

Targeting Constrained Regions: A Case Study of the Fort Churchill Generating Area

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ABSTRACT

In 2008 NV Energy planned to build new generation units in northern Nevada to replace units that were not operating at optimal efficiency at the Fort Churchill generating station in northern Nevada. The proposed substation would connect transmission lines from the Tracey Power Plant to serve the Fort Churchill area. The Public Utilities Commission of Nevada (PUCN) instructed NV Energy to devise a plan to serve the area without building additional infrastructure or running the generation units so rate payers would not absorb the costs of NV Energy running the inefficient units. The PUCN ordered NV Energy to concentrate DSM activities in the area by increasing the marketing and incentive levels to customers and implementation contractors within the region.

The particular challenge in targeting this demographic area was that the territory covered a large land area with relatively small commercial customer use per capita. Moreover the moderate income of many local residents made it difficult to implement projects that yielded energy savings, because many customers lacked the capital to initiate projects.

NV Energy's conservation programs designed a strategy to bring energy savings to this rural region of the state through two projects: the **Dayton Initiative** and the **Sure Bet Program** (The Sure Bet Commercial & Industrial Energy Efficiency Incentive Program). Between the Dayton Initiative and the Sure Bet Program, NV Energy was able to displace the need to deliver 19,137 annual MWh from the Fort Churchill generating units. These efforts offset the fuel costs associated with generating 19,137 MWh for delivery to the Fort Churchill area.

Introduction to the Dayton Initiative & the Sure Bet Program

In the last quarter of 2008, NV Energy received a stipulated order as part of Docket No. 08-08012 "Application of Sierra Pacific Power Company for approval of its 2008 Annual Demand Side Management Update Report as it relates to the Action Plan of its 2008-2027 Integrated Resource Plan. It stated:

"The parties agree that the concentration of DSM energy efficiency measures in Carson City, Dayton, Carson Valley, and South Tahoe has the potential to reduce the run time required for the Ft. Churchill generation units. The increased marketing costs and increased incentives and subsequent reduction in program energy savings required to attain an increased penetration in the smaller market area are estimated to be more than offset by reduced fuel costs. Sierra Pacific, d.b.a NV Energy, will make a reasonable effort within the approved DSM budget

and programs to concentrate DSM activities in this area by increasing marketing and incentive levels to customers and implementation contractors within this region.”¹

NV Energy had originally intended to build a new substation with transmission lines connected to the highly efficient Tracey Power Plant to help serve this area. However, the cost would have been passed along to the ratepayers, so the PUCN instructed NV Energy to devise a plan for serving this area without building additional infrastructure or running the less efficient Fort Churchill Power Plant.

In 2009, NV Energy began to lay the groundwork for a series of coordinated demand-side management energy efficiency programs in the area between the Fort Churchill Power Plant and South Lake Tahoe. These areas include Carson City, Dayton, Carson Valley, and South Lake Tahoe and were to be part of an extensive campaign to bring energy and cost savings to residential and commercial customers. The following is a brief synopsis of these activities and corresponding kWh annual savings associated with the various projects. While many of the projects do not have a finite lifespan and are ongoing, the figures provided include a combination of year-to-date achievements and projections of total energy savings through December 31, 2009.

Residential Initiatives

NV Energy, through its contractors Ecos and Jaco Environmental, was involved in the implementation of two major residential demand-side management programs: ENERGY STAR[®] Lighting and Refrigerator Recycling. The following is a description of the residential initiatives that comprised the Dayton Initiative, the initial market segmentation strategies that helped identify and target specific neighborhoods, and the energy savings methodology used to quantify the impact of the project.

Door Hangers

In an effort to bring energy savings to a segment of the population that is difficult to reach through traditional channels, the utility’s energy conservation and efficiency department launched a rural outreach program designed to bring energy savings through the distribution of educational materials and compact fluorescent light bulbs packaged in conservation kits.

