



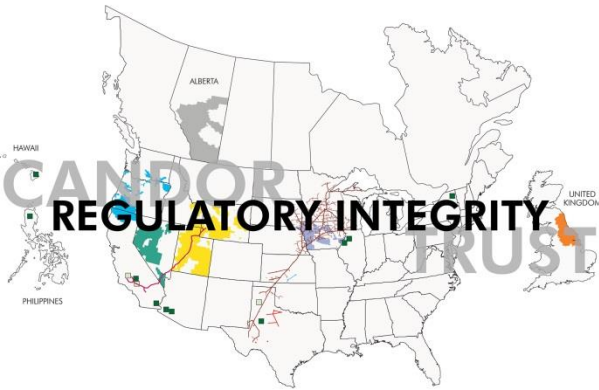
CUSTOMER SERVICE



EMPLOYEE COMMITMENT



ENVIRONMENTAL RESPECT



OPERATIONAL EXCELLENCE



**BERKSHIRE
FINANCIAL STRENGTH
OWNERSHIP**

New Energy Industry Task Force Existing Infrastructure and Modernization of the Electric Grid

March 22, 2016



Agenda

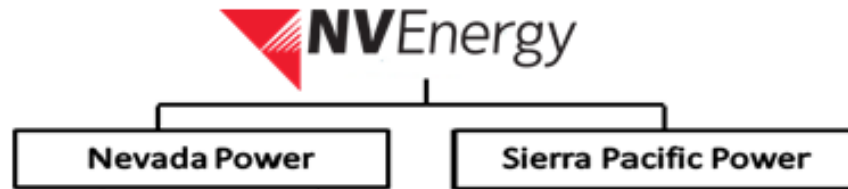


- Existing Infrastructure
 - Fossil generation and transmission
 - Renewable generation
- Modernization of the grid
 - Energy Imbalance Market (EIM)
 - Smart grid - the age of information
 - Energy efficiency programs
- Emerging technologies
 - Distributed generation
 - Energy storage
 - Electric vehicle, EV to the grid

NV Energy Background



- Headquartered in Las Vegas, Nevada
- 2,498 employees
- 1.2 million electricity and 0.2 million gas customers
- Provides service to 90% of Nevada population, along with tourist population of 41 million annually



- Provides electric services to Las Vegas and surrounding areas
- 4,766 megawatts of owned generation
- Provides electric and gas services to Reno and northern Nevada
- 1,372 megawatts of owned generation

Current Generation portfolio*

Coal	10%
Natural gas	68%
Renewables	22%

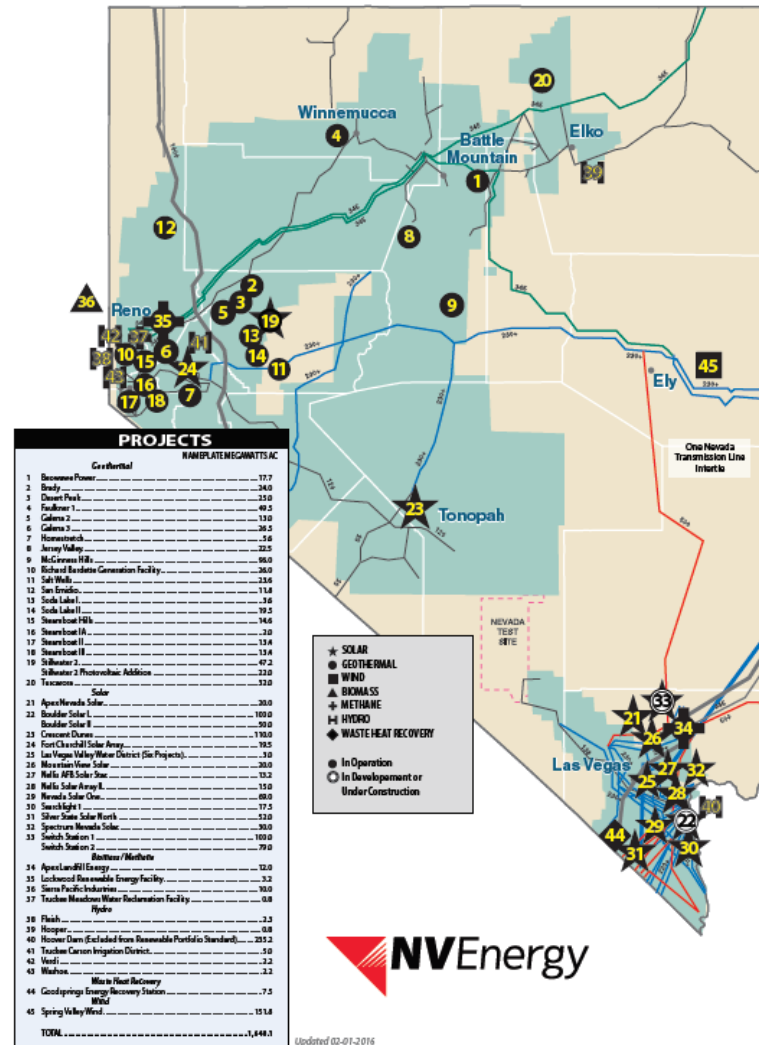
*Including renewable power purchase agreements

Nevada's Renewable Generation



1. Northern Nevada resources consist mostly of geothermal, one large wind project and solar with storage near Tonopah
2. Southern Nevada resources primarily solar
3. Distributed generation primarily rooftop solar spread throughout the state
4. Nevada is one of the highest geothermal and solar producers per capital
5. Nevada has a renewable portfolio standard that is currently 20% of load moving to 25% by 2025
6. NV Energy remains on target to meet the RPS

