BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
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IN THE MATTER OF THE APPLICATION OF TUCSON ELECTRIC POWER COMPANY FOR APPROVAL OF ITS DEMAND-SIDE MANAGEMENT PROGRAM PORTFOLIO PLAN.	DOCKET NO. E-01933A-07-0401 **NOTICE OF FILING PROPOSED DIRECT LOAD CONTROL PROGRAMS** **(Expedited Review and Approval Requested)**

Tucson Electric Power Company ("TEP" or "Company"), through undersigned counsel, hereby requests the Arizona Corporation Commission ("Commission") to approve its proposed Direct Load Control ("DLC") Programs: (i) a Commercial and Industrial Demand Response Program and (ii) a Residential and Small Commercial Direct Load Control Program and related Pilot Program proposal. Detailed descriptions of each program are attached to this Notice.

On July 1, 2008, TEP informed Commission Staff ("Staff") and the Southwest Energy Efficiency Project ("SWEEP") that the DLC programs were being withdrawn and would be refiled at a later date incorporating new technologies. Pursuant to that letter, TEP is now filing the attached updated DLC programs. The Commercial and Industrial Program will target customers capable of delivering over 100 kW of load curtailment and is anticipated to provide up to 40 MW of load reduction potential within 14 to 18 months after the Program is approved. The Residential and Small Commercial Program will use an initial two year pilot program and will be expanded if the pilot program is successful. The pilot program will: (i) utilize programmable thermostats with two-way communication for the majority of pilot participants; (ii) test the effectiveness of load control switches with two-way communication; and (iii) assess customer acceptance of in-home displays and related changes energy usage associated with the displays. Assuming the pilot

program is successful, a full roll out of the Residential/Small Commercial Program has the potential to provide up to 80-90 MW of load reduction. TEP believes the proposed DLC programs are in the public interest and should be approved.

TEP also requests expedited review and approval of the DLC Programs by the end of March 2010. This timing is necessary in order to be able to have necessary infrastructure in place to use the Programs during the summer of 2010.

RESPECTFULLY SUBMITTED this 5th day of January 2010.

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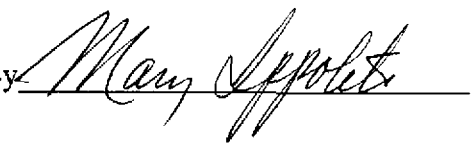
By 

Tucson Electric Power
Commercial and Industrial
Demand Response Program Description

January 5, 2010

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Program Concept and Description

Tucson Electric Power (TEP) proposes to manage peak demand and to mitigate system emergencies through a commercial and industrial load curtailment program. The program will be delivered on a turn-key basis by a third-party implementation contractor, who will negotiate load reduction agreements with multiple customers and "aggregate" these customers to provide TEP a confirmed and guaranteed load reduction capacity available upon request. It is anticipated that the contract between TEP and the demand response (DR) aggregator will be similar to a power purchase agreement in that the contracted party will be obligated to provide megawatts of load curtailment while maintaining a degree of flexibility in how the curtailments are achieved. The goal of the program will be to enroll enough customers to provide up to 40 MW of summer peak demand reduction, available for up to 80 hours per year, with a typical load control event lasting 3-4 hours.

Participants in the program will be compensated with incentives for their participation at negotiated levels that will vary depending on multiple factors including the size of the facility, amount of kW under load control, and the frequency with which the resource can be utilized.

Program Rationale

Commercial and industrial load represents a total of approximately 22% of system demand during peak hours in the late afternoon and evening during summer months. Modification of controls for chillers, rooftop AC units, lighting, fans, and other end uses is capable of significantly reducing power demand at peak times.

