



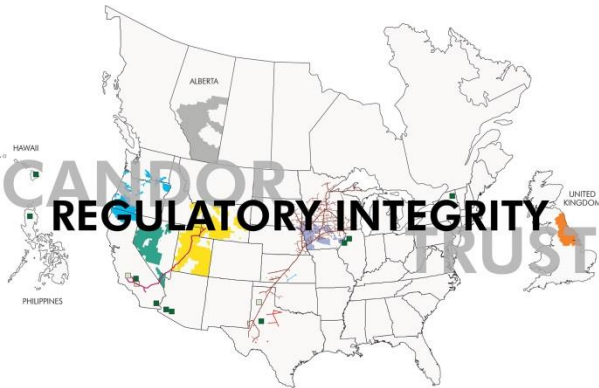
CUSTOMER SERVICE



EMPLOYEE COMMITMENT



ENVIRONMENTAL RESPECT



OPERATIONAL EXCELLENCE



**BERKSHIRE
FINANCIAL STRENGTH
OWNERSHIP**

Technical Advisory Committee on Distributed Generation and Storage

Pat Egan - Senior Vice President, Customer Operations

April 28, 2016



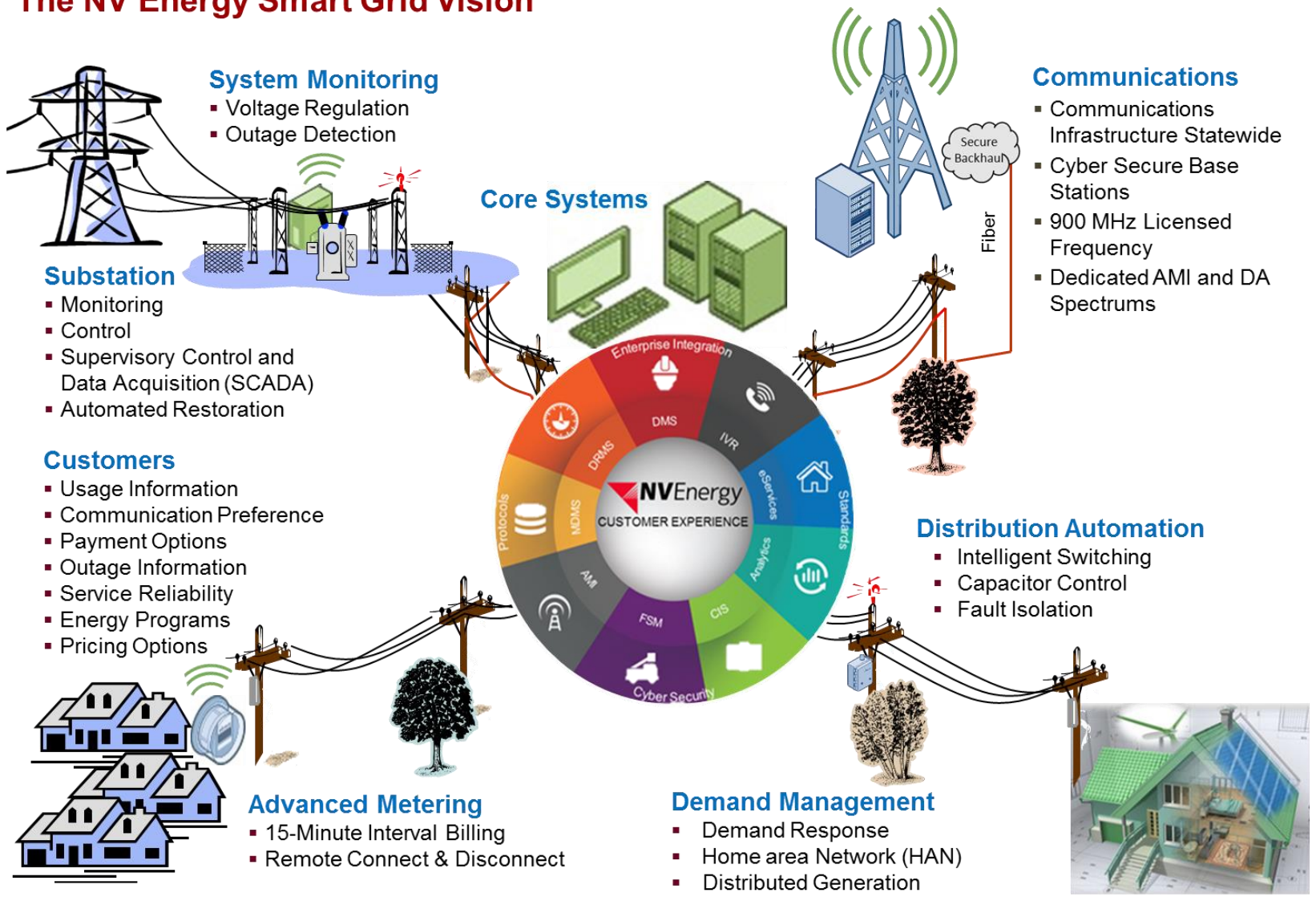


- NV Energy Technology and Communications Investments
 - Smart Meter Installation Project
 - Leveraging Technology to Provide Customer Offerings
 - Transmission and Generation System Operations
 - Monitoring and Diagnostic Center
 - Distribution System Operation
 - Energy Efficiency and Customer Demand Response

Smart Grid of the Future



The NV Energy Smart Grid Vision



Modernization of the Grid

Smart Meters



- Smart meter deployment significantly changed the way NV Energy 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 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 three primary objectives:
 1. Substantially reduce operating costs while improving meter data and billing quality.
 2. Support operational improvement, specifically outage detection and restoration.
 3. Provide 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 600,000 accounts (70,000+ 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
 - Serves as a product and service customer awareness platform

MyAccount Dashboard



nvenergy.com Sign Out

NVEnergy MyAccount

MyAccount

MyDashboard

Account List

Payment & Billing

Programs

Energy Center

Outage Center

Moving Center