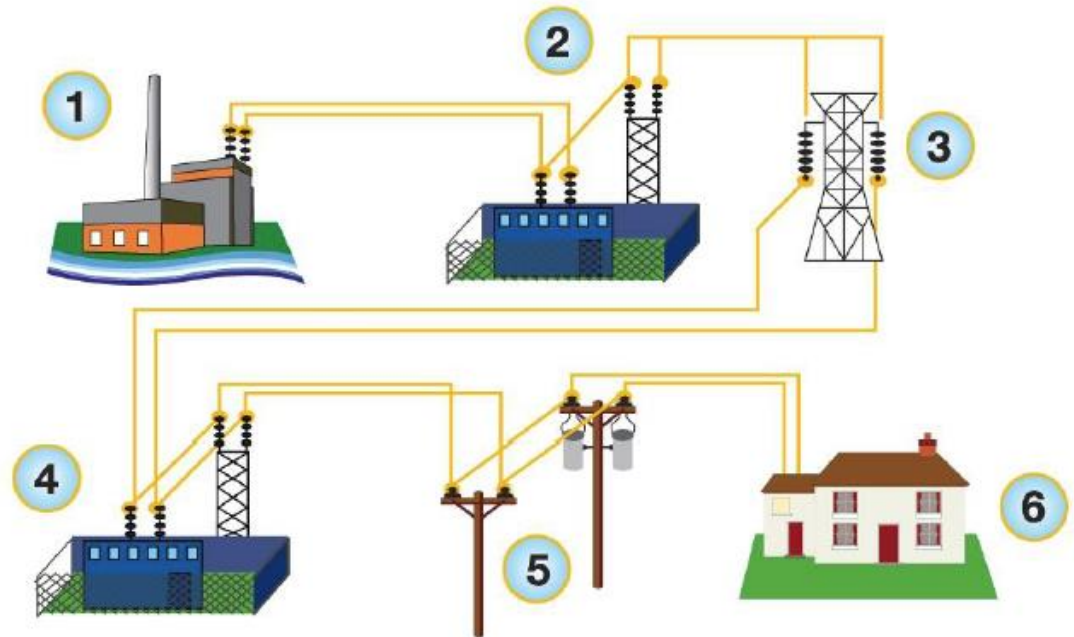
NV Energy's Renewable Energy Sources



The Traditional Electric Service Model



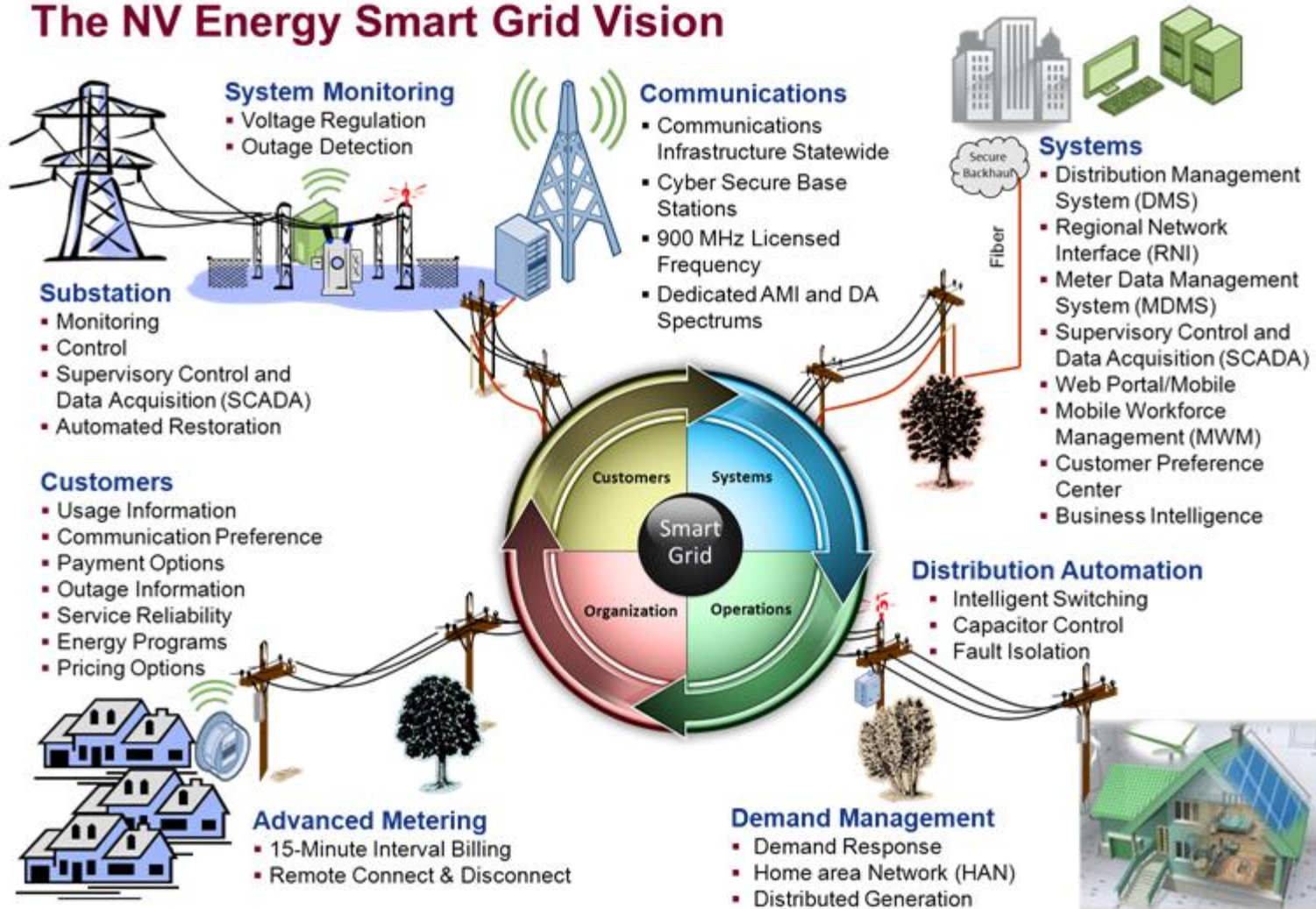
1. Electricity is generated and leaves the power plant
2. Generated voltage is increased at a “step-up” substation
3. The energy travels along a transmission line to the area where the power is needed
4. Once there, the voltage is decreased or “stepped-down,” at another substation
5. A distribution power line carries the electricity
6. Electricity is delivered to your home or business



Smart Grid of the Future



The NV Energy Smart Grid Vision



Modernization of the Grid Transmission and Generation



- Participation in the California Independent System Operator's Energy Imbalance Market ("EIM")
 - NV Energy's participation is voluntary
 - NV Energy received PUCN approval in 2014 and went live in December 2015 resulting in cost savings as soon as the first full month of participation was completed
 - Primary Benefits of EIM Membership for Nevada:
 - Members can avoid having to build new resources to follow imbalance in generation and load due to the fact that existing resources can be shared between balancing areas
 - Increases the cost effectiveness of intermittent renewable resources such as wind and solar because any excess generation can be delivered and used over a larger area

Modernization of the Grid

Monitoring and Diagnostic Center (“MDC”)



- MDC

- NV Energy maintains an MDC that tracks over 100,000 data points at its power plants
- The data helps to predict failures in advance so outages can be avoided or properly scoped
- NV Energy spent roughly \$5 million to build the state of the art facility
- The MDC saved over \$5 million in preventable maintenance in the first two years of operation
- Advanced Pattern Recognition Software – GE SmartSignal is the model used to monitor and identify degradation through pattern recognition and failures

Modernization of the Grid Generation - MDC



MDC



- **Benefits**

- Optimal dispatch and scheduling of resources based on performance data
- Forced outage avoidance
- Maintenance scheduling / optimization
- Centralized fleet-wide process engineering competency

