MINUTES OF THE MEETING
OF THE
ASSEMBLY COMMITTEE ON COMMERCE AND LABOR
SUBCOMMITTEE ON ENERGY

Seventy-Ninth Session
February 13, 2017

The Assembly Committee on Commerce and Labor Subcommittee on Energy was called to order by Chair Chris Brooks at 4:01 p.m. on Monday, February 13, 2017, in Room 4100 of the Legislative Building, 401 South Carson Street, Carson City, Nevada. The meeting was videoconferenced to Room 4406 of the Grant Sawyer State Office Building, 555 East Washington Avenue, Las Vegas, Nevada. Copies of the minutes, including the Agenda (Exhibit A), the Attendance Roster (Exhibit B), and other substantive exhibits, are available and on file in the Research Library of the Legislative Counsel Bureau and on the Nevada Legislature's website at www.leg.state.nv.us/App/NELIS/REL/79th2017.

COMMITTEE MEMBERS PRESENT:

Assemblyman Chris Brooks, Chair
Assemblywoman Irene Bustamante Adams, Vice Chair
Assemblyman Paul Anderson
Assemblyman Nelson Araujo
Assemblywoman Maggie Carlton
Assemblywoman Sandra Jauregui
Assemblyman Jim Marchant

COMMITTEE MEMBERS ABSENT:

None

GUEST LEGISLATORS PRESENT:

None

STAFF MEMBERS PRESENT:

Marjorie Paslov Thomas, Committee Policy Analyst
Wil Keane, Committee Counsel
Earlene Miller, Committee Secretary
Olivia Lloyd, Committee Assistant

OTHERS PRESENT:

Rose McKinney-James, Managing Principal, McKinney-James
Robert Johnston, Senior Staff Attorney, Western Resource Advocates
Jennifer Taylor, Executive Director, Clean Energy Project
Tom Polikalas, Nevada Representative, Southwest Energy Efficiency Project
Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council
Jessica Scott, Regional Manager, Interior West, Vote Solar
Bo Balzar, Division Manager, Bombard Renewable Energy, Bombard Electric, LLC
Jon Lutz, Private Citizen, Washoe Valley, Nevada
Terry K. Graves, representing Retail Energy Supply Association
John Friedrich, Senior Campaigner, Climate Parents

Chair Brooks:
[Roll was called. Committee rules and protocol were explained.]

As Assemblywoman Bustamante Adams mentioned last week, the Assembly Committee on Commerce and Labor has spent a substantial amount of time over several sessions discussing changes to our state's energy policy. These changes have had a profound effect on our economy and on the utility bills of our constituents, often affecting those consumers least able to afford increases. This Subcommittee will meet throughout the session. We are tasked with the initial consideration of energy bills that have been referred to the Assembly Committee on Commerce and Labor. We will closely examine the various energy issues before us this session, hold hearings, and make recommendations on measures to the full Assembly Committee on Commerce and Labor.

I believe that any discussion of energy in Nevada must begin with the understanding of the state's overall energy picture, including a review of the major energy policy history and initiatives, defining important energy terminology, and highlighting potential issues that may arise this legislative session. Over the next two weeks, we will also hear from relevant state agencies, utilities operating in Nevada, and background information on existing state policies and programs. This will ensure that each member has a common knowledge of basic energy policies and programs. Today, our presentation will focus on what I like to call Energy 101. Presenting will be Rose McKinney-James, who will provide an overview of Nevada's energy history, policies, and terminology. She will then moderate the overview as several presenters discuss issues, such as the renewable portfolio standard, clean energy policies, energy efficiency, green buildings, and net metering. I would like to welcome all the presenters: Robert Johnston from Western Resource Advocates; Jennifer Taylor from Clean Energy Project; Tom Polikalas from Southwest Energy Efficiency Project; Jeremy Sigmon from the U.S. Green Building Council; Jessica Scott from Vote Solar; and Bo Balzar from Bombard Renewable Energy. Members, please hold your questions until the end of the presentation, as we have set aside some time at the end of the overview. We will follow that with public comment.

Rose McKinney-James, Managing Principal, McKinney-James:
I appreciate the opportunity to provide an overview of the information that will be presented today. More important, I would like to thank Chair Brooks for making time on the agenda and for extending the invitation and providing the Subcommittee with this educational forum. I would also like to extend my thanks to Kyle Davis and a very special thanks to Jennifer Taylor and her colleague Jared Clark with the Clean Energy Project. They were kind enough to help pull so much of the material together for us.

It has been my privilege to work with the Nevada Legislature for more sessions than I will mention. Much of that time has been devoted to working on energy policy. I have done so in a variety of capacities; initially as the commissioner with the Nevada Public Service Commission, which is the predecessor agency to the current Public Utilities Commission of Nevada (PUCN). I believe this Subcommittee will hear directly from the PUCN in a future meeting. Additionally, I was active in my position as Director of the Department of Business and Industry, where I worked on a variety of measures impacting the former state Office of Energy, Office of the Governor, which at the time was housed within the Department of Business and Industry. Finally, I worked as the chief executive officer of the Corporation for Solar Technology and Renewable Resources (CSTRR), a private entity working primarily on matters related to the deployment and commercialization of renewables in the state. Over the course of this work, I have observed a significant chunk of both maturation and evolution of the policy in Nevada. In those days, most of our energy was acquired through long-term contracts and imported resources, primarily coal. Today, Nevada is a very, very different place. I am here today to provide a brief history and overview of the energy landscape in Nevada before I turn it over to my colleagues, who are all experts in their field. I know we have a packed agenda. We appreciate your kind attention and we also look forward to your questions.

In 2017, energy means different things to different people. If you take a look at my brief handout [page 2, (Exhibit C)], there is a definition I found when I was doing my research. I thought this definition was interesting because I never really thought about energy in this way, which is ". . .the ability to do work, work being the transfer of energy from one form to another; what we use to manipulate the world around us; heat, light, mechanical, electrical, chemical, and nuclear."

