PREPAID METERING ANALYTICAL REPORT

PROJECT 10-10 | JUNE 2012

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Prepaid Metering Analytical Report

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Mark Day is a consultant for Utility Integration Solutions, Inc., with over 23 years of utility experience in the areas of Prepayment, Advanced Metering Infrastructure (AMI), and Meter Data Management (MDM) solutions. In the area of prepayment, he was a significant contributor to the development of the first prepayment system suitable for use in North America. Later he helped develop the first AMI-based prepayment system, which forms the basis for most prepayment solutions today. He has worked with many different utilities over the years to help them implement, maintain, and adapt their prepayment programs to meet changing technology and customer needs. Mark is based in Charlotte, N.C., but serves utilities throughout the country. Mark can be reached at 704.430.7697 or via email at mday@uisol.com.

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PROJECT 10-10

Prepaid Metering Analytical Report

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PREVIOUS VIEW

The National Rural Electric Cooperative Association

The National Rural Electric Cooperative Association (NRECA), founded in 1942, is the national service organization supporting more than 900 electric cooperatives and public power districts in 47 states. Electric cooperatives own and operate more than 42 percent of the distribution lines in the nation and provide power to 40 million people (12 percent of the population).

NRECA's Cooperative Research Network (CRN) harnesses research and development to benefit its electric co-op members in four key ways:

- Improve productivity,
- Control costs,
- Increase service excellence, and
- Keep pace with emerging technologies.

CRN strives to deliver new products and services best suited to the particular needs of electric co-ops. CRN communicates with its members through its Web site (**www.cooperative.com/crn**), online and printed reports, newsletters, Web conferences, and seminars.

In addition, CRN staff present at several annual events, including NRECA's TechAdvantage Conference & Expo, the NRECA/Touchstone Energy "Connect" marketing conference, and Touchstone Energy's New & Emerging Technologies (NET) Conference. For more information about these events and CRN's participation, visit the Conferences & Training section of **www.cooperative.com**. For questions about CRN, call 703.907.5843.

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Questions

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1 Introduction

This document is intended to help cooperatives make various decisions regarding implementing their own Prepayment Programs. While many cooperatives today are considering Prepayment Programs, relatively few—a little more than 100 across the country—use them. However, that number is increasing month to month.

Investing in advanced metering infrastructure (AMI) to support a prepayment service makes the program much more cost-effective and easier to manage. That, coupled with the ability of existing computer information systems (CIS) or third-party solutions to manage the prepayment accounts, makes a prepayment program even more attractive to implement.

This report explains various issues and decisions that should be made regarding a prepayment program. This document includes:

- Technology overview;
- Prepayment program inventory;
- Policy considerations, including regulatory and consumer advocacy;
- Quantification of prepayment program benefits;
- Prepayment program marketing;
- Energy conservation effects of prepayment;
- Future program options; and
- Executive summary.

The development of a prepayment program can be a complex process. Some decisions need to be made regarding the structure of the program in order to make the business case work. Therefore, some aspects of prepayment programs may be duplicated in some sections of this report in order to present the most clear picture of the specific topic without asking the reader to refer to other sections of the report.

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2 What is Prepayment?

In its simplest terms, the answer to that question seems obvious. However, more than simply paying for power in advance—or, as it is sometimes referred to, "Pay as you go"—prepayment is a different way of doing business in order to (1) better meet the needs of some customers, as well as (2) avoid some of the typical problems of utilities.

In its simplest form, prepayment offers customers the ability to:

- Make purchases of power when needed but on their own schedule,
- Manage their power needs in much the same manner as they do the fuel tanks in their vehicles,
- Avoid large deposits for service, and
- Better understand how power is used and which appliances are using it most or at any given time.

From the utility perspective, prepayment allows utilities to:

- Collect past debt in a convenient and customer-acceptable way,
- Avoid incurring new debt,
- Reduce irate customer calls, and
- Increase overall customer satisfaction.

Customers choosing prepayment mainly are concerned with one thing: their account balance. The goal is, obviously, to make sure that their accounts maintain positive balances in order to avoid their power being disconnected. In addition to the account balance, some systems provide other data points which can be useful to the customer. Some of these data points are shown in Figure 2.1.

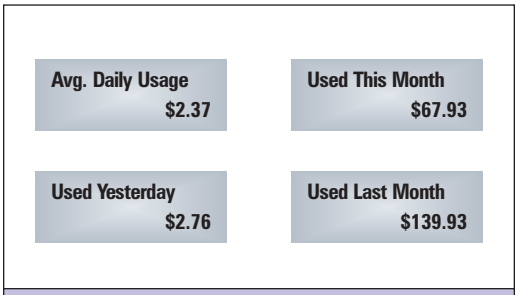

FIGURE 2.1: Power Usage Data Points That Can Be Provided to Consumers

In today's systems, many other types of data may be available, as well as different methods of data delivery, such as text messaging, email, secure website, etc.

One of the benefits of prepayment for the utility is to recover previously accrued debt. How is this done? Typically, a percentage of every amount tendered is applied to the debt, as shown here:

Amount Tendered:		**$10.00**
Percentage to Debt:	**30%**	
Payment to Debt:		**$ 3.00**
Amount on Account:		**$ 7.00**

PREVIOUS VIEW

It should be noted that prepayment is a very effective solution for those consumers who want to be good customers but simply fall behind. Because bills are paid in advance, these customers never owe money to the utility. The lights may go out when the prepayment has been expended, but there are no late charges, disconnection fees, or referrals to a debt-collection company.

Prepayment is not necessarily the right tool for detecting customers who attempt tampering or some other form of fraud, although it's been marketed as such. Even though prepayment monitoring can compare customer purchasing habits to their historical patterns of energy use, modern AMI and meter data management systems can more easily review data and identify anomalies.

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3 Technology Overview

In This Section:

This section of the report contains the following information:

- Brief prepayment technology historical overview, including the eventual utilization of AMI technology
- AMI system considerations for prepayment program implementation, including:
  - Disconnect/reconnect options
  - Communications latency
  - Supported methods of providing customer information
- Head end prepayment engine considerations, including:
  - Billing integrity and capabilities
    - Support for various rate plans
    - Base charges
    - Fuel cost adjustments
    - Taxes
    - Unmetered equipment (security lights)
    - Capital Credit management
  - CIS-supported versus external prepayment engine issues
    - Meter Data Management Solutions as an alternative
  - Overall integration requirements

Technology History

Prepayment had been around since the early 20th century. It became quite popular in the early 1930s and '40s in Europe, especially in the U.K.

Systems such as the one pictured in Figure 3.1 became very common, although these devices required considerable manual servicing. The early units actually accepted coins, which had to be removed periodically from the device. Later coinage was replaced by some type of utility-created tokens, which allowed the utility to collect the money from token vending locations.

FIGURE 3.1: Example of an Early British Utility Prepayment Meter

PREVIOUS VIEW

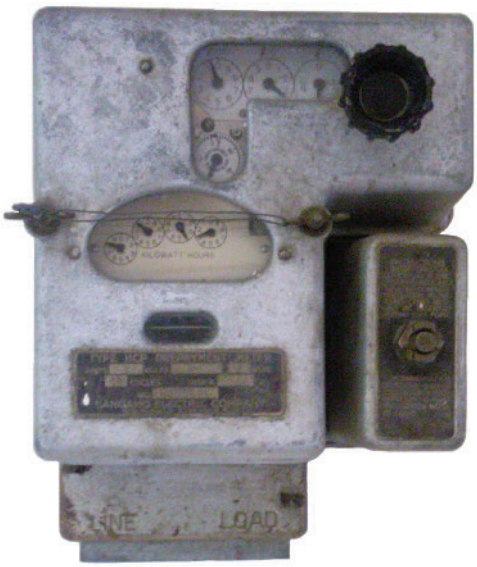

FIGURE 3.2: Example of an Early U.S. Utility Prepayment Meter

In some anecdotal stories, there were instances of counterfeiting of the tokens by freezing ice in a cylinder shape and then slicing off "tokens" that were used in the meter. Upon opening up the device to remove the tokens, service personnel would only find some water and the beginnings of rust forming on the inside of the coin box.

These types of machines were not limited to Europe and the U.K. There is evidence that they were trialed in the U.S. In a recent trip to a utility in the New England area, a prepayment meter was discovered on the utility's "metering history" wall (see Figure 3.2). According to staff at the utility (a municipal), the device had been in service in their territory at some point in time. No one at the utility specifically knew the length of service or the number of devices that were deployed, but the unit on display was the earliest prepayment model known to have been made by Sangamo Electric Company. Called the HCP, is was manufactured from 1928 to 1934 and took quarters.

Another area of the world where prepayment has been used extensively is Africa and, most specifically, the Republic of South Africa. It is routine to install prepayment meters when providing electric service for the first time to very low income customers who will use extremely low levels of power.

Prepayment in North America has gone through a number of system generations. Figure 3.3 represents three of those generations.

In North America, prepayment was pioneered by Joe Sloan, the general manager of Anoka Electric Cooperative in Anoka, Minn. Through a grant from NRECA, Mr. Sloan formed a company called CIC Systems, Inc., and began developing a device called the PowerStat that was more suitable for North American electric service

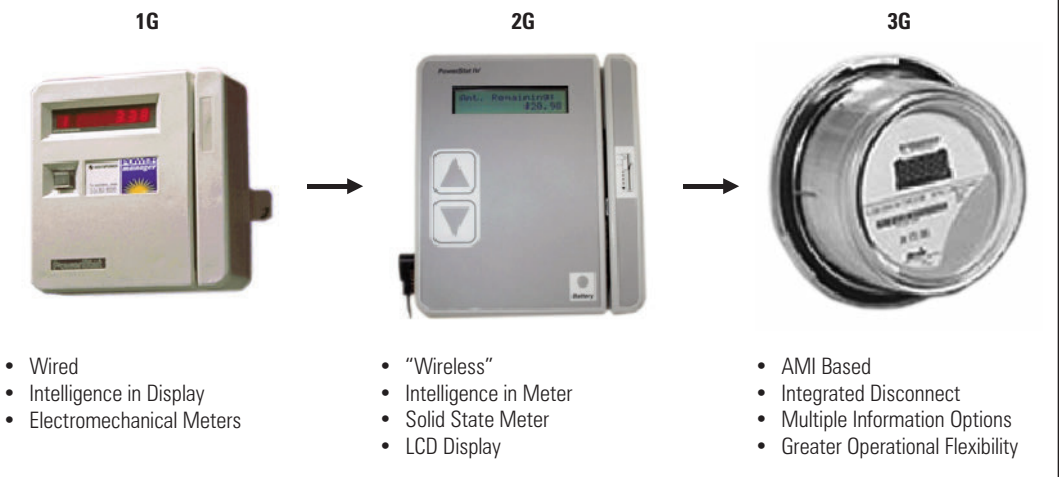

FIGURE 3.3: Three Generations of North American Prepayment Systems

requirements in the late 1980s. The company stayed in existence until about 2005, when its assets were purchased by Distribution Control Systems, Inc. (DCSI, now Aclara).

Some of the innovations pioneered by the PowerStat were:

- Remote display,
- Support for block rates,
- Support for base or fixed charges,
- Secure mag-stripe vending tokens, and
- Real-time display of usage and load.

The vision for the PowerStat was to provide an alternative to traditional service that enabled customers to avoid big bills due once a month, as well as possible large initial service deposits. It was also designed to allow utilities to recover debt amassed by some customers in a reasonable way by taking a percentage of all amounts tendered and applying them to past-due bills.

The drawbacks to the PowerStat were that it not only had a high cost but also cost a lot to install as the initial version involved running a wire from the meter to the in-home display. This made the overall business case for prepayment difficult to justify.

Other entrants into this market were Motorola, Cashpower, and Ampy. While their systems did alleviate some of the problems encountered with earlier devices, they did not yet do enough to propel prepayment programs into the mainstream. At the same time, AMR and AMI systems started gaining traction. Because of the unique hardware configurations of both solutions, utilities had to choose between prepayment and AMR/AMI as they competed for the same meters.

Prepayment Today

Today's AMI meters mean a utility has up-to-the-minute knowledge of its customers' overall account status. Previously, even with prepayment, a utility could not know a customer's balance at any given moment or the status of a disconnect/reconnect order. With AMI, the utility has the same access to the current account data as the customer, so a much better level of support and service can be given.

Figure 3.4 illustrates how an AMI-based prepayment system operates.

1. A Prepayment Engine (or software host system) manages the prepayment accounts.

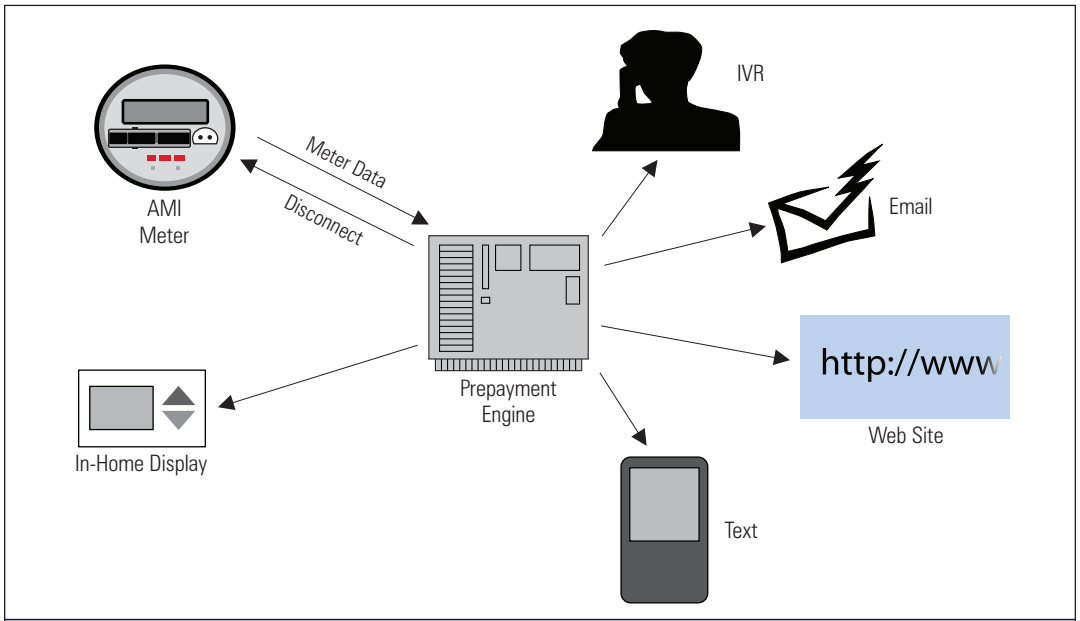

FIGURE 3.4: Components of a Prepayment System Using AMI

2. The Prepayment Engine receives or requests periodic meter readings from the AMI system.
3. The Prepayment Engine performs balance (amount due) calculations based on these readings.
4. Balance information is then provided to the customer in a predefined manner, which may include one or more of the following:
   a. Interactive Voice Response (IVR),
   b. Email,
   c. Website,
   d. Text Message, or
   e. In-Home Display.

One of the other significant advantages of an AMI-based prepayment system is the reduction or outright elimination of equipment churn, or turnover. Traditional prepayment systems were costly to manage in that they involved a "churn" of equipment. Customers choosing prepayment had to have installed at their premises a prepayment meter with a disconnect switch, a very specialized piece of electronics that utilities could not afford to deploy universally or leave inactive at a residence where prepayment was not in use. When the residents moved, this equipment had to be removed if the next resident was not on a prepayment plan. By utilizing a standard AMI meter for prepayment services, equipment churn is greatly reduced. A customer who signs up for prepayment can likely be setup immediately, without the need for a visit by a utility meter technician to the customer premises.

The obvious question in this model is what happens with respect to a disconnect. If there is already a disconnect switch on the meter, then there are really no further steps necessary. But few utilities include disconnect switches with AMI meters because of the increased cost. If a disconnect switch is not present, however, it would not necessarily impede the account setup and operation. As long as the existing AMI meter can be registered with the Prepayment Engine—and the customer starts a balance on his/her account—it should be able to operate until such time that a meter with a disconnect (or a separate disconnect device) can be installed. The utility would likely leave that disconnect in place should that customer move or elect to go back to regular billing; therefore, the utility would typically only need to make one trip to the customer's residence and that trip would not require the customer to be home.