Program experience in other service territories suggests that many participants would be relatively unaffected by a modest and temporary increase in facility temperature resulting from a load control event. C&I customers are expected to participate in a demand response program due the financial incentives provided by the selected contractor. The contractor would be free to customize the incentive terms based on a number of factors including:

- the types of load that customers are able to reduce
- whether the load can be directly controlled by the contractor (automated demand response)
- the amount of advanced notification required by the customer
- the maximum amount of time the customer is willing to curtail load in a given event
- the number of events and hours the customer is willing to curtail load per year

The program will generate the following benefits:

- Avoided firm capacity required to meet reserve requirements.
- Reduced or avoided open-market power purchases during periods of high energy prices.
- Greater grid stability and reduction in outages due to reduced grid demand.
- Emergency and rapid-response demand reduction resource in case of system-wide or localized emergencies

Target Market

The program will be targeted to commercial and industrial customers within TEP's territory with a peak demand sufficient to enable load curtailments of approximately 100 kW or more and whose facility operations will permit load reductions coincident with TEP's summer peak hours.

Delivery Strategy and Administration

Program administration is expected to be highly outsourced to a firm with extensive experience in C&I load control equipment, processes, and marketing. TEP will design basic program requirements and resource specifications (e.g., total MW, desired response times, target market) and will select an experienced DR service provider that will be overseen by TEP staff.

The responsibilities of the third-party contractor will include, but not be limited to, the following:

- Recruitment of participants
- Participant assistance in designing effective load control strategies
- Provision of load control equipment and/or ensuring that participants successfully enable curtailment capability
- Participant tracking and reporting
- Establishing a head-end software system that can be used by TEP to call and monitor load control events
- Call center services
- Customer satisfaction/problem resolution
- Negotiation and payment of incentives to customers for program participation

TEP staff will be responsible for the following:

- Managing the contractor(s) and tracking program implementation
- Developing internal staff training and protocols for calling load control events.
- Public relations, program promotion, cross-program coordination of other demand-side management and renewable opportunities.

Evaluation of program processes, customer feedback, technology assessment, and impact assessment will be conducted by an independent evaluation contractor who is not responsible for program delivery.

Marketing and Communications

Recruitment will be targeted to help ensure that customers invited to participate are able to provide reliable and significant load control reductions. Consequently, it is not anticipated that mass media, such

as radio and television will be used. Rather, the DR aggregator will conduct direct marketing according to an approach approved by TEP for purposes of ensuring a consistent message with TEP's public communications.

Monitoring and Evaluation Plan

Monitoring and evaluation of the program will help ensure that the load curtailments are providing the megawatts for which TEP is paying and counting on for resource planning purposes. Monitoring and evaluation will be conducted by an independent evaluation contractor who is not responsible for program delivery, and will include the following elements:

- **The impact evaluation** will address the changes in demand during load control events. These changes in demand will be estimated using statistical regression modeling and by comparing each customer's expected usage during an event with their actual usage based on interval meter data during the event and in the days and hours prior to the event. The customer-specific load reductions reported by the DR provider will be verified, and system-wide reduction estimated using data from the entire summer season. Alternative baseline methodologies may be examined to assess whether alternative baselines provide a more accurate prediction of usage.
- **The process evaluation** will encompass a review of how well TEP and the selected third party implementation contractor has administered the program and how customers perceive the program. A program delivery assessment will include interviews with TEP staff, vendors, and participants to identify program strengths, areas for improvement, and features that are preferred or disliked by customers. Customer feedback will be a major aspect of the process evaluation and will be obtained primary through surveys of at least a portion of participants at various stages of the program implementation.

Estimated Peak Demand Savings and Environmental Benefits

The program will be capable of delivering up to 40 MW of load reduction during typical summer peak hours, and varying amounts by the season, time of day, and day of the week according to customers' ability to shed load and the contractor's load reduction nominations. These full demand savings will be available after approximately one year of implementation of the program, and persist throughout the anticipated ten year contract duration (Table 1), which may be extended or transferred to continue program benefits. TEP will negotiate with the selected vendor a guarantee provision to ensure the demand reduction resource is available upon request.

