BRIAN SANDOVAL
Governor

STATE OF NEVADA

ANGIE DYKEMA
Director

755 North Roop Street, Suite 202
Carson City, NV 89701
Office: (775) 687-1850
Fax: (775) 687-1869

GOVERNOR'S OFFICE OF ENERGY

December 30, 2016

Mr. Rick Combs, Director
Administrative Division
Legislative Building
401 S. Carson Street
Carson City, NV 89701

Subject: Biannual Report on Energy Reduction in State-Owned Buildings

Dear Director Combs,

This report is required by NRS 701.215(3)(c). To put subsection (3) in context, subsections (1) and (2) are presented below.

1. The Director shall prepare a state energy reduction plan which requires state agencies, departments and other entities in the Executive Branch to reduce grid-based energy purchases for state-owned buildings by 20 percent by 2015.

2. In accordance with, and out of any money received pursuant to, the American Recovery and Reinvestment Act of 2009, Public Law 111-5, the Interim Finance Committee may determine an amount of money to be used by the Director to fulfill the requirements of subsection 1.

3. The Director:
   c. Shall biannually file reports with the Legislative Commission that:
      1. Indicate the general progress of energy reduction in state buildings; and
      2. Identify any state agency that fails to cooperate with the Director in the design or implementation of the plan prepared pursuant to subsection 1.

Energy Consumption in State-Owned Buildings: The majority of information relative to energy consumption in state-owned buildings is obtained from NV Energy, which provides service to 93 percent of the buildings owned by the state. Since 2005 there has been a 14.36% reduction in energy consumption in NV Energy territory, as shown in the attached spreadsheet entitled Energy in NV Energy Territory State-Owned Buildings. Usage in 2005 was 15.95 kWh per square foot and usage in 2016 is projected to be 13.66 kWh per square foot. When the state owned buildings built in 2016 are enrolled further reductions per square foot will be obtained. It should be noted that these numbers differ slightly from those presented in previous biannual reports. This is due to the fact that the database is constantly being updated and improved for accuracy.

The remaining 7 percent of usage data is compiled from 11 municipal utilities, co-ops, and general improvement districts. The records kept by these other sources vary in terms of previous years that historical data is available. Therefore, it is not possible to determine the reductions that have been achieved since the 2005 base year in all of these territories.

Data for the 11 territories can only be compared for the past six years and that data shows declining energy consumption though not at the same scale of NV Energy. Since 2010 there has been a 13.81% reduction in energy consumption in these territories, as shown in the attached spreadsheet entitled Energy in Non-NV Energy Territory State-Owned Buildings. Usage in 2010 was 18.24 million kWh and usage in 2016 was 15.72 million kWh. When the state-owned buildings built in 2016, if any, are enrolled further reductions per square foot will be obtained.

The Governor's Office of Energy (GOE) has projected energy savings through 2020. These savings are primarily based on the anticipated energy savings from historical patterns combined with programs that the GOE is implementing, such as Lucid Design Group's BuildingOS software and Performance Contracting, both expanded upon below. The spreadsheet shows a 23% reduction by the end of 2020 which is realistic since the anticipated reductions are from the programs mentioned in this letter combined with a seven year average growth in square footage of 1.8% annually over a nine year period (2005 to 2014).

Renewable Energy Generated on State-Owned Buildings: In 2010, the state began installing a large number of solar photovoltaic (PV) systems on state-owned buildings and these systems have generated a significant amount of energy. PV systems have been installed at several facilities operated by the Nevada System of Higher Education (UNLV, UNR, DRI, GBC, TMCC, CSN, and WNC), Department of Corrections, Health and Human Services, and Buildings and Grounds. According to information available from NV Energy, in 2010 the state generated 204,183 kWh of energy from the nine PV systems on state-owned buildings. In 2016, that figure has grown to 10,565,044 kWh from 65 systems. These PV systems have also contributed to the energy reductions achieved by the state and are noted on the attached spreadsheets.

***Benchmarking with BuildingOS*:** The GOE is working with Lucid Design Group, Inc. to integrate State-owned buildings into a database and utilize their BuildingOS energy management information software capable of organizing, tracking, benchmarking, analyzing, and reporting all usage and costs related to energy and water consumed and purchased by the State of Nevada. The purpose of the benchmarking program is to provide the State with a tool to achieve the goals set in NRS 701.215 and 701.218 and reduce energy consumption, leading to lower costs for the State of Nevada.