In most cases today, successful implementation of a prepayment system uses multiple vendors.

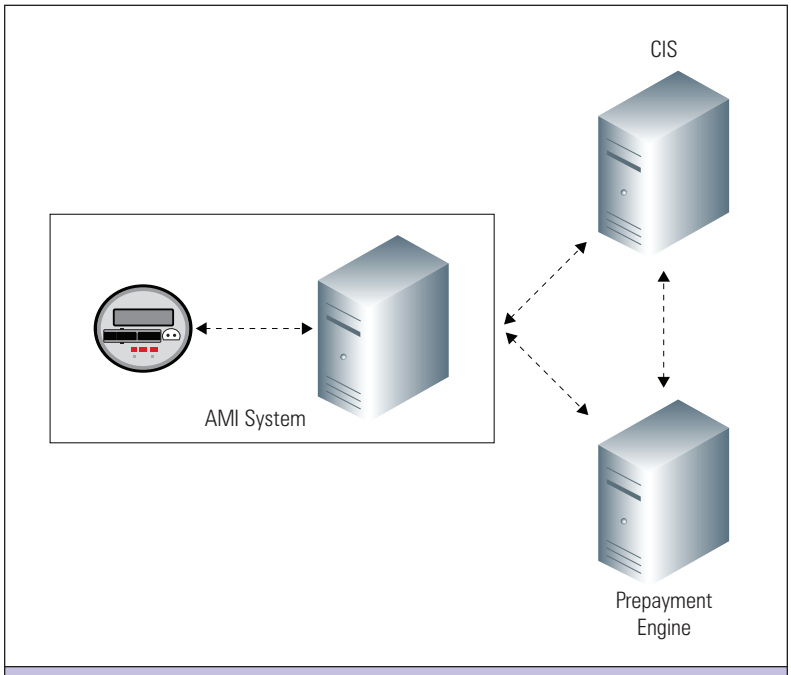

FIGURE 3.5: Components of a Prepayment System

THE ROLE OF AMI

AMI is the means for providing prepayment in a simple and cost-effective manner. Just about every AMI system today offers prepayment. One particular exception is a system that utilizes a customer's internet connection as the communications conduit. In these cases, while it is still possible to provide prepayment information and services, the automatic disconnect—and, more importantly, the reconnect—become problematic.

The basic features necessary in order for an AMI system to support prepayment are:

- On-request total consumption or other readings as necessary to calculate a bill, and
- Support for remote disconnect/reconnect.

Depending on the program structure, it may also be necessary to support an "Arm for Reconnect" feature whereby the customer is required to perform an action at the meter in order to complete the reconnect process.

The overall communications structure will determine how frequently the entire database of prepayment accounts can be updated. Either as part of the overall AMI selection and implementation process or as part of a system upgrade, the increased communications traffic caused by the prepayment system should be considered.

Another feature that is useful is the ability to support an in-home display.

IN-HOME DISPLAY OR NOT?

Traditional prepayment solutions all included an in-home display. However, these older vintage systems came into use at a time before there were so many other communication options available.

The ability to utilize email or text messaging—along with the fact that just about everyone today carries a text-capable cell phone—actually makes the in-home display portable. Instead of customers getting home from work and realizing that they need to make a payment to keep the lights on, they can see their balances while they are still out and then act accordingly.

The other advantage of utilizing text and email messaging is that there is one less piece of equipment to justify, manage, and maintain.

Having said this, there may be other reasons why an in-home display makes sense. As will be covered in other sections of this report, prepayment should be considered as part of an overall smart grid system; therefore, it needs to be compatible with other programs offered. A customer should be able to choose TOU billing as well as prepayment if both make sense. Likewise, a customer should be able to choose to participate in a demand response program as well as prepayment. If these other program offerings require some type of display or thermostat, then the ability to provide prepayment data as part of the overall offering provides for a well-integrated solution.

But the trend today is programs that do not use an in-home display.

AMI System Considerations

As mentioned in the previous section, the acceptance of AMR and AMI systems puts pressure on traditional prepayment programs as they compete for the same meter space. Advanced metering changes the dynamic of what and how prepayment can be offered. It also drastically affects the cost of the equipment and, therefore, the overall business case.

Traditional prepayment systems involved highly customized field equipment that, basically, operated as its own autonomous billing engine for that specific customer. Rates and other account-specific charges were downloaded to the system, typically along with purchase amounts, so that the system performed usage calculations in the field hardware.

The advent of two-way meter communications in AMI systems, along with a significant paradigm shift in how to implement prepayment, drastically changed the vendor landscape as well as the overall business case for prepayment.

These systems have the ability to not only perform meter readings but also to perform remote disconnects and reconnects. By utilizing this capability, the actual balance calculation algorithm is moved from the field equipment into a host system or prepayment engine. This provides a tremendous amount of flexibility for the utility while only introducing one slight drawback to overall system performance. This flexibility includes:

- Support for multiple types of customer notifications,
- Intervention on pending disconnects due to extenuating circumstances,
- Overall moratoriums on disconnects due to weather or other events, and
- Ability to make account adjustments.

The latter benefit—the ability to make account adjustments—is a huge advantage over traditional stand-alone systems in that it avoids one specific problem. Traditional systems operated mainly autonomously, with the lone communications link being the purchase token. Once the amount on the token was applied to the field system, the utility really had no control over or knowledge of the operation of the system until a new purchase was made. With the balance for the account being maintained in the host system, the utility can make adjustments to the account balance as necessary and, basically, in real time. These adjustments could include punitive as

well as beneficial circumstances. Punitive actions include the removal of credit due to a bad check or other condition. Beneficial actions include the addition of credit due to third-party assistance.

The slight drawback of modern AMI-based prepayment programs has to do with the dynamic nature of the account balance. In traditional systems, where the account balance is maintained in the field equipment, customers could see their usage adjust dynamically as power was being used. Pennies of usage would literally click off on the in-home display unit. Correspondingly, these systems could show customers their usage per hour as a type of "speedometer" reading. Customers could see that they were using $0.23/hour or $0.07/hour based on their current load. This ability was a very good instructional tool to educate customers on their appliances and their respective power consumption.

While this had been a very valuable capability for traditional systems, the evidence shows that the lack of this capability does not reduce the overall satisfaction of customers on prepayment. The main area where this has been a slight issue is the case where a utility has had a traditional system and has moved to an AMI-based program. In this case, customers have lost something that they had gotten used to having. Utilities that are implementing an AMI-based solution as their first prepayment program do not have this issue. However, even in situations where the customer has been used to the real-time usage information in a traditional prepayment system, the conversion to an AMI program has been made without adverse impact to customer satisfaction. The most notable conversion of this type was done by Brunswick Electric Membership Corporation (EMC) in Shallotte, N.C.

DISCONNECT/RECONNECT ISSUES

An AMI system must be capable of supporting remote disconnect/reconnect. The disconnect device may be separate from the actual meter, although the trend in AMI systems is to utilize an integrated disconnect in the meter. Most AMI meter vendors support such options.

Another consideration is the ability to support "Arm for Reconnect." Arm for Reconnect means a customer must actually press a button on the meter, or initiate some other action, for the reconnect process to be completed. This was never an issue for traditional prepayment solutions because the usage of a token at the display unit assured that the customer was home during a reconnect. This is not the case with today's remotely controlled devices.

The trend in the market seems to be moving away from this capability, not just for prepayment but for reconnects in general.

The last and possibly less obvious issue with disconnect/reconnect is to guarantee that the communications messages are sequenced correctly. If a customer makes a payment just at the time that his/her home is about to be disconnected, the system must be able to make sure that a command to disconnect—and, subsequently, reconnect—are not sent and executed out of order, thereby leaving the customer in the incorrect state.

COMMUNICATIONS LATENCY

In engineering, latency is the time delay experienced by a system. Communications latency is somewhat related to the message-sequencing issue highlighted in the previous section. Disconnects—and, especially, reconnects—must occur in a timely fashion.

Likewise, if the AMI system is used for sending customer messages, these messages must be processed in a manner that is also reasonably timely. This means that the system is tuned to provide customer messages at a higher priority than normal communications messages.

CUSTOMER INFORMATION

If the AMI program supports some type of in-home display, utilities must understand both whether the display can be utilized to support prepayment and the overhead this would involve. Ideally, the display unit can be given to the customer (or left at the customer's door) during any meter or disconnect installation. The need for an installer to enter the house or spend any significant time training or configuring the display on-site should be avoided.

The data that the display can provide will be somewhat limited to the data that is supported by the prepayment engine. Any local calculation capabilities of the display or the meter should likely be avoided if they are not directly in sync with or linked to the prepayment engine. Situations where incorrect information is provided to the customer should be avoided at all costs.

Prepayment Engines

Prepayment "engines" are the software programs that actually manage the prepayment accounts. These software systems are typically separate from the main Customer Information System (CIS). However, there are some CIS that have developed the ability to support prepayment within their core systems. This presents several advantages if the implementation supports enough features and flexibility. A listing of several prepayment engine providers can be found in **Section 12**.

If the prepayment engine is a separate system from the CIS, it needs to support much of the billing functionality of the traditional CIS. These features would include:

- Syncing of account charges,
- Support for various rate plans,
- Base charges (minimum monthly bill),
- Fuel cost adjustments,
- Taxes, and
- Unmetered equipment (security lights).

In order to effectively manage the overall prepayment program and provide necessary data to the CIS, there needs to be some level of integration between the prepayment engine and the CIS. Figure 3.6 represents a minimal level of data exchange between the two systems.

As stated, this level of integration represents a minimum level and is likely not suitable for a large-scale roll-out of prepayment. At this level, the manual processes that must be performed would become too unwieldy for more than a few hundred prepayment accounts.

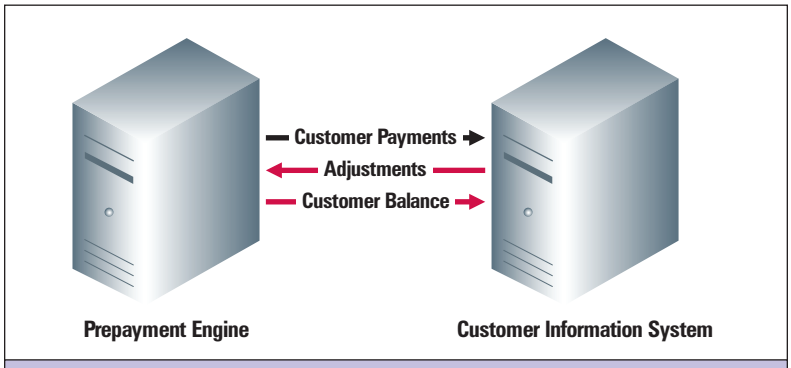

FIGURE 3.6: Prepayment Engine/CIS Data Exchange

One of the main drawbacks is that the prepayment engine needs to perform many functions in real time (rather than being batch-oriented), as it needs to be able to calculate account balances on demand. Because many CIS exist on older platforms and bring with them a legacy of functional requirements, this on-demand billing calculation capability can be somewhat difficult.

With the increasing popularity of Meter Data Management (MDM), prepayment support is seen by some as a natural extension of its capabilities. Because MDM typically includes some level of complex billing and also may offer web presentation of account data, the synergies seem to be viable. However, at this time, there isn't an MDM product that offers prepayment. Some MDM vendors have established partnerships with prepayment engine vendors in order to offer this service.

The following are some specific issues to consider when evaluating a prepayment engine.

SYNCING OF ACCOUNT CHARGES

No matter how detailed the billing calculations are in the prepayment engine, it is unlikely that it will calculate exactly the same values as the CIS. This has to do with various issues, including:

- Differences in data resolution between the two systems,
- Differences in results caused by different calculation methods, and
- Differences in rounding in intermediate calculations.

This is not to suggest that the calculations performed by the prepayment engine are specifically wrong. They simply may differ slightly over time because a prepayment engine typically calculates and monitors usage on a much more granular level than the monthly billing process typically employed in most billing calculations.

To deal with these variations, the utility has two options:

- Ignore them, or
- Periodically sync the CIS and prepayment engine by making small account adjustments.

The first option may be the most popular and does reduce the level of integration required between the two systems. However, it may not be the most viable if the billing variations in the prepayment engine are not always in the customer's favor. Likewise, these variations will need to be ultimately accounted for or absorbed in some manner.

If the CIS is to make periodic adjustments to prepayment accounts, then this synchronization process needs to be done frequently enough that the actual adjustment amounts are small enough to not raise questions by the customers. This is *not* to imply that these adjustments should be hidden from the customer, but rather that they be made at a frequency that does not abruptly or significantly alter the customer balance.

RATE PLANS

Prepayment is a *payment* methodology, not a billing method. Therefore, prepayment customers should be able to participate in most—if not all—of the rate plans offered by the utility, including time-based rates. This is a relatively new concept for prepayment customers but one that most of the prepayment engine vendors are beginning to support.

FIGURE 3.7: Comparison of Monthly and Daily Pro-Rated Charges

BASE CHARGES

The prepayment engine must be able to support the application of base charges to the customer balance. These base charges are simply defined as those charges that are independent of actual usage.

How the prepayment engine applies these base charges is also an important consideration. In looking at Figure 3.7, some of these concerns become evident.

Balance 1 represents an account where the monthly charges are pro-rated throughout the day. Balance 2 represents an account where the daily portion of the monthly charges is taken all at once. While both calculations start and end at the same points, there will be a radical difference in customer perception if the customer is receiving multiple balance updates throughout the day.

If balances are only calculated once per day, then this scenario does not matter. If balances are calculated more often, or can be updated on demand, then the utility needs to understand how the prepayment engine accounts for these charges. If the chosen prepayment engine does not support pro-rating of these charges, then customer service personnel simply need to understand this issue and be prepared in the event that this question arises.

FUEL COST ADJUSTMENTS

If your utility uses a fuel cost adjustment factor, this not only needs to be supported by the prepayment engine but, ideally, it must change this parameter in the same way that the CIS does. This means that the engine needs to regulate the fuel cost adjustment factor either in the middle of the billing cycle or at the end, or via some other mechanism as implemented by the CIS. If the two systems are not in sync, then billing variations will occur and the need to periodically sync the prepayment account in the prepayment engine to the CIS may be required as discussed in an earlier section of this document.

TAXES

The prepayment engine should be able to support the tax structure used by the utility for regular billing. This may include multiple taxes

with variations in compounding rules. If the prepayment engine cannot support complex tax structures, this can be addressed by manually calculating the resultant tax rate. This is not ideal, however, as it increases the complexity of the overall solution by adding manual processes.

UNMETERED EQUIPMENT

If you have unmetered equipment which customers have elected to pay for via fixed charges, then the prepayment engine must be able to support them. Ideally, that support would allow multiple fixed charges to be applied to an account, rather than showing one sum of all charges on the account.

CAPITAL CREDIT MANAGEMENT

Capital Credit is the mechanism by which a nonprofit cooperative distributes the profits from operations over the previous year back to its members. The calculation is typically well handled by the CIS and is based mainly on the money paid by the customer. As long as the CIS is receiving the payments made by the customer, it is likely that the prepayment engine need not support this function.

PREPAYMENT VENDING

Vending (feeding coins or cash directly into a meter) was a critical aspect of traditional prepayment programs. Because these systems operated autonomously from any other system, the customer had to be able to make purchases at any hour of the day or night because disconnects could occur at any time as well. Today's AMI-based prepayment programs are somewhat more flexible and, therefore, more forgiving.

While vending is still a critical aspect of the overall system, the utility can intervene to inhibit disconnects should the vending system experience any downtime. Also, in today's environment, there are many more payment options available. Some of the usual payment options are:

- In person at the utility office,
- In person at a designated payment location,
- Via telephone, or
- Online at the utility website.

