Smart Grid for Nevada

• Nevada Statewide Project - 2010-2012

- Serves 1.3MM electric meters and 150k gas modules
- Benefits 2.4 million Nevadans over 54,000 Square Miles
- Program cost $303MM
- SGIG funding $139MM
- Operational annual benefits $35MM
- Public Utilities Commission of Nevada approval July 30, 2010
Customers have the information to take ownership of their energy usage – and are more than satisfied to do so.
Customer Ownership

**Customer (Benefit 1)**
- Energy usage tools
- Bill to date - NV Energy My Account
- Daily updated energy use information
- Rate comparison tools for customers

**Customer (Benefit 2)**
- Bill thresholds and alerts and messaging
- Bill to date – Smart phones and automated phone channel

**Customer (Benefit 3)**
- Nevada Dynamic Pricing Trial for eligible customers including technology
- Expansion of Demand Response Program
Customer Data
Daily with Temperature

My Energy Usage

Check out your metered data and load analysis tips below. To change your chart, change the Meter, Graph, or Date selection.

Meter: Electric - CC028493142
Graph: Daily Energy with Temp.
Date: 06/26/2011

Period: Billing Cycle, Month, Week, Export Data

Daily Energy with Temperature

NVEnergize
Creating an energy-smart future.
Customer Data
At 15-minute Intervals

My Energy Usage
Check out your metered data and load analysis tips below. To change your chart, change the Meter, Graph, or Date selection.

Period: Week Day Export Data

15-Minute Energy Usage

NVENERGIZE
Creating an energy-smart future.

2.58 kWh
$0.30 total
$0.12 per kWh

15-Minute Energy Usage

Meter: Electric - CC028493142
Graph: 15-Minute Energy Usage
Date: 06/22/2011
Customer Data Alerts

Account Alert: Threshold Exceeded

Account Number: ***********5787
Meter Number: 551144
Service Address: 3 Main St Apt C

Dear Graham Lawes:

As of July 30, 2010, your account has exceeded the cost threshold of $25.00 you established for your electric service.

- Cost-to-date: $26.12
- Number of days into your billing cycle: 20
- Usage to date: 214 kWh

For more account information, to find tips on lowering your bills, to make an online payment or modify your alerts, go to MyAccount at http://www.nvenergy.com/.

This is not your final bill. Account Alerts is a notification service of cost and/or energy usage threshold limits that you may customize for your NV Energy account. Your regular monthly bill is delivered via email or USPS as determined by your account preferences. If you would like to unsubscribe from email alerts, please log in to MyAccount and go to your Account Overview page.

This email was auto generated. Please do not reply.
mPowered – Home Energy Management System

- Real Time Power Use
- Real Time Energy Consumption
- Real Time Energy Costs
- Historical Energy Usage (5 years)
- Central Control of Multiple Thermostats
- Web access to Weather Forecasts
- Expandable Energy Platform, e.g.,
  - Pool Pump Modules
  - Refrigerator/Appliance Modules
  - Mobile Energy Apps
- Energy Conservation Events
Demand Response 2.0
New System

- 150 MW expansion (~65,000 customers)
- Home Energy Management systems
  - Broadband/WiFi gateway
  - Real-time feedback from smart meter via Zigbee SEP 1.0
  - Year round energy savings
- Participation Based Rebates – $/kWh “real-time rebate”
- PTR variant
  - variable start time/date – allows participant phasing
  - variable duration - typically 2-hours
  - variable rebate – equivalent to system marginal supply cost
- Compatible & complementary to price responsive programs (e.g. CPP)
  - Same technology platform
  - Economic dispatch strategy based upon seasonal dispatch model that identifies highest cost days
- Automation Focus
  - High technology incentive / Low financial incentive
  - Does not rely on high price signal for behavior change
- Customer Choice (set and forget)
  - Event response (2-deg minimum setback)
  - Price, energy, or cost thresholds trigger actions
HAN Deployment Strategy

August 2011
- User Acceptance Testing

October 2011
- Employee Acceptance Trial - 99

January 2011
- Customer Acceptance Testing 1 - 400

Feb - Dec 2012
- Deployment – 1500-3000/month
NDPT Details

NDPT will examine customer response to what could be future choices for electric service for our Single & Multi-Family Residential and Small Business Customers.

