



143RD ANNUAL CIVIL ENGINEERING CONFERENCE

Charlotte, NC | October 9 – 12, 2013



CIVIL ENGINEERS - THE FOUNDATION OF THE NATION

WELCOME TO THE ASCE 143RD ANNUAL CIVIL ENGINEERING CONFERENCE

Performance Contracting for
Guaranteed Energy Savings!

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A Place To Call Home

CITY OF HENDERSON, NV

City wide performance energy project

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AMERESCO 

Green · Clean · Sustainable



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Ed McGuire, PE,
Fellow ASCE
City of Henderson
Public Works Dept.
City Facilities Manager

Paul Ira, C.E.M., C.R.M.
Sr. Account Executive
Las Vegas, NV
AMERESCO



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BACKGROUND – The City of Henderson One of Americas Premier Cities

- 275,000 residents
- 105 square miles, 817 miles of streets
- Over 2 Million square feet of City Buildings under roof
- 60 miles of trails, most have lights
- 11 pools
- 7 Recreation Centers
- 52 parks- 1200 plus acres
- Still adding amenities
- Population rising, use of facilities rising
- **BUDGETS FALLING**



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BACKGROUND: Continued

- **City owned Water and Wastewater plants**
- **BUDGETS FALLING**
- Operational Costs are Rising
- All the NON-Glamorous Stuff is wearing out
- Out of date technology
- **BUDGETS FALLING**
- Annual Electricity- \$10.3 Million
- Annual Natural Gas- \$542K
- Annual Water- \$2.3 M (includes sewer charges)
- Utilities are \$3.3 Million a year for Facilities



BACKGROUND: Continued

- **BUDGETS FALLING**

- Las Vegas Valley Economy Sucks
- Residents staying home, *staycationing* at Rec. Centers
- Clients expecting more, willing to pay less
- Clients NEED affordable, durable, cost effective and reliable “stuff”
- City needs to replace or refresh the big ticket, utility consuming stuff
- What do we do? DO MORE WITH LESS?
- Can you do everything with nothing?



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NRS CHAPTER 332 - PURCHASING: LOCAL GOVERNMENTS to the rescue!

The section applies to: *Every political subdivision or other entity which has the right to levy or receive money from ad valorem taxes or other taxes or from any mandatory assessments, including counties, cities, towns, school districts and LVVWD*

See Subsection NRS 332.300 PERFORMANCE CONTRACTS FOR OPERATING COST-SAVINGS MEASURES!



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Performance Contracting Process

- RFP and ESCO Selection by owner
- Kickoff meeting with scope discussion
- Develop Financial Grade Audit with multiple workshops to determine final scope
- Energy Services Agreement signed
- Final Design completed
- Construction
- Measurement and Verification of savings
- Ongoing O&M



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- States with enabling legislation
 - Only Alaska and Wyoming have no legislation in place.
 - All other states have legislation covering all or some markets.
 - www.energyservicescoalition.org is a great resource for legislation and ESCO identification.
 - You can E-Mail ESC@energyservicescoalition.org for specific information.



Energy Performance Contracting

Since 1995

- Support ESC
- ESC Members
- Join the ESC
- Renew Membership
- Board of Directors
- Find a Provider
- State Chapters
- Local Government
- Accelerate ESPC
- ESPC Program Tools
- ESC Newsletters
- ESC Webinars
- ESC Video Clips

With a mission to achieve:

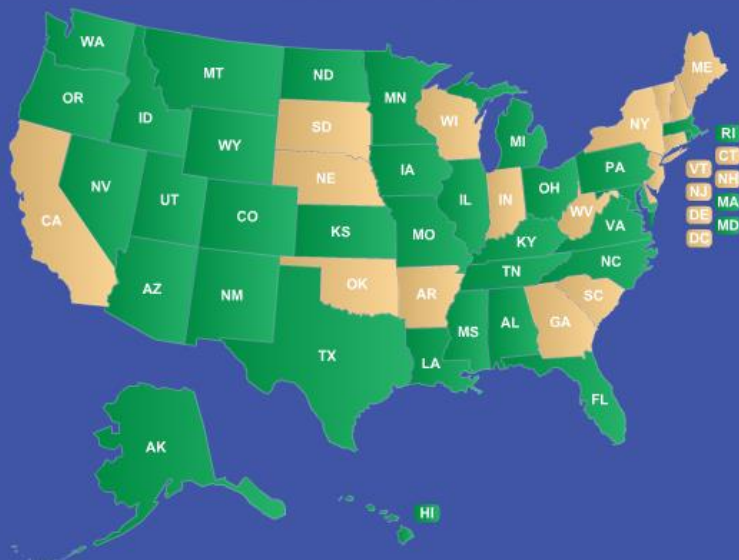
- Infrastructure Modernization - without the need for up-front capital
- Environmental Stewardship – mitigation of greenhouse gases
- Economic Development – real jobs now
- National Security – relieving our dependence on foreign sources of fuels

