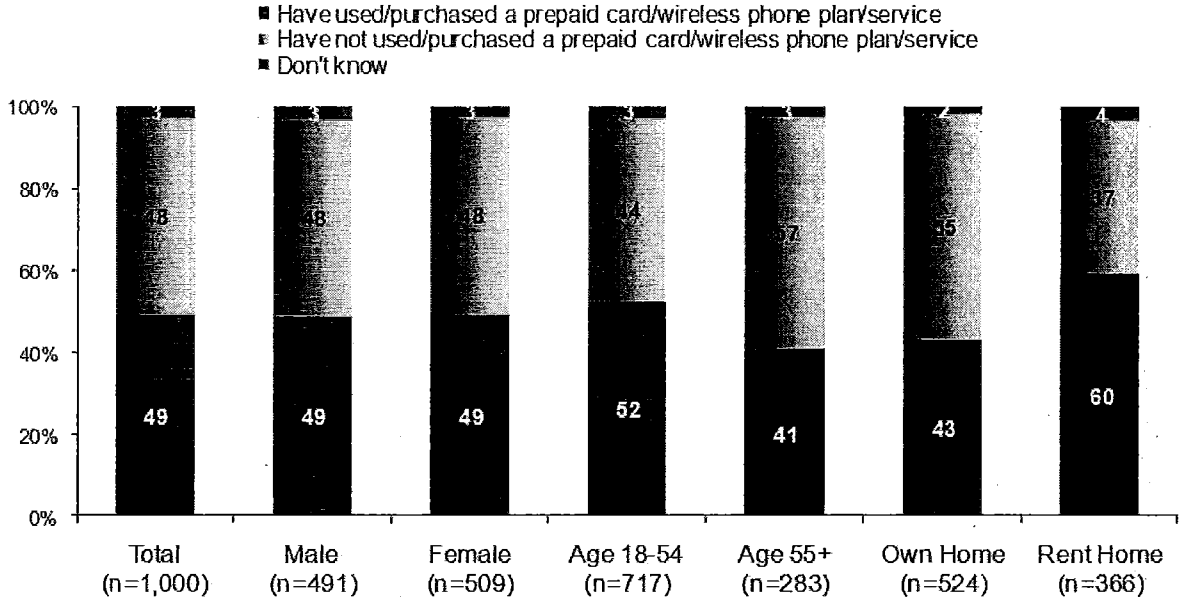
- Consumers cited the following top three benefits for using a voluntary prepay option: 1) paying for energy as you use it, 2) eliminating any surprises at the end of the month; and 3) control over costs. Additionally, saving money and bill management were cited by consumers as the biggest drivers for a voluntary prepay option. These responses highlight the consumer perspective of utility service as a commodity and thus something to be managed and controlled.

As noted in EcoPinion No. 8, smart grid holds a lot of promise in the minds of Americans. Yet for this promise to be realized, new products and services will need to be allowed into the utility sector. Products such as prepay will be challenging in many respects to a traditional regulatory structure that has focused on providing equal access and service to all consumers regardless of their individual preferences and needs. This EcoPinion clearly points to the fact that some customers will readily embrace new options if offered.

Use of Prepay Cards or Services

The findings of the study indicate that approximately one-half of consumers in the U.S. have used or purchased a prepaid card or service. For example, 54 percent of respondents indicated that they had used prepaid wireless phone service, and 51 percent had used a prepaid gift card. Those under age 55 and those who rent a home are significantly more likely to have used or purchased a prepaid card or service.

Prior Usage/Purchase of Prepaid Card or Service



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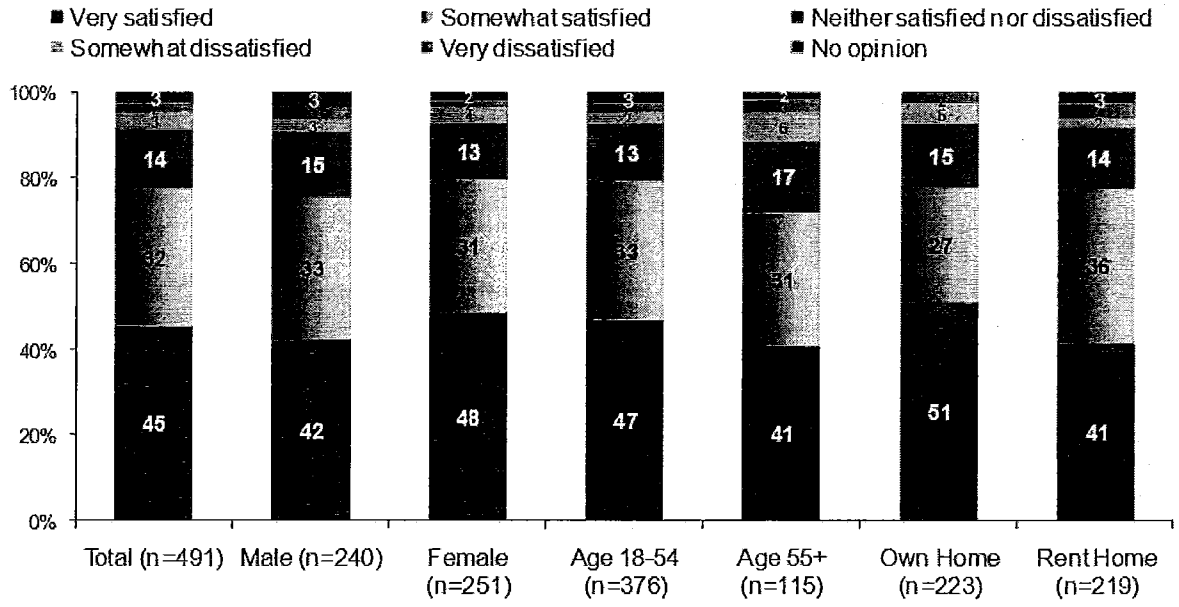
Among those using prepay, satisfaction is high – approximately 75% of prepaid card or service users were "very satisfied" or "somewhat satisfied" with the option. There were slightly higher levels of satisfaction among women and among younger respondents.

Satisfaction with Using Prepay Options



Notably, more than one-half of the respondents who have never used or purchased a prepaid card or service indicated that they were not likely to do so in the next year. Those 55 or older and those who own their own home were the least likely to anticipate purchasing a prepaid card or service in the next year.

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Word Associations

When asked to describe prepaid options, the most common response was "convenient," followed at much lower levels by "easy" and "gift."

One Word Associations with Prepay Options

The survey also queried for emotional responses to prepay options, and consumers mostly expressed "happy," "good," "easy," "safe," and "relieved," and with lesser frequency mentioned "satisfied," "convenient," and "great."

One Word Emotional Associations with Prepay Options

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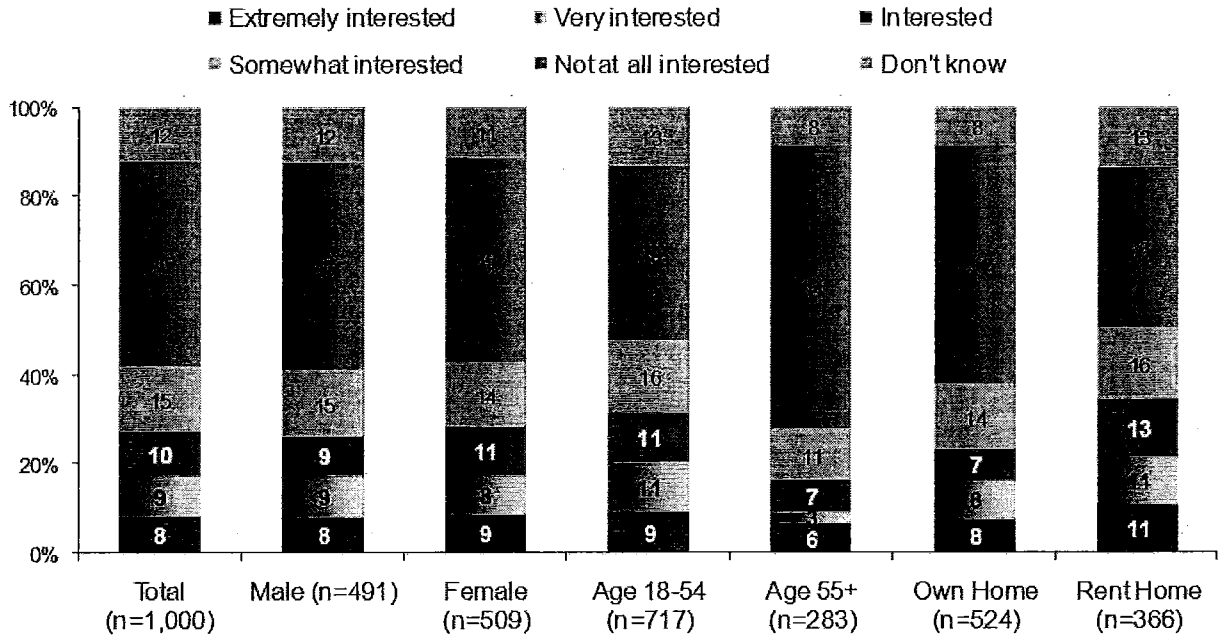
Prepay Utility Option

When asked specifically about their interest in a prepay option offered by their local utility, only 17 percent were "extremely interested" or "very interested" in such an option, even when it was offered free of charge (no fees). Interest then dropped by half when the option was offered with a small fee. As with prepaid options in general, interest was highest among the younger consumers and those who rent a home. Interest was only somewhat higher among consumers who had previously purchased and were satisfied with prepaid cards/services versus consumers that had never used a prepay option.

Interest in Voluntary Prepay Utility Option - Free, No Fee



Interest in no-fee prepay options offered by the local utility was higher among those satisfied with using prepay (28 percent were "extremely interested" or "very interested"). If there is a small fee, interest level in this group of satisfied consumers fell off to 18 percent. Lower levels of interest were registered among those who were neutral or not satisfied with using a prepay option.