Modernization of the Grid Distribution



- Distribution Operations objectives
 - Safety: Ensure highest level of employee and public safety through understanding and application of technology
 - Reliability: Minimize customer outages and improve communication
 - Efficiency: Efficient operation of distribution system
 - Performance: Improve system performance based on technological advancements

Modernization of the Grid Distribution - continued



- Programs currently in place:
 - NV Energize
 - Distribution Line Capacitor Automation
 - Substation Automation and Restoration Schemes
 - Distribution Automation – Intelliteam Switches
 - Substation Gas Detection
 - Substation Transformer Bushing Monitoring
 - Distributed Generation Monitoring (Primary)

Modernization of the Grid

Smart Grid



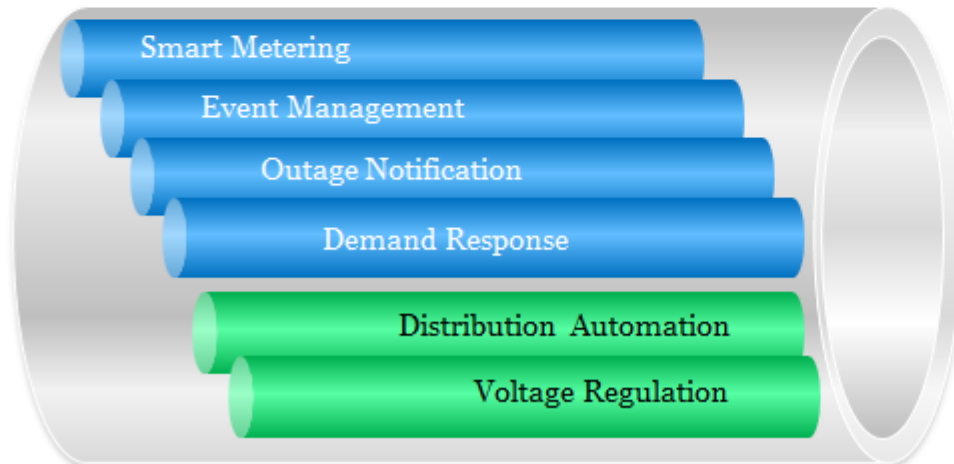
- Smart Grid

NV Energize – Smart Grid Foundation

- Communications Infrastructure Statewide
- Cyber Secure Base Stations
- 900 MHz licensed frequency
- Dedicated AMI and DA spectrums



Multiple Prioritized Channels



PCS
N1-N4

**Advanced Meter
Infrastructure (AMI)**

PCS
N19/25

**Distribution Automation
(DA)**

Modernization of the Grid Smart Grid



Customer Preference Center

- Enables customers to specify which channels and devices they prefer to use when communicating with NV Energy
- Allows NVE to manage all of these customer communications from a single platform
- The Customer Preference Center enables reliable, consistent, effective, economical, and targeted communications

The image displays a screenshot of the NV Energy MyAccount website and its mobile app interface. The website interface includes a navigation menu on the left with options like 'List All Accounts', 'Account Overview', 'My Dashboard', 'Manage Alerts', 'Outage Center', 'Moving Center', 'Show My Energy Use', 'Compare Rates', and 'My Home'. The main content area shows 'Manage Alerts' for Christopher R Jones, with a list of alert types: 'Cost-to-Date Weekly Summary', 'Power Outages', 'Electricity Cost', 'Electricity Usage', 'Gas Cost', and 'Gas Usage'. A 'Contacts' section allows users to manage communication preferences for email and call, both currently set to 'ON'. The mobile app interface, shown on a smartphone, mirrors the website's layout, displaying the 'Manage Alerts' section with a 'By Alert Type' dropdown and a list of alert categories.

Modernization of the Grid Smart Grid



MyAccount and auto notifications

- Enables NV Energy customers to report outages and to receive information, maps, and messages about outages occurring in the NV Energy service territory
- The outage communications platform links with the Customer Preference Center and operates via proven web and mobile applications

The image shows a screenshot of the NV Energy Outage Center website and a mobile phone displaying the same interface. The website interface includes a navigation bar with links for Safety, Company, MyAccount, and Contact Us. Below this is a header for the Outage Center with tabs for Residential, Business, Community, Environment, and Outage. A notification box states: "There are 41 customers without power as of 3:04 PM | May 8, 2015." Below the notification are buttons for "Outage Update", "View as List", and "Report Outage". The main content area features a map of Las Vegas with an "Outage Details" popup window. The popup window contains the following information:

Outage Status :	Probable
No of Customers Out :	<5
Estimated Time of Restoration :	05/08/2015 03:45:00 PM
Outage Reported Time :	05/08/2015 07:20:30 AM
Cause of Outage :	Under Investigation

Below the map is a footer with contact information: "To report a gas emergency for northern Nevada customers, please call (775) 834-4100 or 1-(800) 962-0399."

The mobile phone on the right displays the same interface, showing the NV Energy logo, a "Sign In" button, and a "Report an Outage" button. The phone screen also displays the "Outage Center" header and a notification box.

Modernization of the Grid Smart Grid



Customer Programs – Outage Reporting

Outage Reporting through multiple channels- Utilizing the Customer Preference Center customers have the ability to choose their preferred method to report outages:

Web Outage Reporting

The screenshot shows the 'Report an Outage' page on the NVEnergy website. It includes a navigation menu on the left, a main content area with 'Locate', 'Verify', and 'Report' buttons, and a form for providing account information. The form has fields for 'Last 7 Digits of Account Information' and 'Outage Phone Number'. There are 'Submit' and 'Continue' buttons at the bottom.

Mobile Outage Reporting



The screenshot shows the 'Report an Outage' page on the NVEnergy mobile app. It includes a navigation menu on the left, a main content area with 'Locate', 'Verify', and 'Report' buttons, and a form for providing account information. The form has fields for 'Account Number' and 'Outage Phone Number'. There are 'Submit' and 'Continue' buttons at the bottom.