In addition, our topics will include energy efficiency; transportation; transmission; grid management; economic development and job creation; green buildings; renewable resources to include wind, solar, geothermal, biomass, and small hydro; battery technology; storage; distributive generation; net metering; smart grid; tax abatement incentives; and innovation. These are all related to energy. These topics have a major impact on how our state looks forward to developing energy policy.

Long-term planning for energy consumption is addressed through a process called integrated resource planning. This is housed within the PUCN. Energy use and consumption is measured by load and purpose and may be used to heat, cool, and light buildings. In Nevada, consumption consists of customers of our investor-owned utility, NV Energy, which as some

of you may know, began as two separate entities merged in time. Now, NV Energy is the investor-owned utility we work with. Later this week you will hear from cooperatives, municipal utilities, and general improvement districts.

The Nevada Legislature has a long history related to the development and deployment of renewable energy resources, and we established it as a priority. On this chart [page 3, (Exhibit C)], which is limited to the Southwest, you will see that Nevada is uniquely positioned as it relates to our renewable resources. We obviously use a substantial amount of natural gas. We have no nuclear and the amount of coal we use has decreased over time. In the 1990s, geothermal was the principal renewable resource in the state, and it was significant. In 1995 this body declared our indigenous resources—in other words those resources that are native to our state—should be considered a focus of future development and should support our economic diversification efforts. This established a new focus for energy policy. In 1997 this body acted on that principle by passing a measure that established the first renewable energy portfolio standard, thrusting us into a significant leadership position in the country. This required that the energy mix included renewable resources. You will hear more about that from Mr. Johnston.

Recently, in an effort to reach a broader range of socioeconomic interest, states have initiated discussions around community, or shared, and subscription solar. Frequently, these new measures are designed to promote incremental changes using pilots and demonstration programs as a mechanism. Energy as an industry is capital-intensive, requiring access to financial markets that support daily operations, trading, and investment programs. Access to financial markets requires maintaining an investment-grade credit rating. Financing for these projects requires sophisticated transactions; no renewable energy project can move forward without financing and power purchase agreements, and both are based on the project's ability to secure permits. The Nevada Legislature has acknowledged and addressed this challenge by passing a variety of statutes [page 4, (Exhibit C)].

According to the 2009 annual report coming out of the Office of Energy, Office of the Governor, state officials determined that in their opinion, Nevada had successfully adopted the policies necessary to encourage the development of our renewable energy resources and we saw a pivot to an emphasis on renewable resources. The next critical step in the process was addressing transmission. Access to transmission was a priority and the key to developing the market necessary to support our renewable resources and creating export opportunities. We share a border with California, and we saw that as a viable path for economic development.

Consistent with the agenda before you today, my colleagues are prepared to address a range of these topics that collectively represent most of the key issues that this body has addressed over the past few sessions. We also look ahead to the topics that may surface during this session, and we will attempt to capture the key elements of some of the bill drafts that you have before you and may well be processed by this Subcommittee. We fully recognize that time will not permit a comprehensive review, nor do we think we can cover every important energy issue facing this body, so the presentation is designed to provide you with the basics

and set a foundation for future discussions [page 5, (Exhibit C)]. As Chair Brooks mentioned, we will try to cover all of the key policies, accompanying terminology, and definitions. At the end of the presentation, we will highlight a number of key terms and we plan to distribute a glossary that has been prepared to assist you in your work throughout the session. We welcome your questions and will invite you to direct them to each presenter based on the nature of their presentations. We hope you will consider us a resource for your future inquiries. It is now my pleasure to turn the microphone over to Mr. Robert Johnston.

Chair Brooks:
Before Mr. Johnston speaks, Assemblywoman Bustamante Adams has a question.

Assemblywoman Bustamante Adams:
On page 3 (Exhibit C) regarding the Southwest electricity generation, under nuclear energy, Arizona and California obviously have large numbers. Currently, as far as a repository, what do they do with the nuclear waste?

Rose McKinney-James:
I am far from an expert when it comes to nuclear waste. That is a topic in which the state has a long and strong interest. I absolutely have no idea how they currently deal with their waste. I do know that over time they have been collecting funds to support a final resting place for some of this waste. I would assume at some point there will be additional discussion. The state has a commission that is devoted to addressing that issue on behalf of the state. I am happy to try to get some additional information for you, but it is not a topic in which I have a great deal of experience.

Robert Johnston, Senior Staff Attorney, Western Resource Advocates:
Western Resource Advocates is a regional, nonprofit environmental law and policy organization operating in the interior West, including Nevada. Western Resource Advocates is dedicated to preserving the West's land, air, and water resources. The clean energy program I work on works to transition electricity production away from fossil fuels towards clean, renewable energy and to advance energy efficiency.

This afternoon, I would like to give a high-level overview of Nevada's current renewable portfolio standard (Exhibit D). Nevada's renewable portfolio standard (RPS) requires an electric utility, or other provider of electric service, to generate or acquire renewable energy or save electricity in an amount that is not less than a specified percentage of the total amount of electricity sold by the utility to its retail customers during a calendar year [page 2, (Exhibit D)]. The RPS law provides for establishment of a system of portfolio energy credits (PEC) that may be used by the utility to comply with the standard, with the utility generally entitled to one PEC for each kilowatt-hour of energy generated by a renewable energy system or saved by an energy efficiency measure.

The current RPS for Nevada Power Company and Sierra Pacific Power Company is 20 percent [page 3, (Exhibit D)]. It stays at 20 percent through 2019, then it increases to 22 percent from 2020 through 2024, and then it increases to 25 percent for 2025 and subsequent years. Prior to the passage of Senate Bill 252 of the 77th Session, which was the last legislative action to address the RPS, an electric utility could meet up to 25 percent of its RPS for any compliance year with credits earned from energy efficiency measures. As amended by S.B. 252 of the 77th Session, the 25 percent energy efficiency credit carve-out in the RPS is phased out. It drops to 20 percent from 2015 through 2019, then down to 10 percent from 2020 through 2024, and then it is completely eliminated in 2025 and subsequent years.