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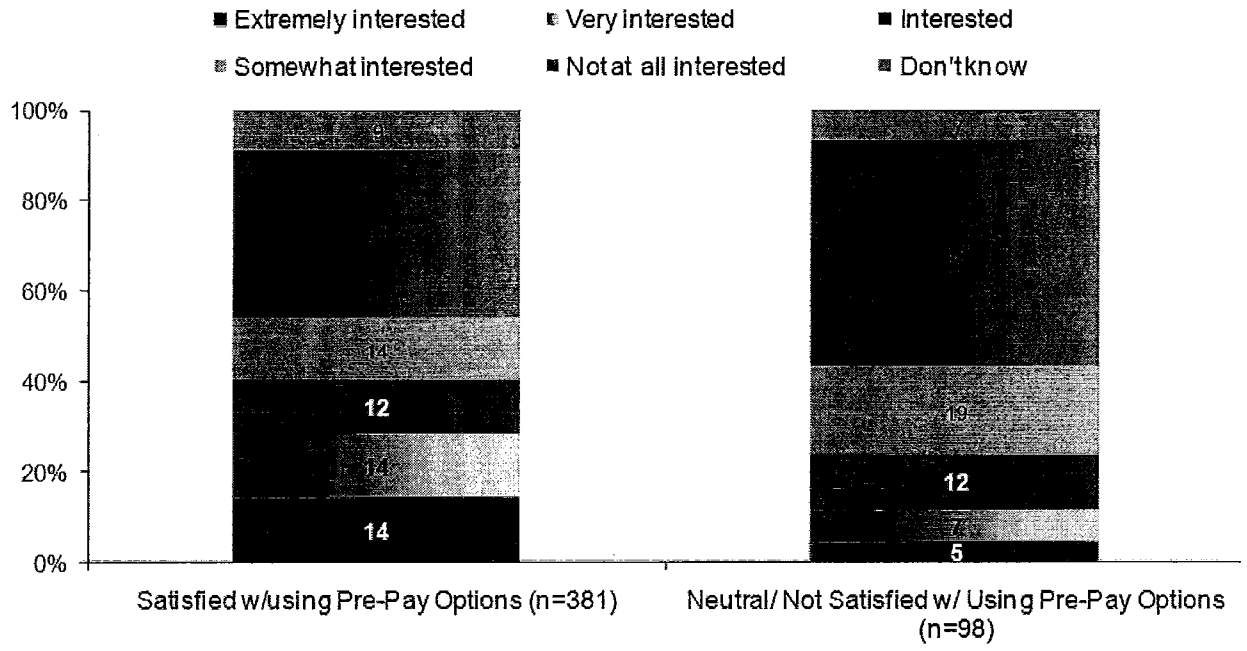
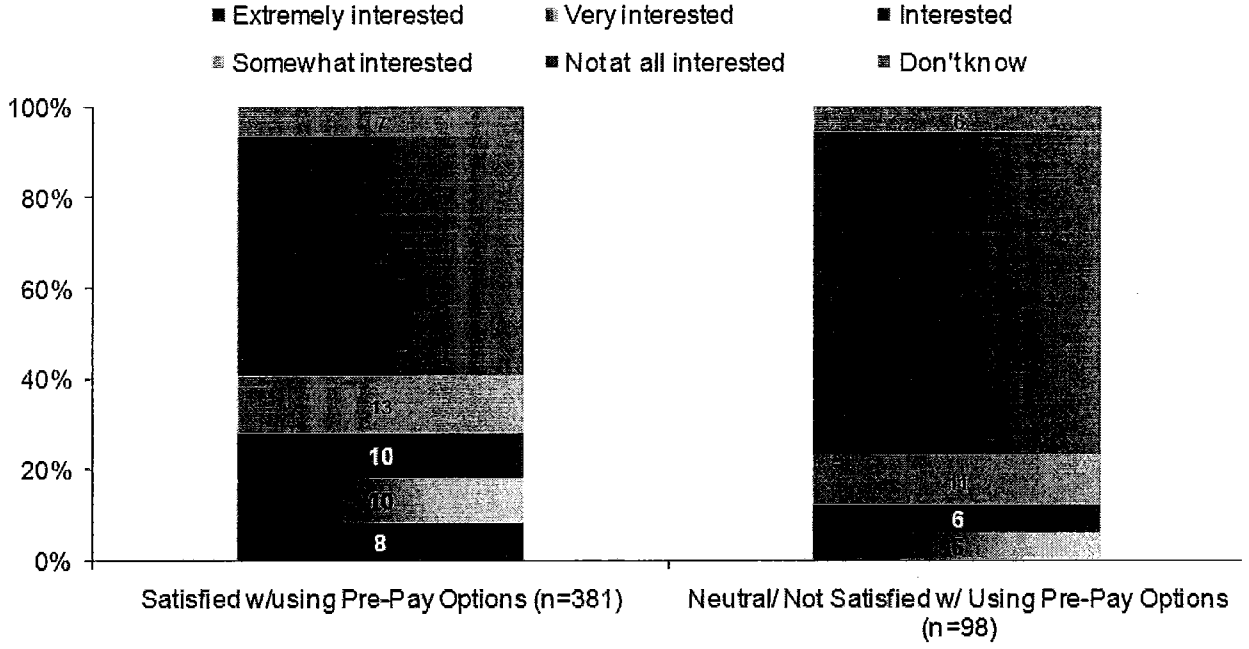
Interest in Voluntary Prepay Utility Option - Free, No Fee



Interest in Voluntary Fee Prepay Utility Option with Small Fee



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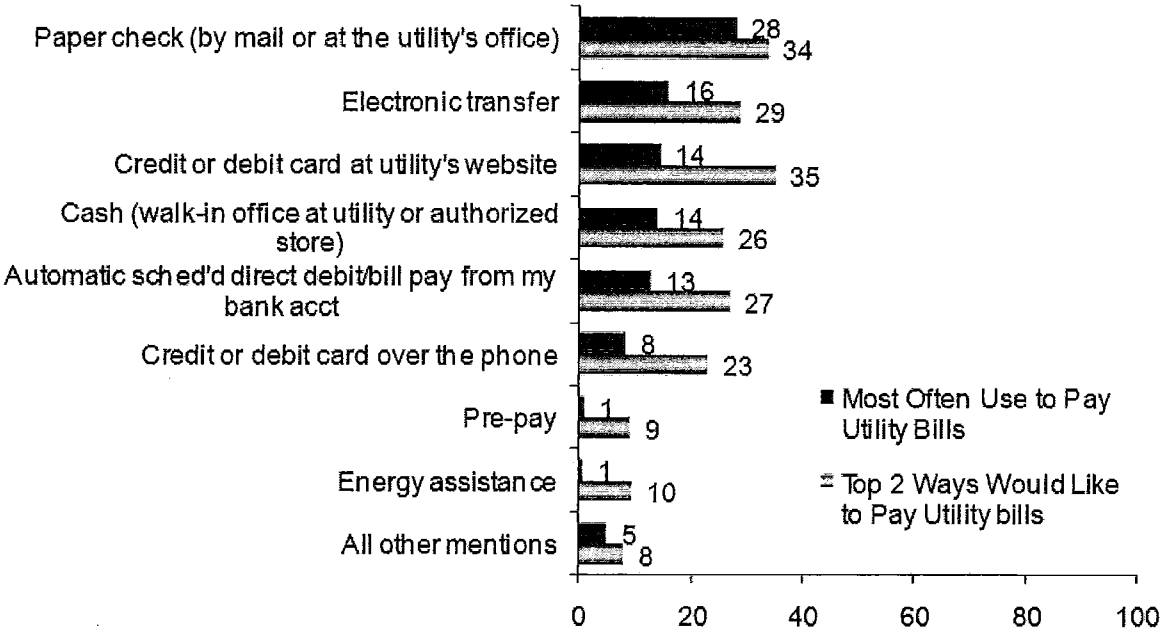
How Do People Pay for Utility Services Now?

Consumers are most likely to pay utility bills by check. (See the blue bars in the chart below.) At somewhat lower levels, consumers use a variety of other methods such as electronic transfers, credit/debit cards, or cash. Older consumers (55+ years) are much more likely to pay by check than younger consumers (38 vs. 24 percent) and more likely to pay by cash (18 vs. 4 percent). Homeowners are more likely than renters to pay by check (33 vs. 22 percent), and renters are more likely than homeowners to pay by cash (22 vs. 8 percent).

When asked what methods they would be interested in using to pay their utility bills – even if such methods were not currently available – credit cards and checks were mentioned most often, followed by electronic transfer, automatic or scheduled debit from bank account, and cash. (See the gray bars in the chart below.)

Utility Payment Type Used Most Often/Would Like To Use



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Reasons for Using a Prepay Utility Option

When asked to select the top two reasons they would use a utility prepay option from a list, the most commonly selected choices were: preferring to pay for energy as it is used; wanting to eliminate any surprises; and wanting control over energy costs and budget.

Top Two Reasons Would Use Utility's Voluntary Prepay Option

	Total	Male	Female	18-54	55+	Own	Rent
Total Respondents	(1000)	(491)	(509)	(717)	(283)	(524)	(366)
	%	%	%	%	%	%	%
You prefer to pay for energy as you use it	29	29	28	27	[33]	[33]	23
You want to eliminate any surprises	28	25	[31]	30	25	30	28
You want control over energy costs and budget	26	25	26	26	25	27	24
You don't want to pay a security deposit to open up an account and/ or avoid other fees associated with traditional service	17	15	18	17	16	14	[20]
You want to reduce energy use and monitor closely	17	15	18	18	14	14	[21]
You want to go paperless and save a stamp	16	15	17	15	18	15	18
You don't want a monthly bill	15	18	13	[17]	10	13	18
You want more feedback/ advice from your utility to manage your bills	7	[9]	5	7	8	8	6
You want to help pay/ manage a family member's account, e.g., student at college	6	6	5	[7]	3	5	7
Don't know	20	21	18	18	[24]	20	17

Nearly one-half of consumers indicated that their interest in a prepay option would increase if it meant they would save at least 10% on their bills. Four out of ten thought their interest would increase if the prepay program helped them lower their energy consumption through increased awareness of usage and the related cost.

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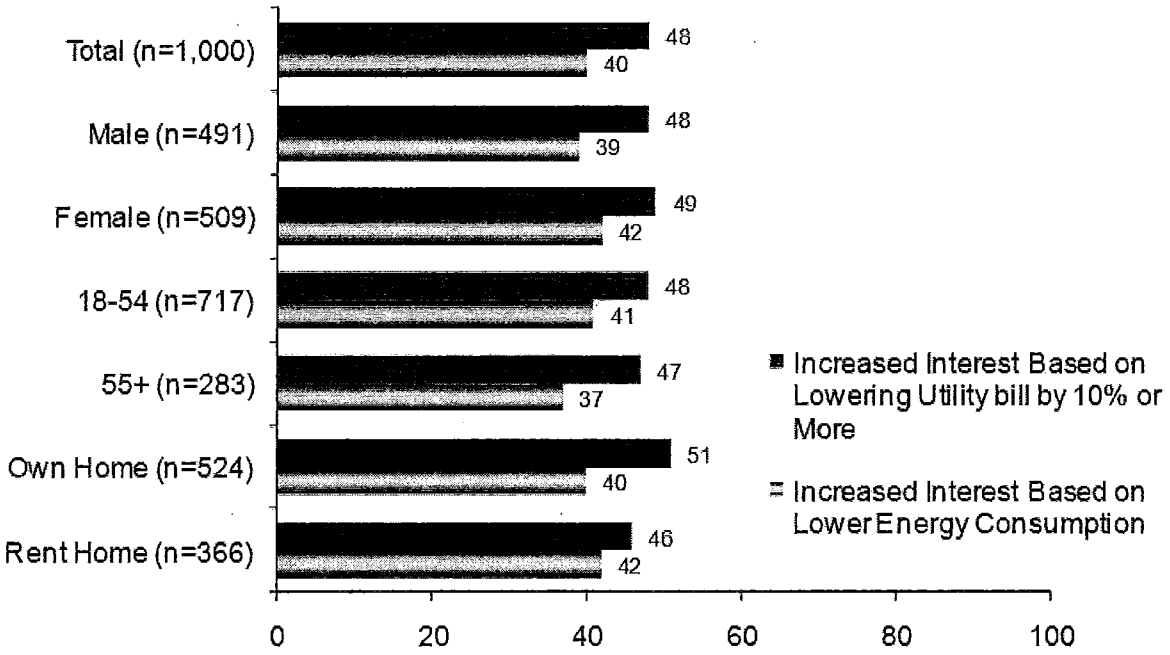
Impact On Interest in Prepay Utility Option - Reduced Cost vs. Reduced Energy Consumption (Would Increase Interest)



Concerns About Prepay Utility Option

In terms of concerns that consumers might have about a prepay utility option, the words used most frequently were related to the costs involved, the loss of control, and what happens to utility service if they run out of credit. Some specific one-word associations were "cost," "overpayment," "control," "service disruption," "uncertainty," "budgeting," "underpayment," "fees," and "errors."