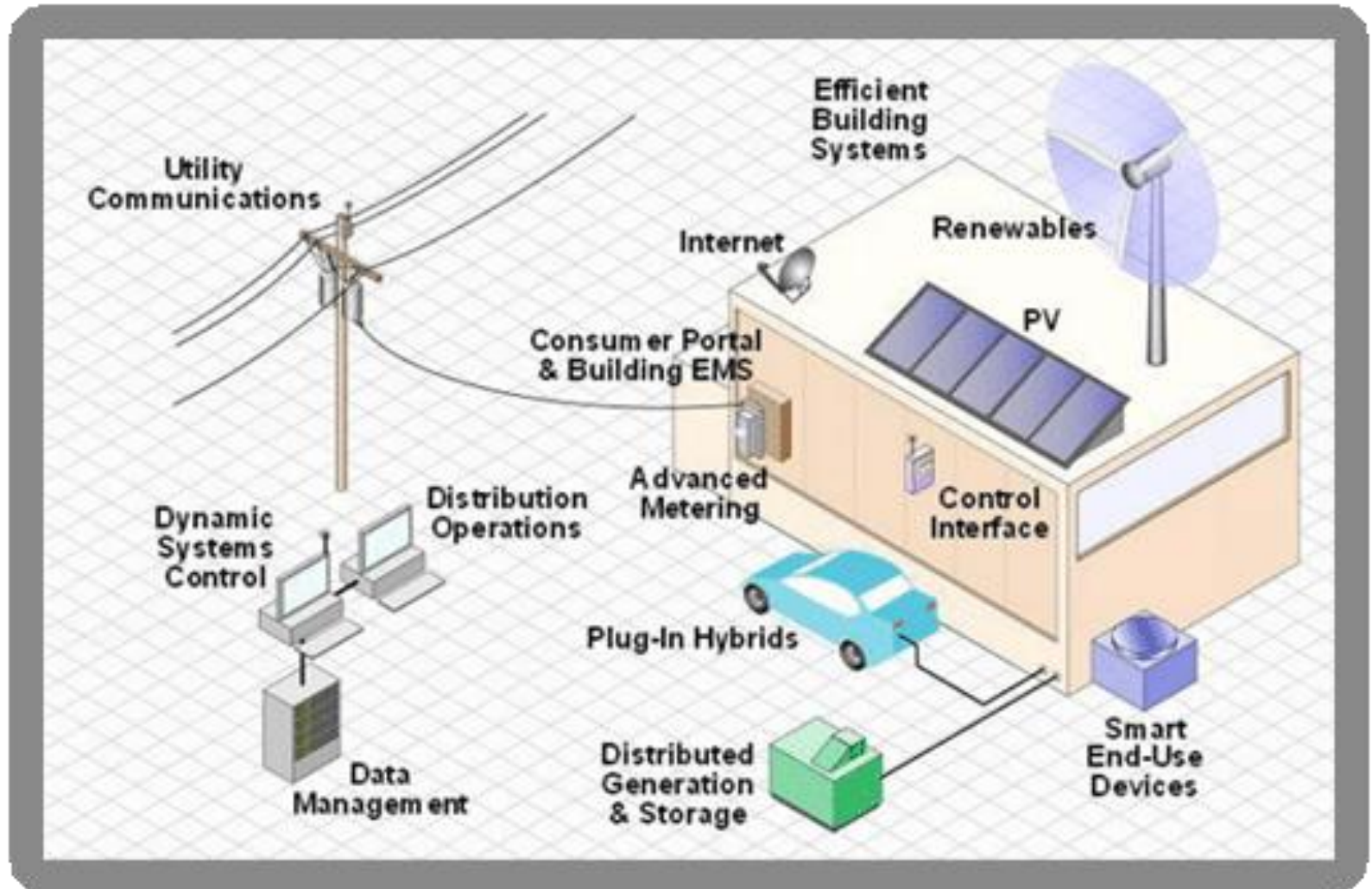
Mobile 2-way SMS



Modernization of the Grid Smart Meters



- Smart Meters



Modernization of the Grid

Smart Meters



- Deployment of smart meters has significantly changed the way NVE communicates and conducts business with customers
 - NV Energy pursued aggressive implementation of smart meter technology, spurred by a \$139 million US Department of Energy grant. Over 1.4 million electric and gas meters were exchanged from 2010-2015.
 - Implemented essential communication networks necessary to collect and manage the metering information. These are the regional network interface (RNI), the meter data management system (MDMS) and the demand response management system (DRMS).
 - The project achieved two primary objectives:
 1. Substantially reduce operating costs while simultaneously improving meter data and billing quality. Also supports operational improvement, specifically as it relates to outage detection and restoration
 2. Provides a technology platform that automates and optimizes enhanced customer communications and demand management solutions.

Modernization of the Grid

Smart Meters



- Smart meters - continued
 - Provides operating cost reductions of \$20 million annually,
 - Over 600,000 avoided annual truck rolls (3.5 million during course of project),
 - Creates and improves a cyber secure network that also provides transmission and distribution operational benefits.
 - Customers benefit by having reduced operating costs, improved metering and billing accuracy, real-time outage and restoration information, remote connect and disconnect services and enhanced data analysis/communications regarding energy usage



- MyAccount

- Over 580,000 accounts (50,000+ annual increase)
 - Multiple new features added in December 2015
 - New dashboard
 - Scroll over data on temperature, use and cost
 - Downloadable two-year data
 - New net metering usage/production graphs
 - Time of use and demand (for commercial customers)
-
- Outage map utilization growing dramatically
 - 1.4 million total hits in 2015 (web and mobile)
 - Serves as a product and service promotion platform

MyAccount Dashboard



nvenergy.com Sign Out



- MyAccount
- MyDashboard
- Account List
- Payment & Billing
- Programs
- Energy Center
- Outage Center
- Moving Center
- MyProfile

Account Summary

7919 Villa Ventana Ave - #1893673

Total Amount Due

\$0.00

Do Not Pay

No payment is due.
You are signed up for [Automatic Monthly Payments](#)

Account Summary as of Jan 27, 2016

Current Charges \$104.23
Amount: [View Bill](#)

Pending Payment \$104.23
Amount: [View History](#)

Next Meter Read Date: Feb 19, 2016

Billing & Payment Options

[Switch to Paper](#)

[Cancel Automatic Monthly Payments](#)

[Change Bank Information](#)

[Enroll in Equal Pay](#)

Smart Meter Highlights

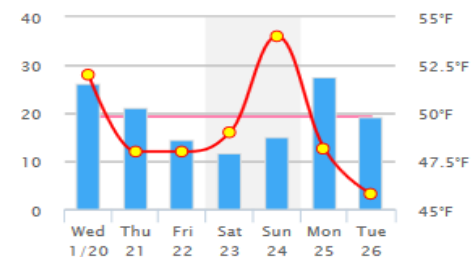
You are 5 days into your billing

Estimated Cost To Date \$23
As of Jan 27, 2016
[Manage Energy Alerts](#)

All amounts rounded to nearest dollar

Projected Bill
This month: \$58 to \$109

Actual Daily Usage (kWh)



— Avg Usage kWh — Avg Temp

Electric: CC029765337

[View Usage](#)

MyAccount

Manage Your Energy Alerts & Notifications



The screenshot shows the 'Manage Your Energy Alerts & Notifications' screen. At the top, there is a dropdown menu labeled 'By Alert Type'. Below this is a list of alert categories on the left side, each with an icon and a right-pointing chevron:

- My Energy Snapshot** (Calendar icon)
- Power Outages** (Lightbulb icon)
- Electricity Cost** (Lightning bolt icon)
- Electricity Usage** (Lightning bolt icon)
- Payment Notice** (Dollar sign icon)
- Bill Reminder** (Calendar icon)

The right side of the screen displays the details for the selected 'My Energy Snapshot' alert. It includes a green 'Add A Contact +' button at the top. Below this, the title 'My Energy Snapshot' is followed by the description: 'Receive a weekly summary of usage and associated costs.' Underneath is a 'Contacts' section with a dropdown arrow. It lists one contact: 'JenCell' with the phone number '(702) 521-3097' and a blue toggle switch set to 'ON'. At the bottom of the contacts list is another green 'Add A Contact +' button.