This is a chart showing the current RPS [page 4, (Exhibit D)]. The RPS steps up from 20 percent to 25 percent and the chart shows how the ability to use energy efficiency credits phases out as the RPS steps up. The required renewable energy credits are shown in green on the bars. The energy efficient credits are shown in blue. For example, if you look at the left side of the chart from 2016 through 2019, the RPS is 20 percent of retail sales. Of that 20 percent, you can meet 20 percent of that requirement with energy efficiency credits, meaning you can use energy efficiency credits equal to 4 percent of retail sales. The remaining 80 percent of the utilities RPS has to be met using renewable energy credits, meaning there needs to be renewable energy credits equal to at least 16 percent of retail sales. Moving to the right side of the chart, from 2020 through 2024, the RPS increased to 22 percent and the ability to use energy efficiency credits decreases to 10 percent of that 22 percent. The relevant percentages for that time period is an amount equal to 2.2 percent of retail sales using energy efficiency credits, and an amount equal to at least 19.8 percent of retail sales using renewable energy credits. On the right side of the chart for 2025 and subsequent years, there needs to be an amount equal to 25 percent of retail sales using renewable energy credits only.

There are more renewable energy credits than kilowatt-hours of renewable energy [page 5, (Exhibit D)]. The amount of renewable energy portfolio energy credits (PEC) available to an electric utility for renewable portfolio standard (RPS) compliance in a calendar year is not an accurate indicator of the amount of kilowatt-hours of renewable energy generated by that utility during that calendar year. There are three big reasons for the discrepancy. First, the RPS in prior years had a 2.4 multiplier for credits from certain solar photovoltaic (PV) generation. That basically covers rooftop solar or other solar that is on the premises of a customer, more than 50 percent of which was used to satisfy the needs of that customer. For all those PV installations, for every kilowatt-hour of energy production, there were 2.4 energy credits. That practice was stopped for systems that went into operation after January 1, 2016. However, for everything built prior to that time, they continue on into the future to receive that 2.4 multiplier on credits.

Nevada also grants credits for what is called station use or parasitic load from renewable generators. This discrepancy relates primarily to geothermal projects. For example, the geothermal project might, over the course of the year, generate 50,000 megawatt-hours of energy, but they are pretty energy intensive, so 12,000 megawatt-hours of that energy would

never make it off-site. It would be used to pump the geothermal brine and run the operation of that geothermal plant. Under this hypothetical, of the 50,000 megawatt-hours generated by that facility annually, only 38,000 megawatt-hours would make it to the grid. Under Nevada law, that geothermal generator gets renewable credits for the entire 50,000 megawatt-hours of generation.

The third discrepancy I have flagged is the ability to use banked credits from prior years. Under Nevada law, if you over-comply in one year and you have credits you do not need to retire to comply with the RPS, you are allowed to roll those forward. For example, if Nevada Power received 20 million megawatt-hours of retail sales and its RPS was 20 percent of that, or 4 billion PECs, but over the course of that year if they had 4.5 billion PECs, that half-billion of PECs could be carried forward to use in subsequent compliance years.

Nevada's RPS is not currently driving the transition to renewable energy in Nevada [page 6, (Exhibit D)]. Nevada Power Company's RPS compliance outlook from August 2016 shows that it does not require more renewable energy RPS compliance until 2025. Sierra Pacific Power Company's RPS compliance outlook from July 2016 shows that it does not require more renewable energy for RPS compliance until 2021. Those compliance outlooks change with events that occur during the year. Both Sierra Pacific Power Company and Nevada Power Company file annual compliance reports with the PUCN. The annual reports for compliance through 2016 will be filed in April 2017. Those will include updated RPS projections for 2017 through 2020, so we will be seeing numbers in the next couple of months.

This chart [page 7, (Exhibit D)] shows credits eligible for compliance. This information is based off data provided to the PUCN67 by Nevada Power Company in its 2015 RPS compliance report. The chart shows thousands of portfolio energy credits (PECs), or what are referred to as kPECS. One kPEC is generally equal to one megawatt-hour of renewable energy. The stacked bars on the chart show the credits available for compliance by source. The energy efficiency credits for 2015 are shown in blue. The current year renewable energy credits earned are shown in green. The yellow portion of the bar shows the banked renewable energy credits that they started the year with, which were rolled forward from prior years. The purple line shows the RPS compliance. I should mention the data shown in this chart for 2015 is the actual report from 2015; 2016 through 2019 is Nevada Power's projection of compliance as of its report from April 2016. If you look at this chart, any credits for any year that are above that purple line are rolled forward to the next year for compliance. If you look at the far right of the chart, I am showing the renewable portfolio standard (RPS) for each of these years, which is 20 percent. The "RPS Achieved" shows what Nevada Power Company reported for 2015 and what it is projecting to report for 2016 through 2019. For example, if you look at 2015, the RPS was 20 percent. Nevada Power reported it had eligible credits equal to 21.2 percent of its retail sales. If you look at the "Current Renewable" (current renewable energy credits) for 2015, those were equal to 15.1 percent of its retail sales.

This chart [page 8, (Exhibit D)] is the same analysis for Sierra Pacific Power Company, again, based off its 2015 RPS compliance report to the PUCN. As you can see, coming into 2015, Sierra Pacific Power Company had a lot more banked credits from prior years to rely upon. Looking at the right side of the report, the RPS was 20 percent, just like Nevada Power Company. Sierra Pacific Power Company reported that it had credits available equal to 31.3 percent of its retail sales. In effect, it beat its RPS by more than 10 percentage points. If you look at the current renewable energy credits available in 2015, it is actually only 11.9 percent of renewable energy. The rest of that 31.3 percent of retail sales really came from the energy efficiency credits and the banked credits from prior years.