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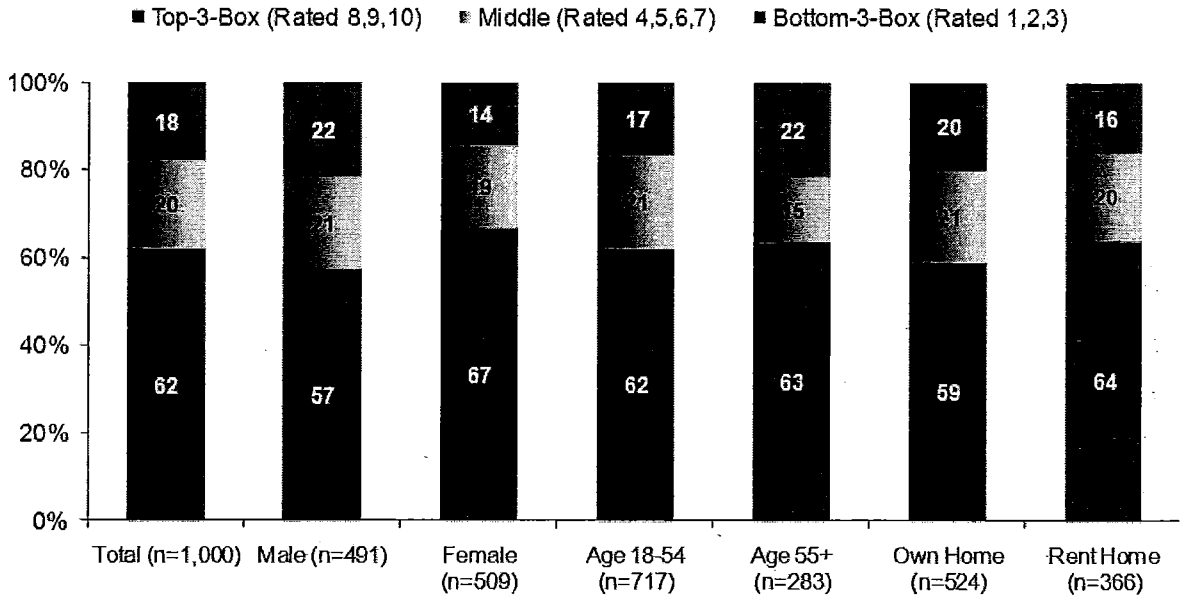
One Word Associations to Describe Biggest Concern with Prepay Options Offered by the Utility

Nearly two-thirds of consumers are extremely concerned (a rating 8, 9, or 10 on a 10-point scale) about the prospect of running out of credit on their prepay account or having service temporarily disconnected while they replenish the account. Women are significantly more concerned about this than men (67 versus 57 percent).

Level of Concern About Running Out of Credits and Services Being Disconnected



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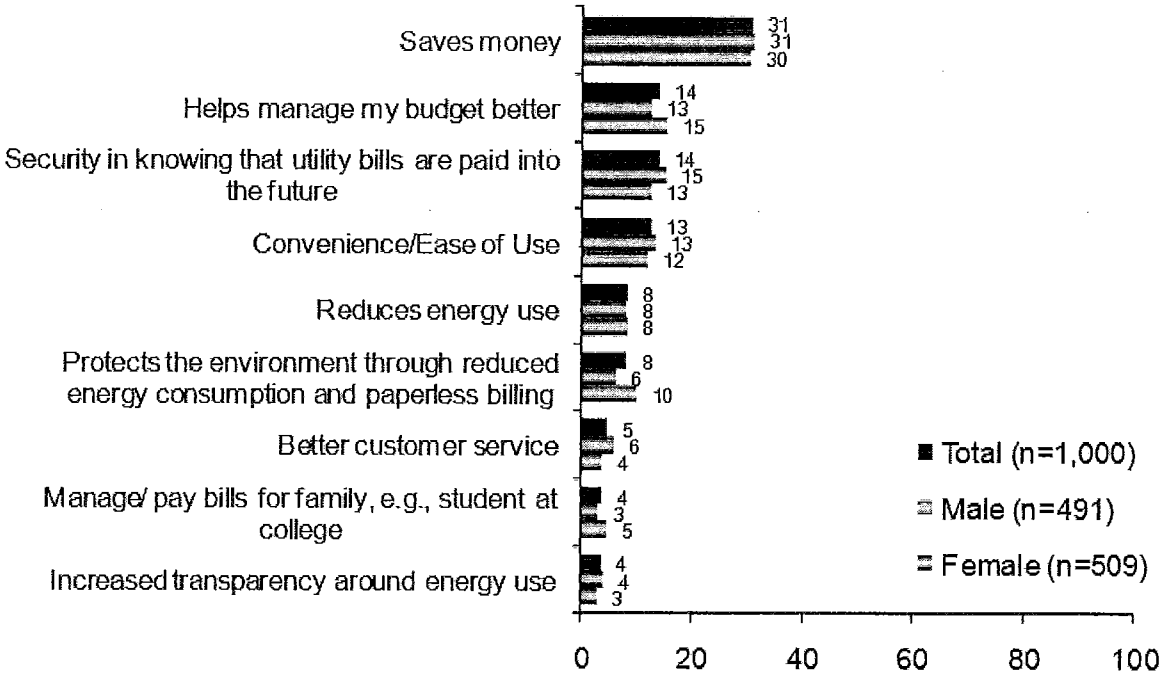
Value of Prepay Utility Option

On the other hand, consumers think the aspect of the prepay program they would most value and would be the most important is that it would help them save money (chosen from a list by nearly one-third of the respondents). At lower levels, they also indicated that a prepay plan would help them manage their budget better, know that their bills are paid, and be convenient/easy to use.

Most Valuable/Important Prepay Option



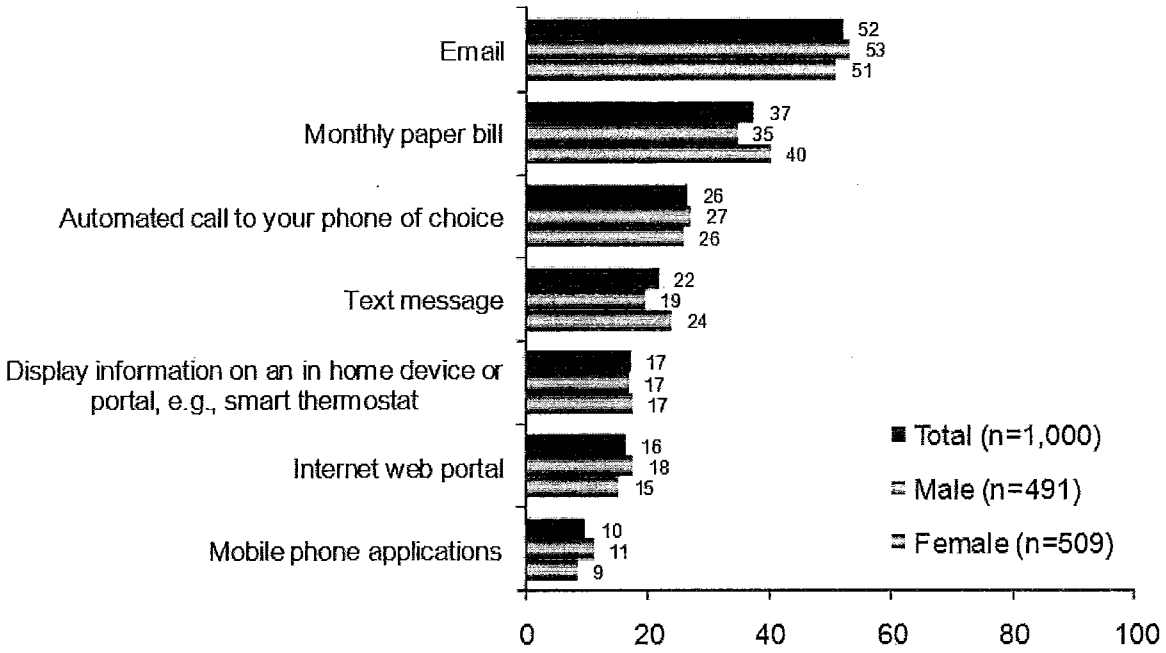
Notifications Methods

Consumers using prepay need to be contacted regarding the level of funds left in their account, and the number of days remaining at typical usage levels. Consumers indicated that email was a preferred method, followed by a monthly paper bill, automated call to a telephone, text messaging, in-home display, Web portal and mobile phone application.

Consumers both older than 55 years and younger than 55 years stated that they preferred email, but there were generational variations for the remaining choices. Older consumers expressed a stronger preference for

monthly paper bill than did younger consumers. Younger consumers expressed a stronger preference for text messaging than did older consumers. Differences among homeowners and renters were less pronounced.

Notification Methods Would Require To Consider Prepay



What Does It All Mean?

Prepay has gone mainstream. Americans are increasingly using prepay and are highly satisfied with it. Once they have used it, they are interested in using it for other transactions, including paying utility bills. The findings from EcoPinion No. 9 point to an addressable market in the short-term of approximately 20 percent of utility consumers who would consider a voluntary prepay option offered by their local utility. Another 25 percent or so could be reached over time through education, marketing and word-of-mouth validation from friends and family. These are potentially huge numbers of participants.

From a consumer perspective, what needs to be done for prepay to reach its full potential as a voluntary bill pay option in the utility sector? EcoAlign's recommendations would include:

1. **Consumer Education**: Consumer education will be important if utilities are planning to pursue prepay options. Prepay may serve as the lead to an overall customer strategy enabled by smart grid. There should be transparency about the motives and benefits to utility.
2. **Voluntary Option**: Utilities ought to focus on the voluntary nature of a new prepay offering, and avoid fees if possible.
3. **Visibility**: Utilities can use prepay to increase visibility of the underlying commodity, tied to new options enabled by smart grid, combined with segmentation and a targeting of the customer profiles most likely to value prepay (e.g., college students). Utilities can offer discounts for consumers and make the savings very visible on the bill or through other means (rebates, coupons, etc.) to increase satisfaction and the "stickiness" of the offering.
4. **Conservation**: Prepay can bolster energy conservation, and the utility can make a connection to measurable energy efficiency results. Measurement and verification (M&V) methodologies must be adapted to cover more behavioral approaches to conservation. More data and analysis will be required.
5. **Clear Policies**: Utilities must have very clear policies and processes in place to handle consumer and regulatory concerns, including billing and accounting issues, service disconnections and disruptions, and consumer protection and data privacy.
6. **Channel Management**: The utility should support the delivery channels and platforms that consumers prefer. As noted in EcoPinion No. 8, there will be nothing "smart" about smart grid with poor customer service and nonalignment of delivery with customer preferences. One need only observe the migration of consumers to other transaction platforms – including text messaging, mobile applications, credit and debit transactions on web sites – to realize there is a growing gap between the current state of utility customer service, channels supported, and consumer expectations.

In order to allow for new products and services that will lead to customer-facing benefits from the investment in smart grid, the utility sector as a whole will need to find a way to move from a "ratepayer" approach to a "customer" mentality. That is, move from the view that all consumers must be served in exactly the same way and receive exactly the same treatment, to an understanding of consumers with different needs, preferences, and values.