These educational kits were distributed by Power Direct Marketing and contained information on ways to save energy through efficient lighting, refrigerator recycling, and home weatherization, to name a few. Numerous field teams distributed utility labeled, bio-degradable bags to 16,200 households. Included in the bag was a six-pack of energy efficient CFLs, information on the lighting and refrigerator recycling programs, and a variety of educational materials highlighting a number of residential efficiency programs sponsored by NV Energy.

Through the distribution of 97,200 CFLs to the more than 16,000 homes in this region, local NV Energy ratepayers will receive a first-year annual energy savings of nearly 5.7 million kWh. This equates to an annual cost savings of almost \$750,000.

¹ Public Utilities Commission of Nevada. Docket 08-08012, Stipulation pgs. 2-3. November 21, 2008

Timeframe:	Completed in October 2009
Utility Programs Highlighted:	All residential programs with a focus on Refrigerator Recycling, ENERGY STAR lighting and home weatherization
Location:	Region between South Lake Tahoe and the Fort Churchill Power Plant. Distribution of bulbs staged from local NV Energy office in Carson City
Materials Distributed:	One bio-degradable bag containing: <ul style="list-style-type: none"> • Six energy efficient light bulbs (13 watt & 23 watt) • Brochure on ENERGY STAR lighting program • Brochure on Refrigerator Recycling program • Brochure on Home Weatherization program (Comfort Savings) • Brochures on other conservation and efficiency programs • NV Energy satisfaction survey card

Supporting Marketing Efforts

- Informed local NV Energy office in Carson about the Dayton Initiative Program and logistical details of the project
- Educated local offices about the purpose of the Dayton Initiative and the reason for targeting this specific region
- Expanded messaging to entire company through corporate communications and internal marketing channels. Highlighted the Dayton Initiative in October issues of internal publication *Powerline*
- Reached out to local media outlets in Carson City/Dayton area to help inform local population about the utility's outreach efforts in their region

School Programs

In May, prior to the end of the 2008-2009 school year, the ENERGY STAR Lighting Program focused on bringing energy savings directly to employees of the local school districts and other industries within this region. Under the direction of Major Account, Accounts Manager Charlene Booth and the utility's Sure Bet for Schools Program Manager, Andy Dumond, more than 11,000 CFLs were shipped to the Carson City School District to be distributed to school staff. Each of the more than 900 employees received a 12-pack of CFLs in addition to valuable information on other energy efficiency programs. In June, the program launched a similar project with the Douglas County School District, providing more than 12,000 CFLs to more than 1,000 county school employees. This component of the Dayton Initiative yielded more than 1.3 million first-year kWh savings for local residents and more than \$170,000 in reduced electricity costs for employees of the two school districts.

Nonprofit Partnerships

In the spring of 2009, NV Energy launched a social marketing campaign through its ENERGY STAR lighting program. The intention was to locate and identify nonprofits in the State of Nevada that could use energy efficiency as an incentive, as well as a thank you, to encourage donations during difficult economic times. Organizations such as United Blood Services, Nevada Humane Society, the SPCA of Northern Nevada, The Pet Network, and Friends of the National Multiple Sclerosis Society of Reno were targeted for their strong reputation and effective outreach networks.

Local residents who gave blood, donated to Friends of MS, or adopted a pet from one of three animal shelters in the Reno-Sparks-Incline Village area were eligible to receive free, energy efficient CFLs from NV Energy.

“The purpose of the program is to thank local residents for supporting these nonprofit organizations during difficult economic times by providing cost and energy savings,” said John Hargrove, project manager for energy efficiency and conservation at NV Energy. “The agencies we’re partnering with all have active community outreach programs that will help us leverage our efforts.”

The program is continuing and by year-end the program forecasts that more than 250,000 CFLs will have been distributed to approximately 15,000 Nevada residents who contribute to these essential organizations. In the Dayton corridor alone, an estimated 10,000 CFLs will be distributed accounting for roughly 580,000 annual kWh savings.