Table 1. Demand and Energy Savings

Energy and Demand Savings	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-10
Annual Demand Savings (Peak) MW	10	40	40	40	40	40+

While some amount of energy savings will occur during load control events, the majority of consumption is typically deferred to off-peak periods rather than avoided altogether. As such, it is conservatively assumed that savings from demand response events are restricted to demand savings only, and

environmental benefits (including carbon emissions reductions) are not considered to be significant enough to influence cost-effectiveness or to contribute significantly toward emissions reductions goals.

There may be additional emissions reductions, not quantified here, due to load-shifting to hours of the day when higher efficiency generation resources are used, as well as environmental benefits related to the reduced need for additional peaking generation.

Program Costs

Table 2 presents an estimate of program costs of $25.4 million over a projected 10-year period for the program. The present value of costs in 2009 dollars is $17.4 million discounted at 7.0%.

Table 2. C&I Direct Load Control Costs

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Cost in $1000s	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-10	Total	NPV (2009$)
Program Administration								
Customer Incentives *(estimate of pass-through)*								
Outsourced Services *(excluding incentives)*								
Total								

Program Cost Effectiveness

TEP expects an outsourced C&I demand response program to be cost-effective over the 10-year program period evaluated for this filing. As discussed above, the present value of program costs are projected to be $17.4 million (2009$) for the period 2010 through 2019. Program benefits in the form of avoided capacity costs (from avoided firm power purchases and avoided generation investment) are expected to be $21.1 million in 2009 dollars. Avoided T&D costs may also be realized but would be smaller than avoided capacity costs and have not been quantified. These figures translate to a benefit-cost ratio under the Program Administrator test of 1.21 for the 10-year program.

Under the Total Resource Cost (TRC) test, incentives are treated as transfers (a benefit to the customer that offsets the cost to TEP) and thus are not included in the net program costs.[1] Excluding incentives, the present value of program costs is only $8.2 million, resulting in a benefit/cost (B/C) ratio of 2.56.

The Societal Cost test (SCT) includes environmental benefits, including those resulting from reduced air emissions. However, as discussed previously, the value of energy savings are considered small relative to

[1] TEP will provide incentives to customers through its contract with a DR aggregator. One advantage of using a third-party contractor is that the contractor is able to customize incentives to meet the needs and load curtailment flexibility of individual customers. Based on similar programs in other utility jurisdictions, it is estimated that greater than 50% of TEP's payments to the contractor will be passed through directly to customers in the form of financial incentives for participation.

capacity benefits and have not been quantified. Thus, the SCT produces the same result as the TRC (Table 3).

Table 3. Benefit-Cost Ratios Under Various Cost-Effectiveness Tests (10-year Program Duration)

Cost-Effectiveness Tests	Program Administrator Test	Total Resource Cost (TRC) Test	Societal Cost Test
	All costs in millions (NPV 2009$)		
Costs	$17.4	$8.2	$8.2
Benefits (Avoided Costs)	$21.1	$21.1	$21.1
Benefit/Cost Ratio	1.21	2.56	2.56

Program Implementation Schedule

TEP anticipates that the full 40 MW of peak load reduction potential will be available within 12 to 18 months after contract signing with the selected implementation vendor, and quick start availability of 10 MW within four months of contract signing.

Table 4 shows an implementation schedule for the first year of the program, with dates for major milestones in the program design and implementation. This schedule assumes a quick approval by the Commission. The initial contract with the implementation contractor is expected to be ten years, but the contact may be extended, or a new contract awarded in order to extend program benefits beyond that term.

Table 4. Direct Load Control Program Implementation Schedule

Major Milestone	Date
Finalize program plan and submit to ACC for approval	Dec 2009
Anticipated date of program approval	Feb 2010
Finalize contract with vendor/implementation contractor	Feb 2010
Complete recruitment and equipment installation for 10 MW	June 2010
Achievement of 40 MW of load curtailment capability	May 2011
Decision regarding contract extension/renewal	2018

Tucson Electric Power

Residential and Small Commercial Direct Load Control Program Description and Pilot Proposal

January 5, 2010

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Program Concept and Description

The Residential and Small Commercial Direct Load Control (DLC) program will enable Tucson Electric Power Company (TEP) to better manage peak demand and to mitigate system emergencies through direct load control of residential and small commercial central air-conditioners (ACs). The program will use two-way communication that sends load control signals to equipment at the home or business and also provides interval consumption data back to TEP for all participants. Participants will receive either 1) a free thermostat that can be programmed manually or remotely via the internet or 2) a load control device placed on their outdoor air conditioning unit. In exchange, customers will permit TEP to cycle AC units or raise thermostat temperature settings for a limited number of hours or events per year.