Some of the difficulty arises in the fact that many prepayment customers are "unbanked." This is the term that refers to people who have no banking relationship whatsoever. These customers are typically limited to being cash-only customers. Therefore, any type of telephone or website payment mechanism is not suitable for them; in-person vending is the main option for these customers. Also, because customers may want to be reconnected at any time, regardless of when they were actually disconnected, the need exists for payments to be able to be taken on a 24/7 basis.

Several utilities have found that convenience stores are the best option for these vending sites. It creates a win-win situation for these locations because they bring in customers. While the customers are there, it is very likely that they will make other purchases as well. Many of these stores are also open on a 24/7 basis.

The advent of secure credit cards and gift cards can change the vending system requirements greatly. With these cards, customers can make purchases via telephone or website.

Other options that are being supported by some prepayment engine vendors are MoneyGrams. This is another very good fit for prepayment as MoneyGram sites are specifically designed to accept cash and transfer it to other businesses.

A utility looking to implement a prepayment program should investigate and understand the vending options available. Likewise, the utility should consider how any existing payment methods will be adapted to support prepayment. In many cases, a utility's existing payment sites are batch-oriented, where the payments are only credited to the utility every few hours or even just once daily. Prepayment requires that payments be credited immediately so that reconnects can occur or disconnects can be avoided.

PROGRAM SCALABILITY

A utility should not enter into a prepayment program without a vision and a long-term plan. This is necessary to understand the scale of things to come. Typical changes to be experienced are that:

- Prepayment customers will make as many as four or more transactions per month, and
- A large number of transactions will typically take place on Friday afternoon because that is when customers get paid.

These concerns are some of the main reasons that vending solutions should be robust and capable of handling larger volumes of transactions in ways that do not disrupt other operations. One utility that began to expand its prepayment program began to realize that they were having a huge influx of customers on Friday afternoon. They were having traffic problems, not to mentions the crowds and lines in the utility lobby. While they tried to offer incentives to get customers to purchase on different days, the fact remained that Friday afternoon was the most convenient for them.

Most prepayment programs today offer a number of vending options that are both convenient as well as capable of handling a larger amount of transactions.

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4 Prepayment Program Policies

In This Section:

In developing a prepayment program, there are several policy and program decisions that must be made. These are important considerations for the overall operation of the program

Disconnect Policies

In operating a prepayment program, the utility needs to decide when and how disconnects will be made. Traditional prepayment systems would disconnect at the moment the balance reached zero regardless of the time of day. While this method has proven to be successful, today's systems can be more forgiving in that the disconnects can be limited to specific times of day.

It should be noted that this is both a feature and a limitation. With an AMI-based prepayment program, it would be impractical to try to read the meter frequently enough to disconnect precisely at a zero balance. By reading the meter periodically, the disconnect will occur at the first reading where the balance is zero or lower.

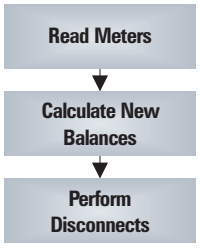

FIGURE 4.1: Typical Disconnect Scenario

Because disconnect events will be tied directly to the meter reading schedule, it is likely that disconnects can be processed immediately following that event. The typical scenario is shown in Figure 4.1.

Depending on the design of the program, this process may take place once per day or multiple times per day. If desired, an additional step can be added that gives the customer one last notification (see Figure 4.2).

A typical schedule might be to read the meters overnight as part of the normal meter reading

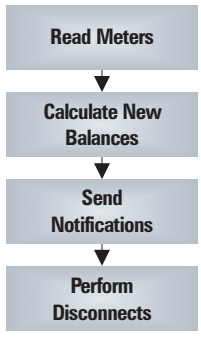

FIGURE 4.2: Additional Customer Notifications in Disconnect Scenario

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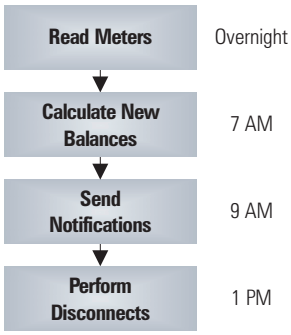

FIGURE 4.3: Timing of Disconnect Scenario with Customer Notification

process. As an example, the remaining operations could be scheduled as shown in Figure 4.3.

The four-hour delay between sending the notifications and actually performing the disconnects is intended to allow customers who are going to be disconnected the time to make a purchase in order to avoid that event.

Even if the top three events in the process in Figure 4.3 are done more often than once per day, performing disconnects once per day is a typical best practice.

Another consideration is whether to perform disconnects every day or only on weekdays. While performing disconnects only on weekdays may seem like a more customer-focused approach, it may actually be creating a less than ideal scenario in that customers may become conditioned to "make it to Friday." Consequently, a larger number of disconnects may need to be processed on Monday. As long as there are suitable vending sites open on Saturday and Sunday, there is no specific rationale to avoid disconnects over the weekend. However, each utility should evaluate that consideration based on their own unique circumstances.

Another consideration with respect to disconnects is whether they are to be performed on recognized holidays. As long as vending mechanisms are available on holidays, there is no specific technical reason why disconnects should be inhibited during that time. However, it is definitely a popular consideration and, since it is only one day, the buildup of potential negative balance amounts are more limited than over a weekend, especially for a Monday holiday.

A utility may also want to consider disconnect moratoriums based on specific weather events. This could be for extreme cold or heat. In these cases, the criteria for such events need to be clearly established. The moratorium can be based on either an actual temperature reading or a forecasted high or low. In either case, the temperature source should come from a recognized and single source so as to avoid any ambiguities.

One of the problems associated with moratoriums is that they typically do not address those customers who have been disconnected just prior to the moratorium going into effect. While it is possible to create a policy that reconnects customers during moratorium events, each utility needs to evaluate the impact and practicality of such a policy.

The last consideration with respect to disconnects is whether they are allowed at all during specified times of the year. This is independent of an exceptional weather event and, instead, linked to established utility guidelines. Some utilities have gotten waivers for these restrictions. Others have implemented current or load limiting to avoid a total disconnect but, instead, provide a lifeline service. Load limiting can likely be supported by today's meters with integrated disconnects. However, the difficulty is in specifying the actual load limit for an individual customer. The ideal scenario is to set a limit that allows a customer to have basic lifeline services but not be able to enjoy normal operations. This means that combinations of activities may not be allowed.

Because everyone's home is different, as are their corresponding energy-use practices, setting an effective load limit can be difficult. Knowledge of a premises' HVAC and appliance types is required. A more effective approach than actual load limiting may be load interruption.

In this scenario, a customer's power is interrupted periodically in order to create a nuisance situation that serves to compel a customer to make a purchase. Load interrupt could be configured to perform a disconnect for 10 minutes every hour or something less frequent.

Load limiting and load interruption are difficult services to manage and they may actually be more detrimental than a full disconnect. It is possible that claims of appliance damage could result due to frequent cycling. Therefore, it is recommended that these services be avoided if at all possible. In typical prepayment programs, the incidence of disconnects is very small for most customers; the ability to make payments on their own schedule is enough to allow them to avoid disconnect situations. Therefore, load limiting and load interruption services may not be as necessary as some initially might think.

Program Fees

One of the biggest discussions that any utility needs to have about a prepayment program is whether there will be any fee for it. This can be an involved discussion with good points on both sides. In the days of traditional prepayment systems, there was a very good argument for additional fees as the prepayment equipment meant significant additional cost.

The arguments today about fees are less clear-cut because of the reduced cost to provide prepayment on top of an existing (and previously cost-justified) AMI program. However, the fact remains that prepayment will mean—at least for some time—a higher cost to serve a segment of your customer base. This is, in part, due to transaction processing fees, prepayment engine ongoing fees, or other costs.

The evidence suggests that the inclusion of fees has no adverse impact on overall satisfaction with the program. Prepayment programs have charged various fees, some of which are obvious and some less so. The following paragraphs detail some of the types of fees being successfully included in prepayment programs.

- **Rates.** Most programs do not have any special rate for prepayment customers. However, there is a growing consideration at some cooperatives to offer a *lower* rate for prepayment as an incentive for the service. This is also because some utilities are seeing significant benefits with prepayment that lower their overall costs. This is a relatively new development in the world of prepayment.
- **Monthly Fees.** Monthly fees are the most common for prepayment services. The amount charged per month has ranged from $3 to as much as $10. This type of fee is much more favored than developing a special rate ($/kWh) for prepayment. This is because the cost to serve a prepayment customer is really independent of the amount of power used. It also provides a much more predictable revenue stream.
- **Transaction Fees.** Some utilities have very successfully included a transaction fee as part of each purchase. The nature of this fee can vary. One utility only charged a fee for transactions that were made at locations other than utility offices or after hours. Customers appreciated the convenience but knew they could avoid the transaction if they went to the utility offices. Therefore, it was a matter of convenience versus cost.

  Also, charging transaction fees is a way to avoid customers abusing the system. Some customers may actually make transactions every day if there is no inducement to limit the number of transactions. This can put a further strain on the utility's transaction processing capabilities.
- **Rental Fees.** If the program is to support an optional in-home display, the utility may opt to charge an additional rental fee and/or a deposit. This is a realistic option in that the display is optional but does incur a cost to provide it from the utility.
- **Reconnect Fees.** This is a fee that is somewhat unusual and was only discovered at a utility

earlier this year. The utility has retained a reconnect fee for customers who let their prepayment balance go to zero and are disconnected. The reconnect fee is nominal but it is a further inducement for the customer to maintain a positive balance. Once again, this fee has not seemingly had any adverse effect on overall customer satisfaction.

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5 Prepayment Program Marketing

There is little to suggest that prepayment needs any significant amount of marketing. Some utilities have branded the service with a number of names, including:

- Pay as You Go,
- FlexPay,
- EasyPay, and
- PayEasy.

Surveys of customer satisfaction at utilities with branded prepayment programs versus those that aren't branded in some manner have very little difference. This is not to suggest that marketing and branding of the service does not have value. In many cases, the branding of prepayment with a unique name does make the service easier to reference and, subsequently, describe. This can have a significant impact on overall understanding of the system.

The main areas of marketing a prepayment program have to do with educational materials, whether they are in print or online. These materials help customers learn what the service is and how it operates. The materials should accentuate the following:

- Added convenience,
- Flexible payment schedule,
- No monthly bills,
- Better usage information helps energy conservation, and
- No late fees.

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6 Evaluating the Business Case for Prepayment

In This Section:

Because there are so many different variables to consider when deciding whether to implement a prepayment program, a standard business case template is difficult to develop. The business case can take many different forms and include many different aspects of the customer relationship. Some of the most prominent considerations are:

- Bad debt reduction,
- Reduction of collection costs,
- Reduced number of late payments,
- Increased sales, and
- Increased customer satisfaction.

In general, a utility should be able to assess the costs of a prepayment program and compare it against the overall benefits of the program to determine the baseline for the business case. If the business case is not positive, the utility can then implement any necessary service fees to make up the difference.

Bad Debt Reduction

One of the most prominent aspects of a prepayment business case is the effect it has on bad debt and write-offs. Table 6.1 shows the impact of prepayment on write-offs for Brunswick EMC in Shallotte, N.C. With one of the oldest and longest-running prepayment programs in the country, BEMC has a significant history and experience with prepayment.

TABLE 6.1: Brunswick EMC Prepayment Program Write-Offs Comparison

	BEMC	U.S. Median	N.C. Median
Before Prepaid	0.34%	Average 0.197	Average 0.328
After Prepaid	0.24%		
Annual Savings	$250,000		

As can be seen in Table 6.1, BEMC has been able to reduce its write-offs to below the North Carolina median, but it is still above the national median. One of the questions that should be asked is why BEMC hasn't enjoyed more success in this particular area. One of the main reasons for this may be that BEMC has experienced a number of growing pains over the years with respect to its prepayment technology. Therefore, at various times the program could not grow as fast as desired.

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TABLE 6.2: Sample Averaged Write-Off Business Case					
	Year 1	Year 2	Year 3	Year 4	Year 5
Average Write-Offs	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Percentage Reduction	2%	5%	10%	20%	30%
Resulting Savings	$20,000	$50,000	$100,000	$200,000	$300,000

TABLE 6.3: Sample Trended Write-Off Business Case					
	Year 1	Year 2	Year 3	Year 4	Year 5
Average Write-Offs	$1,000,000	$1,050,000	$1,102,500	$1,157,625	$1,215,506
Percentage Reduction	2%	5%	10%	20%	30%
Resulting Savings	$20,000	$52,500	$110,250	$231,525	$364,652

To estimate the impact prepayment should have on a utility's bad debt, a five-year history of write-offs for the utility should be compiled. From that information, the business case can take an average of those five years or use those data points to develop a trend on write-offs and make projections over the next five years. From this average or these trending numbers, the business case can assume that prepayment will reduce these numbers by a percentage. From the example above, a conservative percentage is 25% to 35%. This is the resulting annual savings to be expected from prepayment. A further conservative and realistic approach would be to start with a lower percentage in the early years of the program and ramp it up as the program is projected to grow in size.

An example of an averaged write-off business case component is shown in Table 6.2.

An example of a trended write-off business case component is shown in Table 6.3.

Note that this estimation shows a 5% increase in write-offs per year.

Collections

The business case component with respect to collection costs is very similar to the bad debt component. The utility should look at its annual collection costs and predict a suitable reduction in them. The percentage reduction should likely be similar to the percentage estimations in the bad debt section.

Collection costs should include all real and tangible costs, such as third party agencies, late notice printing and postage costs, etc. It is at the utility's discretion as to whether these costs include labor associated with these activities. If the utility believes that personnel associated with these activities could either be assigned to other activities or that the positions would be eliminated, then labor costs should be included.

Late Payments

Late payments can impact the cash flow of a utility. If late payments significantly impact operations and result in periodically utilizing a credit line, then these costs should be quantified and added to the business case. Quantifying these costs on an annual basis can then lead to the same type of analysis as for bad debt and collections.

Service Fees

As mentioned elsewhere in this document, a utility should consider suitable fees for prepayment if necessary to make the business case work. Implementing these fees sooner

TABLE 6.4: Potential Revenue Gained from Fees					
	Year 1	Year 2	Year 3	Year 4	Year 5
Number of Accounts	100	250	750	1,500	2,500
Monthly Fees ($5)	$6,000	$15,000	$45,000	$90,000	$150,000
Transaction Fees ($1/wk)	$5,200	$13,000	$39,000	$78,000	$130,000

rather than later is also a better practice as it is easier to reduce fees than it is to raise them. Some of the potential revenue to be gained from fees is summarized in Table 6.4.

Customer Satisfaction

Customer satisfaction is a very real and measureable consideration. It is, however, difficult to quantify in terms of real dollars. Figures 6.1 through 6.3 are some excerpts from the results of satisfaction surveys done by various utilities.

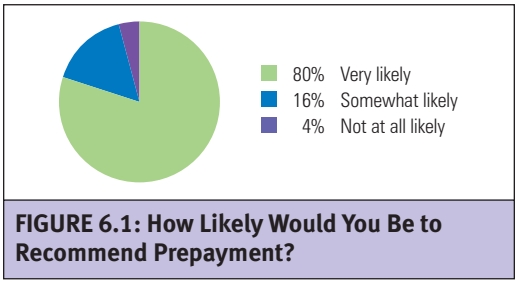

FIGURE 6.1: How Likely Would You Be to Recommend Prepayment?

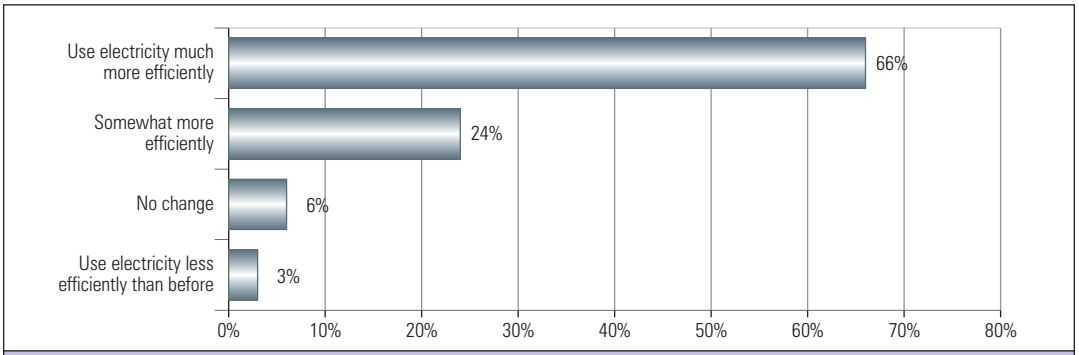

FIGURE 6.2: How Has Prepayment Affected Energy Usage?