Sign-up for notifications to be provided by email, text or automated phone call

MyAccount Weekly Energy Snapshot



Snapshot by Email

Account #: 30-*****8645
Service Address: 3520 Amish Ave North Las Vegas NV 89031



MY ENERGY SNAPSHOT

Billing Cycle: 01/21 - 02/18

Data as of 01/23

Electricity Used to Date <h1>63</h1> kWh	Cost to Date	\$21
	Days Remaining	26
	Projected Monthly Bill	\$85

My Weekly Trends

Previous 01/10 - 01/16	Current 01/17 - 01/23	Comparison
Temperature (low / high)		
30° / 59°	33° / 62°	↑3° / ↑3°
Electric Usage (kWh)		
123	150	↑27
Cost		
\$18	\$21	↑\$3

Snapshot by Text

AT&T LTE 8:31 PM 49%

Messages 683-123 Details

Cost-to-date: \$21
Days remaining in billing cycle: 4
Projected bill this month: \$76

Sunday 3:55 PM

NVE123 Alerts:
BILL SUMMARY
Acct at 3520
Cost-to-date: \$21
Days remaining in billing cycle: 26
Projected bill this month: \$85

Yesterday 8:27 PM

NVE123 Alerts:
THRESHOLD EXCEEDED
Your estimated electric cost-to-date \$26.00

Text Message Send

MyAccount Daily Energy Usage Data



nvenergy.com Sign Out



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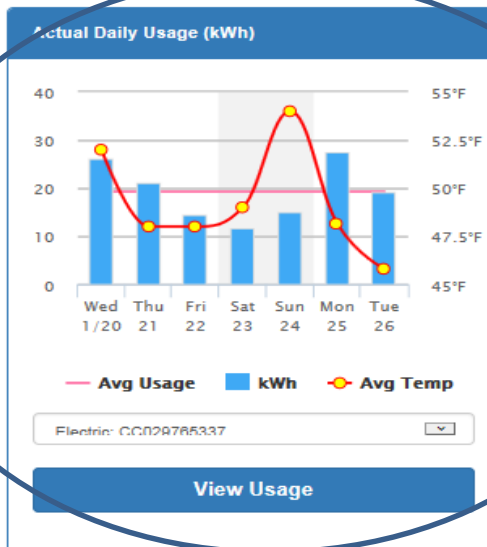
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This month: **\$58 to \$109**

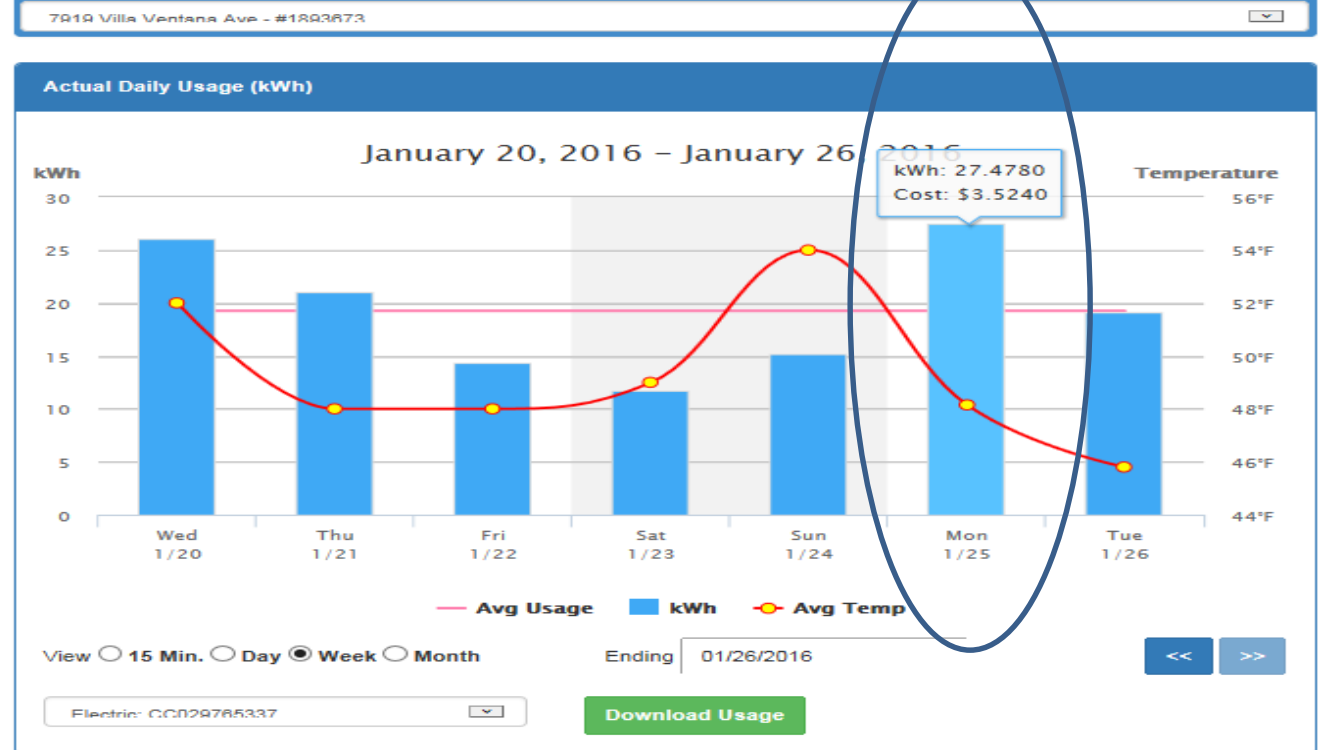


MyAccount Daily Energy Usage & Cost Data



- MyAccount
- MyDashboard
- Payment & Billing
- Programs
- Energy Center**
 - View Energy Usage**
 - Download Usage Data
 - Bill Usage Comparison
 - Ways To Save
 - Improve My Home
 - Learn About Energy
 - My Home Profile
- Outage Center
- Moving Center
- MyProfile