We are turning away now from portfolio energy credits and looking at projected fuel mix [page 9, (Exhibit D)]. This chart shows NV Energy's projected fuel mix from modeling that is Nevada Power Company's preferred plan in an integrated resource plan filing from last summer. This is really joint system energy. When we look at the fuel mix here, we are looking at the combined fuel mix for both Sierra Pacific Power Company and Nevada Power Company—in other words, all of NV Energy, plus their projection of customer generation from rooftop solar, or customer-sided solar. If you look at the tiny sliver of dark blue along the bottom of the chart, that represents hydroelectricity generation from Hoover Dam. Above that is the gray portion of the bar, which represents coal generation. You can see coal winding down and it disappears after 2025 because under this projection, NV Energy is projecting that all of its coal assets will be retired after 2025. The yellow portion shows natural gas generation. The green portion is renewable generation, including customer generation from rooftop solar. The top lighter blue portion shows spot market purchases. This is under the integrated resource plan modeling, which is the basis for this chart. NV Energy was projecting it would take advantage of opportunistic market purchases to buy that percentage of its needs in those years showing.

I would like to direct your attention to the right side of the chart, which shows percentages based on estimates for 2016 from a 2015 integrated resource plan filing. I have not seen actual numbers for 2016, but NV Energy, at that time, was projecting that its fuel mix would be 13.5 percent renewable energy and 73.4 percent natural gas. For 2025, that mix changes under this projection. NV Energy was projecting that they would be at 20.9 percent renewable energy and 71.5 percent natural gas. I would just note that is as of a date where the renewable portfolio standard (RPS) requires that NV Energy's exclusive energy efficiency credits, which have all been phased out, would be 25 percent renewable energy. Again, showing the difference between renewable energy and renewable credits. Under this projection, by 2030 we would hit 25.1 percent renewable energy, but still 63.9 percent dependency on natural gas generation.

This last slide [page 10, (Exhibit D)] shows RPS comparisons. Nevada is not alone in having an RPS. Currently, 29 states plus Washington, D.C., and 3 U.S. territories have renewable standards. Another 8 states and 1 territory have renewable goals, not standards. This last chart compares the 17 states plus Washington, D.C., that currently have an RPS at 20 percent or higher. The bar shows the percentage standard and then for each state the date by which their current RPS requires them to meet that standard. For example, in the case of Oregon,

the chart shows that by 2040, the RPS requires Oregon to meet a 50 percent standard. There is a lot of variation between states as to how those standards are applied, which utilities are covered, how the credits are calculated, what type of generation qualifies as renewable, et cetera. There is not an apples-to-apples comparison across states. You would have to dig into the RPS with respect to all those individual states. However, this does give you a rough idea of how Nevada compares to other RPS states with respect to the current percentage standard we are aiming for and the year by which our standard requires us to achieve that mark.

That concludes my overview of Nevada's renewable portfolio standard. I have passed out some handouts touching briefly on regionalization, but in the interest of time, I think I will forego presenting that information and save that for a later meeting. [Submitted but not discussed are Exhibit E, Exhibit F, Exhibit G, and Exhibit H.]

Jennifer Taylor, Executive Director, Clean Energy Project:
Like the other speakers, I would like to thank you all for providing us with the opportunity to speak and for giving me a chance to speak to you on issues related to the nexus between Nevada's economic opportunities and its energy policies, as well as clean technology innovations that provide additional paths for Nevada to lead the clean energy future.

Clean Energy Project is a 501(c)(3) with deep roots in Nevada's clean technology revolution. We are Nevada's premier advocacy organization to educate civic, community, and business leaders on the importance of smart, forward-looking energy policies that strengthen the state's economy and improve its environment. We are the voice of Nevada's clean energy economy and the small businesses of our state [page 2, (Exhibit I)]. We have nearly 500 businesses that have supported comprehensive clean energy policies, more than 125 local businesses implementing efficiency measures, and we have also had the honor and pleasure to be members of the New Energy Industry Task Force Technical Advisory Committee on Clean Energy Sources, as well as the City of Las Vegas city manager's committee on energy.

I want to highlight the fact that small businesses make up a huge part of our economy here in Nevada. Small businesses employ 49.9 percent of the private workforce, so they are a significant voice in the discussion on energy. In 2011, The Brookings Institution was commissioned to do a study to find out what would be the best sectors for Nevada for furthering economic development and diversification after the recession [page 3, (Exhibit I). There were seven key sectors identified, which I will get to in a moment, but we know that energy was one of them. This goes along with recent documents that have been executed by our Governor that, again, emphasize energy, energy policy, and why it is such an important piece of our economy. One of two key documents the Governor executed last year was the Governors' Accord for a New Energy Future, which was executed in conjunction with 17 other governors from bipartisan states. The key takeaway from that document was that these governors were committing to diversify energy generation, expand clean energy sources, encourage clean energy transportation, and secure a stronger national energy future. The second key document is Nevada's Strategic Planning Framework, which was signed by

the Governor last year as well. This sets the goals and the path for our state from 2016 to 2020. One of the three pieces related to energy was that Nevada would become the nation's leading producer and consumer of clean and renewable energy. The other two pieces had to do with the Governor's announcement of the Nevada Electric Highway, which I will talk about in a moment, and reduction of carbon emissions at or below federal standards.

These eight sectors [page 4, (Exhibit I)] are the key sectors out of the Governor's Office of Economic Development, Office of the Governor. The logos at the top are logos representing a company within that sector that has a renewable energy or a sustainability goal attached to its corporate social responsibility or operations targets. That is a really important thing to remember because as we move forward and want to attract new industry and new companies to the state, we need to make sure our energy policies are aligning with the core goals of these companies.