The software includes the electronic transfer, tracking, and sorting of utility bills and energy usage with the assistance of NV Energy (NVE), Southwest Gas (SWG), The Las Vegas Valley Water District (LVVWD), Truckee Meadows Water Authority (TMWA), Carson City Public Works (CCPW) and other utility providers. The software and the monthly, or more frequent data, provided by the utilities will:

- Improve the ability to manage operations, and provide better insight into data trends.
- Access, track, view, and graph monthly energy consumption in a customized manner.
- Produce intuitive and detailed energy use and cost reports and perform energy reporting.
- Automatically interface with the Department of Energy's Energy Star Portfolio Manager

Of the 3,267 buildings which are state-owned, 425 of the largest buildings over 10,000 SF have been enrolled into BuildingOS. Additional buildings with the highest kWh/SF will also be enrolled in 2017 with other buildings added based on needs and requests from other divisions and departments within the state.

Energy Savings Performance Contracting in Public Facilities: As a result of a Department of Energy grant obtained in 2012, the GOE has developed and implemented a program to promote the use of performance contracting projects in state and local government buildings. Under the Performance Contract Audit Assistance Program (PCAAP) program, eligible Nevada Government Entities (Counties, Cities, School Districts, State Colleges, State Universities, State of Nevada agencies) that choose to enter into a Performance Contract for Operating Cost Savings Measures may request monetary assistance from the GOE for the full costs of a Financial-Grade Operational Audit (FGOA), which is the first step in the performance contracting process.

Performance Contracting is an alternative funding source to make operating cost-saving improvements without tapping into the capital budget. The resulting cost savings pays for all project costs over time, normally between 10 to 20 years. Benefits are immediate through the acquisition of expertise from Energy Service Companies (ESCO's), installation of new energy efficiency measures and equipment, the improvement to operations and maintenance and the ability to accomplish projects all at once. The projected savings are guaranteed by the ESCO. This concept is fiscally responsible since there is no increase to the state's bottom line with savings achieved in future years.

SPWD Statewide Energy Efficiency Program: In July 2013, the SPWD was authorized to begin implementation of the Statewide Energy Efficiency Program. Energy savings achieved from the Statewide Energy Efficiency Program and other activities of the SPWD is estimated to be 7,250,000 kWh per year for the full term of the five year program. SPWD has confirmed that portions of this energy savings and the associated reduction in energy bills are reflected in the 2014, 2015 and 2016 data from the Statewide Energy Efficiency Program. It is anticipated that additional energy reductions will be realized in 2017 and 2018 as additional aspects of the approved program near completion of installation.

Nevada Department of Corrections Energy Efficiency Program: The Energy Division within the Nevada Department of Corrections (NDOC) has pursued several programs to reduce energy consumption in their facilities. The information presented below was provided by NDOC staff.

NDOC performs ongoing Energy Audits to insure that all institutions are in compliance with AR493 which is NDOC's Energy Conservation Administrative Regulation. On February 26, 2014, the NDOC approved comprehensive energy conservation regulations that apply to all of their facilities. Some of the primary features of these regulations are summarized below.

1. The NDOC Energy Conservation Coordinator at each facility conducts an annual energy audit and monitors energy consumption. The targeted utilities are natural gas, fuel oil, LP gas, electricity and water. Energy consumption savings since inception of NDOC Energy Program are as follows:

- 12.5% Consumption Savings of kWh
- 17.1% Consumption Savings of Therms
- 5.4% Consumption Savings in gallons of water.

*These savings have been achieved during an increase in inmate population of 4.3%. If the Energy Program had not been in place, NDOC would have not achieved the reduction in Energy Consumption above, and would have spent more money on energy than budgeted.

2. Numerous conservation measures were implemented and include the following: (a) Set all air conditioning space temperatures at 78 degrees Fahrenheit (summer cooling) during daytime hours and 83 degrees Fahrenheit during nighttime hours in inmate cells, staff offices and common areas. (b) Set all heating space temperatures at 68 degrees Fahrenheit (winter heating) during daytime hours and 66 degrees Fahrenheit during nighttime hours in inmate cells, staff offices and common areas. (c) Close blinds and curtains in areas that do not create security risks. (d) Prohibit the use of individual space heaters and cooling units. (e) Reset domestic hot water temperatures to no higher than 120 degrees Fahrenheit. (f) Cold water laundry washing will be standard operating practice.