View Energy Usage



MyAccount Daily Energy & Weather Data

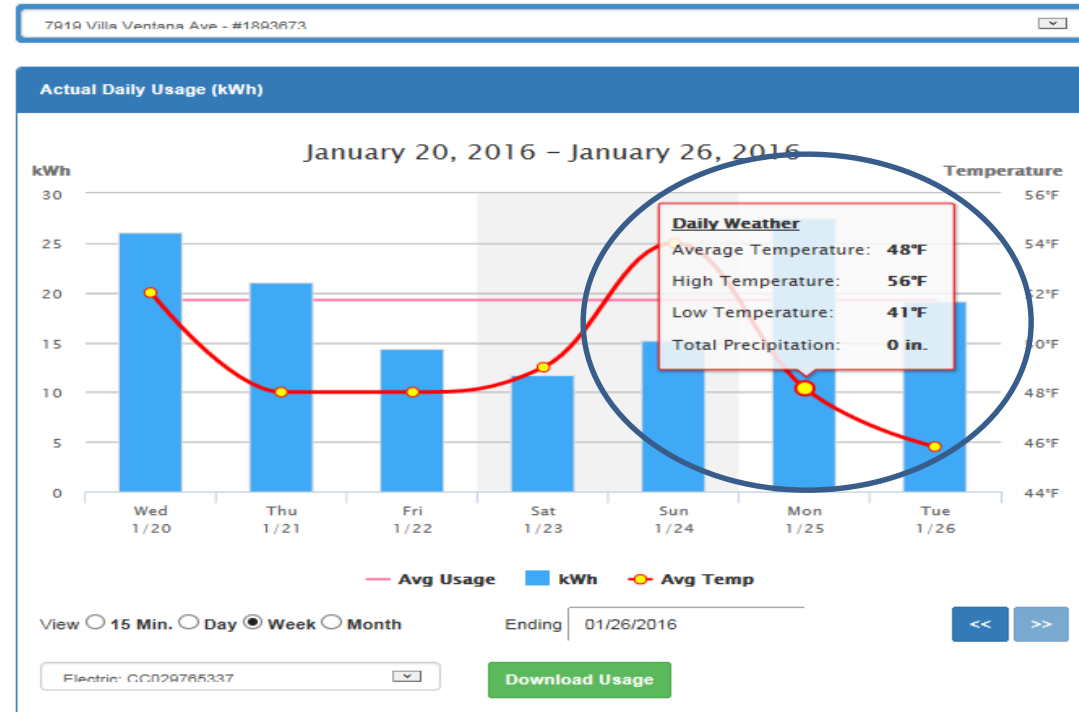


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View Energy Usage

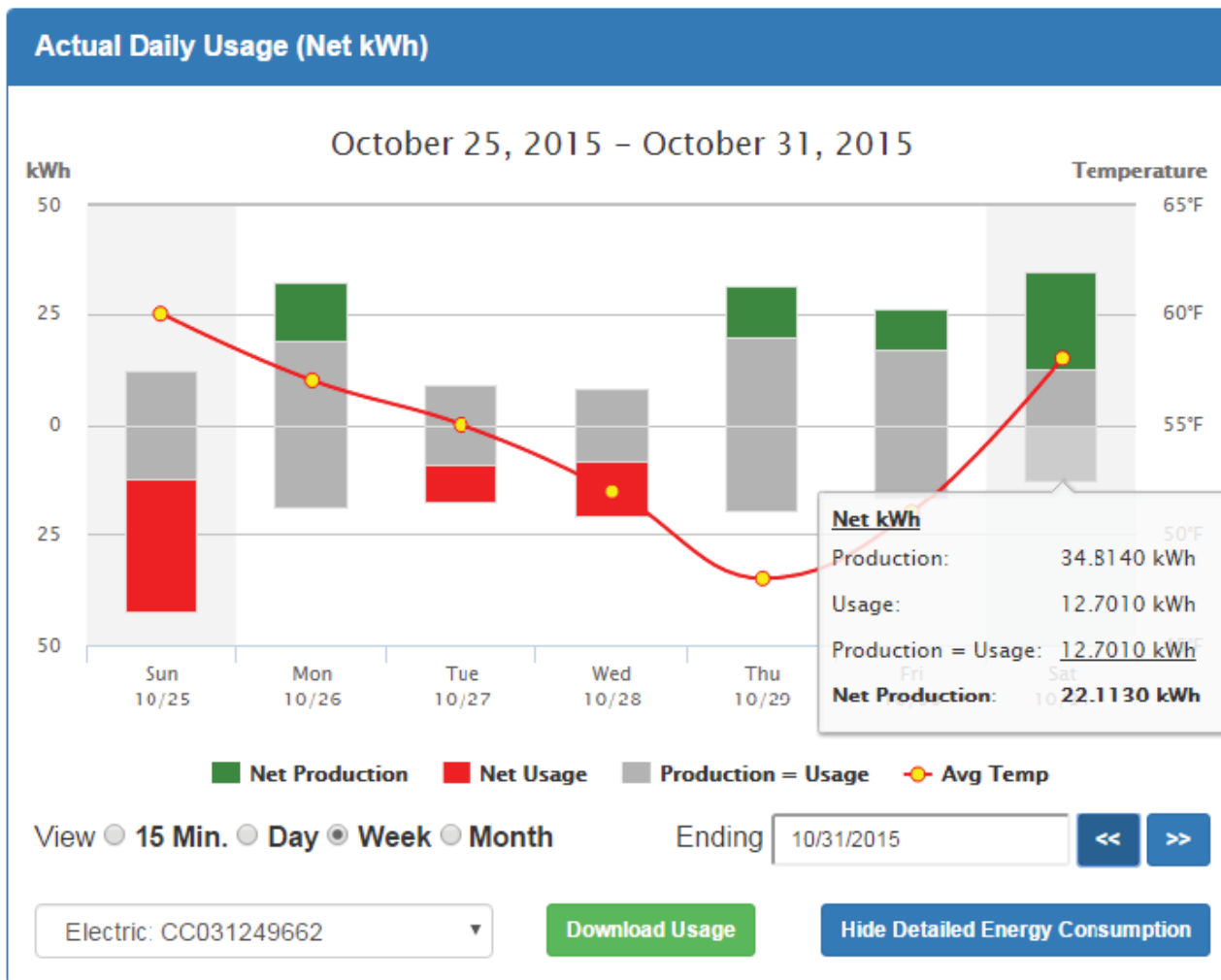


MyAccount

Additional Views For Net Metering Customers



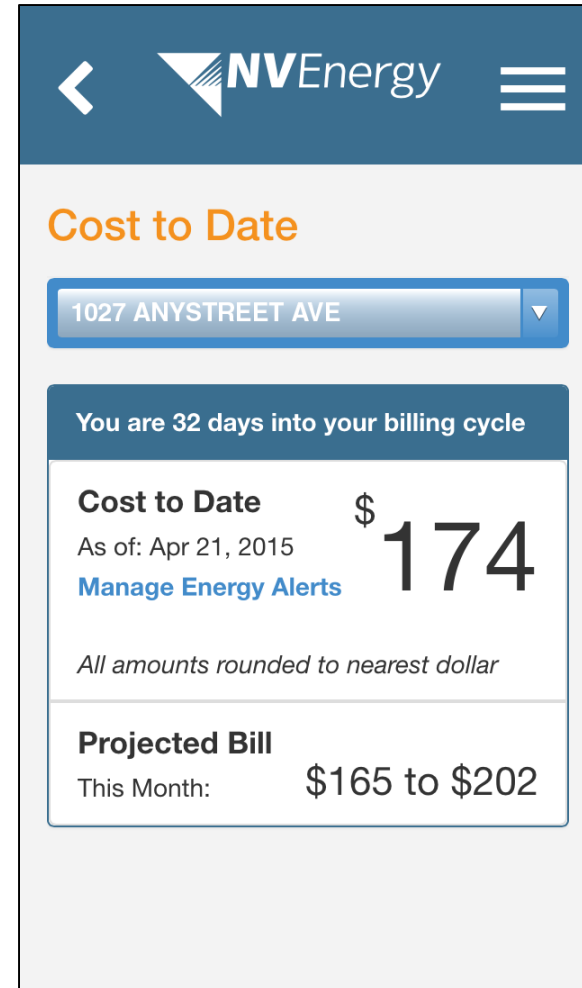