Like Us on ESC's New **FACEBOOK Page**

ESC Market Transformation Conference Information
 August 13-14, 2013
 Denver, CO

The Energy Services Coalition is the only public and private coalition of individual energy experts focused on the promotion of Guaranteed Energy Performance Contracting.

Race to the Top - Energy Savings Performance Contracting Dollars Per Capita



Sign-up for our **FREE Email Newsletter**

UPCOMING WEBINAR

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- [ESC Beginnings](#)
- [ESPC National View](#)
- [Build America Bonds](#)
- [Green Performance Contracting](#)
- [Bigger Bang for the Buck – Leveraging Funds](#)
- [Optimizing Economic Stimulus Dollars through](#)



ESPC Dollars Per Capita

North Carolina

State of North Carolina	
Population (as of 2010):	9,535,483
Performance Contracting Completed:	\$252,640,978.00
Dollars Per Capita:	\$26.49
Number of Job Years Created:	2,746
Estimated Annual Source Energy Saved (million btus):	2,096,414
Estimated Annual Tons of Carbon Avoided:	36,010

[North Carolina State Chapter](#) | [Back to Map](#)

Energy Services Coalition (ESC)

info@energyservicescoalition.org

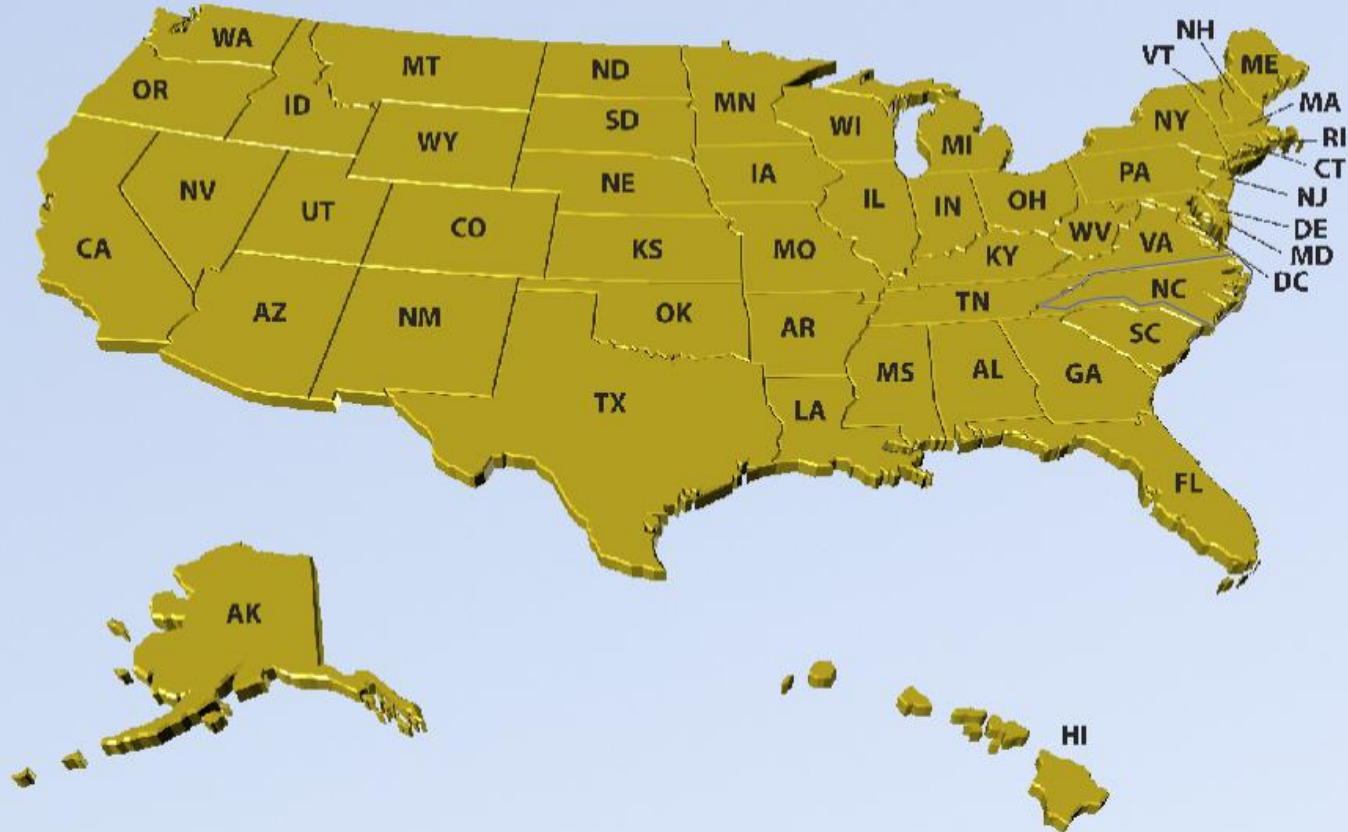
Or contact the [Board member](#) nearest you.