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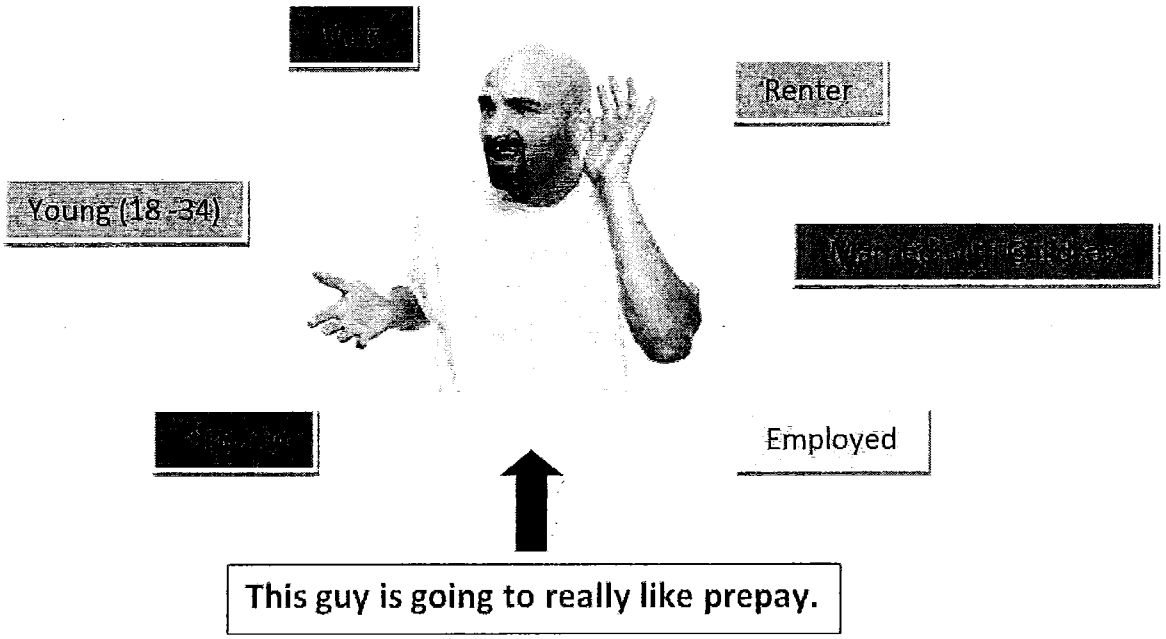
As with other EcoPinion survey findings, this survey demonstrates that there are statistically significant differences among generations, between renters and homeowners, and by gender with regard to perceptions and preferences connected to prepay products. Let customer demand be the "tail that wags the dog" this time.



For more information about adding questions to future surveys, the *2011 Utility Prepay Working Group* or customized survey and research efforts, please contact Jamie Wimberly at (202) 483-4443 or jwimberly@ecoalign.com.

For more information about EcoAlign, visit our website at www.ecoalign.com.

EcoAlign: The Energy and Environment Agency

EcoAlign is the energy and environment marketing agency. We develop and execute marketing strategies for utilities, renewable energy providers and companies operating in the energy and environment space. We are uniquely suited to help companies achieve their business objectives, from reaching efficiency program targets and improving customer satisfaction, to launching new products, increasing market share and repositioning for growth in the green tech space.

Methodology

The survey was conducted online in November 2010 among a sample of 1,000+ online adults across the U.S. Figures for gender, age, and geography were weighted where necessary to match their actual proportions in the population.

In theory, with probability samples of this size, one could say with 95 percent certainty that the results have a statistical precision of plus or minus 3.1 percentage points of what they would be if the entire adult population had been polled with complete accuracy. Unfortunately, there are several other possible sources of error in all polls or surveys that are probably more serious than theoretical calculations of sampling error. They include refusals to be interviewed (non-response), question wording and question order, and weighting. It is impossible to quantify the errors that may result from these factors. This online survey is not a probability sample.

Online sample for the study was drawn from Survey Sampling International's SurveySpot online consumer panel. Survey Sampling is recognized as the premier sample provider in the market research industry. The SurveySpot panel currently has 1.6 million panel members who are recruited using a wide variety of online and offline methods, including website registrations, email invitations and telephone recruiting. For this study, invitations were e-mailed to potential respondents targeted by gender, age, census region and ethnicity.

These statements conform to the principles of disclosure of the National Council on Public Polls.

Data Request Reponses Prepared by David W. Cheng in SDG&E's GRC Phase 2 Proceeding, A.11-10-002

DRA DATA REQUEST NUMBER DRA-06
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 01/31/2012
SDG&E RESPONSE DATED: 02/14/2012

Subject: Prepay program and Partial shut-off

Question 1: Are SDG&E's smartmeters (or other meters) capable of limiting the amount of electricity delivered to a home? That is, can they perform a partial shut-off?

SDG&E Response 01: SDG&E objects to this question to the extent it requests information that is not relevant to the subject matter involved in the pending proceeding and is not reasonably calculated to lead to the discovery of admissible evidence. Subject to and without waiving this objection, SDG&E responds as follows:

SDG&E's smartmeters cannot perform a partial shut-off and cannot regulate the level of current that a customer can draw when connected. The meters can only allow up to the maximum current flow or none at all.

DRA DATA REQUEST NUMBER DRA-06
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 01/31/2012
SDG&E RESPONSE DATED: 02/14/2012

Question 2: Can SDG&E's smartmeters be used to provide a minimal subsistence level of electricity to the home for free in lieu of a complete shut-off?

SDG&E Response 02: SDG&E objects to this question to the extent it requests information that is not relevant to the subject matter involved in the pending proceeding and is not reasonably calculated to lead to the discovery of admissible evidence. Subject to and without waiving this objection, SDG&E responds as follows:

SDG&E's smartmeters cannot perform this function. Please see SDG&E's response to Question 1 above.

DRA DATA REQUEST NUMBER DRA-06
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 01/31/2012
SDG&E RESPONSE DATED: 02/14/2012

Question 3: a. If the smartmeters (or any other type of meter) currently cannot control the amount of electricity delivered to each home, can they be modified to do so?

b. How much would it cost to modify each meter?

SDG&E Response 03: SDG&E objects to this question to the extent it requests information that is not relevant to the subject matter involved in the pending proceeding and is not reasonably calculated to lead to the discovery of admissible evidence. Subject to and without waiving this objection, SDG&E responds as follows:

a. SDG&E is not aware of any road map options from the manufacturer that would enable this type of function.

b. See response 3a. SDG&E is unaware of the costs or meter adjustments needed to provide this functionality.

DRA DATA REQUEST NUMBER DRA-06
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 01/31/2012
SDG&E RESPONSE DATED: 02/14/2012

Question 4: In SDG&E's tariff "disconnection rule" section M, it provides the following statements:

> Service Extender Device:
>
> Where residential service is subject to discontinuance in accordance with Section A. above, the Utility may, at its option and subject to availability of equipment, install a service extender device which will allow continued electric service for minimal use in lieu of full discontinuance of service. The maximum time for providing such extended service shall be determined by the Utility. The Utility shall not be liable for any loss or damage occasioned by the installation of a service extender device or the provision of extended service.

a. Has SDG&E provided such devices to customers?
b. If so, how many devices currently are deployed?
c. How much does each device cost?
d. What are the other costs (e.g., installation) associated with these devices and how much are those other costs?
e. Have these devices ever been activated? If so, when?
f. What issues did SDG&E intend to address through installing these devices?
g. Have the devices worked as SDG&E anticipated?
h. Has SDG&E's intention for deploying these devices been met successfully?
i. Please provide a detailed explanation about how the devices have worked and any problems that have been encountered.

SDG&E Response 04: SDG&E objects to this question to the extent it requests information that is not relevant to the subject matter involved in the pending proceeding and is not reasonably calculated to lead to the discovery of admissible evidence. Subject to and without waiving this objection, SDG&E responds as follows:

a. Yes, but not in the past twenty years. These devices were called load limiters.

b. There are no devices currently deployed by SDG&E.

c. SDG&E is unaware of the present-day cost of a load limiter.

SDG&E Response 04: (Continued)

d. Not applicable. SDG&E is unaware of other costs associated with these devices and has no recent experience with the installation of load limiters.

e. When load limiters were used more than 20 years ago, they were activated in special circumstances, prior to disconnection for non-payment.

f. Through the installation of load limiters, SDG&E intended to provide customers with special circumstances the ability to have partial service while arranging to make a payment.

g. SDG&E does not have information detailing the use and effectiveness of load limiters, given that these devices are not currently used and were last employed more than twenty years ago.

h. See SDG&E's response to 4g.

i. See SDG&E's response to 4g.

GREENLING DATA DRA-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 05/07/2012
SDG&E RESPONSE DATED: 05/18/2012

Question 4: In the Revised Prepared Direct Testimony of David W. Cheng, Chapter 9, on Behalf of SDG&E ("Cheng Testimony"), page DWC-1, it references a survey of SDG&E customers. Please provide the survey questions posed to respondents. Please also provide the survey results.

SDG&E Response 4:

The following survey was presented to approximately 900 residential and 900 business customers in English and Spanish:

> We would like to know what you think about some new services SDG&E might be offering in the near or distant future.
>
> (Commercial) How likely is it your business would use this service?
> -Very likely
> -Somewhat likely
> -Not very likely
> -Not at all likely
>
> (Residential) How likely is it you personally would use this service?
> -Very likely
> -Somewhat likely
> -Not very likely
> -Not at all likely

One of the new services presented in the survey was Prepaid billing cards. The likelihood for Commercial use was 12%, and the likelihood for Residential use was 16%. The Residential customers were segmented as follows:

Successful 12% likelihood
Comfortables 14% likelihood
Professionals 8% likelihood
Young Mobiles 23% likelihood
Established 18% likelihood
Challenged 21% likelihood

GREENLING DATA DRA-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 05/07/2012
SDG&E RESPONSE DATED: 05/18/2012

Question 5: On page DWC-3 of the Cheng Testimony, it lists several types of customers who will not be eligible for participation in the prepay program. Please provide any documents designed to establish customer eligibility for the program or a description of the manner that SDG&E will establish eligibility.

SDG&E Response 5:

All new Residential customers are eligible for the Prepay Program, except for customers who are not eligible for Remote Disconnection as identified in the Disconnection Settlement Agreement. This includes customers who are particularly vulnerable to the health and safety risks associated with the loss of utility service, i.e. self-identified seniors (age 62 or older), self-identified disabled customers, Medical Baseline customers, Life Support customers or other customers who self-certify that they have a serious illness or condition that could become life threatening if service is disconnected.

Existing Residential customers with no arrears (account is current) are also eligible for the Prepay Program, with the same exceptions identified above.

GREENLING DATA DRA-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 05/07/2012
SDG&E RESPONSE DATED: 05/18/2012

Question 6: Please provide any documents describing the outreach or marketing plans SDG&E has to inform customers regarding the prepay program.

SDG&E Response 6:

SDG&E has yet to design such documents. The Prepay Program is not proposed to launch until 2014.

GREENLING DATA DRA-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 05/07/2012
SDG&E RESPONSE DATED: 05/18/2012

Question 7: On page DWC-4 of the Cheng Testimony, it states that there are several options for prepay customers to make payments:

1) online by linking a bank account and making payments from the bank account using MyAccount, 2) online by using a credit or debit card via SDGE's payment processing vendor BillMatrix 3) by phone using the automated IVR system, or 4) by cash or check at one of SDG&E's branch offices or Authorized Payment Locations.

Please state the approximate duration of time it would take for each of these payment methods to be credited to a prepay customers' account.

SDG&E Response 7:

There are two types of postings – memo posts and payment posts. Memo posts occur earlier and will stop any collection actions on the account (including remote disconnection). Payment posts occur once the payment has been confirmed and the credit is applied to an account. The approximate duration of time for both payment posts and memo posts for each type of payment method is as follows:

1) Online by linking a bank account and making payments from the bank account using MyAccount - Memo posts occur on an hourly basis. Payments made by 4pm Monday - Friday will be posted by 8pm that evening. Payments made after 4pm on Weekdays and payments made on Weekends and Holidays will be posted the evening of the following business day.

2) Online by using a credit or debit card via SDG&E's payment processing vendor BillMatrix - Currently memo posts occur nightly, but there is an enhancement work in progress to increase memo post frequency to three times a day. Payments made by 4pm Monday - Friday will be posted by 8pm that evening. Payments made after 4pm on Weekdays and payments made on Weekends and Holidays will be posted the evening of the following business day.

3) By phone using the automated IVR system - Memo posts occur immediately after the customer completes the payment request. Payments made by 4pm Monday - Friday will be posted by 8pm that evening. Payments made after 4pm on Weekdays and payments made on Weekends and Holidays will be posted the evening of the following business day.