Direct Install Programs

In another project designed to secure energy savings, residential lighting program representatives worked with managers of apartment complexes and mobile-home parks to install nearly 13,150 CFLs directly into the sockets of households in Carson City and Dayton. Lighting products have traditionally been supplied by management of multi-family housing. By providing owners and developers with CFLs in 60-, 75- and 100-watt equivalents, the program was able to obtain enthusiastic buy-in from property managers. Installing CFLs enabled properties to attach a “green” and earth-conscious concept to their brands, while also reducing long-range labor and maintenance costs associated with the long life of the energy saving bulbs.

In addition to the direct capture of kWh savings, this project facilitated market transformation by exposing low to moderate income Nevadans to the benefits, value, and aesthetics of CFL technology. Total estimated annual kWh savings for this component of the Dayton Initiative is 836,416 kWh.

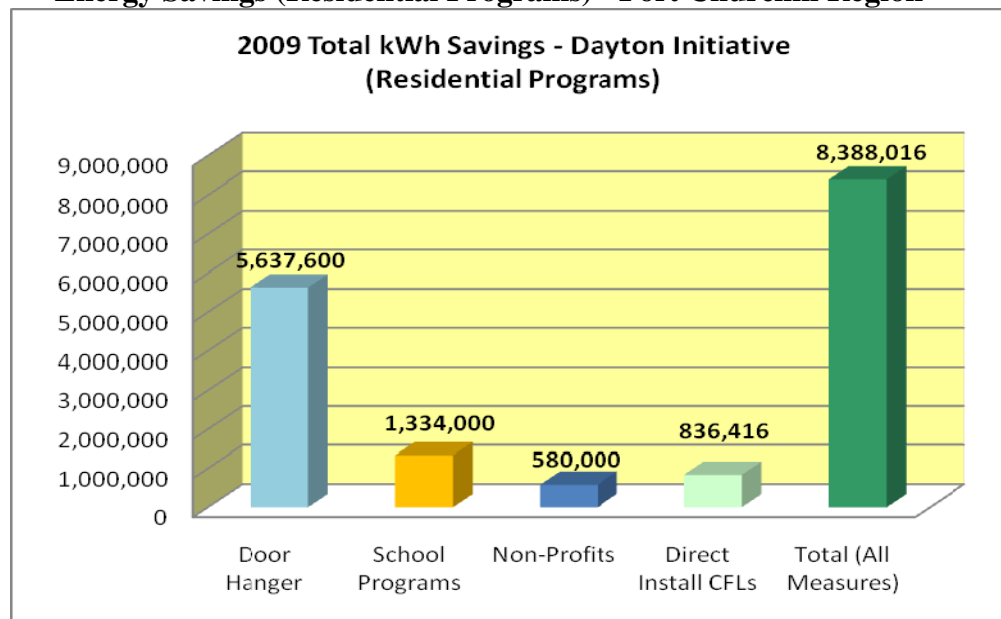
Market Segmentation Strategy

Neighborhoods were chosen based on a combination of location, population density, and median family income distribution. As explained below in the savings methodology section, rural communities were targeted first; however it was important to have a minimum number of households per square mile in order to cut down on travel time and cost. All postal codes with a certain level of median income were automatically disqualified in order to focus efforts on communities that could benefit financially from such a project with lower CFL socket saturation rates per household in order to increase likelihood of install.

Deemed Savings Methodology

For the purposes of this paper, the savings figures for the residential lighting portion of the program are presented as deemed savings based on a baseline wattage conversion from incandescent to CFL using equivalent lumen output. It was imperative that this project strive to maximize the percentage of CFLs that were actually installed by focusing on neighborhoods and regions with lower socket saturation rates. Other variables used to determine a per unit, first-year annual kWh savings figure include daily hours of operation by room type, likelihood of placing bulbs in high-traffic versus low-traffic areas, and potential for shelving of CFLs when larger quantities are distributed.² It was determined that directly targeting a particular demographic or moderate-income neighborhood can drastically increase the likelihood of all CFLs being installed upon receipt thereby increasing the realization rate of the deemed savings once measurement and verification activities are performed. Since the national average residential CFL socket saturation rate is 4.4 per household, it is safe to assume that rural, more sparsely populated areas would have lower CFL socket saturation rates.³ With over 13 sockets in the average household categorized as “high-traffic areas,” the program was confident that distribution of six CFLs per household would yield extremely high install rates in this region. This targeted effort, and the reasons provided above, also help reduce the free-ridership and spillover factor of such projects dramatically.