3. When replacing or purchasing appliances and equipment, energy efficient equipment will be obtained. A summary of the measures to be implemented include: (a) Occupancy sensors will be installed when switches fail. (b) High efficiency motors will be installed when being replaced. (c) Low-flow, tamper-proof water fixtures will be installed when replacing or retrofitting. (d) High efficiency culinary equipment, laundry appliances, water heaters, boilers, air conditioning units, furnaces and light bulbs will be installed when replacing existing equipment. (e) The use of native or adapted plants which require little or no watering will be used. (f) No new turf or lawn areas will be allowed at any NDOC facilities with the exception of farm/dairy use or Director authorized sporting uses. Since the implementation of AR 493 NDOC has installed the following energy savings equipment with savings as noted:

    - Freezer LED Lighting & Motion Sensors — 83% Measured Savings
    - Property Management Thermostats — 11% Measured Savings
    - ICON Water Savings Systems — 54% Measured Savings
    - Time Clocks for Freezers and Warmers — 18% Measured Savings
    - LED Lighting Retrofits — 61% Measured Savings
    - Smart Defrost Kits for Freezers — 27% Measured Savings
    - Wilo Pumps — 41% Measured Savings

4. Operational Procedures have been developed for each facility that meets or exceeds the standards set forth and quarterly reporting will be submitted to the Energy Efficiency Manager. All NDOC Institutions have Operational Procedures in place for compliance with AR493.

The NDOC Energy Manager has researched, selected, and purchased data logging equipment so that NDOC can perform in-house measurement and verification of past and future energy retrofit projects. NDOC is also able to isolate energy using equipment in order to measure the energy usage so that the department can analyze the data and make effective data driven decisions with regard to equipment operations and replacement. The use of this equipment enables NDOC to pinpoint where and when

energy is being used so that an accurate assessment can be made in determining energy project priorities. NDOC uses this equipment on a regular basis to measure before and after readings of energy consumption for the projects we implement and are considering.

NDOC has performed several in house energy savings measures which have not only reduced energy consumption, but have also qualified the department for energy rebates from the NV Energy SureBet program. Finally, NDOC continues to experience 19 to 21 percent fuel savings across institutions as a result of the cold water laundry washing initiative.

Nevada System of Higher Education: NSHE institutions prepare biennial updates for the Board of Regents, reporting progress made toward reducing grid-based energy purchases and energy consumption. These updates also include information on completed and projected energy conservation projects.

UNR reports that its energy conservation efforts resulted in a 12.8 percent reduction in kWh and an 18.8 percent reduction in the cost of electricity purchases between 2005 and 2014. This savings has been achieved through improvements to HVAC systems, roof replacement, lighting and controls retrofitting, and water efficiency. UNR is also designing and constructing LEED certified or equivalent buildings in an effort to maximize energy efficiency and make the most of renewable, sustainable resources. LEED is a tool which helps architects, engineers and clients who are concerned about sustainability to develop a plan to lessen the impact of their building on the environment.

UNLV's Facilities Management has a long history of utilizing technology and improved practices to make the campus as efficient as possible within the limitations of funding and resources. More recently, even newer technologies and metering systems are continually being installed to improve energy efficiency, and both turf reduction and more efficient water projects are being completed to improve water efficiency. All these efforts have resulted in not only reduced energy and water consumption. UNLV has experienced a reduction in electrical and natural gas usage, as well as water use, noting that the FY 2014 expenditures for gas and electrical were equivalent to those incurred in FY 2005, despite a 19 percent increase in the student population and an increase in square footage totaling approximately 900,000 square feet.

Nevada State College's (NSC) campus master plan is centered on the concepts of smart building and sustainable practices. Because the oldest campus-owned building was built to LEED silver in 2007 (as are the two new buildings) the newer technologies provide little room for improved efficiencies. However, NSC still reports a 15.3 percent reduction in energy purchases and a 26 percent decrease in electrical charges between 2009 and 2013. These reductions are attributed to a 206 kW photovoltaic facility that came on line in 2013.

College of Southern Nevada (CSN) is fortunate in that approximately 25 percent of its campus buildings are less than 10 years old and were constructed with energy efficiency in mind. CSN reports that it has achieved a 31.8 percent reduction in electrical costs and a 22.4 percent reduction in gas costs (since 2005) by replacing outdated mechanical equipment and using CIP funds to complete HVAC and lighting remodels.

Great Basin College (GBC) has installed two 50 kW solar arrays – one in Elko and one in Winnemucca. Additionally, GBC recently completed an interior and exterior lighting retrofit, which was eligible for a rebate from NV Energy.

Western Nevada College (WNC) reports a 29.4 percent reduction in electrical usage based on total kWh/sq ft from FY 2005 through FY 2014. Similarly, natural gas usage was reduced by 29.3 percent during the same timeframe.

In 2014, Truckee Meadows Community College (TMCC) took advantage of a free service offered by NV Energy to complete energy benchmarking for its facilities. The study indicated that from July 2009 through July 2014, TMCC reduced its energy consumption by 20 percent per square foot. The report also concluded that TMCC uses approximately 34 percent less energy when compared to similar buildings in similar climate zones, due to its energy reduction and conservation efforts.