4) By cash or check at one of SDG&E's branch offices or Authorized Payment Locations – For SDG&E branch offices, the memo post occurs immediately. A payment made at a branch office will be posted the next working day. A payment made at an APL Monday through Friday during regular working hours 6am -5:50pm is memo posted within an hour. The actual payment will be posted the next working day. Payments made at an Authorized Payment Location between 5:50pm and 9:50pm Monday - Thursday will be memo posted at 10pm. The payment will be posted the next working day. Payments made after 9:50pm, Monday - Thursday will be included in the 6am memo post the following day. Payments made after cut off at Friday 5:50pm through

SDG&E Response 7 Continued:

Sunday evening at 9:50pm will be memo posted at 10pm Sunday evening. Payments made after 10pm on Sunday will be included in the first memo post file sent on Monday morning. All payments made after cut off on Friday through Sunday 10pm will be included in Monday's payment post.

GREENLING DATA DRA-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 05/07/2012
SDG&E RESPONSE DATED: 05/18/2012

Question 8: Please provide any documents designed to inform customers regarding any rights or protections they will be losing by participating in a prepay program.

SDG&E Response 8:

SDG&E has yet to design such documents. The Prepay Program is not proposed to launch until 2014.

The Prepay Program proposed by SDG&E will be completely optional and will provide an additional payment and energy management option for customers.

GREENLINING DATA REQUEST DRA-02
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 08/08/2012
SDG&E RESPONSE DATED: 08/22/2012

Question 1: Please state whether a customer who participates in the proposed prepaid program would be eligible to receive crisis assistance from the Low Income Home Energy Assistance Program (LIHEAP).

SDG&E Response 1:

A customer who participates in the proposed Prepay Program may or may not be eligible to receive crisis assistance from the LIHEAP. In order to be eligible for crisis assistance, the customer must fall within the income guidelines, demonstrate arrears in payments, and be facing an impending disconnection (meaning the customer must be in receipt of a 24- or 48-hour disconnection notice).

SDG&E is in the process of contacting local agencies to discuss whether Prepay Program participants would be able to sufficiently demonstrate arrears in payments and show proof of impending disconnection, assuming that the customer falls within the income guidelines. Under the proposed Prepay Program, customers would be allowed to owe a balance of up to $20. Thus, customers could potentially demonstrate arrears in payments by providing a MyAccount screenshot. Furthermore, customers might be able to demonstrate impending disconnection by presenting the electronic notices of zero or negative prepaid balance.

GREENLINING DATA REQUEST DRA-02
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 08/08/2012
SDG&E RESPONSE DATED: 08/22/2012

Question 2: As eligibility for crisis assistance from LIHEAP requires that a customer demonstrate arrears in their energy payments, would a customer who participates in the proposed prepaid program be eligible for such assistance.

SDG&E Response 2:

Please see response to Question 1 above.

GREENLINING DATA REQUEST DRA-02
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 08/08/2012
SDG&E RESPONSE DATED: 08/22/2012

Question 3: To your knowledge, could eligibility for LIHEAP crisis assistance be based on something besides a demonstrated arrearage, such as a disconnection or pending disconnection.

SDG&E Response 3:

Please see response to Question 1 above.

GREENLINING DATA REQUEST DRA-02
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 08/08/2012
SDG&E RESPONSE DATED: 08/22/2012

Question 4: Please state which community agencies San Diego Gas and Electric Company works with to assist customers in applying to LIHEAP assistance.

SDG&E Response 4:

SDG&E works with Campesinos Unidos, Inc., The MAAC Project and Community Action Partnership of Orange County.

JOINT PARTIES DATA REQUEST NUMBER DR-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 06/14/2012
SDG&E RESPONSE DATED: 06/26/2012

Question 1: Please provide the name of the individual or individuals that introduced the idea for the Prepay Program and describe their position with the utility. Please also set forth any meetings or discussions that contributed to this program's initial development, and name any parties that participated.

SDG&E Response 1:

SDG&E objects to this request to the extent it seeks information regarding individual utility employees, for purposes of protecting their individual privacy rights. Subject to and notwithstanding this objection, SDG&E responds as follows: In February of 2010, SDG&E conducted a survey of approximately 900 residential customers, in both English and Spanish. Customers were asked about their likelihood of using a prepaid service, among other potential new services. Results indicated that 16% of residential customers would be likely to use a prepaid solution. As a result, the Customer Services Division began researching and exploring the concept of a prepaid service.

JOINT PARTIES DATA REQUEST NUMBER DR-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 06/14/2012
SDG&E RESPONSE DATED: 06/26/2012

Question 2: Please provide whether any community based organizations that assisted in the initial development of the proposed Prepay Program, and what constituencies they represent.

SDG&E Response 2:

SDG&E's Prepay Program was discussed with parties to the Disconnection Settlement Agreement adopted in D.10-12-051, which includes DRA, TURN, the Greenlining Institute, the Center for Accessible Technology, and the National Consumer Law Center. The Prepay Program was discussed during both the June and September 2011 quarterly meetings with the above parties. Furthermore, on July 28, 2011, SDG&E conducted a two-hour discussion with the same parties focused solely on the Prepay Program.

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JOINT PARTIES DATA REQUEST NUMBER DR-01
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 06/14/2012
SDG&E RESPONSE DATED: 06/26/2012

Question 3: Please provide whether any community based organizations that were asked to comment upon or evaluate the proposed Prepay Program after its initial stages, and name the constituencies they represent. Please provide any methodology these community based organizations utilized in evaluating the Prepay Program's impact on their constituencies.

SDG&E Response 3:

Please see the above response to Question 2. As a result of the discussions and input from the Disconnection Settlement Agreement parties, SDG&E made significant changes to the Prepay Program proposal. The changes included:

1. Existing customers will not be eligible for the Prepay program unless they have a current balance (no arrears).
2. Only bad debt balances are eligible for the 75/25 Bad Debt feature (Final Bills older than 145 days), not current or recent Final Bills.
3. Reduced fees – Prepay customers will be waived from the disconnection and reconnection fees.
4. Revised implementation date of January 1, 2014 (from January 1, 2013).

Information about the parties referenced in Question 2 can be found on their respective websites:
http://www.dra.ca.gov
http://www.turn.org
http://www.greenlining.org
http://www.cforat.org/
http://www.nclc.org/

JOINT PARTIES DATA REQUEST NUMBER DR-02 (REVISED)
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 07/02/2012
SDG&E RESPONSE DATED: 07/17/2012

Question 1: Please provide information regarding the SDG&E study described in lines 26 to 29 of David Cheng's testimony, including:

a) Whether the study complied with the "Code of Standards and Ethics for Survey Research" set forth by the Council of American Survey Research Organizations, and provide associated information, including:
    i. A description of the sample design, including the method of selecting respondents, the number of attempts to complete a survey, respondent eligibility or screening criteria, and other pertinent information.
    ii. The study methodology, including whether it was conducted through landline telephone numbers.
    iii. A description of the results of the sample implementation including:
        1. The total number of potential respondents contacted
        2. The number not reached
        3. The number of refusals
        4. The number of terminations
        5. The number of non-eligibles
        6. The number of completed surveys
    iv. The basis for any "completion rate" percentages should be fully documented and described
b) A profile of the individuals surveyed including:
    i. The ethnicity and income demographics of all respondents;
    ii. The ethnicity and income demographics of individuals that indicated they are "likely to use a prepaid solution";
c) Please also include the following:
    i. The full SDG&E survey questionnaire referenced in David Cheng's testimony, as well as responses to that questionnaire;

ii. A description of any differences between the Prepayment Program as described in SDG&E's survey and the program as described in Mr. Cheng's testimony.

SDG&E Response 1:

a)

i.

The study complied with the CASRO "Code of Standards and Ethics for Survey Research". A Phone to web recruit methodology was used. A list of customers without self-requested survey restrictions on their account or who were recently surveyed for another study were randomly selected and provided to Vision Critical. Respondents were screened by telephone, an email address was obtained and double confirmed. An email invite was then deployed linking the respondent to a user-friendly visualized survey.

ii.

METHODOLOGY

Overview

- A phone to web methodology was utilized for this study in order to get a representative sample of the entire database and obtain the quality and amount of information required. This methodology involves the recruitment of respondents over the phone who are then forwarded a survey link via email to an email address provided by the respondent.

SDG&E Response 1 Continued:

Recruitment

- Respondents were telephoned and qualified through a recruitment screening questionnaire.
- A total of seven call backs were made to each customer on the list.
- For those that qualified, they were asked for their email address to complete the survey online.

Screening Criteria included:

- "Person responsible for making decisions on your household's energy usage"
- Screening for occupation
- Age 18-64
- Confirmation that SDG&E provide the electricity or natural gas
- Determining language of choice for the survey (English or Spanish)
- Telephone recruitment was conducted in both English and Spanish.
- Telephone interviewers determined language preference for the screening questionnaire upon initial contact.

Online Survey

- Respondents recruited from the telephone screening were sent a link to an online survey via email. The invitation was sent to an email address they provided during the telephone screening process.. Typically, the phone interviewer would remain on the phone until the respondent had confirmed receipt of the email.
- The online survey was approximately 25 minutes in length.
- The online surveys were available in both English and Spanish. Language of preference for the online survey was determined during the screening questionnaire.

Incentives

- Individuals were given a $5 incentive to take part in the survey in the form of a gift certificate to a major online retailer). Amazon was the online retailer used to fulfill the incentives but Amazon was not verbally mentioned to the respondents during the screening process in order that SDG&E could maintain impartiality.
- Additionally, if they completed the draw within 24 hours they were also entered into a random draw for a prize worth $500.
- To increase response rates, the incentive amount was increased to $15 after January 10th 2010.

Field Window

- 928 valid SDG&E residential completed surveys were received between December 11th, 2009 and February 28th 2010.
- 873 English and 55 Spanish completes.

Weighting

- The results were weighted according to the composition of SDG&E consumer segments.

iii.

See ii above

iv.

Completion Rate for Telephone Recruitment (proportion of qualified respondents that completed the interview):

completed recruit/(incomplete recruit + eligible non-recruit) = 15.3%

Completion Rate for Online Survey:

Number of recruits/number of completed online surveys = 40.5%

JOINT PARTIES DATA REQUEST NUMBER DR-02 (REVISED)
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 07/02/2012
SDG&E RESPONSE DATED: 07/17/2012

Total Completion Rate: 6.2%

b)

i.

The ethnicity and income of **all respondents**:

TOTAL	Income			Ethnicity				
	< $59K	$60K - $99.9K	$100K+	Caucasian	African-American	Hispanic	Asian	Other/ no answer
100%	47%	25%	28%	76%	2%	8%	3%	10%

ii.

The ethnicity and income of those who indicated they are **likely to use a prepaid billing card**:

TOTAL	Income			Ethnicity				
	< $59K	$60K - $99.9K	$100K+	Caucasian	African-American	Hispanic	Asian	Other/ no answer
100%	59%	25%	17%	53%	8%	16%	5%	18%

c)

i.

Only one question in the survey is relevant to the Prepay Program:

Intro:

We would like to know what you think about some new services SDG&E might be offering in the near or distant future.

(Commercial) How likely is it your business would use this service?

-Very likely

-Somewhat likely

-Not very likely

-Not at all likely

(Residential) How likely is it you personally would use this service?

-Very likely

-Somewhat likely

-Not very likely

-Not at all likely

One of the new services presented was Prepaid billing cards.

Survey responses for the likelihood of using a Prepaid billing card service:

(Commercial) How likely is it your business would use this service?

-Very likely – 28 respondents (3%)

-Somewhat likely – 79 (9%)

-Not very likely – 273 (30%)

-Not at all likely – 522 (58%)

(Residential) How likely is it you personally would use this service?

-Very likely – 41 respondents (4%)

-Somewhat likely – 107 (12%)

-Not very likely – 278 (30%)

-Not at all likely – 502 (54%)

ii.