MyProfile

Account Summary

Total Amount Due

\$0.00 [Pay Bill](#)

No payment is due.

Account Summary as of Mar 25, 2016

Current Charges	\$305.23
Amount:	View Bill
Last Payment	\$305.23
Received: Mar 14, 2016	View History

Next Meter Read Date: **Mar 25, 2016**

Billing & Payment Options

[Switch to Paperless](#)

[Sign up for Automatic Monthly Payments](#)

[Change Bank Information](#)

View now bill inserts rate schedules and notices

Smart Meter Highlights

You are 28 days into your billing

Estimated Cost To Date **\$ 319**

As of Mar 25, 2016

[Manage Energy Alerts](#)

All amounts rounded to nearest dollar

Projected Bill

This month: **\$319 to \$435**

Additional Cost to Date Information

Meter #: CC030135155

Max Demand (kW)

[02/26/2016 01:45 PM](#) 10.736 KW

Total Consumption (kWh)

3,108.584 KWH

Actual Daily Usage (kWh)

Chart showing Actual Daily Usage (kWh) and Average Temperature (Avg Temp) from Thu 2/17 to Wed 2/23. The chart includes Avg Usage (red line), Demand kW (grey line), and kWh (blue bars).

Electric: CC

[View Usage](#)

MyAccount Daily Energy Usage Data



nvenergy.com Sign Out

NV Energy MyAccount

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

Account Summary

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 [View Bill](#)
Amount:

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

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)

Date	kWh	Avg Temp (°F)
Wed 1/20	28	52.5
Thu 21	22	47.5
Fri 22	15	47.5
Sat 23	15	47.5
Sun 24	15	55
Mon 25	28	52.5
Tue 26	20	47.5