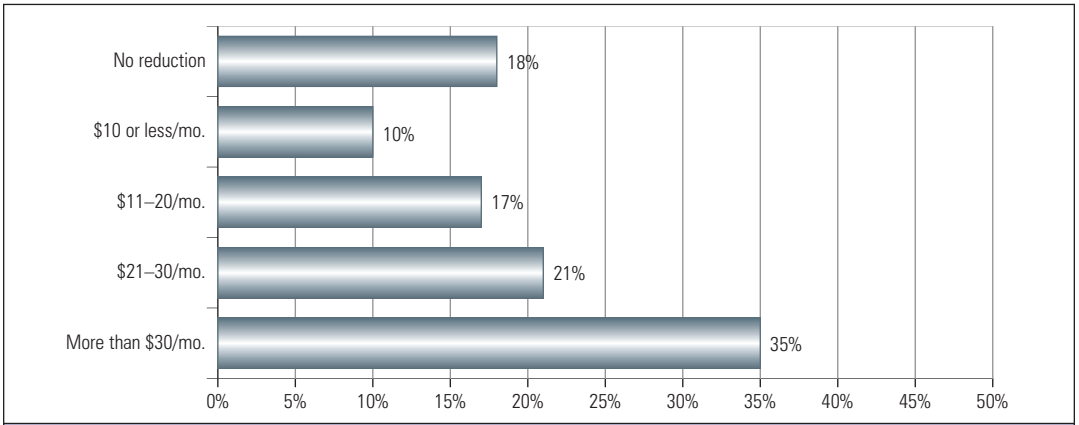

FIGURE 6.3: How Much Has Your Monthly Payment Been Reduced on Prepayment?

Business Case Summary

An overall business case for prepayment should likely take into account the following items:

- **Initial Setup Costs.** These are the costs associated with the initial setup of the program. They typically include any license costs of the prepayment engine software and any other general setup costs.
- **Ongoing Overhead Costs.** These are the monthly or annual costs associated with being able to provide the service regardless of how many customers are enrolled. These typically would include any ongoing software maintenance fees or vending infrastructure charges.
- **One-Time Customer Setup Cost.** These are the one-time costs associated with enrolling a customer into prepayment. These costs may include the addition of a remote disconnect. If the cost of the disconnect and the associated labor are included in the setup costs, then they should also possibly be offset by including the cost of doing a manual disconnect or disconnects on the account over some period of time.
- **Ongoing Customer Costs.** These are the costs associated with the ongoing provision of service. These costs may include service or transaction fees associated with the prepayment vending process. However, if these same fees would apply to a regular bill payment, then these fees should likely not be included.

Table 6.5 is a very rudimentary example of a prepayment business case.

The Bad Debt Reduction row is based on the number of accounts, an average amount of debt, a percentage of customers who actually have debt, and a percentage of debt that will be recovered. In Table 6.5, the breakdown was as follows for Year 1:

Number of Accounts:	**100**
Average Amount of Debt:	**$500**
Percentage of Customers with Debt:	**50%**
Amount of Debt Recovered:	**50%**
Amount Recovered:	**$2,500**

TABLE 6.5: Sample Prepayment Business Case

	Setup	Year 1	Year 2	Year 3	Year 4	Year 5
Initial Setup Costs						
Ongoing Overhead Costs						
Number of Accounts		100	250	750	1,500	2,500
Bad Debt Reduction		$ 2,500	$31,250	$ 93,750	$187,500	$312,500
Collections		$ 3,000	$ 7,500	$ 22,500	$ 45,000	$ 75,000
Total Savings		$15,500	$38,750	$116,250	$232,500	$387,500
Customer Setup Costs		$10,000	$15,000	$ 50,000	$ 75,000	$100,000
Overhead Transaction Fees		$ 100	$ 250	$ 750	$ 1,500	$ 2,500
Total Costs		$10,100	$15,250	$ 50,750	$ 76,500	$102,500
Customer Monthly Fees		$ 6,000	$15,000	$ 45,000	$ 90,000	$150,000
Customer Transaction Fees						
Program Value		$11,400	$38,500	$110,500	$246,000	$435,000

The Collections row is based on a similar methodology:

Number of Accounts:	**100**
Average Amount of Debt:	**$500**
% of Accounts Sent to Collections:	**20%**
% Retained by Collection Agency:	**30%**
Amount Saved:	**$3,000**

The Customer Setup cost is estimated at $100/account. This is a very, very conservative estimate and likely high, depending on the overall allocation of costs, such as disconnects.

The Overhead Transaction Fees are estimated at 1% of all amounts tendered, assuming that customers have an average monthly bill of $100.

The Customer Transaction Fees are those that could be directly charged to the customer and can directly cover the Overhead Transaction Fees. In the case of this estimate, these fees have been left blank.

This business case estimate shows an overwhelmingly positive value, in part, because the program setup fees and ongoing overhead costs have not been specified.

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7 Prepayment and Energy Efficiency

Prepayment has long been considered an effective tool for energy conservation and efficiency. The logical argument is that someone who can see their energy usage is likely to use less. This was considered especially true in the days of traditional prepayment systems, when usage was displayed in terms of dollars per hour of usage. Customers could actually turn on various appliances, see what each was costing them to operate, and then make much more informed decisions as to whether to operate an appliance or not.

The problem with the argument that prepayment fosters energy efficiency is that there is limited statistical support. In order to prove specifically that prepayment is an effective energy saving tool, a reasonably controlled data gathering process needs to be followed. The basic steps of this process are:

1. Establish usage patterns for a customer over a minimum of one year at a specific residence where the metering data is recorded.
2. That same customer would then be enrolled in prepayment for another year minimum to see how the usage patterns differed over that period of time.

The problem with these two seemingly simple steps is that detailed metering data prior to the enrollment of prepayment may not be available. This is because either the meter was not read regularly (sometimes not even monthly if bills were estimated periodically) or the customer has not lived in one location for a full year prior to enrolling in prepayment. Since more transient customers are attracted to prepayment, it is not a surprise that a history for that customer at a particular site is not readily available. Also, if the meter prior to prepayment was not read on a frequent basis (at least daily), then conclusions on usage are difficult to make. In fact, in the early days of selling prepayment to utilities, one of the selling points was that the meter no longer needed to be read. (This argument was not a practical benefit in many ways.)

There are many utilities which have been running prepayment systems over the years that have estimated the energy conservation and efficiency benefits of their programs. These estimates range anywhere from 4% to more than 15%. The typical numbers quoted are around 12%.

Modern AMI-based systems give a greater opportunity to study the effects of prepayment on energy usage. Whether specific meters are designated as prepayment sites or not, AMI systems typically collect at least daily data.

The numbers in **Table 7.1** represent two accounts from the prepayment program at Pee Dee Electric Cooperative in Florence, South Carolina.

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TABLE 7.1: Comparison of Two Prepayment Accounts at Pee Dee EC																	
2009			2010									2011					
Regular												Prepayment					
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1590	1164	1781	2935	4114	3263	1988	815	1418	2476	2588	2371	1805	1070	1760	2831	2155	1255
990	1166	1436	2622	1945	1607	894	1090	1499	1913	1944	1737	936	498	1234	2050	1537	427

TABLE 7.2: Detailed Comparison of Savings for Two Pee Dee Prepayment Accounts						
Oct	Nov	Dec	Jan	Feb	Mar	Total
–215	94	21	104	1959	2008	3971
54	668	202	572	408	1180	3084

TABLE 7.3: Potential Energy Savings from the Pee Dee EC Prepayment Program					
Year	Month	Average Residential kWh on Cycle 3	Average Prepaid kWh	Difference	% Change
2010	Jan	2360	1958	402	17.04%
2010	Feb	2050	1844	206	10.07%
2010	Mar	1554	1454	101	6.47%
2010	Apr	1010	820	191	18.88%
2010	May	1145	993	152	13.28%
2010	Jun	1348	992	356	26.43%
2010	Jul	1689	1151	538	31.87%
2010	Aug	1923	1621	302	15.72%
2010	Sept	1605	1005	600	37.36%
2010	Oct	1122	883	239	21.32%
2010	Nov	1162	1055	107	9.18%
2010	Dec	1675	1389	286	17.07%
2011	Jan	2514	2163	351	13.96%
2011	Feb	1884	1837	46	2.47%
2011	Mar	1054	1048	6	0.57%

The data in Table 7.1 is from two accounts that had been on regular bill payment from October 2009 through March of 2010. These same two accounts were on prepayment during the same months one year later, from October 2010 through March of 2011. In comparing the usage from one year to the next, as shown in Table 7.2, the following data is revealed.

The first account showed a net savings over the six-month period of 3,971 kWh. The second account showed an equally impressive savings of 3,084 kWh. These are real savings, although the argument could be made that these usage values have not been temperature-corrected to account for weather variations between the two years. It is also noted that something was especially different in March of 2011 for both accounts as their usage was drastically lower than the year before.

Pee Dee Electric has tried to look at the usage patterns a number of ways. Table 7.3 is another simple analysis to look at the potential energy savings.

Table 7.3 looks at the average usage of customers on Cycle 3 of the Pee Dee billing cycles. It calculates the average kWh usage of regular bill payment customers versus prepayment customers. In each month, the prepayment customers average less usage than regular bill payment customers. Once again, it is noted that March of 2011 seems to be an interesting month as the usage differential was minimal. However, the trend is fairly consistent. **Figure 7.1** provides a better representation of the differences in the usage patterns of the two types of customers.

If we look strictly at the percentage changes in the usage, the graph looks as shown in Figure 7.2.

The important thing to note here is that the percentage difference is significantly higher in the summertime, except for the month of August. Part of this savings is likely due to prepayment customers using less air conditioning. The other contributor to this difference could be that some of the prepayment customers may not have air conditioning at all; therefore, the numbers could be somewhat skewed. However, with the exception of the anomalous month of March 2011, there is a consistent differential of 5% to more than 15%.

As more utilities implement prepayment programs, it is likely that the energy conservation and efficiency impacts of prepayment will become even more statistically validated.

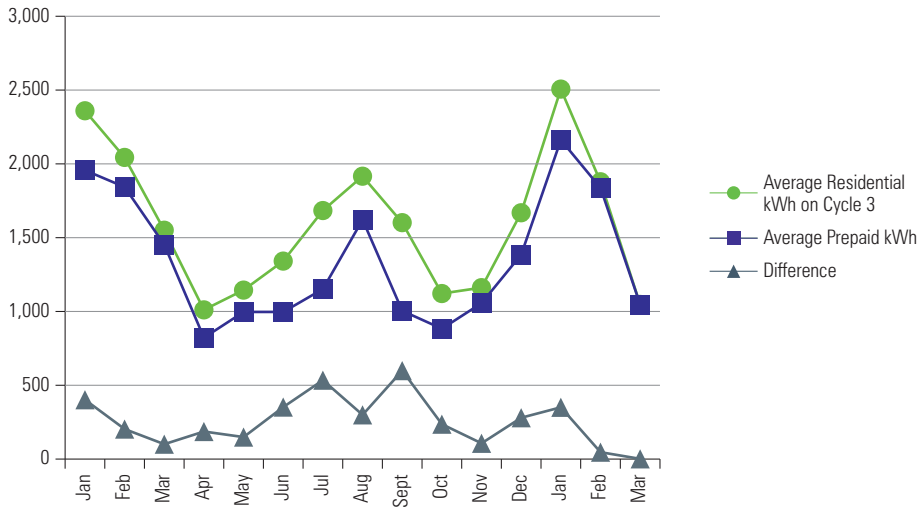

FIGURE 7.1: Usage Comparison Between Two Customer Types

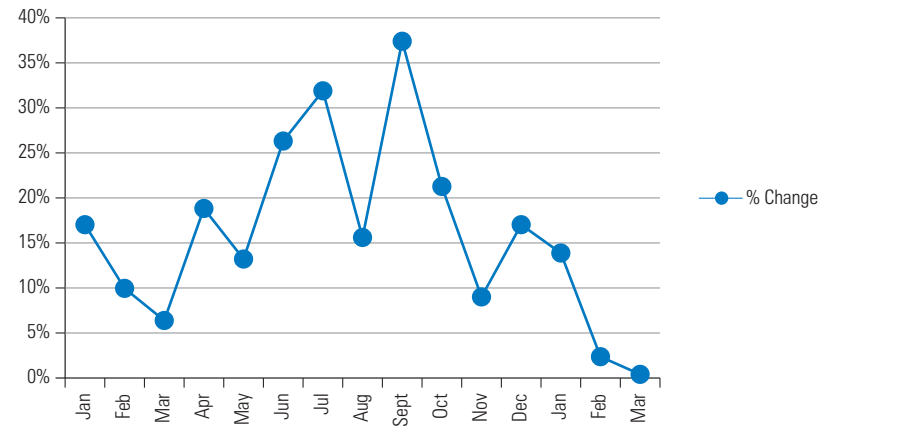

FIGURE 7.2: Percentage of Usage Change Between Two Customer Types

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8 Ten Utility Questions

The following questions are ones that every cooperative should ask its organization before beginning a prepayment program:

1. What are your business objectives?
2. How well will your existing systems support prepayment?
3. Are there any external regulatory or advocacy obligations or obstacles?
4. How do your business processes need to change—or what new ones do you need—to support prepayment?
5. What are your current obligations/restrictions for disconnect?
6. What is your expected customer penetration for prepayment?
7. How will the program be promoted and structured?
8. Who will manage the program?
9. What is the overall impact of implementing prepayment?
10. What is your overall long-term vision for prepayment?

These questions are expanded upon in this section.

Q1 What are your business objectives?

This is perhaps the most important and fundamental question to ask. The answer to this question will dictate several of the facets of the overall program, as well as determine the specific measurements of success. Some of the typical objectives for prepayment are:

- Dealing with no pay/slow pay customers,
- Providing a mechanism to collect debt,
- Providing an alternative to high customer deposits for service,
- Reducing irate customer calls due to disconnects and high bill complaints,
- Reducing the number of disconnects in general, and
- Improving customer satisfaction.

All of the above objectives are valid reasons for starting a prepayment program. Measuring the impact the prepayment program has on these objectives can be quite straightforward or somewhat difficult. For instance, see the measurements for each objective in **Table 8.1**.

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TABLE 8.1: How to Measure the Impact of Prepayment Program Objectives	
Objective	**Measurement**
Dealing with no pay/slow pay customers	The utility should compare the number of customers and total amount of arrears on a month-to-month basis.
Providing a mechanism to collect debt	Measure the total amount of arrears, write-offs, and third party or other debt-collection costs.
Providing an alternative to high customer deposits for service	The most prominent measure of success for this objective is increased customer satisfaction. Customer satisfaction is likely something that is periodically measured at your utility based on an established process.
Reducing irate customer calls due to disconnects and high bill complaints	If the call center currently records the reason for calls to the call center, this metric should be easy to measure.
Reducing the number of disconnects in general	This specifically refers to utility-initiated disconnects, whether they are remotely actuated or require a truck roll. While prepayment may have its own disconnects, this operation is basically under control of the customer; utility personnel typically have no role in the process.
Improving customer satisfaction	Prepayment can have a huge impact on the overall customer satisfaction rating. This is, in part, because the customers who typically express the most dissatisfaction with the utility are those who have to pay high deposits, fall behind, and are periodically disconnected. Therefore, this improvement should be reflected in the regular customer surveys that utilities typically conduct.

Q2

How well will your existing systems support prepayment?