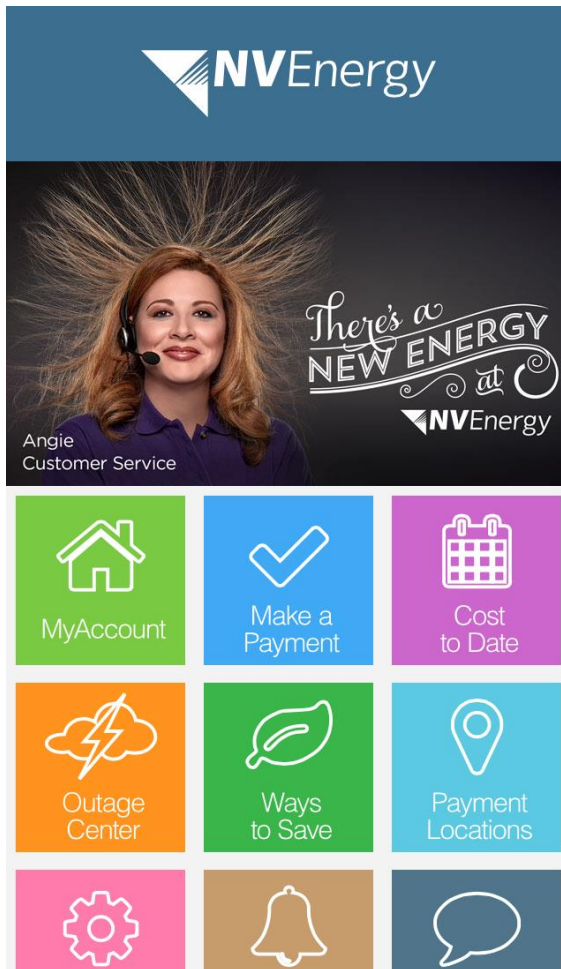
Net Metering Usage Graph



Available Now – NVEnergy Mobile App



NV Energy Mobile App – available in iTunes or Google Play



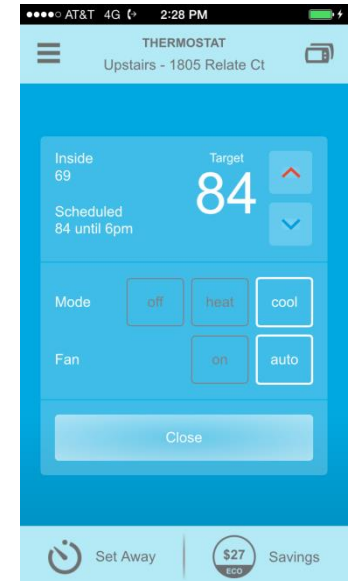
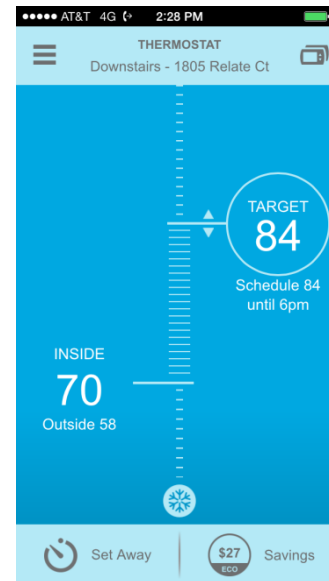
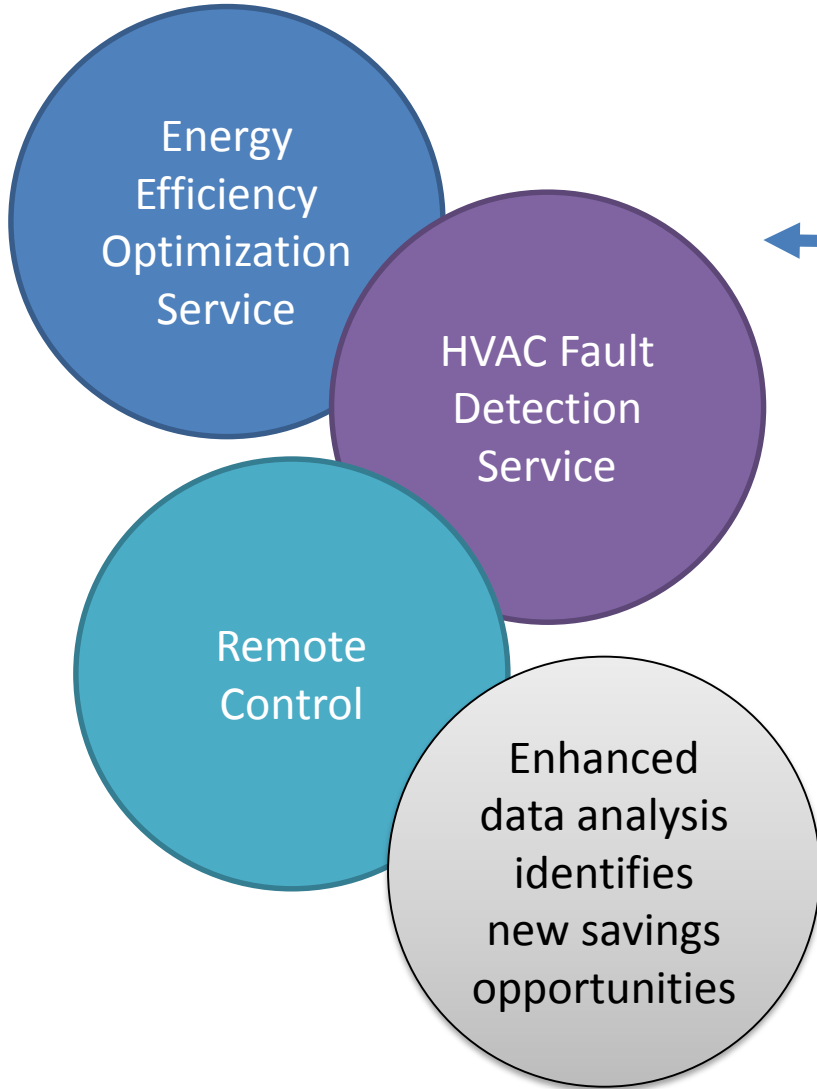
Grid Modernization