PERFORMANCE CONTRACTING BY STATE

Status of ESPC Enabling Legislation in the United States

Clicking on a state will take you to a page providing information on whether state and local government organizations are allowed to use performance contracting to acquire building upgrades and energy efficiency improvements for that state. For each state, an empty circle (○) represents no current legislation, while a green circle (●) represents legislation covering that entity.

Please help us keep this data up-to-date and accurate by sending e-mail to kellyjs@ornl.gov with any updates from your state.





NORTH CAROLINA ESPC LEGISLATION

Web Sites

[North Carolina Guide to Energy Performance Contracting](#)

Citations

North Carolina General Statutes—

- Procedure for letting of public contracts—[§143-129](#)
- [North Carolina Energy Codes](#) (MS Word File)
- [Application for Energy Savings Contract](#) (MS Word File)
- [§143-64.17B](#) Guaranteed Energy Savings Contracts

Applicable Areas

Any Public Agency



School Districts



Municipalities



State Colleges and Universities



Counties



State





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The City has past experience with *PERFORMANCE CONTRACTS FOR OPERATING COST-SAVING MEASURES*

In 2006 and 2007 The City of Henderson entered into an energy performance contract with AMERESCO to upgrade and retrofit a variety of items.

The first Energy Savings Performance Contract (ESPC) completed by the City was a \$2.8M energy savings project for the Justice Facility. Completed in 2007, the project is saving over \$250,000 per year. Funding was a combination of 1/3 Capital Funds and 2/3 medium term bond (10 years).



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The second project cost \$20M and is saving about \$2M a year!

The second project was financed with a 15 year loan. The City put out a Request For Proposals for bank loans and received several inquiries with Bank of America delivering the best terms.

Both projects have GUARENTEED savings, if the savings goal is not achieved either the ESCO installs further upgrades to increase savings or pays down the cost of the energy saving measure until the cost benefit is positive. **Your ESCO is your business partner, select them carefully!**



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PROJECT DESCRIPTION:

The selected citywide measures include:

- Retrofitting or replacing over 4,000 building lighting fixtures
- Replaces 23,000 4' T-12 lamps with T-8 28 watt high output lamps
- Installing over 1,500 new lighting occupancy sensors
- Installing/upgrading energy management system in 15 facilities
- Replacing 17 boilers in nine facilities
- Replacing 2 chillers in 2 facilities
- Retrofitting over 310 plumbing fixtures
- Installation of ultraviolet water treatment on indoor swimming pools (improves indoor air quality and decreases chemical usage)

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Examples of sexy projects



UV Water treatment



200 Ton Magnetic bearing,
Frictionless McQuay Chiller
ready for install

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Old boiler after a “hard light”