The two-way communication to and from the customers will allow verification of load impacts and enable TEP to provide usage and billing information to customers via an in-home display or the internet. This communication pathway takes advantage of the expanding installed base of automated meter reading (AMR) meters in TEP's service territory, rather than requiring investment in full advanced metering infrastructure (AMI) or expensive two-way radio frequency communications. The program design and technology choices will afford TEP the flexibility to expand the program to include future time-of-use pricing options as well as providing a migration path to an AMI-based infrastructure.

It is expected that TEP will call roughly 8 to 10 load control events each year. Customers will have the option to change thermostat settings or override cycling strategies during a control event.

Pilot Program

TEP proposes a two-year pilot program, with the second year a contingency in the event that the first-year evaluation is not sufficient to adequately assess the functionality of the load control or communications technologies or that significant program changes are required. The pilot program will deploy devices in approximately 800 locations within TEP's distribution area. Some participants may be concentrated around a single substation or distribution feeder in order to test the ability of direct load control to mitigate local distribution contingencies. It is expected that TEP will call approximately 10 load control events between April and October, testing various control strategies that are likely to include temperature offset options and cycling strategies. If the pilot program proves to be successful, TEP plans to expand to a full program rollout.

Pilot Program Objectives

The pilot program is intended to confirm the feasibility and effectiveness of the direct load of residential and small commercial air conditioners. Load impact results and customer feedback gained through the pilot program will enable a better assessment of cost-effectiveness of DLC and inform program enhancements for a broader rollout.

Specific objectives for the pilot include the following:

- **Refine estimates of load impacts.** Experience throughout the country provides a rough indication of the load reductions achievable utilizing current generation load control technology. However, these reductions will vary by customer characteristics, climate, control technologies, dispatch protocols, and other factors such as program design. The pilot program will provide load impact information specific to TEP's service territory and customer base.

- **Test the effectiveness of the new generation of load control technology.** Various approaches proposed by vendors will be considered for the Pilot. However, the following technology elements are considered "core" to the program:
    - Use of customers' broadband internet connections with existing AMR meters to leverage an existing deployed asset, reducing the need for expensive AMI meter and infrastructure rollout;
    - Two-way communication between TEP and the buildings being controlled, which will allow for verification of load reductions and enable future dynamic pricing;
    - Enhanced communications to participating customers regarding their household or business usage and their program activity levels, which will allow for more effective participation
- **Assess customer experience.** The pilot will help determine how much the residential and small commercial customer segments are amenable to different load control approaches (e.g., direct AC cycling, set-point control only, or traditional load control switch). Actual experience with load control events will provide an indication of how many events per year, and for what duration, may be acceptable to customers.

The pilot is not intended to measure the most appropriate level of incentive; this will be assessed through customer focus groups and a review of utility experience with residential load control.

Pilot Program Participation

Pilot program participation will be targeted at approximately 800 customers, broken into two groups – residential or small commercial. Additional grouping may be done to create samples based on geography, load control strategy (e.g., cycling vs. temperature offset), or other factors. Table 1 shows the participation goals for the pilot program.

Table 1 Pilot Program Participation Goals

	Participation (number of accounts)
Residential	**600**
Thermostat Only	*200*
Thermostat & In-home Display	*200*
External Load Switch Only	*200*
Small Commercial (*Thermostat Only*)	**200**
Total	**800**

Pilot Program Marketing and Recruitment

Pilot participants will be recruited from throughout the TEP service territory. Prior to inviting participation, TEP will establish recruitment criteria based on multiple profiles that are likely to include some demographic, geographic, and usage identity information. These criteria will ensure that participants represent the population of eligible customers and are capable of contributing significant load reductions to the system.