The NDPT is a Randomized Encouragement Design

- Randomly assigned treatments with voluntary (opt-in) acceptance
- Two service territories with separate trials (North & South)
- Spans two consecutive years (1/1/2013-12/31/2014)
- Ask for a 2 year commitment with ability to opt-out after the first
- Best bill guarantee for the first year (removed for the second year)
- Equal Payment Plan (EPP) will be available to participants

Analysis and information

- Survey for demographics, premise, & customer attitudes/acceptance - baseline, random and longitudinal
- Data analysis after each year of the trial for both territories
- Examine attitudes toward equal payment plan & price response effect and PUCN ordered review of arrearages for participants.
## Participation & Treatment

**NDPT aims to include 18,664 participants statewide**
- 14,060 Treatment & 4,604 Control and Bias Control Groups

### Rate Treatments:
- Time-of-use Enhanced (TOU-E)
- Critical Peak Price (CPP)
  - Separate higher CPP period (event driven) overlaid on TOU-E structure
  - Discount provided during On-peak period (non-CPP) relative to TOU-E rate schedule

<table>
<thead>
<tr>
<th>Technology &amp; Education Applied to Treatments</th>
<th>Existing Flat Rate Applied to Control Group</th>
<th>Rates Applied to Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Only</td>
<td>Control Group Sample</td>
<td>Enhanced TOU Rate (TOU-E)</td>
</tr>
<tr>
<td>Rate + Education</td>
<td>Treatment Group Sample</td>
<td>Dispatchable Critical Peak Pricing Rate (CPP) Built on TOU-E Base</td>
</tr>
<tr>
<td>Rate + Education + Technology</td>
<td>n/a</td>
<td>Treatment Group Sample</td>
</tr>
</tbody>
</table>

Control Group Sample
Treatment Group Sample

(Treatment Group Sample (Southern RS Class Only))

(Treatment Group Sample)

(Treatment Group Sample)

(Treatment Group Sample)
Energy Efficient Pool Pumps

- 2nd Major Source of Energy Consumption next to HVAC
- Properly Set, Reduces Consumption by 50%
- Program sold out during summer of 2011
From Belly Flop to Energy High Dive

• Prior to 2010, Program was Mid-Stream Incentive Only

• Pool Pumps were not properly calibrated and impacted by factors like high flow rates

• In 2010, $200 rebate to customer & $100 to Pool Contractor who Calibrates

• Contractor Class on Pool Pump Calibration for Program Participants
Changing Regulatory Environment

- AB 178 mandates all general purpose lamps sold in Nevada after Jan. 1, 2012, must produce 25 lumens per watt of electricity consumed - CFL will become the baseline.

- The Energy Independence and Security Act of 2007 (EISA) defines “general service incandescent lamp,” but this definition also does not apply to reflector lamps, three-way incandescent lamps and candelabra-based lamps.

- The U.S. Department of Energy (DOE) standard for incandescent reflector lamps effective Jul. 14, 2012; however, it is less stringent than AB 178.

- The estimated hours of use (HOU) will be reduced to 1.9 hours per day in Southern Nevada and 1.9 hours per day in Northern Nevada for general purpose CFLs. This has applied downward pressure on program cost-effectiveness since the previous HOU was 2.3 for both regions.
Next Generation Lighting Program Objectives

• The 2012-2013 ENERGY STAR Lighting Program will offer incentives or discounted retail prices for certain ENERGY STAR-qualified CFLs and LEDs using an upstream buydown/markdown model

• Promotion of increased sales of:
  o CFL Reflector Lamps
  o LED Reflector Lamps
  o LED MR16
  o Three-way CFLs
  o Candelabra CFLs.

• Promotion of ENERGY STAR brand and CFLs with longest rated lives, lowest mercury and best light quality with lowest wattage
Revised Program Delivery

- Program re-launched with new product mix and quantities
- Leveraged Existing manufacturer and retailer relationships
- Amendments negotiated to existing Participation Agreements to include the new product matrix and set a timeline for product migration
- Retailers receive new marketing material and sales training that focuses on the new product mix and lighting measures
- Customer marketing materials away from incandescents and CFLs to the expanded product mix, as well as the new standards that will affect the marketplace in the near future
HVAC: CheckMe!® Plus Program

- Instant rebates up to $1,000 for qualified systems!
- Replacing an inefficient air conditioner or heat pump with a high efficiency unit
- Air conditioner and heat pump tune ups
- Addition of a specialized cooling control designed for the Las Vegas climate
- Installation of a high efficiency fan motor
- Duct testing and sealing
- Heat Strip Lock Outs & Duct Work Modification
Future Challenges & Opportunities

- Program Cost Effectiveness
  - Natural Gas Prices
  - Long on Generation
  - Slow Economic Recovery
    - Residential Permits Up 32%
    - Commercial Permits Down 40%
Future Challenges & Opportunities

• Impact of Replacement Revenues
• Resource Planning with Energy Efficiency