Electric: CC0297R5337

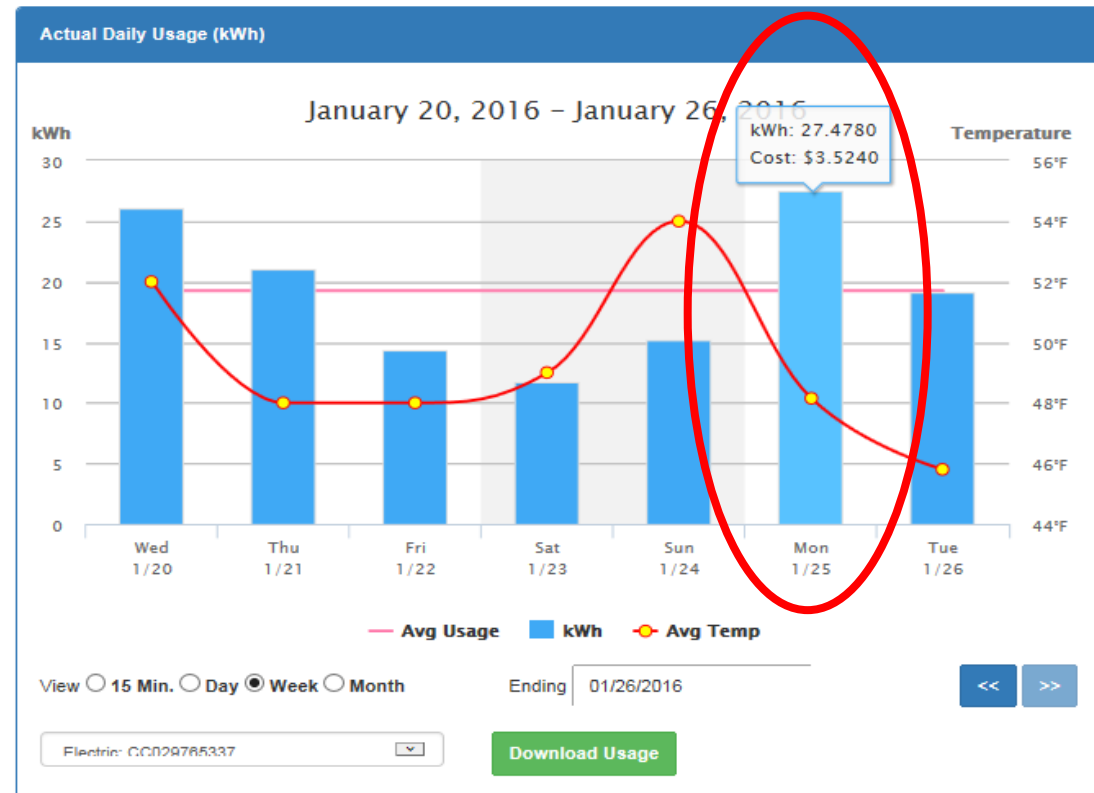
[View Usage](#)