new high efficiency, low emission boiler

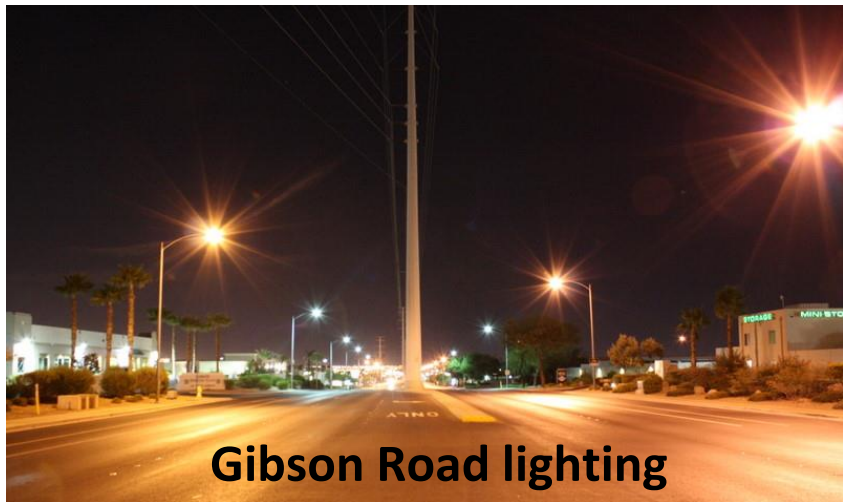
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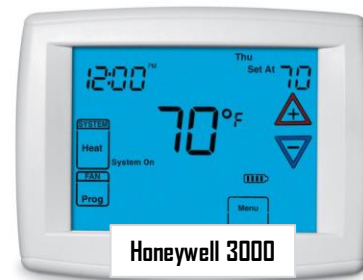
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Gibson Road lighting





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PROJECT DESCRIPTION cont.

- Installed two 30-kilowatt photovoltaic arrays
- Replaced rooftop HVAC units at multiple locations
- Retrofitting or replacing nearly **28,000** HPS street lights with induction lighting technology



- Replaced 12 large exhaust fans at the Jail
- Repaired or replaced appurtenant maintenance items that don't meet the energy saving test but are critical and failing like valves, controllers etc., paid for with energy savings.

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All old lamps, ballasts, fixtures and thermostats were **recycled**, all new equipment is low emission, high efficiency. Two R-22 refrigerant equipped chillers were upgraded with new R-134a compatible chillers (non ozone depleting refrigerant)



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- Coordination with 1900 full time employees
- Convince The Public Works, Finance, Utilities and Building Department heads the project will work and pay for itself
- Coordinate 15 contractors working in 36 locations plus all 817 miles of public streets
- Built-in conflicts with all the old valves, switches and connections. Every shutdown was an adventure!
- All the buildings were open for business and remained so for the term of the contract
- No major shutdowns, no closures



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The City had the dream team for this project:

The City selected **AMERESCO** as the most qualified Energy Service Company (ESCO), they function like a Prime Contractor in a design/build. AMERESCO selects “subs”, designers, engineers, suppliers and installers to complete the project.

The City hired **Celtic Energy** as our third party energy consultant to provide project oversight. This is required by NRS 332.360, the third party must possess an AEE “Certified Energy Manager” certification.

City staff managed the day to day work and helped coordinate with the occupants of all the locations, processed all payments, reviewed certified payroll and attended bi-weekly coordination/project meetings.



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Original Contract Amount :	\$17,506,991.00
Change orders owner added 13%:	\$2,589,678.00
Contract Price after This Change	\$20,096,669.00

Added to the Base Contract via change orders, all owner requested changes or additional work funded by others

NV Energy Rebates total approximately	\$845,000
American Recovery Act Funds	\$1,043,000
City Capital Funds	\$700,000

No time growth



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Sample power bill, Residential Streetlights

Your new quarterly rate adjustment will become effective on January 1, 2009. Please see the enclosed insert for more details.

ELECTRIC - PUBLIC STREET LIGHTING								
Meter Number	Service Category	Service Period		Bill Days	Meter Readings		Meter Multiplier	Billing Usage
		From	To		Previous	Current		
674038861	KWH	Nov 3	Dec 4	31	97917	98634	1	717
ELECTRIC CONSUMPTION					717.00	KWH x .0619200	44.40	
TEMP. GREEN POWER FINANCING (TRED)					717.00	KWH x .0005400	.39	
RENEWABLE ENERGY PROGRAM (REPR)					717.00	KWH x .0007100	.51	
CITY OF HENDERSON FRANCHISE TAX						5%	.45	
TOTAL ELECTRIC SERVICE AMOUNT								\$45.75

USAGE HISTORY	NO. DAYS	KWH	AVG KWH PER DAY	AVG COST PER DAY
THIS MONTH	31	717	23.1	1.48
LAST MONTH	31	1,476	47.6	
LAST YEAR	33	1,890	57.3	

Avg KWH Per Day By Month

Month	Avg KWH Per Day
D 2007	58.9
J 2008	58.9
F 2008	58.9
M 2008	58.9
A 2008	58.9
M 2008	58.9
J 2008	58.9
J 2008	58.9
A 2008	58.9
S 2008	58.9
O 2008	58.9
N 2008	58.9
D 2008	19.6

2007

2008



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Sample power bill, Arterial Streetlights

D 2227

THIS BILL IS DUE AND PAYABLE UPON RECEIPT. PLEASE SEE REVERSE SIDE FOR MORE INFORMATION.