Prepayment can draw upon a number of existing systems in the utility. In many cases, these systems are very batch-oriented, while prepayment requires much more real-time or minimum latency operations. Systems of specific interest are:

- AMI System,
- Customer Information System (CIS),
- Interactive Voice Response (IVR),
- Customer Relationship Management (CRM), and
- Financial/Accounting.

If any of the above systems (or any others) lack the ability to support a prepayment program, they must be dealt with or compensated for with external systems. Some specific system considerations are as follows.

AMI SYSTEM

The AMI system must have basic functionality to support prepayment. This functionality includes periodic as well as on-request meter readings. It also includes the ability to perform remote disconnects and reconnects at properly equipped meter sites. These functions are pretty basic.

What can be overlooked is that another essential requirement of the AMI system is that it have very high availability. This system must be extremely reliable. This means that, not only does the AMI system implementation need to be robust but, also, there needs to be specific disaster-recovery plans in place to avoid any downtime. The reason for this requirement is that customers who are currently disconnected cannot be reconnected when the AMI system is down. Conversely, they cannot be disconnected, but that is not nearly as problematic as having a

hundred or more customers who have made payments and the system cannot immediately reconnect them.

CUSTOMER INFORMATION SYSTEM (CIS)

Depending on the capabilities of your CIS, it may be the actual prepayment engine for the program. That capability simplifies some things and, potentially, complicates others. Like the AMI system requirement above, if the CIS is the actual prepayment engine, then it needs to have high availability as well in order to support disconnects and, more importantly, reconnects.

If the CIS is *not* the prepayment engine, then it can play a variety of roles in the program. Typically, the CIS is still the system of record for all payments and other monetary transactions on the account. This means that the method of getting financial transactions entered into the CIS must be defined and implemented in such a way that it is fully automated. Correspondingly, the decision must be made as to whether the CIS will have the ability to transfer payments from existing vending channels back into the prepayment engine. While this may be highly desirable, the function must have minimal or no delay as these payments may be triggering the reconnection of service.

INTERACTIVE VOICE RESPONSE (IVR)

If your utility already utilizes an IVR system for other business purposes, its role in the prepayment program must be defined. Some prepayment engine vendors may support their own IVR program for taking payments and checking balances. Having two separate systems may be confusing to customers. Ideally, the two systems would be integrated so that calls could transfer from one to the other or that functionality from one could be replicated on the other. At a minimum, the existing system would need to direct customers to call a different number for prepayment transactions.

CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

In many cases, the CRM function may be supported as a module of the CIS. Regardless of where or what it is, it must be able to support prepayment. In many ways, this is as much of a process issue as it is a system issue. Specific processes of concern are:

1. How do call center personnel identify prepayment customers versus other customers? In what system do they look first?
2. Can call center personnel access the prepayment engine in order to answer questions, troubleshoot problems, or take payments?
3. Can (or should) call center personnel be able to initiate reconnects for customers with extenuating circumstances?

FINANCIAL/ACCOUNTING

From an accounting perspective, prepayment is the process that accepts payment for a service prior to it being provided. This can be problematic for some accounting systems and departments as the traditional mentality is to be able to match up every dollar received to some amount of kilowatt-hours or other services. Prepayment revenue cannot be readily allocated to a specific number of kilowatt-hours because customers will use energy at different rates. Ten dollars received from one customer with low daily usage means that more of the 10 dollars goes to base charges than actual kilowatt-hours, as shown in Table 8.2.

TABLE 8.2: Comparison of Base Charge Payments

Customer	Amount Paid	Average Daily Usage (kWh)	Daily Base Charges	Energy Rate (per kWh)	Amount to Energy	Amount to Base Charges
Customer A	$10.00	30	$0.50	$0.05	$7.50	$2.50
Customer B	$10.00	90	$0.50	$0.05	$9.00	$1.00

The two customers compared in **Table 8.2** have decidedly different daily usage amounts. From a $10 purchase, Customer A will spend $7.50 of that amount on kWh and $2.50 on base charges. Customer B will spend $9.00 of that amount on kWh and $1.00 on base charges. Obviously, due to these different daily usage amounts, Customer A's purchase lasts five days. Customer B's purchase lasts two days.

While this may not be a specific stumbling block for many utilities, it has been problematic for others.

Q3 Are there any external regulatory or advocacy obligations or obstacles?

If your utility is unregulated (or self-regulated), specific approval requirements may not be required for a prepayment program. However, if regulatory approvals are required, then make sure you understand the approval process and timeline involved.

Even if regulatory approvals are not necessary, it is advisable to engage any specific regulatory or consumer advocacy agencies, or even news outlets, to disseminate correct and appropriate information about prepayment. This will help to avoid delays later due to negative perceptions of the program.

Information advocacy agencies—as well as any assistance agencies—may be the most important to contact. Teaching advocacy agencies about the benefits of prepayment for the consumer should be done in a manner that doesn't hide the utility benefits or the utility costs to provide the service.

A third group that should be addressed are the assistance agencies. These organizations help customers who have amassed debt. The agency processes are designed to respond to notices of disconnect or "past due." In prepayment programs, these notices no longer exist. Therefore, it is important to know if and how these groups can alter their policies to provide support for prepayment. In a specific case at one utility, these agencies encouraged the customer to get off of prepayment and get back on regular billing because that was the only way they could or would provide assistance.

Q4 How do your business processes need to change—or what new ones do you need—to support prepayment?

Prepayment is a different way of doing business. Depending on the nature of the prepayment program chosen, some of the processes that can be affected are:

- Customer Enrollment (new customer),
- Customer Enrollment (switching existing customer from regular payment),
- Equipment Installation (if necessary),
- Customer Vending,
- Customer Disconnect,
- Customer Reconnect,
- Payment Processing,
- Customer Exceptions, and
- Financial Reporting.

An example of how a particular process might need to change can be shown for remote disconnects. The current disconnect process for regular billing customers may involve various levels (or "milestones") of communications prior to the actual disconnect. This might involve phone calls, door hangers, or other means. With prepayment, the disconnect process can be much more automatic and streamlined. Typically, you want to remove as many manual steps to the process as possible while, at the same time, put in enough checks to make sure that inadvertent disconnects do not occur. In most cases, the prepayment engine should be able to provide notices automatically. However, for

various reasons, a utility may want to be able to manually review plans to disconnect a customer prior to allowing it to happen. As a program grows, it is likely that any manual review of the disconnect process may prove unwieldy, but it may provide the necessary comfort level for a utility that is just beginning a prepayment program.

Q5 What are your current obligations/restrictions for disconnect?

Prepayment somewhat assumes that customers can be disconnected and reconnected as often as necessary based on their particular payment habits. In most cases, these disconnects and reconnects are separate from any traditional disconnection processes and restrictions, including issues associated with disconnect notifications and moratoriums. In some cases, it may not be feasible to bypass these restrictions. If so, it is important to make sure that they can be supported when selecting vendors for the program.

In lieu of being able to perform a full disconnect, some vendors may support load limiting or periodic load interruption when the customer balance falls below zero. It is important to understand the specific capabilities of these services and their configuration requirements prior to committing to such a program. During the research for this report, no load limiting or load interruption programs were identified.

It should be noted that the inability to perform disconnects may not be a factor that limits the success of a prepayment program. Data from various programs show that only a few accounts actually are disconnected. This suggests that the ability for the customer to make payments on their own schedule may be all that is necessary for the account to remain in good standing.

Q6 What is your expected customer penetration for prepayment?

Some studies have shown that the expected level of penetration for prepayment can be in the 10% to 15% range. Specific territorial and demographic considerations can impact that percentage in either direction. While it may take years to achieve these levels, the impacts of these percentages must be considered. In many cases, the uptake of customers at utilities offering prepayment can possibly create a strain on staff, resources, and systems.

Q7 How will the program be promoted and structured?

Initiating a prepayment program is a significant undertaking. The publicity for a program needs to be carefully considered. Prepayment is not something that typically needs broad promoting or advertising. It is a program that can be promoted through customer service and call center personnel to customers who are having difficulty paying their bills or for new customers who can't afford the typical deposit for regular service.

This is *not* to suggest that prepayment should be promoted as a low income or bad customer solution. Utility experience shows that it should be offered to all customers regardless of service or payment history. This same experience shows that customers who can benefit from prepayment are the ones who naturally gravitate to it.

Call center and customer service personnel need to be carefully trained to offer prepayment in the right context. They also need to fully understand that any stigmatizing comments must be avoided. In situations where a customer with a good payment history inquires about prepayment, comments such as "that really isn't for

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you" or "you wouldn't want that" should be avoided. This is, in part, because some customers may simply prefer prepayment over regular billing regardless of their payment history.

These customers are actually ones that can be used as examples if anyone ever questions the intent and appeal of a prepayment program.

Q8 Who will manage the program?

This rather simplistic question is important in today's environment. Traditional prepayment programs were seen as metering systems and, so, were typically managed from the meter shop. Today's systems tend to be much more customer service and IT focused in their implementation, assuming that an AMI system is either already—or in the process of being—deployed. Typically, the overall management of the program comes from customer service or other similar department.

Prepayment programs obviously can't "just happen." There needs to be a clear-cut assignment of responsibility, as well as the acknowledgment that a prepayment program will take some time to implement. Therefore, the person or persons responsible for the program need to have suitable adjustments in their work assignments so as to help make the program a success.

Q9 What is the overall impact of implementing prepayment?

Implementing a prepayment program can have a lot of positive aspects. However, in its zeal to create a program, the utility should stop and look at the complete deployment picture to understand the overall impact to the utility and its personnel. This is not to be construed as an attempt to talk any utility out of implementing prepayment but simply as a word of caution.

Staff for one of the longest-running prepayment programs at a cooperative have said many times over the years that they would eliminate their prepayment program if they could. However, they know that their customers would be extremely displeased. In all fairness, that utility implemented its program when there was special prepayment hardware and a separate head-end system that didn't interface well with the CIS, which resulted in a lot a double-keying of data.

Today's systems can avoid much of that pain. However, minimizing the need for integration between the prepayment software and the CIS can have a serious impact on program viability. If the uptake of the service takes off faster than expected, any manual work that was deemed acceptable for a lower number of participants may become unwieldy.

Q10 What is your overall long-term vision for prepayment?

This last question is somewhat tied back to the first (on what your business objectives are) and includes issues associated with other questions on the list as well. By establishing the appropriate goals of the program initially, an effective program can be designed. The design can compensate for shortcomings of existing systems and allow a good measure of success. However, it is important to understand if any of these adjustments are not suitable for long-term operation.

The overall vision for prepayment should be part of the total smart grid and system architecture. There is likely a good argument to be made that prepayment can be positioned as one of the most tangible customer services for smart grid systems. To that end, the goal of prepayment should be viewed as just another billing method with very little, if any, specific overhead that is not directly compensated by the service itself.

The direction of prepayment suggests that most CIS will ultimately support it. There is likely to be a question at some time in the future as to whether a third-party prepayment engine is a better and more cost-effective solution than using the services offered by the existing CIS. It also remains to be seen as to when and how well some CIS will support prepayment.

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9 Ten Vendor Questions

In This Section:

The following are questions that a utility should ask vendors during the evaluation process. Because prepayment programs today are typically multivendor in nature, two sets of 10 questions are provided. The first set of questions should be asked of the metering vendor. The second set should be asked of the head-end prepayment application vendor.

Metering Questions

The following are the 10 questions to be addressed to a metering/AMI vendor.

1. What utilities are currently using your system for prepayment?
2. Are there any specific options that the meter must include for it to be used for prepayment versus a standard meter? Likewise, are there any additional software modules in the AMI head end that are necessary to support prepayment?
3. How frequently can the metering system provide meter data for balance calculations for 15% of the meter population?
4. Can your system support an in-home display for the purposes of providing account information? If yes, how frequently can the metering system support the transmission of balance information to these displays for 15% of the meter population?
5. What is the typical latency from the time a disconnect or reconnect command is issued until the operation is completed? Are all commands guaranteed to be executed in proper sequence?
6. Can the reconnect methodology support an "Arm for Reconnect" process?
7. Can the metering system support any type of load limiting or periodic load interruption in lieu of a full disconnect during times when disconnects are not allowed?
8. Does your metering system provide any specific function to support prepayment? If so, what prepayment engines support its use?
9. With what head-end prepayment application has the metering vendor integrated? Is there a preferred vendor or partnership?
10. What support, if any, does the metering company provide for the setup and implementation of a prepayment program?

Each question is expanded upon in this section.

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Q1

What utilities are currently using your system for prepayment?

If a utility is considering implementing an AMI program, an option for prepayment should be part of the selection process. If the AMI program is already selected/deployed, then it is important to understand how other utilities have implemented prepayment. Responses to this question should include utility name, contact name, size of program, and length of time it has been in operation.

Q2

Are there any specific options that the meter must include for it to be used for prepayment versus a standard meter? Likewise, are there any additional software modules in the AMI head end that are necessary to support prepayment?

It is vital to understand if a special meter, other than the embedded disconnect, is necessary to support prepayment. Having to change out meters at locations to support prepayment and, subsequently, remove them when the prepayment service is discontinued, is a labor- and time-intensive process. While the traditional prepayment systems involved custom hardware, the preferred approach is to be able to use a standard meter for prepayment. The answer to this question should be no.

Some metering system vendors may have additional modules that are required to support prepayment or to interface to prepayment software vendors. It is important to note the overall cost of such interfaces in evaluating the overall structure and cost of the program.

Q3

How frequently can the metering system provide meter data for balance calculations for 15% of the meter population?

Metering systems can collect data at various intervals of time. Data must be collected often enough to supply any balance updates requested by the program, as well as ad hoc readings. The additional overhead of these types of readings can be significant. It is important to understand the impact on the overall operations of the meter system, as well as how it meshes with other requirements of the metering system.

Q4

Can your system support an in-home display for the purposes of providing account information? If yes, how frequently can the metering system support the transmission of balance information to these displays for 15% of the meter population?

The utilization of a dedicated in-home display is something that most traditional prepayment systems offered. While newer programs have proven that such a device is not necessary for overall program success, it is a good potential option to deal with certain situations where other communication options may not be available. The burden of this communication needs to be factored in with other communication requirements, such as demand response, pricing signals, etc.

Q5

What is the typical latency from the time a disconnect or reconnect command is issued until the operation is completed? Are all commands guaranteed to be executed in proper sequence?

Disconnects and reconnects are part of the nature of a prepayment program. It is important to understand if the metering system has any inherent delays associated with executing these types of commands. In some cases, delays can be shortened based on the tuning of the AMI network. Of similar concern is that all commands are guaranteed to be executed in proper sequence. If a customer has a low or zero balance, is due for disconnect, but makes a purchase, it is important to make sure that commands are not executed in the wrong order, such that the customer remains disconnected.

Q6

Can the reconnect methodology support an "Arm for Reconnect" process?

"Arm for Reconnect" is when the customer has to actually press a button on the meter—or initiate some other action—for the reconnect process to be completed. This was never an issue for traditional prepayment programs because the usage of a token at the display unit assured that the customer was home during a reconnect. This is not the case with today's remotely controlled devices.

This document will not attempt to address the overall issues associated with "arm for reconnect" capabilities. However, the trend in the market seems to be moving away from this capability, not just for prepayment but for reconnects in general. But a utility's policy for prepayment may require that the metering program support some type of "arm for reconnect" process to ensure that the customer is on-site when power is restored for safety reasons (i.e., so the customer can turn off any appliances—such as a stove—that were on when the power went out).

Q7

Can the metering system support any type of load limiting or periodic load interruption in lieu of a full disconnect during times when disconnects are not allowed?

Load limiting can be an effective alternative to full disconnect. However, depending on the capabilities of the metering system, it can be more labor-intensive to manage. There is no prominent example of a prepayment program using this type of function.

Q8

Does your metering system provide any specific function to support prepayment? If so, what prepayment engines support its use?

Some vendors have included a number of functions in their meters which facilitate the implementation of prepayment. These capabilities must be fully evaluated to determine both how they will help provide the service and if they are supported by the prepayment software.