Not applicable, as the only information presented to the respondents was the name of the potential new service itself – Prepaid billing cards.

JOINT PARTIES DATA REQUEST NUMBER DR-02 (REVISED)
SDG&E 2012 GRC PHASE 2 A.11-10-002
REQUEST DATED: 07/02/2012
SDG&E RESPONSE DATED: 07/17/2012

Question 2: Do you believe that the processes outlined in David Cheng's testimony fully meet SDG&E's standards of securing full and adequate input from underserved communities before attempting to design and implement a program intended to benefit low and moderate income families?

a) If your answer is in the affirmative, please rate this on a scale of 1-10, with 10 being "outstanding."

SDG&E Response 2:

Not applicable.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 1: Following up on SDG&E's response to Greenlining DR 1-4, please provide documentation of the sampling methodology used in the survey referenced in the company's response.

SDG&E Response 1:

Regarding the sampling methodology used, first a random sample of accounts was generated with a sampling size generally 10 times the target number of responses; for this survey, the target number of responses was 900. This list was then provided to a research vendor, who then randomly contacted customers to conduct the survey. The vendor had a total of 902 responses from commercial accounts and 928 responses from residential accounts.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 2: Following up on SDG&E's response to Greenlining DR 1-4, please provide all background information regarding prepaid service -- including but not limited to, information regarding disconnection procedures -- that was provided to respondents prior to the posing of survey questions.

SDG&E Response 2:

The only information presented to the respondents was the name of the potential new service itself – Prepaid billing cards.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 3: In the Revised Prepared Testimony of David W. Cheng at page DWC-1, Mr. Cheng references a study conducted by EcoAlign in November 2010. With respect to this study please provide the following documentation and information:

a. the complete survey instrument,
b. documentation and analysis of responses to each survey question, and
c. identification of the funding sources behind the referenced study.

SDG&E Response 3:

SDG&E is not aware of such documents or information related to the EcoAlign study. The EcoPinion Survey Report is available on www.ecoalign.com.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 4: In the Revised Prepared Testimony of David W. Cheng at page DWC-1, Mr. Cheng states that the Company's prepaid service program would allow "customers the ability to manage their energy usage by prepaying for energy prior to consumption." Please fully describe the extent to which SDG&E customers who do not participate in a prepaid service offering would have the ability to manage their energy usage by prepaying for energy prior to consumption.

SDG&E Response 4:

SDG&E believes that the last sentence of the question was meant to state "Please fully describe the extent to which SDG&E customers who do not participate in a prepaid service offering would have the ability to manage their energy usage ~~by preparing for energy prior to consumption~~."

All energy usage management tools available to customers participating in the optional Prepay Program will also be available to traditional post-pay customers. However, as noted in the Revised Prepared Testimony of David W. Cheng on page DWC-3, other utilities have reported a reduction in energy consumption for Prepay customers after switching from traditional post-pay.

The primary goal of the Prepay Program is to provide customers an additional payment option for those that value such an option.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 5: Please provide full documentation of any and all modifications or upgrades to the Company's IT systems, billing systems, customer service operations or other operations that would be needed to implement a new residential prepaid service program.

SDG&E Response 5:

To date, modifications to the following systems have been identified:

Service Orders system, Finance system, Billing system, Credit system, and Metering system.

SDG&E will undertake detailed development of system requirements and system modifications design when the Prepay Program is approved.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 6: Please provide any estimates, projections and documentation in the company's possession regarding costs associated with modifications or upgrades to the Company's IT systems, billing systems, customer service operations or other operations that would be needed to implement a new residential prepaid service program.

SDG&E Response 6:

SDG&E's response to Question 6 and the attached spreadsheet are confidential and are produced pursuant to the non-disclosure agreement executed by NCLC in this proceeding.

Currently, the estimated system modification cost for implementing the Prepay Program is approximately $1.4 mil. (please see attached spreadsheet) The cost estimate is subject to change once more detailed requirements are established.


Prepay Estimate (Confidential).xls

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 7: Please provide detailed information describing how the company plans to allocate costs associated with implementation of a new residential prepaid service program.

SDG&E Response 7:

SDG&E is not seeking incremental funding in this application to implement the Prepay Program. Ongoing costs of the program will be included in SDG&E's next General Rate Case.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 8: In the Revised Prepared Testimony of David W. Cheng at page DWC-2, Mr. Cheng states that "utilities have reported a significant savings in energy consumption for customers after switching to a prepaid solution." He references a 2007 study of the Salt River Project M-Power program and the prepaid electric program of Oklahoma Electric Cooperative. Please provide all available documents, reports and analysis regarding the source of reported usage reductions, including but not limited to reductions attributable to involuntary disconnection of service or forced usage reduction to avoid complete loss of light, cooling and heat. To the extent that SDG&E is not aware of such existing documents, reports and analysis, please provide a detailed explanation here.

SDG&E Response 8:

SDG&E is not aware of such documents or information. Mr. Cheng's testimony is based on the following two sources, as also footnoted in his testimony :

King ,Jennie, "M-Power: A Better Way to Keep Customers in Power," Metering, AMR, and Data Management, Energy Central (Jan. 18, 2007).

Chartwell, Jonna Buck, Oklahoma Electric Cooperative, "Prepaid Experience," Webinar, July 2008.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 9: On page DWC-3, Mr. Cheng states that customers who are particularly vulnerable to the health and safety risks associated with the loss of utility service will not be eligible to participate in the Company's proposed prepaid service program. Please explain why customers who are particularly vulnerable to the health and safety risks associated with loss of utility service will not be allowed to participate in the program.

SDG&E Response 9:

The Prepay Program utilizes Remote Disconnection and Remote Reconnection in order to maximize efficiency of service and minimize program costs. Customers who may face health and safety risks due to the interruption of energy services are already excluded from remote disconnection on a post-pay basis. These risks are not mitigated as a result of providing customers with an additional utility payment option.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 10: For each of the past five calendar years please provide the number of new residential customers that apply for service with a prior bad debt.

SDG&E Response 10:

2007 – N/A
2008 – N/A
2009 – 15,848
2010 – 15,946
2011 – 15,804
2012 – 7,641 (through 5/31)

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 11: On page DWC-3, Mr. Cheng references prepaid electric programs operated by Arizona's Salt River Project, North Carolina's Brunswick Electric Membership Corporation, and the prepaid electric program operated by Oklahoma Electric Cooperative. For each of these referenced programs, please the following information separately for general residential customers, and prepaid electric service customers, for the most recent twelve months:

a. Total number of customers
b. Rates of disconnection for nonpayment
c. Duration of disconnection for nonpayment
d. Number of service reconnection's after disconnection for nonpayment
e. Number of payment agreements entered
f. Number of payment agreements successfully completed
g. Number of failed payment agreements
h. Number of customers eligible to participate in the Low Income Home Energy Assistance Program.

SDG&E Response 11:

SDG&E is not in possession of nor aware of such documents or information.

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 12: Please provide any information or analysis in the Company's possession regarding projected savings through implementation of prepaid electric service in the following areas:

a. Customer service operations, and
b. Reduced bad debt.

SDG&E Response 12:

There are no projected savings in Customer service operations at this time, as there are too many opposing factors, such as potential longer Customer Service call times balanced by potential fewer calls, and potential savings from reduced check processing expenses balanced by potential need for additional staff in Branch Offices if more cash payments are received. Thus, on balance, there are no projected savings.

The projected savings for reduced bad debt are as follows: $28,000 in 2014 (assuming a 1% participation level), $56,000 in 2015 (assuming a 2% participation level), and $84,000 in 2016 (assuming a 3% participation level).

NCLC DATA REQEUST
DR-01
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: MAY 22, 2012
Date Submitted: JUNE 6, 2012

Question 13: Please provide evidence of any prepaid electric service program operating in the United States where participation is not disproportionately concentrated among households living below the median income of the implementing utility service territory.

SDG&E Response 13:

SDG&E is not aware of evidence for or against the proposed statement that a prepaid electric service program operating in the United States is disproportionately concentrated among households living below the median income of the implementing utility service territory.

SDG&E Estimate - CISCO Prepay Estimate

Requirement			Routine Type	Complexity	New / Existing	Developer Skill	Model Hours	Adjustment	Estimated Hours	CFG %	CFG Hours	Total Hours	Responsible Team
	Requirement	Business description of requriement.											
1.1	CUSSO010 - SOTN	1.) Modify SOTN to allow prepay indicator to transfer with customer when a transfer of service is requested. 2.) Modify SOTN to allow new prepay prompt screen to be displayed if deposit is required.	Online (Update-S)	Medium	Existing	Average	50		50	30%	15	65	Service Orders
1.2	CUSSO510 - SOTN SM	1.) Modify SOTN to allow prepay indicator to transfer with customer when a transfer of service is requested. 2.) Modify SOTN to allow new prepay prompt screen to be displayed if deposit is required.	Online (Update-S)	Medium	Existing	Average	50		50	30%	15	65	Service Orders
1.3	CUSSO015 - SOTF	1.) Modify SOTF to allow prepay indicator to transfer with customer when a transfer of service is requested.	Online (Update-S)	Medium	Existing	Average	50		50	30%	15	65	Service Orders
1.4	CUSSO515 - SOTF SM	1.) Modify SOTF to allow prepay indicator to transfer with customer when a transfer of service is requested.	Online (Update-S)	Medium	Existing	Average	50		50	30%	15	65	Service Orders
1.5	Service order Completion	1.) Modify completion of SOTF/SOTN to allow transfer of prepay set up and funds to transfer to new account. Currently the deposit transfer process uses the 02/01 cd-trf pending and the 05/10 to determine if the deposit transfers - this process could be leveraged to look for prepay status records and transfer the status to the new account. 2.) Modify completion to accommodate prepay remote disconnect order. 3.) Modify completion to accommodate prepay remote cut-in order. 4.) The order process will not suppress an order if it is created - there would be no process to hold the order until a payment is rec'd. Instead, at the turn on time, change mtr completion with pending prepay, the completion process should set the prepay status from pending to active. 5.) If the account is on prepay and the order CPPs a PWQ to credit would be generated. 6.) Service Order PWQ's - If meter is replaced and the new meter is not a remote connect meter, a PWQ will need to be generated, the same would be true if the meter was reprogrammed. We could add logic to the RMC process to only allow the meter to be programmed to a program with remote configuration status of E.	Common Module	High	Existing	Average	45	240	240	30%	72	312	Service Orders
1.6	SODP - Conversation (CRDP???)	1.) Add new step to conversation which will be a prompt screen that allows user to select prepay option when customer is eligible. 2.) Add new step to conversation which will be a prepay set up screen. ***Modify CRDP as well???--- Ask Eileen and Michele	Conversation	Medium	Existing	Average	10		10	30%	3	13	Service Orders