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



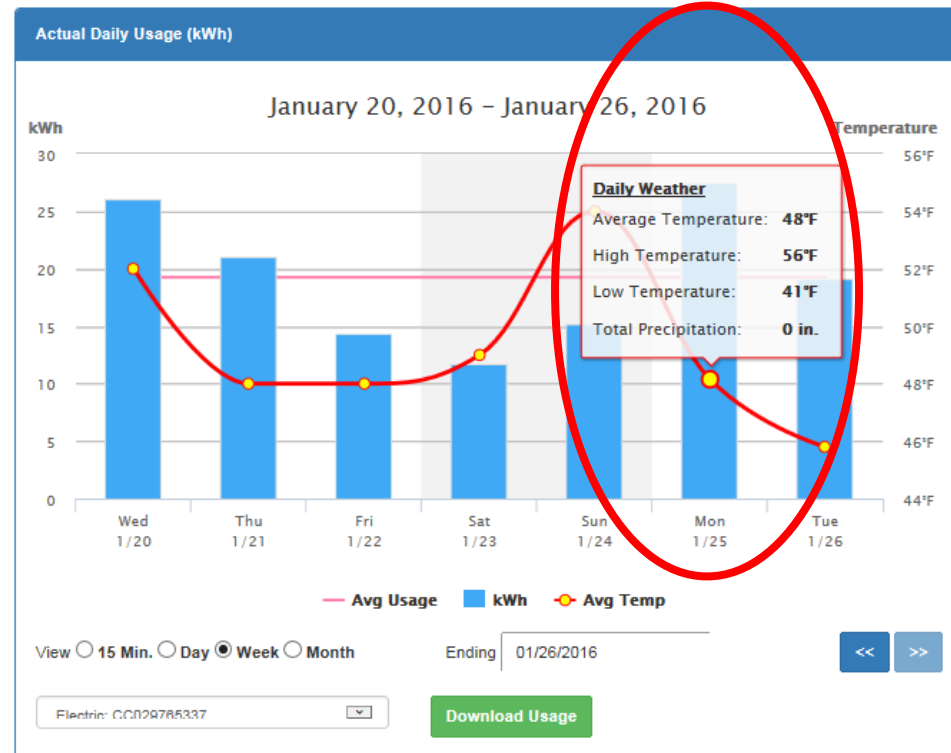
MyAccount Daily Energy & Weather Data



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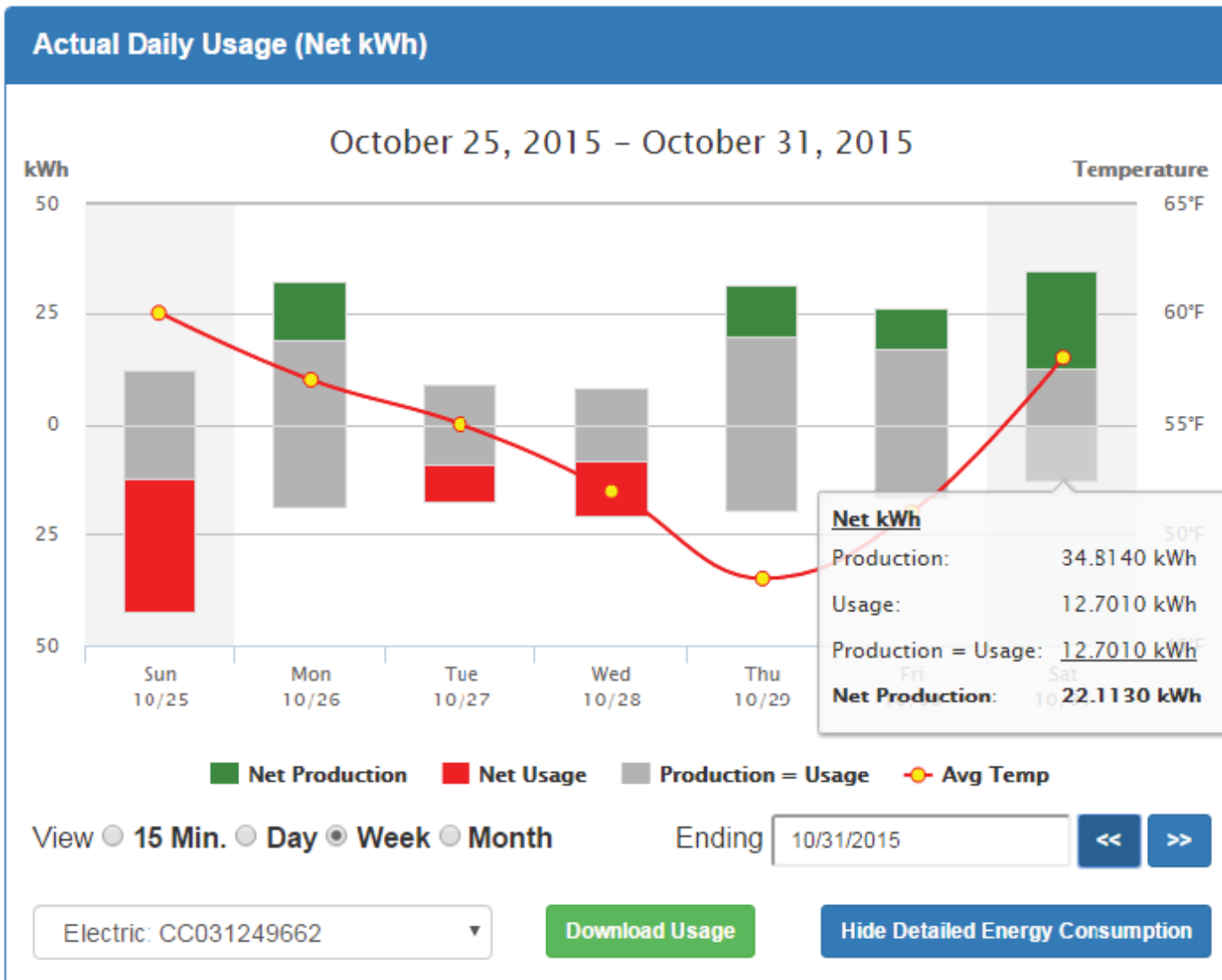
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View Energy Usage



MyAccount

Additional Views For Net Metering Customers



Net Metering Usage Graph

Modernization of the Grid Customer Preference Center



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 customer communications from a single platform
- The Customer Preference Center enables reliable, consistent, effective, economical, and targeted communications