Nevada leads the nation in geothermal and solar development potential. About 82 percent of our electricity is generated using natural gas or coal, which means despite that economic potential and that resource potential, less than 18 percent of our electricity currently comes from renewable resources. We do not produce natural gas or coal, which means it has to be imported from neighboring states to power our homes and businesses. There is about $600 million annually that leaves the state for fuel importation, and that does not include the fuel we use to power our vehicles.

When you look at these companies, many of them are looking for direct access to clean energy [page 5, (Exhibit I)]. Nevada currently ranks forty-seventh in corporate procurement when that procurement is from non-utilities or self-procurement. Another note on businesses and their demands for clean energy is that 71 percent of Fortune 100 companies and 43 percent of Fortune 500 companies have renewable energy targets, sustainability targets, or both.

I want to share with you a quick article from July discussing Microsoft and some of its goals and efforts to have direct access to renewable energy to power its data centers. Remember, data centers and information technology are core sectors that the Governor's Office of Economic Development is working on for our state's economy and diversification. What the Microsoft energy manager indicated in that article was that he was intent on making sure he had direct access and Microsoft had direct access to renewable energy. He, along with Facebook, Google, and other companies of that sort of new technology sector, would be willing to use their corporate power to leverage policymakers to move in a direction that allowed those companies, if they stayed in those states, to get direct access to renewable energy. That is why this is such an important piece. If we want to attract these companies, we need to make sure that we have the policies that make them want to come to Nevada and/or expand in Nevada.

It is also worth noting that BlackRock, Inc., which is the world's largest asset manager, has indicated that investors really should factor in technologies and policies that look toward climate change and climate change mitigation, which includes renewable energy and

sustainability goals. What BlackRock has found in analyzing companies that have integrated those types of policies into their corporate operations is that when they cut their carbon footprint, they perform better than their peers who do not make such changes.

You have heard a little bit about our potential and where we have been. One place we have been is in a fantastic position for development of utility scale projects [page 6, (Exhibit I)]. I understand next week you will be hearing from some of the regulators, including the Governor's Office of Energy and possibly the Governor's Office of Economic Development, about how their offices work with clean energy. One of the programs the Governor has been able to leverage through his Office of Energy is the tax abatement program, which has provided utility scale projects in the amount of about $6.6 billion in capital investments in our state, with more than 4,300 jobs since 2011. This represents about a 9-to-1 return on the tax abatements and has provided economic benefits through these jobs, as well as the payroll and property taxes.

Here is some additional data on where we are in terms of clean energy development [page 7, (Exhibit I)]. As of 2016, Nevada had installed more than 2,900 megawatts of renewable energy. Some of that goes to power our homes and businesses here in Nevada, but some of it goes to export, which is important because it is a piece of the Governor's economic framework for the state and part of his vision for Nevada. It is something we have in abundance as a resource and it is something that we should be working to export. Hopefully, Mr. Johnston will be able to come back and speak about regionalization and how important that ability is to export to regional markets.

The National Renewable Energy Laboratory has also done some analysis of markets within states and provides a robust estimate of what renewable energy targets in Nevada could provide, which is $5 billion in wages and in excess of more than 92,000 jobs for the state. I also want to mention Frontier Observatory for Research in Geothermal Energy (FORGE), which is a U.S. Department of Energy program that was set out for competition between a number of states. Nevada has now become one of two finalists, along with Utah, to host a federal laboratory to develop the next generation of geothermal energy technology. This team includes Reno-based Ormat Technologies, Inc., as one of the finalists. The FORGE team shares $29 million in seed money over several years to fully equip, test, and certify their underground labs for the competitive third phase of the FORGE effort, after which one of those sites will be chosen as the final FORGE headquarters. The goal is to develop enhanced geothermal systems capable of producing more than 100 gigawatts of renewable energy generating capacity. Nevada, while it has the greatest development potential for geothermal, ranks second for production behind California. What is great about FORGE is that while it is not necessarily producing geothermal energy to go onto a grid, it does provide additional benefits of having secondary education optics and a profile for the University of Nevada, Reno (UNR), which is also part of the FORGE team.

I have a hodgepodge of things to talk about. In addition to the economic benefits and making sure we are emphasizing policies that mirror the core values of corporations, I am also going to talk briefly about the Energy Choice Initiative, which was State Question No. 3 on the 2016 ballot [page 8, (Exhibit I)]. What the Energy Choice Initiative would do is amend the *Nevada Constitution* to require electricity markets be open and competitive and prohibit the grant of monopolies for the generation of electricity. This measure passed with 72 percent support, which was the highest margin for a ballot measure in Nevada's history. While the initiative gives the Legislature until 2023 to establish an open retail market, it does not preclude any work being done on the market structure prior to that. This is something that could be addressed in the 2017 Legislative Session. It was just announced today that the Governor's executive order has been issued and the Committee on Energy Choice will be chaired by Lieutenant Governor Mark Hutchison. Members of the Legislature will be members of that committee as well.

One of the important things to remember about the Energy Choice Initiative is that it has a specific provision, section 1, subsection 3, paragraph (c), in the language which says that nothing in this initiative will invalidate Nevada's public policies on renewable energy, energy efficiency, or environmental protection, or limit this Legislature's ability to impose such policies on participants in a competitive electricity market. Regardless of what happens with this market, if the Legislature were to adopt different renewable portfolio standards, entrance into our market could be subject to those requirements even though they came before the market was fully set up.

Finally, it is worth noting that having a choice in our generation means that it is going to be more important than ever to ensure we have a stable, experienced utility to manage the grid in a reliable and modernized way that can accept some of the disruptive technologies that are coming online and providing either energy or storage or both.

Another policy you will be looking at is integrated resource planning [page 9, (Exhibit I)]. Integrated resource planning is, as Ms. McKinney-James noted, something that happens at the PUCN and is a method by which our regulators can assist the utility with forecasting its energy needs over several decades. It happens every three years; individually for Sierra Pacific Power Company in the north and a separate docket for NV Energy.