Special functions need to be carefully considered as they may operate on estimations rather that complete data. A specific example is the ability to slightly delay the time until the meter is configured for disconnect by crediting an amount of kilowatt-hours to the meter until such

time that a disconnect is performed. Few utilities would wish to use such a capability because:

- There is no way to know specifically how many kilowatt-hours can be used prior to disconnect due to fixed charges also associated with the balance.
- "Pre-arming" the disconnect in this way means that the system must be able to get a "cancel" message through to the meter if the customer makes an additional purchase prior to the amount of kilowatt-hours being depleted. The delivery of these messages in a timely manner is critical.

What this example shows is that most of the "fancy" capabilities that some meter vendors might offer really don't enhance the prepayment service as a whole and may actually create more problems than they solve. Best practice is to initiate the disconnect at a time when the disconnect needs to occur—when the balance reaches zero—and there is no doubt about the customer balance.

Q9

With what head-end prepayment application has the metering vendor integrated? Is there a preferred vendor or partnership?

Some metering vendors may have specific partnerships with some prepayment software programs. While these partnerships may not limit the utility's ability to select an alternative software program, it does potentially indicate an established working integration and relationship and, therefore, less risk during implementation.

Q10

What support, if any, does the metering company provide for the setup and implementation of a prepayment program?

While most metering companies do not provide any prepayment-specific project support, the question should be asked in order to gauge the overall familiarity of the vendor with prepayment programs. Dialogue on this topic can be a very good indication of what you can expect from the vendor.

Prepayment Software Questions

The following are 10 questions to be addressed to a prepayment software (prepayment engine) vendor.

1. What utilities are currently using your system for prepayment?
2. How frequently can the software system provide balance calculations for 15% of the meter population?
3. What are the customer notification options supported by the prepayment software?
4. What is the level of integration supported with the main utility CIS?
5. What types of rates and account add-ons can the system support?
6. How accurately can the prepayment software calculate customer charges?
7. What are the vending methods supported by the system? Do these methods require any specific arrangements with third-party vendors?
8. Can the software support "arm for reconnect" and/or load-limiting functions?
9. With what metering system has the software vendor integrated? Is there a preferred vendor or partnership?
10. What is the overall cost of the prepayment software program and how is it structured?

Q1

What utilities are currently using your system for prepayment?

Understanding what the features and capabilities of a prepayment engine are is one of the most important aspects of implementing a program. Perhaps most important in this discovery process is identifying and discussing prepayment with the vendors' references. These are the people who can give you their real world experience, not only with the vendor, but also with prepayment in general. Responses to this question should include utility name, contact name, size of program, and length of time it has been in operation.

Q2

How frequently can the software system provide balance calculations for 15% of the meter population?

Understanding the scalability of the prepayment software is important in understanding the overall capability of the system. The 15% amount is a basic guideline. Some prepayment software vendors offer the capability of providing basic usage calculations to customers who are not on prepayment but want to be able to keep closer watch on their power bills. This means that the volume of customers on the system could be significantly more than 15%. This same question was asked in the metering vendor questions and the overall answer of the two vendors must be considered together, as the system can only perform at the level of lowest performance of each system.

Q3

What are the customer notification options supported by the prepayment software?

The answer to this question should be a wide variety of options, including:

- Text messaging,
- Email,
- Interactive Voice Response (IVR),
- Web presentation, and
- In-home display.

For each of these options, it needs to be clearly understood what resources the utility is responsible for and what resources the vendor provides. As an example, if IVR is supported, is this IVR system provided by the software vendor or is an interface to a utility-owned system assumed?

Q4

What is the level of integration supported with the main utility CIS?

If the prepayment program is part of the utility CIS, then this question may not be as important as it is when two different systems are involved. However, the question should likely still be asked in order to make sure that the CIS vendor hasn't developed a separate prepayment module rather than integrating the service into the core CIS function. This question is important in determining some of the basic processes that need to be put in place to support prepayment. Some of the follow-on considerations to this question are:

1. Can a customer be enrolled into prepayment from the main CIS customer screen without the need to access the prepayment software user interface?

2. Can account adjustments be exchanged on either system without the need for double-keying?
3. Can payments be exchanged on either system without the need for double-keying?
4. Can the system support the transfer of rate and other billing parameter changes from the CIS to the prepayment software without the need for double-keying?
5. Can the prepayment system provide balance and/or disconnect status information to the CIS in a periodic and automated fashion?

In many cases, the limiting factor for these integrations is the CIS. However, it is necessary to know in order to understand the level of impact on processes and overhead the prepayment program will require. In the initial phases of a program, minimal integration can be accepted, but this is likely not a long-term acceptable condition.

Q5

What types of rates and account add-ons can the system support?

As noted elsewhere in this document, prepayment is a payment method and not a billing method. Ideally, customers should also be able to participate in time-of-use (TOU), critical peak pricing, load control, and other customer-focused programs while still enjoying the benefits of prepayment. Likewise, the prepayment software should be able to support the inclusion of other customer charges, such as security lighting, rental programs, or other programs to which they might subscribe.

Q6

How accurately can the prepayment software calculate customer charges?

This question has to do with the fact that it is unlikely that a third-party prepayment software engine will calculate the customer bill to the exact penny as the CIS does. The CIS traditionally has been the system of record and, therefore, its calculations are the standard. Knowing how close the prepayment software can calculate the usage charges in comparison to the CIS will determine another aspect of the overall system design, i.e., how often the two systems need to be synced in order to accurately reflect customer charges.

Some utilities have elected to allow the prepayment software to be the system of record for prepayment and do not perform any balance synchronizations between the systems. This is the most expedient approach, but may not be suitable for long-term, full-scale deployment. Syncing up periodically, so that small adjustments can be made in the customer balance, is one way to deal with this issue. If this approach is taken, then the frequency of these synchronizations should be such that only small adjustments in the customer balance are being made and they are, therefore, transparent to the customer.

Q7

What are the vending methods supported by the system? Do these methods require any specific arrangements with third-party vendors?

Some prepayment vendors bring their own vending methods as part of their system. It is important to understand how these work and how well they suit your customers' needs. As an example, a vendor who supports MoneyGram for making purchases may not have much value if your territory has very few MoneyGram locations.

Correspondingly, if a vending method involves additional overhead charges, you'll need to decide whether these expenses will be passed on to the customer or absorbed by the utility.

Q8

Can the software support "arm for reconnect" and/or load-limiting functions?

The potential benefits of these features have been addressed in the metering questions. If they are deemed important, then, obviously, the metering system *and* the prepayment software need to support them.

Q9

With what metering system has the software vendor integrated? Is there a preferred vendor or partnership?

If the utility has already deployed an AMI program, then this question becomes whether the software vendor has integrated with the metering system used by the utility. Once again, knowing what the existing capabilities are between the expected metering and software systems lessen the risk of integration and implementation. In the case where the AMI program is already deployed, many of these questions should be adjusted to specifically address the capabilities with that metering system.

Q10

What is the overall cost of the prepayment software program and how is it structured?

Perhaps one of the most important criteria to the selection of a prepayment software system is the overall cost. This cost can be configured in a number of ways—one time license, per meter, per transaction—so it is up to the utility to make sure the charges are fully understood and how they affect the overall cost of the program. It is also important to understand how much, if any, of these costs can be supported by the customer.

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10 Prepayment Program List

One of the objectives of this report was to generate a comprehensive list of prepayment programs around the country. The most expedient means of determining where these prepayment programs were located was to consult the vendors who assist in providing the programs. While some vendors were very forthcoming with the list of prepayment customers, other vendors preferred not to divulge that information due to privacy concerns. A total of 73 prepayment programs were identified. A breakdown of these programs on a state-by-state basis appears in Table 10.1.

The southeastern United States by far has the highest concentration of programs. Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, and Virginia represent 42 of these programs.

A map showing the overall location of these programs across the United States appears in **Figure 10.1**.

The complete list of prepayment programs appears in **Table 10.2**.

TABLE 10.1: Number of Prepayment Programs by State

State	Qty.
Alabama	6
Arkansas	3
Colorado	1
Florida	2
Georgia	10
Illinois	4
Indiana	7
Kansas	3
Kentucky	3
Minnesota	1
Missouri	6
Montana	3
North Carolina	12
North Dakota	1
Ohio	2
Oklahoma	9
Oregon	2
South Carolina	8
South Dakota	1
Tennessee	4
Texas	4
Virginia	1
Washington	1
Wisconsin	1
Total:	**95**

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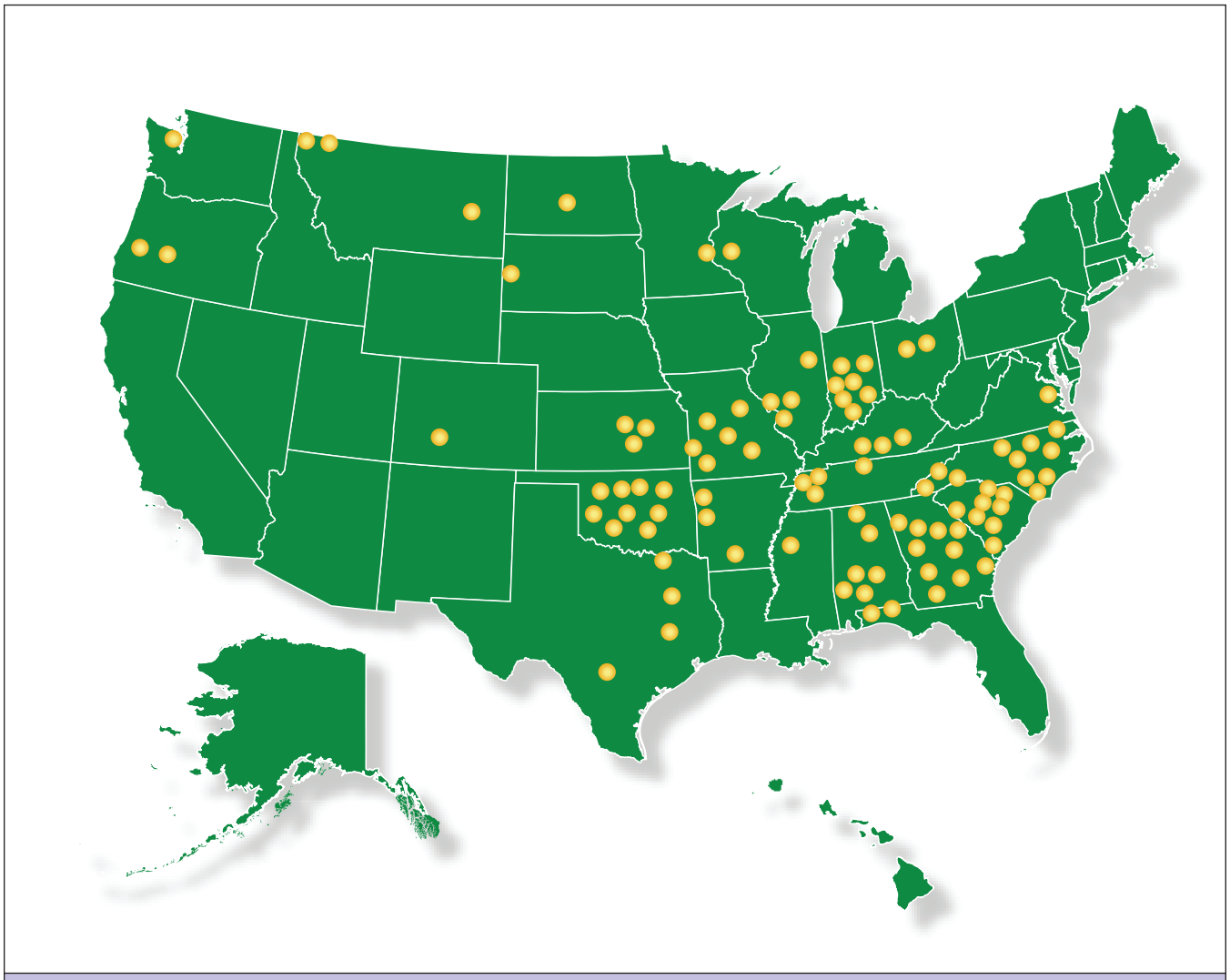

FIGURE 10.1: Map of Prepayment Program Sites in the U.S.

TABLE 10.2: List of Prepayment Programs at Cooperatives in the U.S.

Utility Name	City	State	Prepayment Engine	AMI System
Central Alabama Electric Cooperative	Prattville	AL	Exceleron	Aclara
Coosa Valley Cooperative	Talledega	AL	Exceleron	Aclara
Covington Electric Cooperative	Andalusia	AL	Exceleron	Aclara
Cullman Electric Cooperative	Cullman	AL	Exceleron	Aclara
Dixie Electric Cooperative	Union Springs	AL	Exceleron	Aclara
Wiregrass Electric Cooperative	Hartford	AL	Aclara	Aclara
Arkansas Valley Electric Cooperative	Ozark	AR	Aclara	Aclara
Ouachita Electric Cooperative Corp.	Camden	AR	Aclara	Aclara
Ozarks Electric Cooperative	Fayetteville	AR	Exceleron	Aclara
San Luis Valley Electric Cooperative	Monte Vista	CO	Exceleron	Cooper (Cannon)
Choctawhatchee Electric Cooperative	Defuniak Springs	FL	Exceleron	Landis+Gyr
West Florida Electric Cooperative	Graceville	FL	Aclara	Aclara
Carroll EMC	Carrollton	GA	Exceleron	Aclara
Central Georgia EMC	Jackson	GA	Exceleron	Landis+Gyr
Diverse Power	LaGrange	GA	Exceleron	Aclara
Greystone Power Corporation	Douglassville	GA	Exceleron	Landis+Gyr
Irwin Electric EMC	Ocilla	GA	Exceleron	Cooper (Cannon)
Jefferson Electric Cooperative	Wrens	GA	Exceleron	Landis+Gyr
Middle Georgia EMC	Vienna	GA	Exceleron	Landis+Gyr
Okefenoke Rural EMC	Nahunta	GA	Exceleron	Aclara
Tri-Country EMC	Gray	GA	Exceleron	Aclara
Tri-State EMC	McCaysville	GA	Exceleron	Landis+Gyr
Eastern Illini Electric Cooperative	Paxton	IL	N/A	Aclara
Monroe County Electric Cooperative	Waterloo	IL	Aclara	Aclara
Southwestern Electric Cooperative	Greenville	IL	Aclara	Aclara
Tri-County Electric Cooperative	Mt. Vernon	IL	N/A	Aclara
Hendricks Power Cooperative	Avon	IN	N/A	Aclara
Kankakee Valley REMC	Wanatah	IN	Exceleron	Landis+Gyr
Parke County Electric Cooperative	Rockville	IN	Exceleron	Landis+Gyr

Continued

TABLE 10.2: List of Prepayment Programs at Cooperatives in the U.S. (cont.)				
Utility Name	**City**	**State**	**Prepayment Engine**	**AMI System**
Southeastern Indiana REMC	Osgood	IN	Aclara	Aclara
Southern Indiana Power	Tell City	IN	N/A	Aclara
Utilities Dist. of Western Ind. REMC	Bloomfield	IN	Aclara	Aclara
White County REMC	Monticello	IN	N/A	Aclara
Butler Rural Electric Cooperative	El Dorado	KS	N/A	Aclara
DS&O Electric Cooperative, Inc.	Solomon	KS	N/A	Aclara
Flint Hills RECA	Council Grove	KS	Aclara	Aclara
Jackson Energy Cooperative	McKee	KY	N/A	Aclara
Pennyrile RECC	Hopkinsville	KY	Aclara	Aclara
South Kentucky RECC	Somerset	KY	Aclara	Aclara
Minnesota Valley Electric Cooperative	Jordan	MN	NISC	Aclara
Barry Electric Cooperative	Cassville	MO	Aclara	Aclara
Barton County Electric Cooperative	Lamar	MO	N/A	Aclara
Co-Mo Electric Cooperative	Tipton	MO	Exceleron	Aclara
Cuivre River Electric Cooperative	Troy	MO	Exceleron	Landis+Gyr
Farmers Electric Cooperative	Chillicothe	MO	Exceleron	Cooper (Cannon)
Intercounty Electric Cooperative Assn.	Licking	MO	N/A	Aclara
Delta Electric Power Association	Greenwood	MS	Exceleron	Landis+Gyr
Flathead Electric Cooperative	Kalispell	MT	N/A	Aclara
Glacier Electric Cooperative	Cut Bank	MT	Aclara	Aclara
McCone Electric Cooperative	Circle	MT	N/A	Aclara
Blue Ridge EMC	Lenoir	NC	Exceleron	Aclara
Brunswick EMC	Shallotte	NC	Aclara	Aclara
Central EMC	Sanford	NC	Exceleron	Aclara
Edgecombe-Martin County EMC	Tarboro	NC	N/A	Aclara
Four County EMC	Burgaw	NC	Aclara	Aclara
French Broad EMC	Marshall	NC	N/A	Tantalus
Haywood EMC	Waynesville	NC	N/A	Aclara
Lumbee River EMC	Red Springs	NC	Aclara	Aclara
Pee Dee EMC	Wadesboro	NC	Exceleron	Aclara
Piedmont EMC	Hillsborough	NC	Exceleron	Landis+Gyr

Continued

TABLE 10.2: List of Prepayment Programs at Cooperatives in the U.S. (cont.)