SDG&E Estimate - CISCO Prepay Estimate

1.7	New Prepay Maintenance Conversation	1.) A new Install/1 conversation will be developed which will allow the user to set customers up on prepay and terminate prepay agreements. It is assumed that most prepay arrangements will be established during the SOTN kprocess. This conversation will be utilized for customers who are already active, but have elected the prepay option. In addition, this conversation will allow them to terminate their prepay agreement and transition to traditional billing when eligible. 2.) This new conversation will go directly to the prepay setup screen.	Conversation	Medium	New	Average	40		40	30%	12	52	Finance
1.8	New Prepay DB2 Table	1.) A new DB2 table will be developed which will store prepay start date, term date, status, account, etc.	DB2 Table	Medium	New	Average	10	40	40	30%	12	52	Billing
1.9	New Deposit Prompt Screen	1.) A new deposit prompt screen will be developed which will allow the user to designate whether they will be initiating a deposit or setting up a prepay agreement. The prompt screen would include prepay eligibility validations which will be set up in PTRM. The 'initiate prepay' field will be protected if the customer is not eligible. In addition, a message will be displayed to indicate why the customer is inelligible. 2.) Screen could be set up to default to cash deposit - Deposit and Bad Debt and Closing Bill informatiuon displayed on screen if debt is eligible to be paid back and matches customer ID. Screen could be set up to select account for viewing or a PF key could be added to view the customer credit history screen. This will help the CSR work with the customer and determine the best option.	Screen	Medium	New	Average	30	40	40	30%	12	52	Finance
1.10	New Deposit Prompt Program	1.) A new deposit prompt screen will be developed which will allow the user to designate whether they will be initiating a deposit or setting up a prepay agreement. The prompt screen would include prepay eligibility validations which will be set up in PTRM. The 'initiate prepay' field will be protected if the customer is not eligible. In addition, a message will be displayed to indicate why the customer is inelligible. 2.) Screen could be set up to default to cash deposit - Deposit and Bad Debt and Closing Bill informatiuon displayed on screen if debt is eligible to be paid back and matches customer ID. Screen could be set up to select account for viewing or a PF key could be added to view the customer credit history screen. This will help the CSR work with the customer and determine the best option.	Online (Update-NS)	High	New	Average	80		80	30%	24	104	Finance

SDG&E Estimate - CISCO Prepay Estimate

New Pre Pay Set Up Screen 1.11	1.) A new PrePay set up screen will be developed which will allow the user to set the customer up on prepay and terminate prepay. 2.) Prepay start date would default to turn on date. If account is active, it would default to day after last read date. Screen would require account to have a 0 balance. Rules have to be defined about when a customer has to make a payment. 3.) If customer meets eligibility but does not have a remote connect meter, confirmation of the set up will generate a change meter order to install a remote connect meter. (Would only be allowed if account is not Medical BL/Life Support, meter is Calss 100 or 200 and meter form is 01s, 02s or 12s). If service is not form 1,2, or 12 or CL100 or 200, Prepay is not allowed - this will need to be displayed on the new screen. 4.) If customer is eligible and meter is a remote connect meter and the meter has a program that has the remote disabled, the new set up program will need to insert a row in the Remote Meter Configuration table (CU16TB25) to have the meter reprogrammed to an enabled program. 5.) Initial prepayment amount will be due on the sotn dt_wanted date for SOTN initiated prepay agreements. For all other prepay setups, the date the account is active on prepay will be the date that the prepayment is due. 6.) A PF key will be added to this screen which will take the user to a prepay history screen. This screen would show the history of prepay agreements at the premise for the customer.	Screen	Medium	New	Average	30	40	40	30%	12	52	Finance
New Pre Pay Set Up Program 1.12	1.) A new PrePay set up screen will be developed which will allow the user to set the customer up on prepay and terminate prepay. 2.) Prepay start date would default to turn on date. If account is active, it would default to day after last read date. Screen would require account to have a 0 balance. Rules have to be defined about when a customer has to make a payment. 3.) If customer meets eligibility but does not have a remote connect meter, confirmation of the set up will generate a change meter order to install a remote connect meter. (Would only be allowed if account is not Medical BL/Life Support, meter is Calss 100 or 200 and meter form is 01s, 02s or 12s). If service is not form 1,2, or 12 or CL100 or 200, Prepay is not allowed - this will need to be displayed on the new screen. 4.) If customer is eligible and meter is a remote connect meter and the meter has a program that has the remote disabled, the new set up program will need to insert a row in the Remote Meter Configuration table (CU16TB25) to have the meter reprogrammed to an enabled program. 5.) Initial prepayment amount will be due on the sotn dt_wanted date for SOTN initiated prepay agreements. For all other prepay setups, the date the account is active on prepay will be the date that the prepayment is due. 6.) A PF key will be added to this screen which will take the user to a prepay history screen. This screen would show the history of prepay agreements at the premise for the customer.	Online (Update-NS)	High	New	Average	80		80	30%	24	104	Finance

1.13	New prepay eligibility common module	1.) A new common module will be developed which will determine if a customer is eligible to particiate in the prepay program. This module will be called by the prepay set up screen. In addition, billing's batch prepay module which runs nightly will validate all active prepay accounts to ensure that they are still eligible. All eligibility requirements should be maintained in the PMRC conversation so that they can be modified with minimal coding impact. This common module will also provide us with the flexibility to allow prepay to be established via multiple channels, MyAccount, IVR, etc.(in the future)	Common Module	High	New	Average	70	80	80	30%	24	104	Billing
1.14	New prepay Termination eligibility common module	1.) A new common module will be developed which will determine if a customer is eligible terminate prepay and transition to traditional billing. This module will be called by the prepay set up screen. Rules will need to be established to determine whether a customer can transition to traditional billing, ie. If bills paid on time for 1 year, account open for 5 years, bad debt paid off, etc... Rules will need to be defined by credit .	Common Module	High	New	Average	70	80	80	30%	24	104	Billing
1.15	New Prepay history screen	1.) A new screen will be developed which displays the prepay history for a customer at a specified premise id. The customer could potentially have multiple prepay agreements. (for example, go on prepay, go off prepay, go back on prepay) Therefore, this new screen would provide the CSR a history of the prepay agreements for the customer at the given premise. Some terminations may be due to NPSO and some terminations may be due to customer's preference.	Screen	Medium	New	Average	30	40	40	30%	12	52	Billing
1.16	New Prepay history program	1.) A new screen will be developed which displays the prepay history for a customer at a specified premise id. The customer could potentially have multiple prepay agreements. (for example, go on prepay, go off prepay, go back on prepay) Therefore, this new screen would provide the CSR a history of the prepay agreements for the customer at the given premise. Some terminations may be due to NPSO and some terminations may be due to customer's preference.	Online (Display-S)	Medium	New	Average	65	80	80	30%	24	104	Billing
1.17	CUSSO009	1.) SOME - Add logic to add remarks to any meter order with prepay identifying the account as pre-pay and that remote connect meter is required.	Online (Update-S)	Medium	Existing	Average	50		50	30%	15	65	Service Orders
1.18	Autogenerate cut-in orders - new common module	1.) Auto-generate Cut-In orders - Billing's nightly prepay program will initiate a call to this module which will initiate a cut-in order to prepay accounts which have been NPSO'd, but not finaled. This program would derive the job code and create the order. Billing program would need to pass premise, spt, and date wanted.	Common Module	High	New	Average	70	80	80	30%	24	104	Service Orders

SDG&E Estimate - CISCO Prepay Estimate

1.19	CINQ- CUSCI002	1.) Prepay indicator - currently there is no deposit indicator in SAD or on the landing page on CINQ. A prepay indicator will be required on the Credit History Screen . An indicator could be required in SAD and we could also be required to create a warning condition.	Online (Update-NS)	Medium	Existing	Average	40		40	30%	12	52	Service Orders
1.20	CUDIVR02	1.) Prepay indicator should be added to IVR profile grab. This indicator will be used on the IVR to drive processing. 2.) We may not want to allow customers to sign up for LPP or other programs if they are on prepay. 3.) TMD 08/23/11 Per V. Tabiara - Changes will include 5 additional data elements (Prepay flg, Prepay balance, Bill-to-date, forecasted bill, last payment made, last payment date). Forecasted and Bill to date might have to come from CISCO via Aclara, needs to be done. Change to WSDL	WSDL	Medium	Existing	Average	10		16	30%	4.8	20.8	Service Orders
1.21	CUDIVR02	1.) Prepay indicator should be added to IVR profile grab. This indicator will be used on the IVR to drive processing. 2.) We may not want to allow customers to sign up for LPP or other programs if they are on prepay. 3.) TMD 08/23/11 Per V. Tabiara - Changes will include 5 additional data elements (Prepay flg, Prepay balance, Bill-to-date, forecasted bill, last payment made, last payment date). Forecasted and Bill to date might have to come from CISCO via Aclara, needs to be done. Change to Web Service module	Web Service Module	Medium	Existing	Average	30	40	40	30%	12	52	Service Orders
1.22	CUDWS010	1.) Prepay indicator should be added to My Account profile grab. This indicator will be used on the Web to drive processing. 2.) We may not want to allow customers to sign up for LPP or other programs if they are on prepay. Change to WSDL	WSDL	Medium	Existing	Average	10	16	16	30%	4.8	20.8	Service Orders
1.23	CUDWS010	1.) Prepay indicator should be added to My Account profile grab. This indicator will be used on the Web to drive processing. 2.) We may not want to allow customers to sign up for LPP or other programs if they are on prepay. Change to Web Service module	Web Service Module	Medium	Existing	Average	30	40	40	30%	12	52	Service Orders

1.24	CUMCI130	1.) Prepay indicator should be added to My Account profile grab. This indicator will be used on the Web to drive processing. 2.) We may not want to allow customers to sign up for LPP or other programs if they are on prepay. Change to common module to extract data	Common Module	Medium	Existing	Average	35	40	40	30%	12	52	Service Orders
1.25	CUSMH751	1.) Add logic to MHRC process to only allow the meter to be programmed to a program with remote configuration status of E for prepay accounts.	Online (Update-NS)	Medium	Existing	Average	40		40	30%	12	52	Metering
1.26	CUBSO250	1.) The service order batch job which initiates fielded orders for remaining service points that have been NPSO'd - This program will now have 2 paths a.) traditional credit strategies (3 day rule) b.) prepay credit strategies (60-90 days) 2.) This job is also responsible for setting the bill account status to pending final once all service points have been shut off. Setting the account to pending final triggers billing to pick up the account and final bill the account.	Online (Update-NS)	Medium	Existing	Average	40	80	80	30%	24	104	Service Orders
1.27	Remote Disconnect for credit strategies	1.) CISCO does not currently perform remote disconnects related to credit strategies. A whole new process is scheduled to be implemented within the next year. Prepay would be dependant on this process being in place. We are assuming that we may need to make some modifications to this process to accomodate any specific prepay requirements. ***This functionality does not exist. We are assuming that it will be developed before prepay is implemented. We would modify this process to accomodate prepay. This estimate only includes modifications to this process, NOT the creation of this process.	Common Module	Medium	Existing	Average	35	240	240	30%	72	312	Service Orders
	SubTOTAL (Service Order)							1732					
2.1	Pre Pay Billing data to Aclara Interface	New interface to extract and pass Pre Pay accounts, their billing determinants and interval data to Aclara for Bill-to-Date process. *** The assumption is that Pre Pay will leverage the interface built for the DPP project but this estimate accounts for any code changes and the corresponding integration involved with having the DPP interface support the daily batch transmission of PrePay customer data.	Batch Driver	Medium	Existing	Average	45	300	300	30%	90	390	Billing