During the New Energy Industry Task Force, one of the first things we did on the Technical Advisory Committee was have Anne-Marie Cuneo, Director of Regulatory Operations at the Public Utilities Commission of Nevada, come in and talk about energy statutes and energy policies. One of the things she talked about was the prioritization of different issues for them to analyze and determine what were the best energy sources for that resource plan. She indicated there were some concerns where she could consider things like environmental issues, jobs, and economic opportunities in the state, there had not been a definitive determination or directive from the Legislature as to what the prioritization of those external factors should be, in part because the statute governing it said the PUCN may consider this. The Legislature did not direct the PUCN that they absolutely had to consider these different factors. The recommendation of the task force was simply "may" be changed to "shall" so

those factors need to be considered when doing long-term planning. Additionally, in an abundance of transparency, the task force requested there be a larger, more open public period of comment and involvement in that planning. That is also part of what has now become Senate Bill 65 from the Governor's Office of Energy. Having this directive is another way to let the PUCN look at clean energy and the externalities that come along with clean energy resource development.

Another new and clean technology is electric vehicles [page 10, (Exhibit I)]. Everyone is very excited about electric vehicles. There were long lines when Tesla's Model 3 first launched and people could place a down payment on an upcoming car. Everyone was excited about it. Because this is a newer technology, Nevada does not really have policies developed to govern how we address electric vehicles and a number of the pieces that go along with that. Currently, in all of Nevada we have 2,761 battery electric vehicles, at least through October 2016, such as the Nissan Leaf and Teslas, as well as plug-in hybrid electric vehicles such as the Chevrolet Volt. That gives you a framework of where we are relative to other states. Nationally, those two types of technologies in transportation make up about 0.7 percent of an entire state's fleet. In California, it is about 3.04 percent of the entire state fleet. In Nevada, we lag behind that national average at 0.46 percent of the market share.

As I mentioned earlier, integration and development of the market for the electric vehicles is one of the key sections in the Governor's Strategic Planning Framework. That is something he has highlighted through programs such as the Nevada Electric Highway and his corridor tristate compact with Colorado and Utah in order to establish highway connections on our interstates.

One of the things to think about in terms of electric vehicle market opportunities is that, like many of these clean energy resources, it can provide economic benefits, health benefits, and it can continue to work in alignment with goals from both the Governor's Office of Economic Development and his Office of Energy.

This slide [page 11, (Exhibit I)] shows a map of the proposed Nevada Electric Highway and it is part of the Governor's "New Nevada." There are currently charging stations in Beatty and Fallon. Initially, this was a joint venture with NV Energy and now, as the Nevada Electric Highway has expanded further on Highway 95 and onto additional highways past Highway 95, the Department of Transportation is included in the partnership as well. The next two charging stations will be in Hawthorne and Tonopah. When you have an opportunity with the Governor's Office of Energy next week, you may be able to get additional updates from their director.

One piece of the market that will help invigorate the electric vehicle market will be determining how we build infrastructure for long-dwelling charging [page 12, (Exhibit I)]. This would include opportunities in low-income areas and multi-family residential areas.

I would like to go back to the previous slide [page 11, (Exhibit I)], which also mentions the Volkswagen settlement [In re *Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation*, Case No. 3:15-md-02672-CRB]. Everyone knows about the Volkswagen scandal and as part of dealing with those emissions issues, there was a settlement put in place that would provide states the opportunity to receive funds to mitigate air quality issues that had been exacerbated by the fact that Volkswagen was admitting to far greater amounts of pollutants than it had been disclosing. There are two pieces of the Volkswagen settlement that matter. There is Appendix D, which is the mitigation trust fund monies of about $25 million, which is to be used for those mitigation efforts in terms of transforming markets, replacing outdated technologies, and making sure large emission sources could be mitigated with those funds. It is a public-benefit set of funds. Of that, 15 percent is going to be dedicated to further infrastructure on the electric highways. The reason I wanted to go back to the previous slide is because when we look at long-dwelling charging opportunities, the second piece of the Volkswagen settlement is Appendix C, which is another several million dollars to build out zero-emission vehicle infrastructure and to work on education and outreach around the benefits of zero-emission vehicles. Nevada has submitted a proposal to Electrify America, which is the administrator in charge of that set of funds under Appendix C.

The last technology I want to talk about is energy storage [page 13, (Exhibit I)]. It is really an old concept with a new focus. The slide shows a picture of Lake Mead, which is storage. Storage is something that has been around in a way to make sure folks can have access to energy, and there are many different applications for it. What has really driven the discussion around storage now is the fact that it can handle storing and redeploying renewable energy. This is a video (Exhibit J) which shows an island that had been functioning solely on imported diesel for energy. It shows the solar field that was put up by SolarCity. That solar field, in conjunction with Tesla Powerpacks, allows this island to now function solely on solar energy. They no longer have the burden of having to import diesel, and they have their own energy security within their island.

This is the kind of opportunity that storage can provide, and this is the sort of opportunity we think of now when we talk about storage [page 15, (Exhibit I)]. The Tesla Gigafactory is really what we think of when we think of storage today. Lithium-ion batteries are the trending technology in storage, although there are other types of storage, such as hydro pumps and flywheels. There has been a drastic decrease in costs for storage through lithium-ion batteries, similar to what we saw with solar energy's drastic decreases over the past ten years. There has been about an 80 percent decrease in the cost of solar. We are seeing the same sort of thing with lithium-ion storage. Grid application storage has fallen from about $1,000 per kilowatt in 2010 to less than $500 per kilowatt today due to manufacturing, gradual technology improvement, and product standardization. There will probably be opportunities to talk about storage as you move forward, but this is just a very basic piece of it.