ACCOUNT NUMBER: **3000100600616459395**

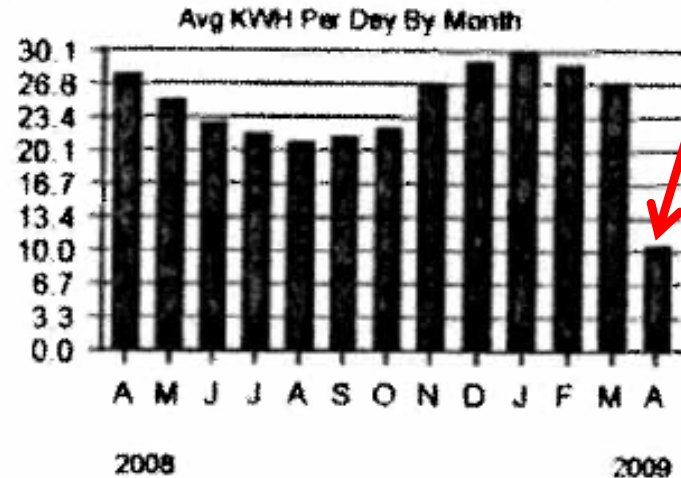
Page 2 of 2

Service: CITY OF HENDERSON
Address: 375 N GIBSON RD SL SL
HENDERSON, NV 89014

Customer: 001006006
Premise: 1645939

ELECTRIC - PUBLIC STREET LIGHTING- Continued

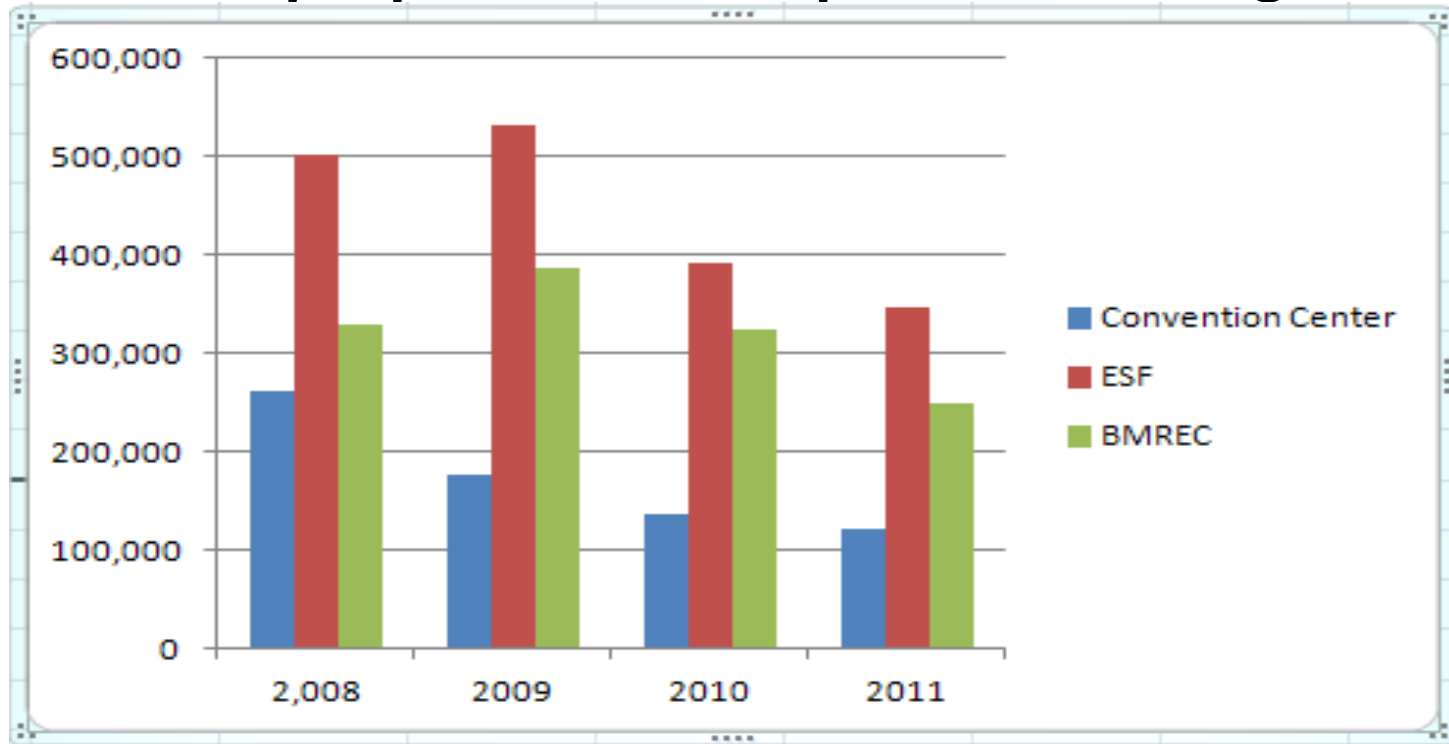
USAGE HISTORY	NO. DAYS	KWH	AVG KWH PER DAY	AVG COST PER DAY
THIS MONTH	28	303	10.8	0.73
LAST MONTH	32	871	27.2	
LAST YEAR	32	894	27.9	