In order to achieve these recruitment objectives, it is not anticipated that mass media, such as radio and television will be used. Rather, the marketing campaign will consist of direct mail, bill stuffers, and/or telemarketing to those customers meeting the initial eligibility criteria. Program literature and marketing messages will highlight the relationship between reducing peak loads and deferring investment in new peaking generation.

Participants will be required to have a functioning broadband internet connection that they commit to maintaining for the duration of the pilot program. The broadband connection is essential for the Company to leverage its existing infrastructure investments in AMR meters to obtain interval meter data.

Participants will receive a $50 incentive for participating as well as one or more (depending on the number of cooling zones in the building) free internet-enabled programmable thermostats that will be installed at no charge by a qualified contractor. These thermostats could enable customers to save energy as well as participate in the DLC program.

Additional incentives that could be offered to customers for participating include the following:

- Web access to energy usage information.
- In-home displays that inform customers about their energy use.
- Additional cash incentives or gift certificates to help with retention and to encourage cooperation during pilot survey efforts.

Pilot Program Implementation Schedule

Table 2 shows an implementation schedule for the first year of the Pilot, with dates for major milestones in the program design, implementation and evaluation. This schedule assumes a quick approval by the Commission.

Table 2. Direct Load Control Pilot Program Implementation Schedule

Major Milestone	Date
Program plan submitted to ACC for approval of pilot	Dec 2009
Anticipated date of pilot approval	Feb 2010
Finalize contract with vendor	Feb 2010
Complete recruitment and equipment installation	Apr 2010
Commence program for customers	May 2010
Conclude program (one season)	Oct 2010
Program evaluation complete	Dec 2010
Year 2 of Pilot (if needed)	Apr - Oct 2011

DLC Program Rationale

Residential and small commercial load represents a total of approximately 78% of system demand during peak hours in the late afternoon and evening during summer, and an average of 35% of that total use is for air conditioning. Direct load control of AC is capable of significantly reducing power demand at peak times.

Some homes are unoccupied during these periods and customers would scarcely be affected by a reduction in air conditioning. Furthermore, program experience in other service territories suggests that many residents would be relatively unaffected by a modest and temporary increase in household temperature resulting from a load control event. Small commercial businesses are often able to reduce cooling for a short period without impact to their business operations.

A significant share of residents and small business owners may be willing to participate in a load control program due to one or more of the following motivating factors:

- Desire to assist TEP in reducing the need for additional power plants to serve peak loads;
- Interest in supporting demand-side management programs perceived to improve environmental quality;
- One or more free internet-programmable thermostats per building;
- Other possible incentives, including: in-home displays, web-accessible information on customer energy consumption and costs, and a monetary incentive for curtailments.

Target Market

The program will be directed to residential and small commercial customers with central air conditioning using direct expansion units or heat pumps, where the premises are occupied and the AC is expected to be used during the summer months.

Residential customers that have one or more central AC units that are completely controllable via a signal to one or more thermostats will be targeted. This would exclude customers living in multifamily units where the AC system serves more than one residential unit.

The target market for the small commercial sector is customers with an estimated peak demand of 20 kW or less and a central AC system that is completely controllable via a thermostat inside the premises. This would exclude customers whose facilities are cooled from an AC system that serves more than one commercial space.

Program Eligibility and Participation

The DLC Program will be offered to TEP's residential and small commercial customers that meet the following criteria:

1. Home or building must have direct expansion electric central air conditioning or heat pump system.

2. All AC units serving the home or building must be controllable by TEP.
3. The premises must be occupied and the AC expected to be used during the summer months of the pilot program.
4. The customer must have a functioning broadband internet service that can be used for data transmission.
5. The customer must receive electric service from TEP in order to participate in this program.