Leveraging Communication



- NV Energy has among best-in class technology-enabled communications
 - In April, surpassed 600,000 MyAccount customers
 - In less than a year, over 70,000 “app” downloads
 - In 2015, over 1.4 million outage website hits
 - 67% of payments received electronically
- Very positive impact on customer satisfaction
 - 10% increase in res customer sat (south) since 2013
 - #6 (of 66) in 2015 JD Power utility web site/mobile review
 - #3 (of 102) in eSource utility web site review
- Will enable proposed “FlexPay” prepay program

MyAccount Weekly Energy Snapshot



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 Email

AT&T LTE 8:31 PM 49%

Messages 683-123 Details

COST-to-date: \$00
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

Snapshot by Text

Modernization of the Grid Outage Communications



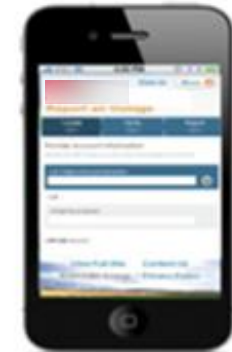
Customer Programs – Outage Reporting

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 NVEnergy website's 'Report an Outage' page. It features a navigation menu on the left with options like 'Home', 'Outage', 'Status', 'Outage Reporting', and 'Outage Reporting'. The main content area has a 'Report an Outage' heading and a 'Locate' button. Below this, there is a section for 'Provide Account Information' with a text input field and a 'Submit' button. The page also includes a sidebar with account details and a footer with social media icons.

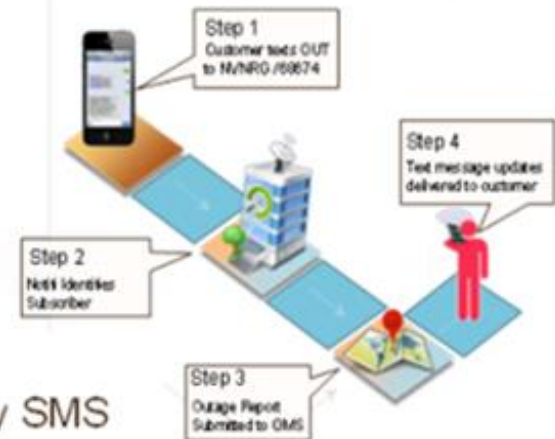
Mobile Outage Reporting



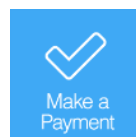
The screenshot shows the NVEnergy mobile app's 'Report an Outage' screen. It features a navigation menu on the left with options like 'Home', 'Outage', 'Status', 'Outage Reporting', and 'Outage Reporting'. The main content area has a 'Report an Outage' heading and a 'Locate' button. Below this, there is a section for 'Provide Account Information' with a text input field and a 'Submit' button. The page also includes a sidebar with account details and a footer with social media icons.



Mobile 2-way SMS



Available Now – NV Energy Mobile App



Account Summary

Account #

Total Amount Due

\$121.61 Pay Bill

Due: Apr 07, 2016

Account Summary as of Mar 26, 2016

Current Charges	Amount:	\$245.22
Balance Forward	Credit Balance:	(\$2.00)
Last Payment	Received: Mar 22, 2016	\$121.61

12-Month Bill History

March 2016	Billing Cycle: Feb 16, 2016 - Mar 17, 2016	\$243.22	View Bill
February 2016	Billing Cycle: Jan 20, 2016 - Feb 17, 2016	\$58.43	View Bill
January 2016	Billing Cycle: Dec 17, 2015 - Jan 19, 2016	\$69.02	View Bill

Pay Bill

10428 HOLLOWAY HEIGHTS AVE

Payment Amount & Date

Total Amount Due **\$11.52**

Payment Amount **\$ 11.52**

Payment Date **05-05-2015**

Choose a Payment Method

[Checking ****3837](#)

[New Checking/Savings](#)

Outage Center

There are 73 customers without power as of 10:59 AM | May 5, 2015.