Utility Name	City	State	Prepayment Engine	AMI System
Pitt & Green EMC	Farmville	NC	Exceleron	Aclara
Roanoke Electric Cooperative	Ahoskie	NC	Aclara	Aclara
Capital Electric Cooperative	Bismarck	ND	N/A	Aclara
Consolidated Electric	Gilead	OH	Aclara	Aclara*
Union Rural Electric	Marysville	OH	Aclara	Aclara*
Central Rural Electric Cooperative	Stillwater	OK	Exceleron	Aclara
Cimarron Electric Cooperative	Kingfisher	OK	Aclara	Aclara
Cookson Hills Electric Cooperative	Stigler	OK	Aclara	Aclara
Cotton Electric Cooperative	Walters	OK	Exceleron	Landis+Gyr
Indian Electric Cooperative	Cleveland	OK	Exceleron	Aclara
Kiamichi Electric Cooperative	Wilburton	OK	Exceleron	Aclara
Lake Region Electric Cooperative	Hulbert	OK	Exceleron	Cooper (Cannon)
Northwestern Electric Cooperative	Woodward	OK	Exceleron	Landis+Gyr
Oklahoma Electric Cooperative	Norman	OK	Exceleron	Aclara
Lane Electric Cooperative	Eugene	OR	Exceleron	Cooper (Cannon)
Midstate Electric Cooperative	La Pine	OR	Exceleron	Cooper (Cannon)
Aiken Electric Cooperative	Aiken	SC	Exceleron	Aclara
Black River Electric Cooperative	Sumter	SC	Exceleron	Landis+Gyr
Coastal Electric Cooperative	Walterboro	SC	N/A	Aclara
Fairfield Electric Cooperative	Winnsboro	SC	Exceleron	Aclara
Horry Electric Cooperative	Conway	SC	Exceleron	Aclara
Pee Dee Electric Cooperative	Darlington	SC	Exceleron	Aclara
Santee Electric Cooperative	Kingstree	SC	N/A	Aclara
Tri-County Electric Cooperative	Saint Matthews	SC	Exceleron	Aclara
West River Electric Association	Rapid City	SD	N/A	Aclara
Forked Deer Electric Cooperative	Halls	TN	Aclara	Aclara
Gibson EMC	Trenton	TN	Aclara	Aclara
Southwest Tennessee EMC	Brownsville	TN	Exceleron	Landis+Gyr
Tri-County EMC	Lafayette	TN	N/A	Aclara
Bandera Electric Cooperative	Bandera	TX	Aclara	Aclara
Farmers Electric Cooperative	Greenville	TX	Exceleron	Landis+Gyr

Continued

TABLE 10.2: List of Prepayment Programs at Cooperatives in the U.S. (cont.)

Utility Name	City	State	Prepayment Engine	AMI System
Mid-South Synergy	Navasota	TX	Exceleron	Aclara
Wood County Electric Cooperative	Quitman	TX	Ampy	Ampy
Northern Neck Electric Cooperative	Warsaw	VA	N/A	Aclara
Peninsula Light Company	Gig Harbor	WA	SmartGridCIS	Landis+Gyr
Barron Electric Cooperative	Barron	WI	Aclara	Aclara*

* Denotes programs that are using original PowerStat™ prepayment system.
N/A indicates that the prepayment engine vendor was not available. In those cases, it is likely that the prepayment engine is the incumbent CIS for the utility.

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11 Utility Surveys

To make sure that the utility perspective was accurately represented in this report, a number of utility surveys were conducted. These surveys posed a series of questions designed to help other utilities understand the specific experience of the target utilities. The utilities selected represent a fairly random set. They do not represent any specific AMI or prepayment software vendor. As such, questions regarding the specific systems were limited in favor of gaining an understanding of the overall prepayment program experience. The questions on the survey were as follows:

1. Why did you implement a prepayment program?
2. Have you achieved the desired results for your program?
3. How many customers do you currently have on prepayment?
4. How long has your program been in operation?
5. Is your program being run via your CIS or through a third-party software package?
6. If using a third-party package, please describe the interface, if any, between the CIS and the software package.
7. Have you conducted any satisfaction surveys of your prepayment customers? If so, what have been the results?
8. Are you offering an in-home display (IHD) as part of your prepayment program? If so, is it optional or mandatory?
9. Are you doing any load or current limiting as part of your program in lieu of a full disconnect?
10. Do you have a special rate for your prepayment customers? (Rate, in this sense, specifically refers to the cost per kWh.)
11. Are you charging any additional fees for prepayment customers, such as an additional base charge, charge per transaction, etc.? Please describe.
12. How and when are disconnects performed? Are they limited to certain hours of the day?
13. How are payments being supported from your prepayment customers? Do you accept/require credit cards? Can you accept cash? Is vending available 24 hours/day? Is the vending handled exclusively by the third-party software package?
14. What is your utility's vision for prepayment?
15. Please list your utility's name and address. If you wish your responses to remain anonymous, please leave this question blank. If you do include your utility name, please indicate your willingness to entertain additional questions from other utilities and the appropriate contact person for these inquiries.

As indicated by the last question, the utility had the option of responding anonymously to the survey. The following survey results were obtained.

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TABLE 11.1: Survey Results	
Utility Name	**Responses**
Why did you implement a prepayment program?	
Black River EC	High deposits and to offer consumers an option in a bad economy.
Blue Ridge EMC	Like most utilities in today's economy, we were looking for an option for our members that enabled them to setup an account without having to establish credit and/or pay a large deposit, and to eliminate possibility of late pay/cutoff fees. Senior management was also looking for a way for the cooperative to reduce bad debt/charge offs.
Brunswick EMC	BEMC was looking for ways to assist customers that were having difficulty with their electric bills. Helping these members would also help us with our delinquent and write-off.
Minnesota Valley EC	a. Provide an additional payment option for our members. b. Help manage uncollectable accounts.
Oklahoma EC	Initially it was to reduce bad debt and to offer an alternative to paying a large deposit.
Pee Dee EC	An additional customer service tool to enhance customer satisfaction.
West Florida EC	In combination with other efforts to control bad debt write-offs and to offer our member owners an option to increasing deposits.
Utility A	To give our members another payment option.
Have you achieved the desired results for your program?	
Black River EC	Yes, we believe we have.
Blue Ridge EMC	In process. ~1,000 members are now enrolled in the program (marketing name is FlexPay) and there has been a noticeable drop in charge-offs and a corresponding increase in member satisfaction by being able to use the prepayment option.
Brunswick EMC	Yes. A survey of our prepay customers shows a very high satisfaction rate and we have provided a program that assists them with keeping the power on.
Minnesota Valley EC	Not yet. We had hoped to attract more members to the program initially.
Oklahoma EC	Yes, our bad debt has been greatly reduced.
Pee Dee EC	Yes, we have.
West Florida EC	Yes.
Utility A	We are still in the early stages of the program but, so far, it has worked for us.

Continued

TABLE 11.1: Survey Results (cont.)	
Utility Name	**Responses**
How many customers do you currently have on prepayment?	
Black River EC	831
Blue Ridge EMC	Approximately 1,000
Brunswick EMC	Over 7,300
Minnesota Valley EC	83
Oklahoma EC	4,800 (about 10% of residential customers)
Pee Dee EC	1,600
West Florida EC	1,250
Utility A	Approx. 55
How long has your program been in operation?	
Black River EC	Since September/October 2009
Blue Ridge EMC	Was started on a district-by-district basis. First of four districts started FlexPay in 2009. Fourth district started Late Summer 2010. (This was, in part, due to the last AMR meter installations not being activated until January 2011. FlexPay requires an account to have an activated AMR meter/disconnect switch.)
Brunswick EMC	Since 1991
Minnesota Valley EC	Since April 2011
Oklahoma EC	5 years
Pee Dee EC	4 years
West Florida EC	Since late 2003
Utility A	10 months
Is your program being run via your CIS or through a third-party software package?	
Black River EC	We are using Exceleron Software, Inc.
Blue Ridge EMC	3rd party—Exceleron (PAMS = prepaid account management system)
Brunswick EMC	Currently a third-party package. We are working to migrate it to our CIS system.
Minnesota Valley EC	Via CIS
Oklahoma EC	Third party—Exceleron
Pee Dee EC	Third-party software package
West Florida EC	We have Aclara Utilisales prepaid software and we are working toward a customer interface with our billing CIS.
Utility A	It is run with our CIS software

Continued

TABLE 11.1: Survey Results (cont.)	
Utility Name	**Responses**
If using a third-party package, please describe the interface, if any, between the CIS and the software package.	
Black River EC	Good two-way integration. CIS provides account and payment info. Prepay interfaces with AMI and provides usage, billing, and disconnect info. Current prepay info displays in CIS.
Blue Ridge EMC	Exceleron interfaces to our ATS (our CIS provider) system and Aclara (our AMR provider) systems. Payments are received/posted by ATS typically within five minutes; Exceleron checks several times per hour for payments to update the FlexPay account status and/or initiate meter commands as necessary through Aclara.
Brunswick EMC	The interface is a series of Batch processes or double entry. The AMR readings are all that is integrated into both systems.
Minnesota Valley EC	N/A
Oklahoma EC	Exceleron accesses CIS via a view through an ODBC connection. They do not pass balance or other information (like connect status) back to CIS.
Pee Dee EC	The interface utilizes web services and a custom-built interface utilizing an ODBC connection.
West Florida EC	None
Utility A	N/A
Have you conducted any satisfaction surveys of your prepayment customers? If so, what have been the results?	
Black River EC	No
Blue Ridge EMC	Just unofficial at this time. Feedback to our district offices from members on prepay has been overwhelmingly positive. (We feel like this is due, in part, to requiring members to come into the office to have a detailed explanation of the program on the front-end, plus they sign an agreement that acknowledges their understanding of how the program works.) Feedback has also been favorable from landlords and from families of college students sharing apartments/condos.
Brunswick EMC	The BEMC satisfaction survey showed a 93% satisfaction rating.
Minnesota Valley EC	Not yet
Oklahoma EC	We have done two. Both came back very similar, with over 85% of prepay customers reporting that they are either satisfied or very satisfied with prepay.
Pee Dee EC	No
West Florida EC	Extensive customer survey conducted that showed overall customer satisfaction with prepayment at 88.2%.
Utility A	No

Continued

TABLE 11.1: Survey Results (cont.)	
Utility Name	**Responses**
Are you offering an in-home display (IHD) as part of your prepayment program? If so, is it optional or mandatory?	
Black River EC	No. One of the options that we like about Exceleron is that they provide information through Internet, e-mail, telephone, and/or text. We prefer not to have an IHD.
Blue Ridge EMC	Not presently. In part, because they can check their account status at any time if they have Internet /smart phone access.
Brunswick EMC	We do offer an IHD. It is mandatory only in that it is the only way to receive notification updates.
Minnesota Valley EC	Yes, all participants have an IHD.
Oklahoma EC	We do not offer in-home displays at this time.
Pee Dee EC	No.
West Florida EC	Yes, optional.
Utility A	Yes, mandatory.
Are you doing any load or current limiting as part of your program in lieu of a full disconnect?	
Black River EC	No
Blue Ridge EMC	Not presently; but we have the option to offer that if/when we go to combination meter/disconnect switch device.
Brunswick EMC	No
Minnesota Valley EC	No
Oklahoma EC	No
Pee Dee EC	No
West Florida EC	No
Utility A	No
Do you have a special rate for your prepayment customers? (Rate, in this sense, specifically refers to the cost per kWh.)	
Black River EC	No
Blue Ridge EMC	No
Brunswick EMC	All customers are charged the same per kWh.
Minnesota Valley EC	No
Oklahoma EC	No. It is the same as our regular residential rate.
Pee Dee EC	We do have a special rate, but the prepayment members are paying the same amount per kWh as a traditional payment member.
West Florida EC	No
Utility A	No

Continued

TABLE 11.1: Survey Results (cont.)	
Utility Name	**Responses**
Are you charging any additional fees for prepayment customers, such as an additional base charge, charge per transaction, etc.? Please describe.	
Black River EC	We charge an additional $9 facilities charge and a $10 reconnect fee.
Blue Ridge EMC	Yes. We have a flat $10 per month "prepay meter option charge" which helps to cover the cost of the disconnect switch, monthly texting, and phone charges, plus monthly charges from Exceleron for use of the software.
Brunswick EMC	We do have a $3 higher base charge per month for prepay customers.
Minnesota Valley EC	No.
Oklahoma EC	No. We used to charge an additional fee on base charge but we discontinued that a couple of years ago.
Pee Dee EC	We did increase our customer charge for prepayment members by $10. This increase covers the cost of the prepayment program and the cost of the disconnect collar that we deploy on all prepayment accounts.
West Florida EC	Yes, we charge a transaction fee of $2 and a lease fee of $5 monthly.
Utility A	Yes, there is an additional $3 monthly charge.
How and when are disconnects performed? Are they limited to certain hours of the day?	
Black River EC	Business days at 10:00 a.m.
Blue Ridge EMC	We provide a one-day "cut-off grace period" after the account balance goes negative. We do not currently cut-off on weekends or designated holidays. Applicable cut-offs are initiated at 11:30 a.m. each business day. If an account is disconnected, reconnection is made typically within 20-40 minutes after payment is made to pay for the negative balance plus establishing a minimum of $25 positive balance on the account.
Brunswick EMC	All disconnects perform automatically once the money amount is zero or less.
Minnesota Valley EC	Disconnects are performed between 8 a.m. and 5 p.m., no holidays, no weekends. For locations with a reconnect collar, the service is disconnected remotely. For those without, a meter reader performs the disconnect.
Oklahoma EC	We schedule disconnects for 9:30 in the morning, Monday-Friday, excluding holidays.
Pee Dee EC	Disconnects are completed Monday-Friday at 10 a.m. for accounts with a negative balance after 24-hour notice has been given.
West Florida EC	Disconnects occur 365 days per year at 10 a.m., if the customer is in the negatives at the midnight read.
Utility A	10 a.m. weekdays only.