Energy Savings (Residential Programs) - Fort Churchill Region



Source: Ecos Inc.

² 2009 Energy Star Lighting Program – NV Energy – Measurement & Verification Field Report. ADM Associates, Inc.

³ California Lighting and Appliance Saturation Study 2005. CFLs installed and Saturation: D&R International, Ltd., 2009.

Commercial Initiatives

During the first quarter of 2009, a listing of commercial customers by zip code was comprised to help identify those customers in the target area and their annual kWh usage. Commercial customers were targeted through the Sure Bet Program for specific marketing efforts, based on a stratification of the customer list. KSI proposed to define three market segments that were under KSI's program responsibility. They were:

- High-impact organizations defined as organizations responsible for multiple facilities using more than 600 MWh/yr. This included an estimate of 10-12 organizations/facilities.
- High-use organizations defined as all other facilities using more than 600 MWh/yr. This included an estimate of 100 organizations/facilities.
- Direct-install facilities defined as all facilities using less than 600 MWh/yr. This included an estimate of 4,000 organizations/facilities.

KSI proposed a specific outreach activity targeted at each segment and several broader activities that could reach all C&I customers in the Fort Churchill area. Specific segment activities are described first, followed by the broader activities. The broader activities were scheduled to be deployed if the initial specific segments were not effective at achieving the program objectives in the area.

A key component of the Commercial Retrofit Program was the contractor network promotion of the program. KSI sent out invitations to a contractors meeting held on March 18, 2009 in Carson City for both the retrofit and direct install components. More than 60 contractors in attendance demonstrated significant interest and a positive reaction to the additional incentive that would be provided to customers in the targeted area.

Program Goals for Fort Churchill Area

The 2009 goals and incentive budgets for the Fort Churchill area are as follows:

Incentive type	Annual MWh	Incentive Budget
Standard + 25% adder	10,400	\$642,400
Direct Install	1,333	\$200,000

Segment Specific Strategy

High-impact organizations. KSI selected up to 12 high-impact organizations and worked with their Major Account Executive (MAE) at NV Energy to conduct in-person program outreach. Technical services were also provided to support these organizations to install energy efficiency measures in 2009. Examples included the State of Nevada, Carson City Water District, Carson City Departments, Douglas County entities, Chromalloy-Nevada, and one or more gaming properties in the FC Area (Montbleu, Harrah's).

The MAE was asked to arrange an in-person meeting with KSI, NV Energy staff, and the customer. The meeting purpose was to provide the customer an overview of the program, including the 25% incentive bonus, and to identify potential energy efficiency (EE) projects that the customer is considering. KSI assessed the customer situation and offered one or more of the following services:

- Project opportunity assessment
- Contractor/vendor/procurement support
- Energy savings analysis
- Project management

High-use facilities. All remaining facilities that used more than 600 MWh in 2008, with the exceptions of public schools and hotels/motels, were assigned to the high-use segment. KSI screened out a few customers where it was known that the facility was fairly new or if the Sure Bet Program had previously determined that no significant opportunities existed for EE investment. KSI's analysis determined that there were about 80 to 100 facilities in this segment.

The first activity was to have the assigned MAE send an email to their contacts, which described the program and the 25% incentive bonus. The email offered that KSI could perform a free on-site opportunity assessment if the customer wanted assistance in identifying potential EE projects. The email also informed the customer of other technical services that KSI provides as part of the Sure Bet Program. Depending on the response to the email, KSI would explore with NV Energy the need to conduct follow-up phone calls to gather data.