[View as List](#)

[Get an Outage Update](#)

Payment Locations

Bring your bill to our authorized locations. Cash, check or money order payments are posted the same day.

zip or address Search List

NV Energy Mobile App – available in iTunes or Google Play

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”)



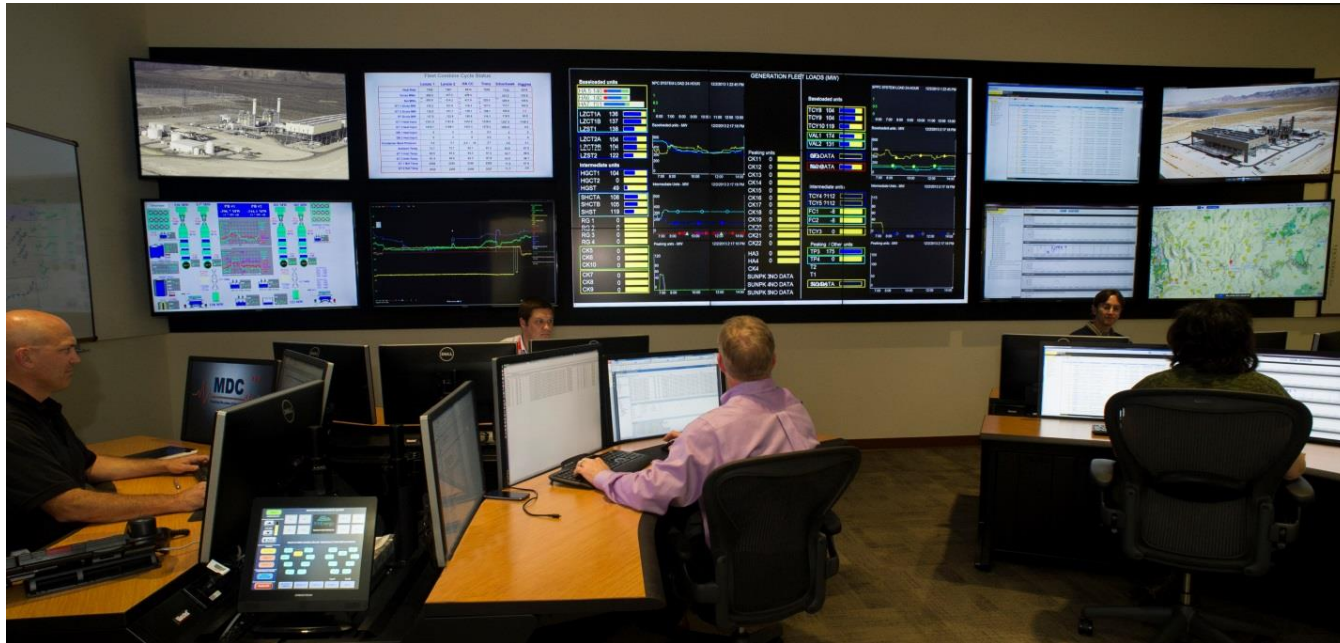
- MDC

- 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

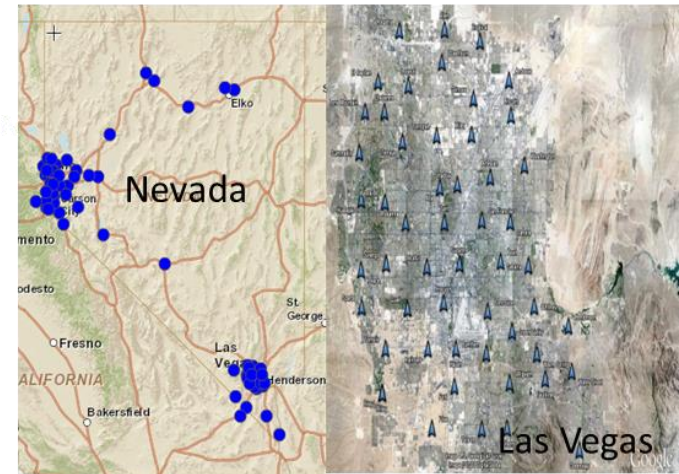
Modernization of the Grid Communications Infrastructure