Continued

TABLE 11.1: Survey Results (cont.)	
Utility Name	**Responses**
How are payments being supported from your prepayment customers? Do you accept/require credit cards? Can you accept cash? Is vending available 24 hours/day? Is the vending handled exclusively by the third-party software package?	
Black River EC	Credit Cards 24/7; cash in our office during business hours.
Blue Ridge EMC	Credit cards, cash in offices during regular business hours, in district payment drop box after business hours, and local Wal-Marts. Members can make payments on-line or by phone 24/7, by credit/debit card or e-check.
Brunswick EMC	We provide 24/7 payment options at several of our eight kiosk locations. They are cash-only for our prepay customers. Customers can purchase at the counters with cash, check, or credit card. They can also call in and use credit card. The kiosks are managed through a third-party company.
Minnesota Valley EC	Credit cards are accepted and no fees are charged. There are no vending options, so cash is only accepted in the office.
Oklahoma EC	Any payment type can be supported except reoccurring bank draft. We accept credit cards through a third party. Cash can be paid in the office or through a third-party kiosk. Vending is available 24 hours per day. Vending is handled by a third party but cash payments can be made in the office during business hours.
Pee Dee EC	Payments are accepted by the same methods as our traditional payments: cash, check, credit card, credit card and check by phone, credit card and check online, MoneyGram, kiosk, and third-party RPPS.
West Florida EC	We sell prepaid electricity 24 hours a day via our cashier's counter and our 24-hour service department. We accept cash, checks, credit cards.
Utility A	Online payments or payments taken at office.
What is your utility's vision for prepayment?	
Black River EC	We currently only offer prepay to new customers, but would like to offer it to existing consumers with poor pay histories.
Blue Ridge EMC	We definitely want to increase enrollment in the program (goal of 6K out of 70K members). It is a program that has many positive benefits and is an excellent payment option for members and the membership as a whole.
Brunswick EMC	To see the program grow to help many other people and for many different options.
Minnesota Valley EC	a. Provide an additional payment option for our members. b. Help manage uncollectable accounts.
Oklahoma EC	Our goal for prepayment is to have at least 20% of customers on prepay. We want prepay to be recognized as a program which can benefit any consumer, not just the credit-challenged person.
Pee Dee EC	We see prepaid as a member-service tool to meet the needs of those members who desire to pay for their usage as the cost is incurred while minimizing the risk to the cooperative.
West Florida EC	To continue to provide this option to our member owners, and to allow demand to drive implementation.
Utility A	[No Response]

Continued

TABLE 11.1: Survey Results (cont.)	
Utility Name	**Responses**
Please list your utility's name and address as well as a contact person for further questions.	
Black River EC	Black River Electric Cooperative, Inc. P.O. Box 130 Sumter, SC 29151
Blue Ridge EMC	Blue Ridge Electric Membership Corporation 1216 Blowing Rock Blvd. Lenoir, NC 28645
Brunswick EMC	Brunswick Electric Membership Corporation P.O. Box 826 Shallotte, NC 28459 Contact: Jimmy Green, 910.754.4391
Minnesota Valley EC	Minnesota Valley Electric Cooperative 125 Minnesota Valley Electric Drive Jordan, MN 55352 Contact: Ryan Hentges, ryanh@mvec.net, 952.492.8202
Oklahoma EC	Oklahoma Electric Cooperative P.O. Box 1208 Norman, OK 73070 Contact: Jonna Buck, jbuck@okcoop.org, 405.217.6634.
Pee Dee EC	Pee Dee Electric Cooperative P.O. Box 491 Darlington, SC 29540 Contact: Lori Stuckey, Vice President, Member Services
West Florida EC	West Florida Electric Cooperative P.O. Box 127 Graceville, FL 32440 Contact: Penny Hagan, phagan@westflorida.coop, 850.263.3231
Utility A	[Anonymous]

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12 Vendor Lists

The purpose of this report is not to endorse any particular vendor or vendors. In the case of AMI system vendors, it is believed that most cooperatives know the players or have already begun to implement solutions. The vendors of prepayment engines may be less well-known. A list of vendors is included here. Note that this list does not include any CIS vendors which either are offering or developing a prepayment program. Any investigation into the viability of a prepayment program should include an investigation into the incumbent CIS capabilities.

Exceleron Software Inc.
5440 Harvest Hill Road, Suite 233
Dallas, TX 75230
972.852.2711
www.exceleron.com
sales@exceleron.com

SmartGridCIS
12600 Deerfield Parkway, Suite 100
Alpharetta, GA 30004
866.678.1110
www.smartgridcis.com
internetsales@smartgridcis.com

PayGo Electric
333 North Point Center East, Suite 250
Alpharetta, GA 30022
678.325.6511
www.paygoelectric.com

Guardian Payment Systems
6 South Tejon Street, Suite #400
Colorado, CO 80903
719.487.2775
www.guardianpayments.com

Of note in the list of vendors above is that PayGo Electric has developed firmware that can be downloaded to an existing AMI meter so that real-time usage calculations can be supported for the customer, thereby emulating the features of the original systems described earlier in this document. The main issue is that this capability may not be supported by all AMI systems. Also, it is left for the individual utility to determine if there is enough value in this feature to justify its implementation.

There are some other options to consider that may be viable considerations depending on the individual needs of the utility. If your utility has

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not yet deployed—and is not ready to select—an AMI program, but would like to implement prepayment, an alternative would be to deploy a metering program that can be surgically deployed (i.e., anywhere within a cooperative's entire territory) with minimal communications overhead. Such systems typically utilize existing cellular coverage as the communications link between the residence and the head end. Some vendors to consider in this camp are:

Carina Technology
655 Discovery Drive, N.W., Suite 201
Huntsville, AL 35806
256.704.0422
www.carinatek.com

SmartSynch, Inc.
4400 Old Canton Road
Jackson, MS 39211
888.362.1780
www.smartsynch.com

Metrum Technologies
315 S. University Parks Dr.
Waco, TX 76701
254.752.7300
www.metrum.us

Nighthawk
6116 N. Central Expressway, Suite 710
Dallas, TX 75206
214.234.7571
www.nighthawkcontrol.com

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13 Future Prepayment Options

Certainly the future of prepayment looks bright. Prepayment programs are becoming more and more common, not only with cooperatives but with other utility types as well. The natural expectation for prepayment is for it to become more pervasive and, subsequently, easier to implement. As that implementation gets easier, additional fees for prepayment may fade away.

One of the most likely systemic changes for prepayment in the future is the increased level of support from incumbent CIS. Many of the leading CIS vendors today are developing and delivering prepayment as part of their offerings. As these offerings get more mature, it remains to be seen as to what the future is for third-party prepayment engines.

As more experience is gained with prepayment, it is likely that the service will evolve. One of the things that no one currently knows is whether prepayment could still be a viable service if there's no threat of a disconnect. Some initial indications, including data showing a low frequency of disconnects for prepayment customers, seem to give that possibility credence.

One of the most interesting, but legally problematic, options for prepayment is to utilize the debt payment feature as a savings mechanism. Customers who have paid off their debt could simply opt to continue having a percentage of all amounts tendered put into basically a savings account. This account could be refunded periodically to the customer at the most advantageous time. The concept of a Christmas account is the most likely scenario.

As stated, this type of innovation is problematic because the utility would essentially be a bank and potentially subject to all banking rules and restrictions. However, it is possible that a utility and a bank might be able to partner some day to offer such a program.

Another future option for prepayment involves the potential to create hybrid payment and billing. As electric pricing becomes more real-time, there is a concept that was considered in New Zealand as part of a prepayment offering after the country deregulated the electric utility industry.

The basic concept is that customers could have service either in a prepayment or post-payment mode and move between the two seamlessly. The concept is that customers operating in prepayment mode would pay a lower rate. As a customer moves from prepayment to post-payment mode (i.e., their account balance has run down to zero), the rate could potentially increase. The result is that the customer can enjoy a discount by paying in advance, while still maintaining service in post-payment mode without incurring a disconnect.

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14 Prepayment Program Structure

In This Section:

This is a template for a prepayment program. An overview of the various components of the program is shown in Figure 14.1.

Within each of these program components, a number of decisions must be made and definitions determined. The subsequent sections of this document raise many of these issues and decision points.

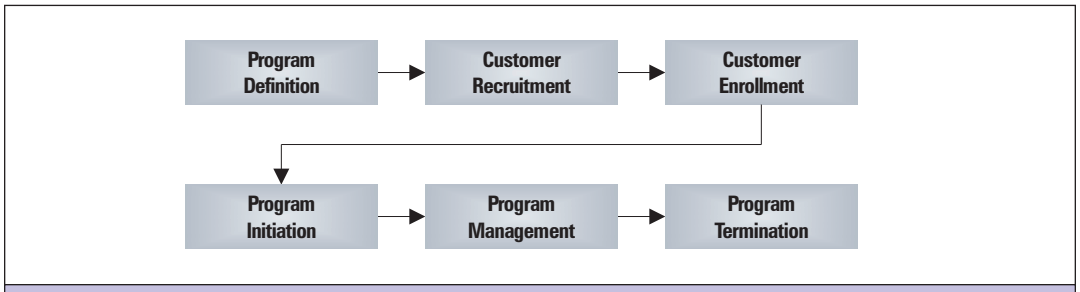

FIGURE 14.1: Prepayment Program Template

Program Definition

The Program Definition is the basis for the entire pilot. Specific questions about what the service entails must be defined to set the stage for all other steps of the program. Specifically, the questions that must be answered are:

1. What is the rate or rates offered in the program?
2. What are the base (monthly or daily) charges associated with the program? Is there a specific component for prepayment?
3. Can the program support other fees as part of the program? (This includes things such as rental fees, unmetered equipment, etc., and is important to help define the recruitment criteria for the program.)

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4. How are the base and other fees charged? Daily? Hourly? What is the policy associated with these fees during times of disconnect? (Also, what is the capability of the head-end software for fees?)
5. What is the deposit policy for prepayment? (The waiving of the account deposit has been proven to be one of the main enticements for some customers.)
6. How will any existing debt be handled? (Also, what is the capability of the head-end software for handling existing debt?)
7. What are the options for customer notification of balance information?
   a. Texting
   b. Email
   c. In-home display
   d. Web presentation
8. What is the customer balance notification frequency? Daily? More often?
9. What is the disconnect policy?
   a. Additional notifications
   b. When can disconnects be performed?
   c. What are the reconnect requirements?
10. How can customers make purchases?
    a. Point of Sale
    b. IVR
    c. Web
11. What utility employees need to be trained on the program offering?
12. What, if any, are the data exchange requirements and method between the prepayment head end and the CIS?

All of these criteria must be established prior to the commencement of customer recruitment.

Customer Recruitment

Recruiting prepayment program customers will be an integral part of the validity and success of the program. At the same time, experience has shown that only minimal effort is necessary to recruit customers for prepayment. Utilities have typically not needed to advertise or create other promotions as incentives to enrolling in prepayment. Customers who can most benefit from prepayment readily see the advantages of the service.

In order to facilitate the enrollment process, all utility employees who deal directly with customers need to be educated as to the benefits of prepayment so that they can discuss it knowledgeably. Utility experience has shown that this is the most valuable recruiting tool.

In one particular case, a utility essentially created an incentive program for call center and customer service personnel based on how many customers they were able to sign up for prepayment. While this was an unusual measure as compared to other utilities, it was effective.

In order to maintain the integrity of the program, it is recommended that there be only one criterion for participant selection. That criterion is simply the customer's desire to participate based on the perceived benefits of the program. Adding any other participation incentives to the customer offering only serves to potentially compromise the overall results of the program.

Customer Enrollment

The enrollment process entails the procedure by which the customer signs up for the prepayment service. You will need to specifically ask yourself the following questions:

1. What is the process by which existing customers transition from regular bill payment to prepayment?
   a. How is the time between customer sign-up and deployed operational metering equipment handled?
   b. What is the necessary coding of the customer account in the main CIS?
   c. How is necessary customer information transitioned from main CIS to prepayment head end?
   d. Can the existing customer deposit be used in the transition process to either minimize debt or create initial balance?
2. What is the process by which new customers enroll for prepayment?

   a. How does the customer need to be entered into main CIS?
3. Is the customer required to be home for equipment installation? Does this change based on the support for an in-home display?
4. What is the required customer deposit for service, if any?
5. Will the customer be required to sign a contract/agreement?
6. What is the facility for customer training?

Program Initiation

The Program Initiation phase is the period when metering equipment is deployed and the prepayment service is started. This phase needs to have processes and policies established for the following issues:

1. How is metering hardware installation initiated and completed?
2. How is the completion of hardware installation registered in the prepayment head end?
3. What are the new equipment registration requirements for the prepayment head end?
4. Conversely, what are the existing meter removal registration/recording requirements for the existing CIS and, possibly, the prepayment head end?
5. Is any on-site customer training necessary?

Ideally, the program can be designed so that the enrollment and service initiation are seamless. This is feasible if the AMI system is already operational, so that a meter reading can be retrieved during the enrollment process, a final bill for regular service can be generated, and the initial state of the prepayment account can be completely specified.

Program Management

The Program Management phase is the ongoing service after the initiation of the program until prepayment is discontinued. It will ultimately impact not only the impression customers have of the utility but also the work load of the utility staff to offer the service. If all previous components of the program have been designed correctly, this period of the process should only need to deal with exceptions. In particular, exceptions would include:

1. How does the system support the replacement of metering equipment in the event of failure?
   a. What is the process when valid metering information is still manually available from the failed meter?
   b. What is the process when valid metering information is not available?
2. How are customer questions handled with regard to prepayment services and by whom?
3. What are the processes/authorities associated with deviations from the prescribed system operation, such as disconnect postponements?

Program Termination

This phase occurs when a customer opts to leave the program. Specific aspects of service termination include:

1. How does the customer request service termination in the case of leaving the program early?
2. How does the utility inform the customer of service termination at the end of the pilot?
3. How does the customer transition to regular service?
   a. Is a deposit required?
   b. How does the remaining balance on prepayment get transitioned to the CIS?
   c. When is the metering equipment removed and how does the equipment change?

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15 Conclusion

The implementation of prepayment is emerging as a valued and popular service among cooperatives. In fact, there may be no more tangible, visible, and readily accepted use of smart metering technology by utility customers than to implement a prepayment program. Of the prepayment programs in operation today, cooperatives boast the most programs, as well some of the longest-running.

There are many different ways to implement prepayment. The essential pieces in today's market are an AMI system of some type and a head-end software package to manage the prepayment accounts. This head-end software package may be the existing CIS if that capability has been implemented. Otherwise, a third-party system can be chosen. For those utilities concerned about the public image of their smart grid initiatives, prepayment may be one of the more tangible and easily understood programs that validates these initiatives.

The information gathered from a number of existing prepayment programs almost suggests that there is no way to do it wrong. Traditionally held concepts that there must be an in-home display and 24/7 vending sites that accept cash are being proven no longer necessary.

Most prepayment programs do not charge a special rate ($/kWh) but many charge an additional monthly fee that ranges from $3 to $10 per month. In some cases, customers were charged a transaction fee and, in one specific case, the utility charged a reconnect fee. In all cases, customer satisfaction was very high.

The main motivations for implementing prepayment are to reduce bad debt/write-offs and to offer a service that does not require a large deposit.

The business case for prepayment can basically be what the utility wants it to be. Some utilities view the cost of prepayment simply as the cost of doing business. Other utilities have put together a specific business case with fees associated with the service to make it either a break-even or slightly profitable program. Depending on how specific costs are allocated, what fees the utility elects to charge, and the valuation of customer satisfaction and goodwill, a positive business case is achievable for virtually any utility.

Because of the various ways in which prepayment can be implemented, utilities should carefully consider the systems and methods they choose since the service will likely become a core payment method of the utility for the foreseeable future.

The experience with prepayment is growing. This means that there is more information and knowledge on the subject than ever before. Utilities looking to implement prepayment should leverage this knowledge by talking to other utilities with programs to learn their lessons as a way of avoiding possible mistakes.

If you are a utility that:

- Would like to offer an alternative to regular billing,
- Has some level of bad debt or write-offs,
- Has an initial service deposit that has grown to an unmanageable level, or
- Has already deployed or has plans to deploy AMI,

prepayment is something that you should seriously consider.

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A Abbreviations

AMI Advanced Metering Infrastructure
AMR Automated Meter Reading

CIS Customer Information System
CRM Customer Relationship Management

EC Electric Cooperative
EMC Electric Membership Corporation

HVAC Heating, Ventilating, and Air Conditioning

IHD In-Home Display
IT Information Technology
IVR Interactive Voice Response

kWh Kilowatt-Hour

LCD Liquid Crystal Display

MDM Meter Data Management

ODBC Open Data Base Connectivity

PAMS Prepaid Account Management System

RPPS Remote Payment and Presentment Service

TOU Time-of-Use

PREVIOUS VIEW

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