DRI has actively pursed energy conservation projects; however, many of these projects were completed prior to the 2005 baseline, so these efforts are not reflected in their progress during the 2005-2015 timeframe. DRI has installed over 2.4 MW of photovoltaic panels, which generate nearly 4 million kW hours per year. These systems are expected to reduce DRI's grid purchased electricity by over 40 percent-double the mandated reduction.

We trust that this letter addresses the general progress that has been made to reduce energy consumption in state-owned buildings over the past year. If you have any questions or if further clarification is needed on any of the information contained in this letter, please contact me.

Respectfully submitted,

Angela Dykema
Director

cc: Rocky Cooper, Legislative Counsel Bureau, Audit Division
Pam Robinson, Governor's Office, Policy Director

Energy in Non-NV Energy Territory State-Owned Buildings[a]

Service Provider	2010	2011	2012	2013	2014	2015	2016
Alamo Power District	65,597	76,715	49,624	50,827	54,233	52,650	51,178
Boulder City Municipal Utility	2,589,748	2,279,382	2,265,031	2,270,532	2,327,792	2,296,134	2,275,698
Caliente Public Utilities	1,389,600	1,293,635	1,216,800	1,269,600	1,288,800	1,130,400	1,191,600
Fallon Municipal Electric	469,697	461,037	434,688	419,817	442,157	436,144	432,262
Harney Electric Cooperative	256,393	272,834	214,932	266,047	217,113	240,174	257,310
Lincoln County Power District	259,800	298,463	268,824	223,638	259,818	256,284	254,004
Mt. Wheeler Power District	9,302,704	9,177,546	8,923,162	7,931,566	7,971,591	7,863,177	7,793,195
Overton Power District	716,984	696,410	667,853	697,121	717,285	692,358	686,196
Pioche Public Utility	489,600	429,696	453,888	470,784	412,544	406,933	403,312
Valley Electric Association	711,211	614,938	559,980	515,041	576,561	568,720	563,658
Wells Rural Electric	1,985,563	1,947,351	1,969,837	2,068,213	1,869,434	1,826,079	1,809,827
TOTAL	**18,236,897**	**17,548,007**	**17,024,619**	**16,183,186**	**16,137,328**	**15,769,054**	**15,718,240**
% Decrease from Prior Year [b]		-3.93%	-3.07%	-5.20%	-0.28%	-2.34%	-0.32%
% Decrease from 2010		-3.78%	-6.65%	-11.26%	-11.51%	-13.53%	-13.81%

[a] These are buildings that are NOT served by NV Energy, which is 7% of all state-owned buildings.

[b] The % decrease is presented for 2010 - 2016 since these are the only years for which complete data is available for all territories.

[c] If in "red" the data is unavailable and the same 1.36% reduction achieved with NV Energy is assumed.

[d] If in "red" the data is unavailable for 2016 and the same 0.89% reduction achieved with NV Energy is assumed.

Source: All of the utility companies listed above.

Energy in NV Energy Territory State-Owned Buildings

				Base	Y-Y
Year	**kWh***	**SF****	**kWh/SF**	**kWh/SF%**	**kWh %**
2005	347,453,279	21,782,607	15.95	n/a	n/a
2006	356,256,287	22,142,318	16.09	0.87%	2.53%
2007	371,910,155	22,705,397	16.38	2.69%	4.39%
2008	375,657,931	23,863,073	15.74	-1.31%	1.01%
2009	376,042,816	24,552,394	15.32	-3.98%	0.10%
2010	369,379,977	25,107,191	14.71	-7.77%	-1.77%
2011	368,184,876	25,201,156	14.61	-8.41%	-0.32%
2012	371,851,494	25,369,222	14.66	-8.11%	1.00%
2013	363,241,705	25,589,555	14.19	-11.01%	-2.32%
2014	357,716,971	25,601,531	13.97	-12.40%	-1.52%
2015	352,843,382	25,601,531	13.78	-13.60%	-1.36%
2016	349,720,313	25,601,531	13.66	-14.36%	-0.89%
2017	346,572,830	26,062,359	13.30	-16.63%	-0.90%
2018	343,453,675	26,531,481	12.95	-18.84%	-0.90%
2019	340,362,592	27,009,048	12.60	-21.00%	-0.90%
2020	337,299,328	27,495,211	12.27	-23.09%	-0.90%

* Provided by NV Energy: Usage Report Dated 10-6-16

** Provided by State Public Works Department (SPWD)

Red = Projections

2016 kWh available through the end of Q3. Projection made as descibed below.

2016 Y-Y kWh % = 7-Yr. Average Loss of 0.89% in kWh (2009-2015)

2017 to 2020 = 0.90% Reduction in kWh & 1.8% Increase in SF