Energy Efficiency and Demand Response



- Customer Energy Management Solutions
 - New program designs integrate energy efficiency and demand response to provide enhanced services to customers well beyond traditional rebate programs
- A new portfolio of programs leverage the smart grid infrastructure to allow customers to take advantage of new data driven solutions for enhanced energy management
- “Big data analysis” is applied on both sides of the meter to:
 - Optimize how customers use major energy systems
 - Allow NV Energy to actively manage its peak demand via peak shaping technology

Grid Modernization New Customer Solutions

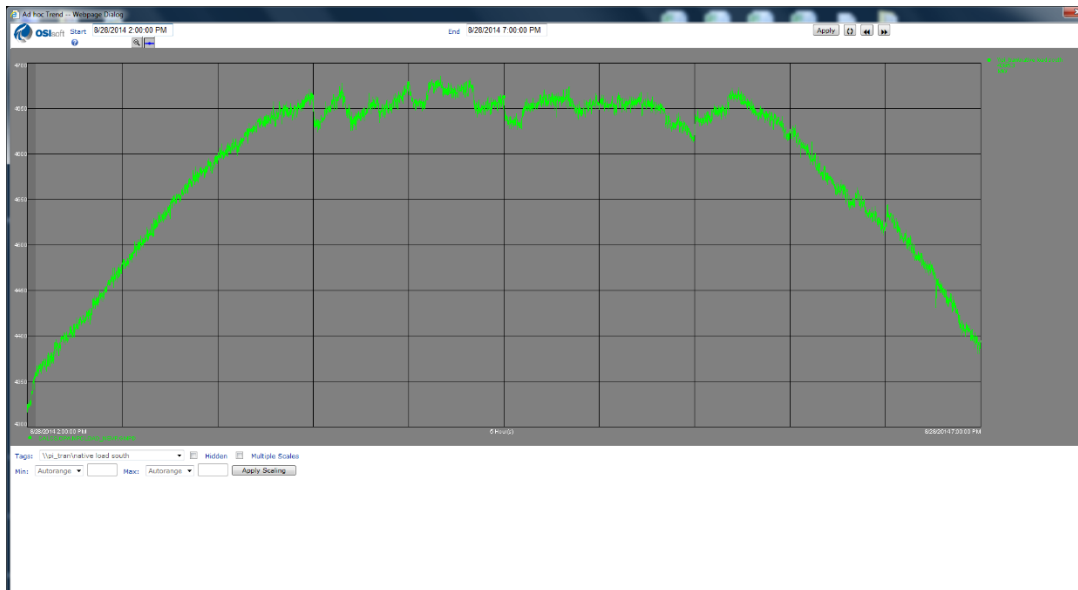


Grid Modernization

Advanced Peak Demand Management



- DRMS – advanced platform integrated to other enterprise systems allows NV Energy to forecast and optimize the “dispatch” of customer loads to reduce and shape the electric peak load. New approaches minimize customer impact, and most customers do not notice events.
- NV Energy has deployed the most advanced integrated energy efficiency and demand response platform in the country allowing flexible and locational dispatch to support both system wide and distribution level demand management (~240 MW of demand response statewide).



Demand response event optimization flatlines the electric peak producing significant avoided cost savings.

Grid Modernization

Role of Demand Response



- Demand response – programs that allow NVE to control customer's loads to assist in meeting the electric peak load without adding generation
- NVE's Program is one of the largest in the country
 - Controls over 244 MW of load thus avoiding the need to construct new generation to serve the load
 - 201 MW at Nevada Power
 - 35 MW Irrigation load at Sierra Pacific
 - 8.4 MW other load at Sierra Pacific

Grid Modernization

What's Next?



- Transmission
 - Continue to develop and expand working relationships with regional transmission organizations
- Generation
 - Expand MDC role in monitoring NVE and other generating assets
- Distribution
 - Distributed generation integration and impact to the grid
 - Study the benefits of smart inverters
 - Volt/Var optimization pilot program
 - Fault location, isolation, and service restoration
 - Remote controlled switching
 - Integrated mobile dispatch
 - Distribution automation

Grid Modernization – What's Next?



- Customer service offerings
 - Continue to develop emerging technologies and interfaces with customers offering a suite of products and services to help customers track and manage consumption
- Use of Emerging Technologies
 - Use of storage technologies,
 - Batteries
 - Electric Vehicles (EV)
 - Infrastructure needed to promote EV use across Nevada
 - The “Electric Highway” is a catalyst
 - Forecast underway to determine potential EV penetration
 - Potential use as a demand side resource either through demand response or acting as a storage device



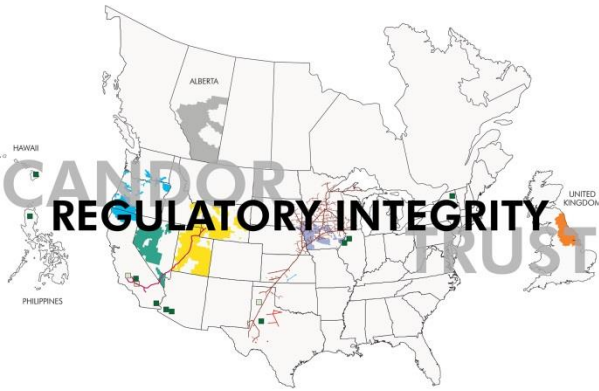
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Questions?