SDG&E Estimate - CISCO Prepay Estimate

2.2	Aclara Bill-to-Date to CISCO Interface	New interface to pass Aclara Bill-to-Date results to CISCO for the following processing activities: (1) Evaluate eligibility of PrePay accounts. Create a pwq if the account no longer is eligible. (2) Evaluate scheduled bill date in relation to BTD date, special handle when within a specified # of days of the bill date. (3) Compare BTD results with notification/disconnect thresholds. Create file for customer notification to send to CCM. (4) Initiate/cancel credit strategies based on BTD results & thresholds (5) Initiate cut-in orders based on BTD results & thresholds (6) Post BTD results in new Pre Pay history table *** The assumption is that Pre Pay will leverage the interface built for the DPP project to receive the Bill-to-Date results but this estimate also accounts for any changes and the corresponding integration involved with having the DPP interface support the daily batch transmission of PrePay customer results.	Batch Driver	Very Complex	New	Average	130	300	300	30%	90	390	Billing
2.3	Pre Pay Balance Screen	New screen to display the account's current balance, the Bill-to-Date balance, and the remaining credit.	Screen	Medium	New	Average	30		30	30%	9	39	Billing
2.4	Pre Pay Balance Program	New program to display the account's current balance, the Bill-to-Date balance, and the remaining credit.	Online (Display-S)	Medium	New	Average	65		65	30%	19.5	84.5	Billing
2.5	Pre Pay History DB2 Table	This table will store Bill-to-Date results.	DB2 Table	Medium	New	Average	10	20	20	30%	6	26	Billing
2.6	Pre Bill changes	Modify programs as appropriate to accommodate billing NPSO businesses.	Batch Driver	Very Complex	Existing	Average	90	400	400	30%	120	520	Billing
2.7	Bill Calc changes	Modify programs as appropriate to accommodate billing NPSO businesses.	Common Module	Very Complex	Existing	Average	70	200	200	30%	60	260	Billing
2.8	Bill Print changes	Show Pre Pay related information: batch and Dialogue changes - Due Date box on bill copy will reflect appropriate payment message for pre-pay accounts	Batch Driver	High	Existing	Average	60	200	200	30%	60	260	Billing
2.9	Rebate/Rebill changes	Modify programs as appropriate to accommodate billing NPSO businesses.	Online (Update-S)	Very Complex	Existing	Average	110	200	200	30%	60	260	Billing
2.10	My Account enrollment eligibility interface	Provide eligibility check for Pre Pay enrollment	Web Service Module	High	New	Average	50	80	80	30%	24	104	Billing
2.11	My Account unenrollment eligibility interface	Provide eligibility check for Pre Pay unenrollment	Web Service Module	High	New	Average	50	80	80	30%	24	104	Billing
2.11	My Account Pre Pay indicator	Real time web service to know when an account is enrolled/not enrolled for link display within My Account	Web Service Module	High	New	Average	50	80	80	30%	24	104	Billing
2.12	EBPP changes	Bill Ready notification changes to due dates/bill mesaging (as per changes to paper bill)	Common Module	Medium	Existing	Average	35		35	30%	10.5	45.5	Billing
	SubTOTAL (Billing)							1990					
3.1	IVR Application Development		Online (Update-S)	Very Complex	Existing	Average	110	920	920	15%	138	1058	Finance
3.2	Genesys Attached Data Changes		Online (Update-S)	Very Complex	Existing	Average	110	20	20	15%	3	23	Finance
3.3	Adding new Disposition		Online (Update-S)	Very Complex	Existing	Average	110	4	4	15%	0.6	4.6	Finance
	SubTOTAL (IVR)							944					

SDG&E Estimate - CISCO Prepay Estimate

4.1	Pre Payment credit action when below threshold	Add new category (cd-cr-cat= PP) for Prepayment strategy - update decode	Parm Table Maint	Low	New	Average	8	8	8	30%	2.4	10.4	Finance
4.2	Pre Payment credit action when below threshold	Add new category to parm tables (cu28tb15,cu28tb23,etc.)	Parm Table Maint	Low	New	Average	8	8	8	30%	2.4	10.4	Finance
4.3	Pre Payment credit action when below threshold	Create new strategies (for processing and remote disconnect) for PP (need exception classes or just one?)	Parm Table Maint	Low	New	Average	8	8	8	30%	2.4	10.4	Finance
4.4	Prepayments to pay portion of bad d	New table to store PP bad debt accounts for payment processing.Identify bad debt accounts to be credited on Prepay accounts (customer data table - not parm table)	Parm Table Maint	Medium	New	Average	12	12	12	30%	3.6	15.6	Finance
4.5	Exception classes	New table to store PP exception classes and priorities	Parm Table Maint	Medium	New	Average	12	12	12	30%	3.6	15.6	Finance
4.6	Prepayments to pay portion of bad debt	New program to transfer prepaid payment percentage to bad debt account. Pre pay at turn-on	Batch Driver	High	New	Average	80		80	30%	24	104	Finance
4.7	Prepayment to pay portion of bad debt. Do not transfer bad debt and no deposit request for PP customer	Modify to not do bad debt transfer and/or deposit for prepay (cumcr306) for turn-ons	Batch I/O Module	Low	Existing	Average	25		25	30%	7.5	32.5	Finance
4.8	Prepayment to pay portion of bad debt. Do not transfer bad debt and no deposit request for PP customer	Determine if bad debt transfer and/or deposit for prepay(cubcr566)	Batch Driver	Low	Existing	Average	30		30	30%	9	39	Finance
4.9	Prepayment to pay portion of bad debt. Do not transfer bad debt and no deposit request for PP customer	Detmine if bad debt transfer and/or deposit for prepay (CUMCR567)	Common Module	Medium	Existing	Average	35		35	30%	10.5	45.5	Finance
4.10	Prepayments to pay portion of bad debt	New program to transfer percentage of PP account payments to bad debt accounts	Batch Driver	Medium	New	Average	80		80	30%	24	104	Finance
4.11	Prepayment customers to not have deposits requested	CUBCR410 - Deposit driver - chg for PP to determine deposit request	Batch Driver	Medium	Existing	Average	45		45	30%	13.5	58.5	Finance
4.12	Prepayments to pay portion of bad debt. Transfer Prepayment information to new account.	Change batch transfer (cubar100) to check for PP, transfer PP status,	Batch Driver	Medium	New	Average	80		80	30%	24	104	Finance
4.13	Prepayment to pay portion of bad debt. Do not transfer bad debt and no deposit request for PP customer	Change balance transfer (cumar101) for PP	Batch Driver	Medium	Existing	Average	45		45	30%	13.5	58.5	Finance
4.14	Search & Store for Bad Debt	New module to search for bad debts and add to table. Allow to run and refresh	Common Module	Medium	New	Average	60		60	30%	18	78	Finance
4.15	Pre Payment credit action when below threshold	Add PP logic to strategy creation module (cumcr516)	Common Module	Medium	Existing	Average	35		35	30%	10.5	45.5	Finance
4.16	Remote disconnect. Memo post payments to cancel strategy	Add PP logic to strategy cancellation/update module (cumcr518)	Common Module	Medium	Existing	Average	35		35	30%	10.5	45.5	Finance
4.17	Pre Payment credit action when below threshold	On-line strategy creation (CUSCR516) - ADD PP logic	Online (Update-NS)	Medium	Existing	Average	40		40	30%	12	52	Finance
4.18	Reporting prepayment data to PUC	New batch program to extract prepay payments	Batch Driver	High	New	Average	80		80	30%	24	104	Finance
4.19	Reporting prepayment data to PUC	New batch program to report prepayment	Report Extract	Medium	New	Average	40		40	30%	12	52	Finance
4.20	Transmit prepayment data to PUC	New/existing job to send prepayment reporting to PUC	Report Edit	Medium	New	Average	35		35	30%	10.5	45.5	Finance
	SubTOTAL (Finance)							793					
5.1	MyAccount IT Changes	Flat estimate provided							1000	**30%**	300	1300	My Account
	Sub TOTAL (MyAccount)							1000					
TOTAL CISCO Development									**6459**		**1496.1**	**8255.1**	

SDG&E Estimate - CISCO Prepay Estimate

	Requirements Analysis / Testing / Sup	Requirements, Testing and Support based on a percent of the Development effort.							
1	IT Requirements Analysis		10%	646	20%	129	775	0.1 of total development effort.
3	IT Integration Test		20%	1292	10%	129	1421	0.2 of total development effort.
3.1	HP Quality Center - Set up test conditions/data		10%	646	10%	65	710	0.1 of total development effort.
4	CSST - 40% of total IT Time		40%	2584	10%	258	2842	0.4 of total IT Time
5	System Test - IT (10% of STS's System Test Hours)		10%	258	10%	26	284	0.1 of CST System Test Hours
9	Data Base Admin Support		5%	323	10%	32	355	0.05 of total development effort.
10	Infrastructure Support			0	10%	0	0	As Required
11	Information Protection Support			0	10%	0	0	As Required
12	IT Lead		10%	646	10%	65	710	0.1 of total development effort.
13	Contingency for New & Change	Additional Scope Requirements	20%	1292	0%	0	1292	0.2 of total development effort.
14	Regression Testing		10%	646	10%	65	710	0.1 of total development effort.
15	Merge (Depending on other projects)		5%	323	0%	0	323	0.05 of total development effort.
16	Migration		2%	129	0%	0	129	0.02 of total development effort.
17	Training Region Sync		10%	646	0%	0	646	0.1 of total development effort.
18	Post Production Support		0%	0	0%	0	0	0 of total development effort.
	subtotal			**9430**		**769**	**10199**	

TOTAL CISCO Requirements Analysis, Development and Test	**15889**	**2265**	**18454**			
				Cost per hour	**Subtotal**	
TOTAL IT Hours	**12983**	**1974**	**15257**	100	1525666	
TOTAL CSST Hours	**2584**	**258**	**2842**	75	213147	
TOTAL BOS Hours	**0**	**0**	**0**			
TOTAL DBA Hours	**323**	**32**	**355**	100	35524.5	
TOTAL IEO Hours	**0**	**0**	**0**			
TOTAL IP Hours	**0**	**0**	**0**			

Total Estimate
1774337

NCLC DATA REQEUST
DR-02
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: SEPTEMBER 28, 2012
Date Submitted: OCTOBER 4, 2012

Question 1: With respect to the Salt River Project ("SRP") M-Power prepaid service program referenced in the Revised Prepared Testimony of David W. Cheng at page DWC-2, please provide a description of the means by which SRP's M-Power participants receive information regarding the following:

a. electricity consumption and cost,
b. customer account balance or prepaid credit available to the customer, and
c. disconnection of service due to depletion of prepaid credits.

SDG&E Response 1:


EPRI Paying Upfront.pdf

a. According to a study (attached) in October 2010 titled "Paying Upfront: A Review of Salt River Project's M-Power Prepaid Program" by Electric Power Research Institute, information regarding electricity consumption and cost is available on the in-home display, referred to as the User Display Terminal (UDT).

b. Based on the same study referenced above, the prepaid credit available is also available on the UDT.

c. SDG&E is unaware of how M-Power participants receive information regarding disconnection of service due to depletion of prepaid credits.

NCLC DATA REQEUST
DR-02
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: SEPTEMBER 28, 2012
Date Submitted: OCTOBER 4, 2012

Question 2: In order to receive information regarding electricity consumption, cost, credit balance, and disconnection of service, please indicate the extent to which SRP's M-Power prepaid service program participants must retain access to one or more of the following services:

a. Internet,
b. mobile telephone, or
c. landline telephone

SDG&E Response 2:

SDG&E is unaware of M-Power's program requirements with regards to access to the Internet, mobile telephone, or landline telephone.

NCLC DATA REQEUST
DR-02
SDG&E PHASE 2 GRC – A.11-10-002
Date Received: SEPTEMBER 28, 2012
Date Submitted: OCTOBER 4, 2012

Question 3: With respect to the SRP M-Power prepaid service program referenced in the Revised Prepared Testimony of David W. Cheng at page DWC-2, please provide information regarding SDG&E's current understanding or evidence of the following:

a. Total number of customers,
b. rates or frequency of disconnection of service after depletion of billing credits,
c. frequency of payment for billing credits,
d. median income of M-Power participants, and
e. cross tabulation of M-Power participation by race

SDG&E Response 3:

a. According to a study in October 2010 titled "Paying Upfront: A Review of Salt River Project's M-Power Prepaid Program" by Electric Power Research Institute, M-Power has more than 100,000 customers.

b. SDG&E is unaware of M-Power's disconnection rates.

c. Based on the same study referenced above, M-Power customers purchase an average of $21-$24 each time, with an average of four times a month during the winter and seven times a month during the summer.

d. Based on the same study referenced above, median income of M-Power participants decreased from $27,600 in 2007 to $17,900 in 2010.

e. Based on the same study referenced above, in 2010 41% of M-power participants were Hispanic, 14% were African American, and 34% were Caucasian.