Direct-install facilities. The direct-install program was designed to provide comprehensive energy efficiency upgrades to small commercial businesses in the Ft. Churchill area. In order to address the unique barriers to participation of this target group, the program provided opportunities for higher incentives and shorter payback periods. The direct-install concept is a "turn-key" approach in which marketing, energy education, site-specific energy analyses, financial incentives, equipment procurement, and installation are provided. The customer can be involved every step of the way or can simply sign an approval form and pay their portion of the cost when the installation is complete. This type of leveraged turn-key marketing and implementation process takes customers quickly from interest and intent to actual installation of measures and begins the creation of a sustainable energy efficiency presence in the small business market.

KSI determined that the most effective way to promote the direct-install program was for program participants to be directly recruited through the use of approved direct-install contractors. Primary energy efficiency measures were lighting, occupancy sensors, programmable thermostats, and refrigeration. All direct-install contractors were given a program flyer that specifically addressed the Fort Churchill targeting initiative in order to generate more energy savings penetration among small businesses in the target region.

Commercial Marketing Activities

Program flyer. KSI produced and provided a one-page program flyer that highlighted program benefits and services. The flyer was provided during all facility visits and to the contractors who worked in the Fort Churchill area. A second flyer showing a summary of the incentives offered was also developed and used to show the types of projects that qualified for the program.

Association visits and community events. KSI sought out opportunities to present at various community events such as Rotary Clubs and/or Chamber of Commerce events. KSI strived to coordinate with other EE implementation contractors and NV Energy staff before scheduling any event or presentation for maximum market segment penetration.

Along with all of the direct customer discussions, marketing efforts also included attendance at a local distributor lighting show and meeting with product vendors to explain the potential incentives available to their customer base to assist them in marketing their technology. Additional outreach included meeting with the Carson City Chamber of Commerce and the Business Council of Douglas County and scheduling several joint University of Reno/NV Energy customer trainings through the UNR small business development center.

KSI was prepared to deploy an array of marketing activities in order to meet the goals for the target area. The following two marketing activities were not used in the 2009 program because the marketing strategies detailed above were sufficient to meet the target area objectives.

Optional newspaper advertising and earned advertising. It was planned that if warranted KSI would work with NV Energy to place advertising in local newspapers to facilitate/encourage news stories on the merit of the program activities in the Fort Churchill area. The local Carson City newspaper allowed the Carson City Chamber of Commerce to use their article every other week to discuss the Sure Bet Program in the Fort Churchill area.

Direct mail campaign. KSI was also ready to design and implement a direct mail campaign to approximately 1,000 customers with annual energy use between 75 MWh and 600 MWh. The plan was to either promote the direct install or standard rebate program with a 25% bonus. KSI planned on introducing this campaign in early summer if there was an indication that one or more of the program goals would not be reached.