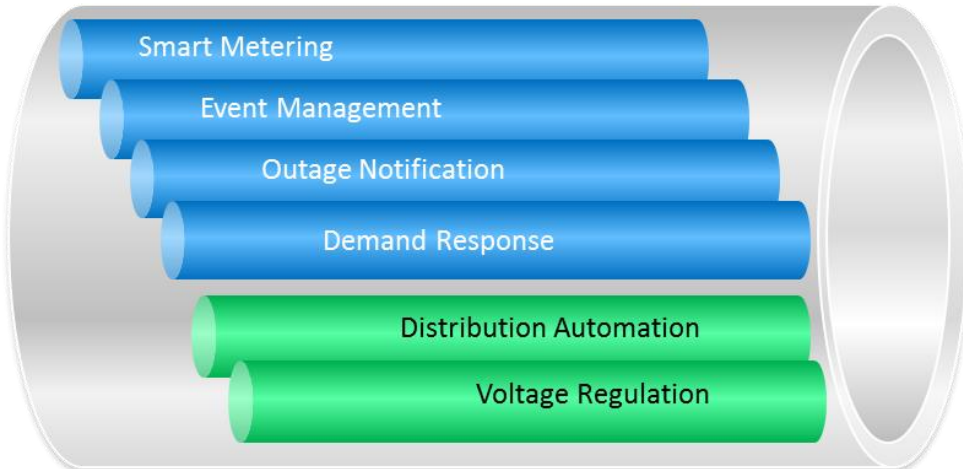
Smart Grid

Communications Infrastructure

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



Multiple Prioritized Channels



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)

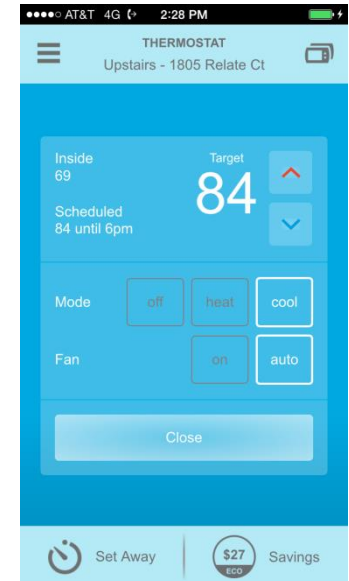
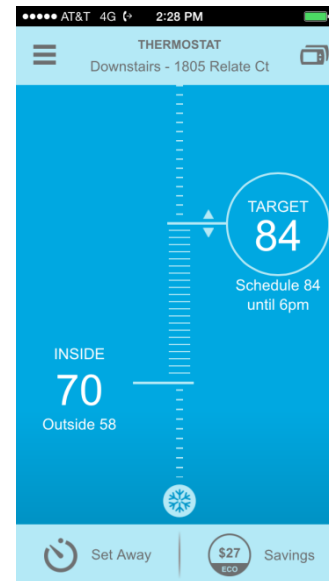
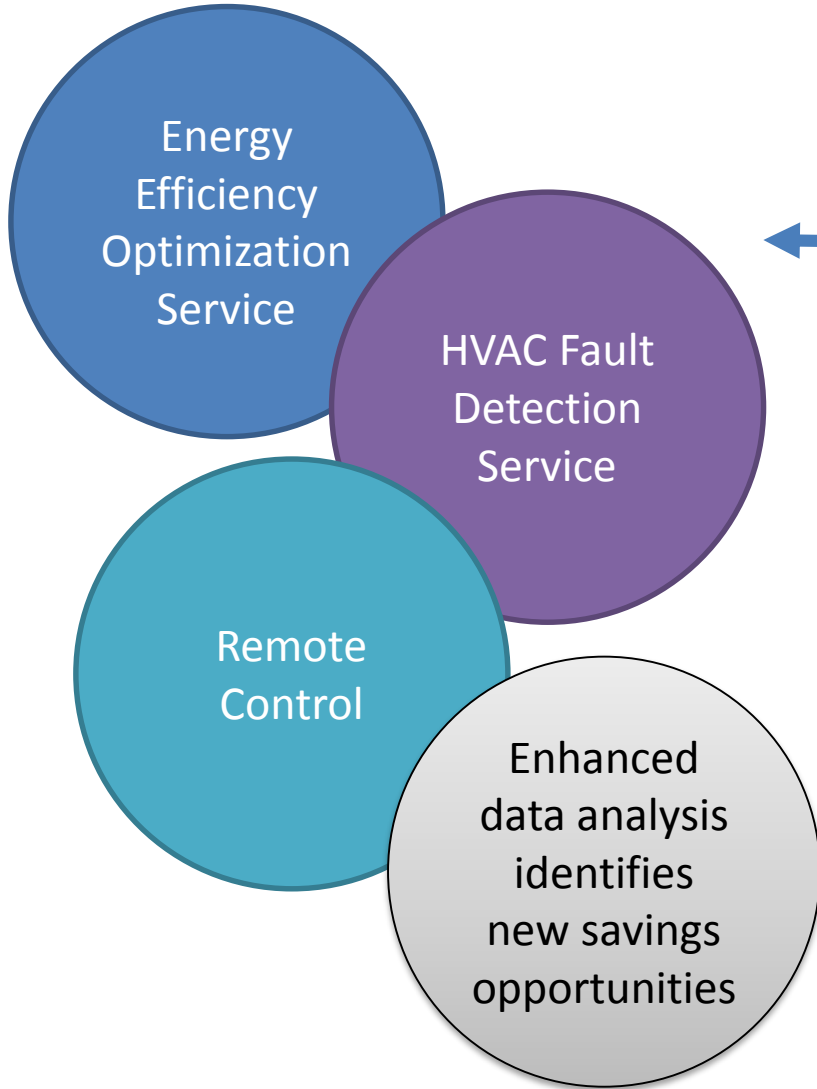
Grid Modernization