With our regulators, the PUCN has a docket on storage. They also have a docket on electric vehicles that may provide some opportunities to get some guidance from the experts in the

regulatory bodies. One of the things they are looking at with the electric vehicle docket, and is an important piece to look at in terms of accelerating the market, is defining what constitutes a seller of electricity. Does someone who just has a charging station at a convenience store constitute a seller of electricity who would need to be regulated by the PUCN? It is similar with storage, both at the state level and the federal level, trying to determine what actually constitutes storage and how it is defined. Storage and electric vehicles really work together, and that is something else to think about as you move forward with work on these two technologies.

Thank you for your time and I would be happy to answer any questions.

Assemblywoman Bustamante Adams:
At a later time, I would be interested in the information about your small businesses and energy efficiencies [page 2, (Exhibit I)]. Also, regarding the renewable energy investment and our competition with Utah, when will the finalist be awarded by the Frontier Observatory for Research in Geothermal Energy?

Jennifer Taylor:
I think it is a couple of years down the road. They are working on resource and development options so the two states can be judged and the finalist chosen. Please let me know what kind of information you would like on the small businesses and I would be happy to provide it to you.

Rose McKinney-James:
I would like to move our conversation around to energy efficiency. We call energy efficiency the third leg of the stool when we talk about what is important regarding energy policy. I would like to turn the microphone over to Tom Polikalas.

Tom Polikalas, Nevada Representative, Southwest Energy Efficiency Project:
It is an honor and a privilege to be here to speak on energy efficiency and its benefits for Nevada. I have been the Nevada representative for the Southwest Energy Efficiency Project for the past three years. Prior to that, I worked for consumer-owned electric companies for about 15 years. During former Governor Miller's administration, I worked for the Governor's Office of Energy around 1990. I also did some work for the National Energy Management Institute. When I was a graduate student at UNR, I had the chance to do some work under Jon Wellinghoff, our first consumer advocate. This past year, along with Ms. Taylor, Mr. Johnston, and other folks, I had the opportunity to serve on the Technical Advisory Committee on Clean Energy Sources.

The Southwest Energy Efficiency Project is a nonprofit organization [page 2, (Exhibit K)]. We have worked for the past 15 years to advance energy efficiency in six states with a focus on utilities, buildings, transportation, and industrial programs. One of the benefits of being part of an organization that looks at many state policies is that we have the opportunity to see things at a 30,000-foot view and compare policies to see what is working in various states.

We offer them up as ideas and do an information exchange. With that, we can identify some of the best practices in each state.

Energy efficiency is defined as a more productive use of energy made possible by superior technologies [page 3, (Exhibit K)]. It does not mean freezing to death in the dark. We are using less electricity with light-emitting diodes (LEDs) that can produce light equal to or better in quality than incandescent bulbs. We have better insulated and sealed homes and higher efficiency air conditioners and heat pumps. Today, through technology, which often works, we have Wi-Fi-enabled thermostats so people can adjust their thermostat 15 minutes before getting home, saving energy and money. Energy efficiency is not a silver bullet; rather, it is silver buckshot that can help stimulate the Nevada economy.

This slide [page 4, (Exhibit K)] has been described by previous speakers. In our integrated resource planning, we are taking a look at powering Nevada's sustainable economic development. We want to use the least costly resource that is available. We do not want to spend money that we do not need to. We want to be as economical and frugal as possible, looking for the resource that can help power our economy. That is identified as energy efficiency. It is the least costly, least risky, and cleanest energy resource we have available that can be deployed very quickly. As we will illustrate, and as your handouts indicate, we could save Nevada's consumers literally billions of dollars over time.

We are building on success [page 5, (Exhibit K)]. There have been tremendous programs offered through our utilities, as well as the electric cooperatives and other entities across the state, Southwest Gas Corporation included. However, when we take a look at electricity, we were using 8 percent less in 2016 as a result of the excellent programs offered by NV Energy and the cooperatives. The demand side management (DSM) is efficiency. When we get into the discussion about whether it is cheaper to save energy–which is DSM or energy efficiency–or to produce energy, that is really the fundamental discussion as we move forward at the policy level here at the legislature and at the PUCN.

One thing that is not as evident to many folks is that we already have in place a manufacturing economy that is tied to energy efficiency [page 6, (Exhibit K)]. We have all heard about Tesla, but not many people have heard we have insulation manufacturing east of Reno in Fernley. We have the Johns Manville plant that employs about 30 people. There is another insulation plant called Rmax that is about the same scale as Johns Manville. There is also a new high-efficiency window manufacturer in Reno. There is a company called ElectraTherm, Inc., which was recently acquired by a multinational company, that produces electricity from waste heat, which is an efficient use of that heat. In Sparks, there is a company called Sunvelope Solar, Inc. which manufactures solar hot water systems. We already have a burgeoning industry within the manufacturing sector.

When we think of energy efficiency in general and how we create jobs, it is really tied to the construction trades [page 7, (Exhibit K)], whether that be insulating, caulking, installing a high-efficiency air conditioner or heat pump, or trading out windows. It is a skillset that Nevadans have and a skillset we can deploy fairly quickly.

This slide [page 8, (Exhibit K)] reiterates that there is tremendous job opportunity within the energy efficiency realm. On the handout provided (Exhibit L) it indicates we already have over 15,000 jobs tied to energy efficiency in Nevada. Many of those are scattered throughout the state in heating, ventilation, air conditioning, plumbing, and a number of others in manufacturing. It is a very healthy industry, and one we can encourage and expand fairly quickly.

Some of the benefits we have talked about in the integrated resource planning process and the opportunity of valuing other factors in addition to the price of electricity, we can count to energy efficiency's scorecard, which includes water savings and the reduction of emissions [page 9, (Exhibit K)]. That is something that is derived from the monetary and economic savings associated with saving power. If you take a look at the various statistics on the slide, we are saving 400 million gallons of water a year as a result of NV Energy's efficiency programs already in place. We have also reduced carbon emissions and other pollutants by a substantial amount.