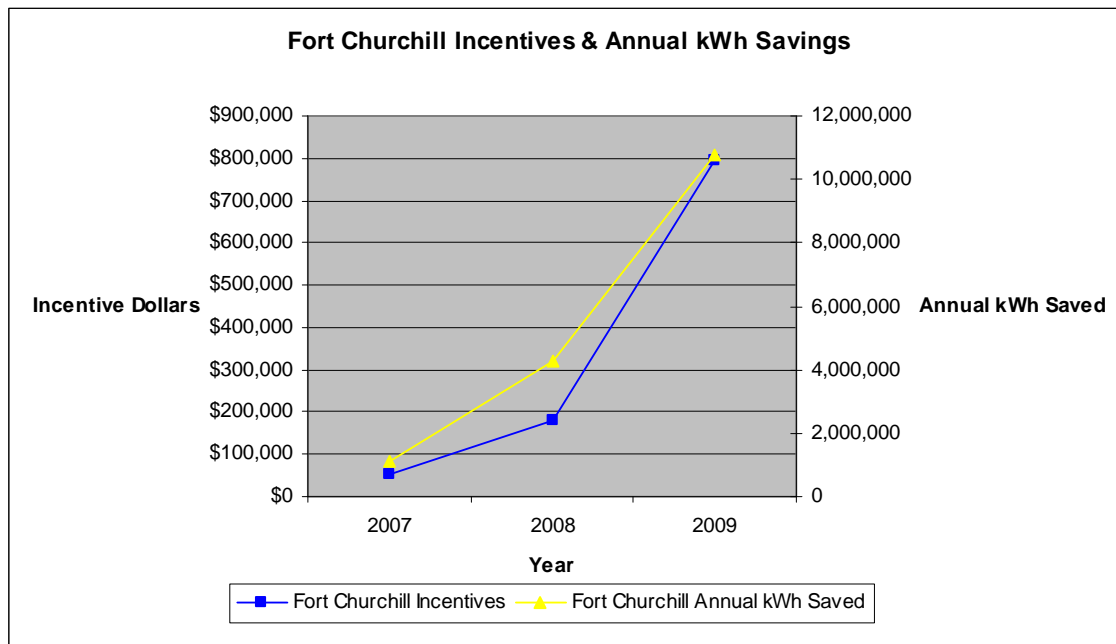
Commercial Activity

The effort to target the Fort Churchill area has led to the successful implementation of numerous energy efficiency projects. The number of incentives paid and kWh annual saved in the Fort Churchill has increased each year since 2007, as shown in Table 1 below. During 2007 and 2008 there was no special emphasis placed on targeting the Fort Churchill area. All the annual savings attained during 2007 and 2008 came from Sure Bet Program participation in which customers received no additional incentive for participating in the program. In 2009, in response to the Public Utilities Commission of Nevada ruling, NV Energy authorized a bonus incentive offering for customers to participate in the Sure Bet Energy Efficiency Program in the Fort Churchill target area.

Table 1. Fort Churchill Annual Energy Savings & Incentive Activities

Northern Retrofit & Fort Churchill Activity 2007-2009						
Program Year	Incentives Paid in Target Area	Annual kWh Saved in Target Area	Total Incentive Paid in Northern Retrofit (Including Target Area)	Annual kWh Saved in Northern Retrofit (Including Target Area)	Target are Incentives as a Percent of Northern Retrofit Incentives	Target Area kWh as a Percent of Northern Retrofit Annual kWh
2007	\$53,644	1,107,801	\$840,497	20,870,053	6%	5%
2008	\$177,937	4,265,570	\$1,502,796	32,664,515	12%	13%
2009	\$796,398	10,749,866	\$2,384,485	40,455,147	33%	27%

Although there had been Sure Bet Program participation in the Fort Churchill area in 2007 and 2008 it was anticipated that it would take substantial time and effort to gain enough customer acceptance of energy efficiency in the Fort Churchill area to meet the aggressive goals set forth. The marketing plan efforts garnered positive results with 91 customer projects completed and 10 other retrofit projects underway at the closing of the 2009 program. Additionally, the direct-install portion of the program reached its target for customers requesting services.

Figure 1. Fort Churchill Annual Incentive and Energy Savings

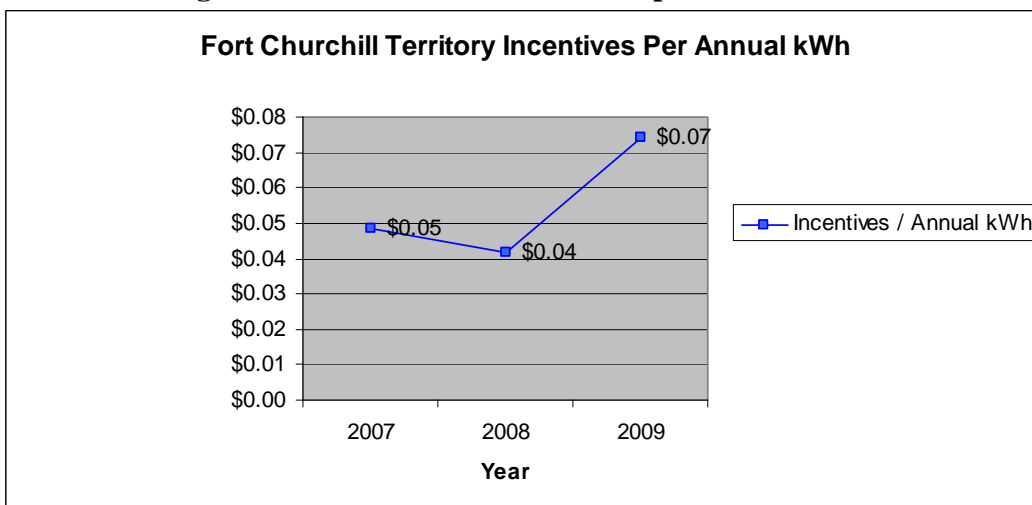
Source: KEMA, Inc.