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

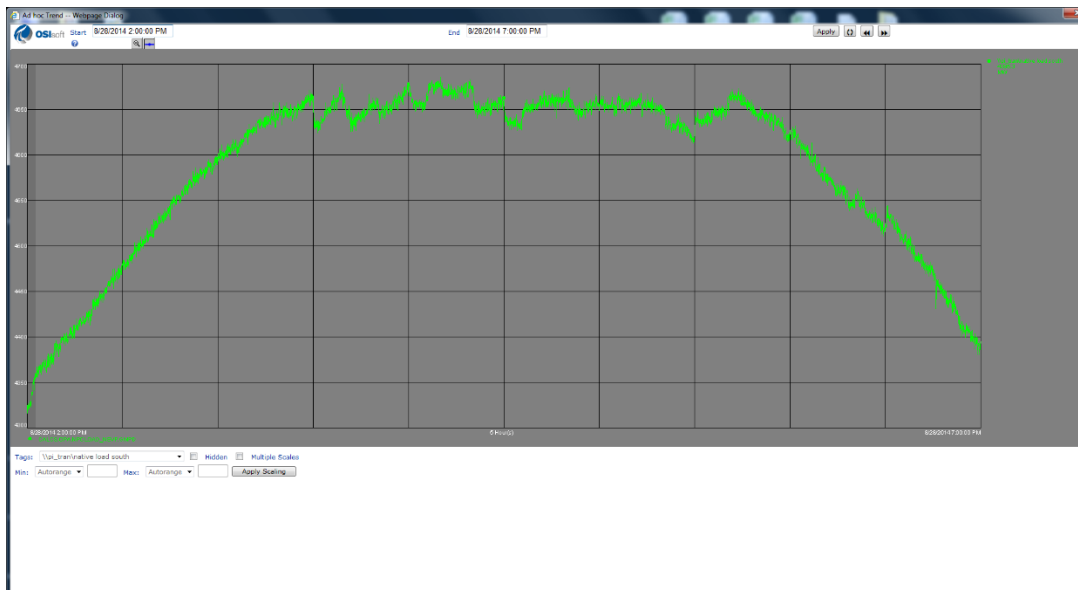


Grid Modernization

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 minimally manage customer loads to assist in meeting peak load without adding generation
- One of the largest home thermostat/Home Energy Management programs 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



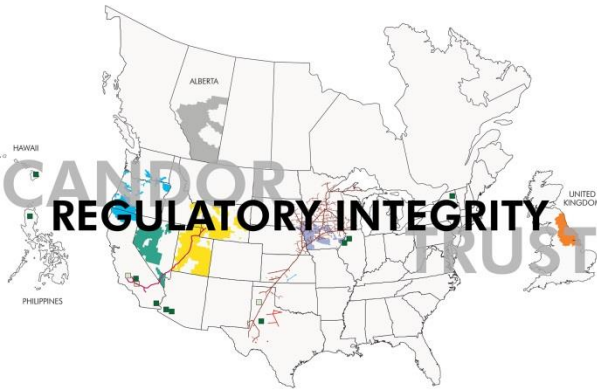
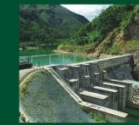
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Questions?