It is anticipated that a full program rollout will enroll 10,000 to 15,000 residential customers per year and between 1,000 and 2,000 commercial customers per year for approximately five years. After this time, enrollment would stabilize at roughly 60,000 residential customers and 6,000 commercial customers.

Delivery Strategy and Administration

Program administration is expected to be highly outsourced to firms with extensive experience in load control equipment and program delivery. The program will be overseen by TEP staff, but specific implementation tasks will be carried out by one or more third-party contractors

The responsibilities of the third-party contractors will include, but not be limited to, the following:

- Provision of load control equipment and "head-end" control software that can be used by TEP to call and monitor load control events
- Training on software and assistance in designing effective load control strategies
- Marketing and recruitment strategy
- Recruitment of participants (via telephone/in-person, by receiving calls in response to bill stuffers and other invitations to participate, and by processing internet requests)
- Participant tracking and reporting
- Technology installation (and possibly procurement, depending on the technologies and vendor selected)
- Call center services
- Customer satisfaction/problem resolution

TEP staff will be responsible for the following:

- Managing the contractor(s) and tracking program implementation
- Developing internal staff training and protocols for calling load control events.

Evaluation of program processes, customer feedback, technology assessment, and impact assessment will be conducted by an independent evaluation contractor who is not responsible for program delivery.

Marketing and Communications

Eligible customers from the TEP service territory will be invited to participate in the program.

Mass media advertising, such as through radio and television may be used as well as direct mail, bill stuffers, and/or telemarketing. Program literature and marketing messages will highlight the relationship between reducing peak loads and deferring investment in new peaking generation.

The primary customer incentive for participating in the program will be one or more (depending on the number of cooling zones in the building) free internet-enabled programmable thermostats that will be installed at no charge by a qualified contractor. These thermostats could enable customers to save energy as well as participate in the DLC program.

Additional incentives that could be offered to customers for participating include the following:

- Web access to energy usage information.
- In-home displays that inform customers about their energy use and costs.
- Annual cash payments which are currently being envisioned in the range of $25 per residential participant and $40 per commercial participant.

Monitoring and Evaluation Plan

Evaluation, measurement, and verification (EM&V) is a critical process for the program in that it will provide robust estimates of the load impacts, inform future technology choices, and improve program marketing and delivery. TEP will develop a detailed evaluation plan that will guide an ongoing impact, technology, and process evaluation. Elements of this plan are as follows:

- **The impact evaluation** will address the changes in demand during load control events. These changes in demand will be estimated using statistical regression modeling and by comparing the expected peak usage with the actual peak usage based on interval meter data.
- **A technology assessment** will address the accuracy, reliability, and customer acceptance of the various technologies associated with the DLC and Smart Grid architecture. These technologies include the customer-facing equipment such as in-home displays, smart thermostats, and web portals as well as back-end system such as interval meter data collection via broadband.
- **The process evaluation** will encompass a review of how well TEP has administered the program and how customers perceived the program. A program delivery assessment will include interviews with TEP staff, vendors, and participants to identify program strengths, areas for improvement, and features that are preferred or disliked by customers. Customer feedback will be a major aspect of the process evaluation and will be obtained primary through surveys of at least a portion of participants at various stages of the program implementation.

Estimated Peak Demand Savings and Environmental Benefits

The goals for demand reduction will depend upon when the load control event is called, what cycling or setback strategy is used, and how long the event lasts. Reductions are expected to be at least 1.0 kW per residential participant during events lasting two to four hours during times of high cooling loads. For an emergency event of one hour or less, demand reductions of double this amount can be expected. Demand reductions from small commercial customers are projected to be approximately twice as large as for residential customers. Demand reduction figures presented in Table 3 are estimates only and will be revised based on pilot performance data.

Table 3. *Estimated Peak Demand Savings Per Participant*

	Demand Savings Per Participant	
	Residential	Small Commercial
3-hour event	1.2 kW	2.0 kW
System Emergency	1.8 kW	4.0 kW

Under a full program rollout, peak demand savings are expected to reach between 80 MW and 90 MW within five years and remain roughly stable as new participants balance the loss of customers who drop off the program.