The Fort Churchill demographic area covers a large land area with relatively small commercial customer use per capita making it an extremely challenging area to target.

In order to continue to achieve the goals set forth in the Fort Churchill area, it is expected that there will be a continued use of the direct-install program because of the large population of small commercial customers. Using the direct-install strategy is more costly than traditional implementation strategies, because it targets a customer group where the majority of businesses do not have ownership of the site or the available capital to invest in energy efficiency.

improvements. The figure below displays the overall increase in the ratio between incentives spent and annual kWh saved in the target area from 2007 to 2009.

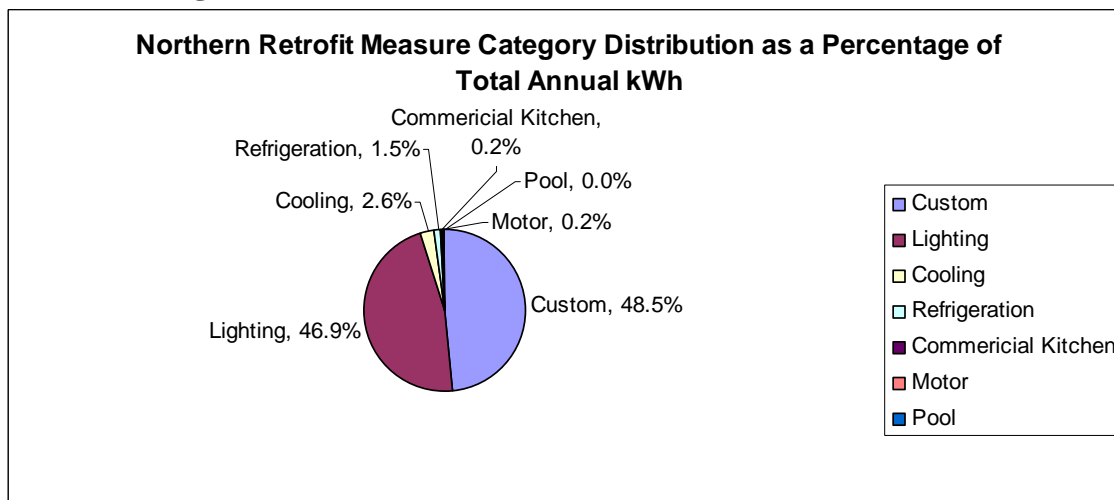
Figure 2. Fort Churchill Incentives per Annual kWh



Source: KEMA, Inc.

In the 2009 program year, the completed customer retrofit projects resulted in annual energy savings of 9.2 million kWh. The direct-install projects resulted in 1.5 million kWh in annual energy savings, for total program energy savings at approximately 10.7 million annual kWh saved in 2009. There are currently customer retrofit projects that are in process and are estimated to provide an additional 1.2 million kWh in annual energy savings within the first few months of 2010. The figure below shows the distribution of measure categories that made up the majority of Annual kWh savings in 2009 in the Northern Retrofit territory.