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Sample power consumption, 3 Buildings



Convention Center, Black Mountain Rec. Center and Emergency Services Facility. Power consumption 2008 to 2011 for June, July and August. Summer Months show 35% decrease at each location!



Continued Savings



UtilityTrac Plus



City of Henderson
Nevada



Home

Search

Buildings & Meters

Actual Data | Calendarized Data | Normalized Data | Savings | Organization Properties

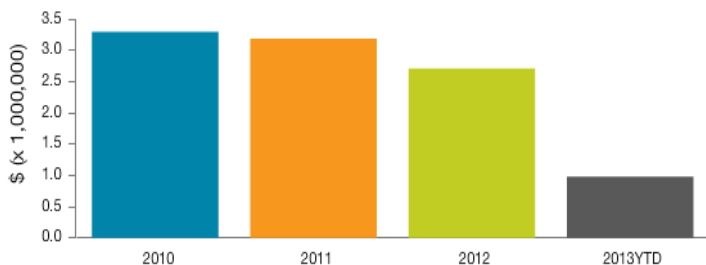
City of Henderson

- ▶ Animal Control
- ▶ Convention
- ▶ Fire Department
- ▶ General Government
- ▶ Justice
- ▶ Parks & Rec
- ▶ Police Department

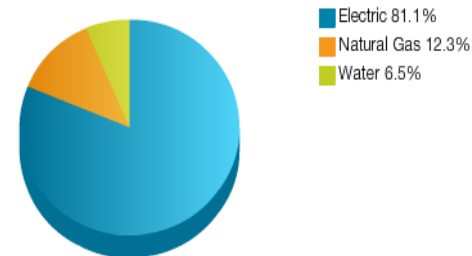
Summary | Commodity | Monthly | Greenhouse Gas

Fiscal Year Summary (FY ends in Dec of year shown) Last updated: 07/29/2013 14:11

Total Cost Summary



Energy Cost Percentage



Daily Average Cost

Percentage Change from
Previous Year To
Current Year

Current Year:
Jun 2012 - May 2013
\$7,083.18

Previous Year:
Jun 2011 - May 2012
\$8,421.63

15.8 %



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Summary

- The project reduced the City's carbon footprint, greenhouse gas emissions and remove 240 milligrams of mercury.
- The project appreciably reduced maintenance cost and effort
- The project has resulted in a *Cultural Change* at the City of Henderson
- All rebates were spent on additional related energy saving work.
- The project had a \$20 million dollar impact with \$700,000 direct cost
- All equipment was high efficiency, low emissions and low or mercury free
- Most street lamps were retrofit, those that could not were replaced and recycled
- All 28,000 street lamp ballasts were recycled
- The project has reduced utility spending by \$2.4 Million dollars a year!
- Using EPA Energy Star benchmarking software, City Hall improved over 20 points (20%).
- Savings has exceeded the contract based on 17% guaranteed savings

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Questions and Answers?



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THANK YOU FOR ATTENDING THE **ASCE 143RD ANNUAL CIVIL ENGINEERING CONFERENCE**

WE LOOK FORWARD TO SEEING YOU
NEXT YEAR IN **PANAMA!**