Regarding environmental benefits, it is conservatively assumed that savings from the direct load control program are restricted just to demand savings. Given the relatively short duration of the anticipated load control events, total reductions in energy usage during events is expected to be less than 50 kWh per customer annually. Furthermore, AC loads typically "rebound" after an event is over as indoor temperature are brought back down to normal set points. Thus, much of the apparent energy savings from load curtailment would not be realized. As such, overall energy savings are small to non-existent, and environmental benefits (including carbon emissions reductions) are not considered to be significant enough to influence cost-effectiveness or to contribute significantly toward emissions reductions goals.

There may be additional emissions reductions, not quantified here, due to load-shifting to hours of the day when higher efficiency generation resources are used, as well as environmental benefits related to the reduced need for additional peaking generation.

Program Costs

Program costs are projected annually for a one-year pilot[1] plus a 15-year program and are estimated at $74.8 million. The present value of costs in 2009 dollars is $49.1 million discounted at 7.0%.

Pilot Program Cost

The cost of the pilot is expected to be approximately $1.1 million for the first year and $462,000 for the optional second year. There would be no equipment purchases or installation in the second year, thus allowing for the significant reduction in required budget (Table 4).

[1] The pilot program is planned for a minimum of one year, with an optional second year. For purposes of this cost-effectiveness analysis, it is assumed that the pilot would last one year and the full program rollout would begin the following year.

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Table 4. Proposed Pilot Program Cost

Cost in $1000s	Year 1	Year 2 (optional)
Program Administration		
Customer Incentives		
Equipment Purchases		
Equipment Installation		
Other Outsourced Services		
Total		

* Equipment installation is included in the package of outsourced services offered by TEP's preferred vendor.

Full Program Cost

The projected budget for the full program ramps up in the first several years, from $6.7 million in year 1 to $11.5 million in year 4, due to the costs of initial customer recruitment and equipment purchase and installation. Beginning in year 5 acquisition of new customers is expected to taper off and by year 6 costs are expected to drop to roughly $3 million per year as the program maintains roughly a steady level of participation (Table 5). The line item for Other Outsourced Services includes recruitment, customer service, software licensing, and evaluation.

Table 5. Projected Direct Load Control Program Costs

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Cost in $1000s	Pilot	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7-15	Total	NPV (2009$)
Program Administration										
Customer Incentives										
Equipment Purchases										
Equipment Installation										
Other Outsourced Services										
Total										

Program Cost Effectiveness

TEP expects a mass market direct load control program to be cost-effective in a full program rollout over the 16-year period evaluated. As discussed above, the present value of program costs are projected to be $49.1 million (2009$). Program benefits in the form of avoided capacity costs (from avoided firm power

purchases and avoided generation investment) are expected to be $62.2 million in 2009 dollars. Avoided T&D costs may also be realized but would be smaller than avoided capacity costs and have not been quantified. These figures translate to a benefit-cost ratio under the Program Administrator test of 1.27.

Under the Total Resource Cost (TRC) test, incentives are treated as transfers (a benefit to the customer that offsets the cost to TEP) and thus are not included in the net program costs. Excluding incentives, the present value of program costs is only $37.1 million, resulting in a benefit/cost (B/C) ratio of 1.67.

The Societal Cost test (SCT) includes environmental benefits, including those resulting from reduced air emissions. However, as discussed previously, the value of energy savings are considered small relative to capacity benefits and have not been quantified. Thus, the SCT produces the same result as the TRC. (Table 6).

Table 6. Benefit-Cost Ratios Under Various Cost-Effectiveness Tests (Pilot plus 15-Year Program)

Cost Effectiveness Tests	Program Administrator Test	Total Resource Cost (TRC) Test	Societal Cost Test
	All costs in millions (NPV 2009$)		
Costs	$49.1	$37.1	$37.1
Benefits (Avoided Costs)	$62.2	$62.2	$62.2
Benefit/Cost Ratio	1.27	1.67	1.67