Figure 3. Fort Churchill Commercial Measure Distribution



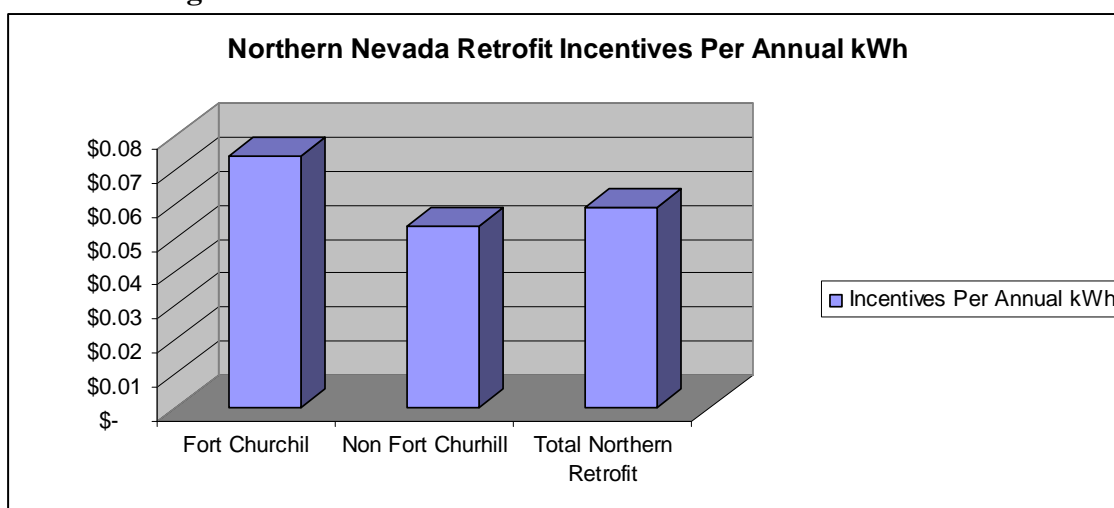
Source: KEMA, Inc.

The measure distribution in the Fort Churchill component of the northern retrofit territory mirrored the measure distribution for the remainder of the non-Fort Churchill component of the

territory. Custom projects and lighting projects made up more than 95% of the total territory annual kWh savings.

The effort to target the Fort Churchill area has been extremely successful. Energy savings penetration has dramatically increased since the program began offering the bonus incentive in 2009. The cost of implementing energy efficiency in the region has increased as a result of the incentive bonus offering and a ramp-up in the direct-install activities. Although the cost of delivering energy savings in the area increased (as shown in the figure below); the efforts displaced the need for Sierra to deliver 10,740 MWh in 2009. Even though the average cost of saving a kWh (annual) was roughly two cents more in Fort Churchill than in non-Fort Churchill areas, the additional cost helped yield annual kWh savings increases of 152% in the Fort Churchill territory from 2008 to 2009.

Figure 4. Northern Retrofit Incentive Per Annual kWh 2009



Source: KEMA, Inc.

The success in penetrating energy savings in C&I facilities in the Fort Churchill region can be largely attributed to the three program marketing and outreach strategies. The three pronged approach allowed KSI to leverage both the high-impact organizations and high-use facilities. In 2010 it will be especially important to focus the marketing activities on the high-use facilities. The direct-install program was and will continue to be extremely successful in the region because of the large amount of small commercial customers in the area.

Conclusion

The efforts to increase energy savings penetration in the Fort Churchill region through the Dayton Corridor Residential Initiative and the Sure Bet Program were very effective. The savings attained through the programs displaced the fuel, transmission, and distribution costs for NV Energy to generate 19,137 MWh for delivery to the Fort Churchill area. Moreover rate payers did not absorb the costs of replacing the Fort Churchill generating units.

Commercial customers were identified and segmented based on high impact, high use customers where greater opportunities for energy efficiency exist. Residential customers were targeted based on income distribution to identify a population that could benefit from energy and

cost savings in a depressed economy. A focused and concerted marketing effort supported both programs allowing for rapid deployment of savings measures and increased visibility among the local community and media.

The increased marketing costs and increased incentives needed to deliver the energy savings were more than offset by reduced fuel costs. Even though NV Energy still has plans to build a new substation in the Fort Churchill area, the increased DSM activity in the Fort Churchill region allowed NV Energy to delay the plans for the project allowing NV Energy the flexibility to implement a strategy to pass the costs of the new substation onto the ratepayers over a longer period of time.

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