There is a road to tremendous savings [page 10, (Exhibit K)]. You have in your package a Nevada Highlights sheet titled "The $20 Billion Bonanza" (Exhibit M). That particular road map going to Nevada indicates that consumers, over a ten-year period, could save $3.4 billion in costs by deploying best practices energy efficiency programs already in place in other states. It does not take new research and development or new manufacturing; it is simply deploying the best technologies that are available using the best utility practices across the Southwest and many other places in the country.

Now that we know where the road map is taking us, there is an opportunity ahead. As we look to the past in the rearview mirror, we can take a look at how we got here [page 11, (Exhibit K)]. NV Energy's efficiency programs did ramp up substantially after legislation allowed the utility to receive credits towards the renewable portfolio standards, as Mr. Johnston described in detail. Then we saw a bit of a decline as a result of the Great Recession. I will show a slide that shows the trend line, but definitely the Great Recession impacted energy efficiency and the spending the utilities were putting forward to help consumers save energy and money. Beginning in 2014, we have seen a rebound with the economic recovery. NV Energy has moved forward and has actually tried to expand to an even greater extent some energy efficiency programs. Recently, the high-efficiency lighting program was discontinued by the PUCN in 2015. The new commission is examining that, so we are hopeful of getting high-efficiency lighting back in play as part of the portfolio programs available to NV Energy.

This chart [page 12, (Exhibit K)] shows how much, as a percentage of sales, NV Energy has been saving its consumers over time. Going back to the early heyday, NV Energy was actually the leading utility across the Southwest states. With the Great Recession, they began to decline in terms of savings as compared to sales. As some of the nonprofit analytic groups evaluate states across the nation in terms of where they are in energy efficiency, Nevada did slide [page 13, (Exhibit K)]. We were down to thirty-seventh in the last survey. This is where I would like to insert whatever your favorite Super Bowl analogy would be in terms of

an opportunity to come back from behind. We are thirty-seventh now, but there is definitely an interest in energy in general, so this is the opportunity to really try to get back on top to save consumers more energy and money.

This slide [page 14, (Exhibit K)] shows the trend line. The orange line reiterates that NV Energy was the leader of the pack in the 2008-2009 time frame and is now coming back up. Those are the seven largest utilities in the Southwest. NV Energy is on the upswing, and we would certainly like to see that continue in the future.

How do we get there? One of the discussions that took place at the New Energy Industry Task Force proceedings was to give a greater priority to energy efficiency in integrated resource planning [page 15, (Exhibit K)]. A second concept was to adopt a fairer and more favorable comparison of energy efficiency compared to supply site options. That is something you may be hearing about soon. There is also the opportunity, kind of like the renewable portfolio standard, to either set a savings goal or a savings standard, and also the possibility of incentivizing the utilities so that if NV Energy exceeds a savings target, it would receive a financial reward for helping customers save money and energy. The last point on discussion is to also help low-income Nevadans have some programs available to help them, as low-income Nevadans are spending a lot more on a percentage basis than most Nevadans. Sometimes it is as high as four times the amount because they are living in less-efficient homes and apartments. They have a much higher percentage of their income going toward energy.

The synopsis of my presentation is that I would like to help you and all Nevadans save energy, save money, and then spend those savings in our local economy, generating additional jobs and economic development. That is the high-level view of energy efficiency and, over time, I will go into a lot more detail. I would be delighted to meet with any of you individually to plunge into additional details.

Rose McKinney-James:
Our next presenter is Jeremy Sigmon with the U.S. Green Building Council. Green buildings obviously play a key role, and historically have, in our energy policy. We are delighted to have Mr. Sigmon, who has come all the way from Washington, D.C.

Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council:
It is difficult to see on the first slide [page 1, (Exhibit N)], but Jeneane Harter is the Director of U.S. Green Building Council, Nevada Community. She apologizes that she is not able to be here today. Despite our name as the U.S. Green Building Council (USGBC), many of you may not know that the sustainability design standards are only a piece of the work that we do now. We also work within performance measurements within real estate portfolios, municipal utilities, landscapes, neighborhoods, and even cities. Buildings remain the majority of the work we do, but we are expanding the horizon of who the USGBC is in your minds.

The buildings component is the biggest piece of the work we do at the USGBC. In 24 years, the USGBC has become the drive train of what is now a $300 billion industry annually across the United States, employing approximately 3 million Americans. That includes the construction industry that is touching green construction. The USGBCs Leadership in Energy and Environmental Design (LEED) program across the country accounts for about one-third of that activity. Here in Nevada, that percentage is actually a little higher, more like 50 percent. Green construction here in Nevada is pretty big business, especially in southern Nevada. But we can always do better.

Our research estimates that from 2015 to 2018, green construction in Nevada accounts for a cumulative $17 billion in state gross domestic product, and supports 200,000 jobs, and that accounts for approximately $12 billion in labor earnings over the same period. In three of the five years since the USGBC began counting, Nevada has ranked among the top ten states for LEED project activity, including just this past year when nearly 6.5 million square feet of LEED certified space was added. That adds up to a grand cumulative total here in Nevada of 326 million square feet. For those of you who are having a hard time visualizing what that is, it is about 120 Empire State Buildings worth of real estate that has been certified. We are proud of that commitment, but we know we can do more here in the state.

Who is USGBC? We are a diverse community of industry actors who are engaged in this fast-growing market [page 2, (Exhibit N)]. As you can see, we generally do three things [page 3, (Exhibit N)]. We set standards for what defines leadership. In particular, what we do is simplify all of the amazing amounts of information you have already heard today and will continue to hear. Our job is to simplify that for you. We then educate the industry and consumers on how to meet those standards, and we celebrate them when they do. Next week, USGBC Nevada will be hosting a tour of the new southern offices of the Nevada Supreme Court in Las Vegas, which is expected to earn LEED Gold Certification, and might be the first LEED Gold Certified courthouse in the country. We look forward to that announcement.

Jeneane Harter runs USGBC Nevada, which is our statewide community. It is made up of business leaders and individuals who are engaged in better, greener real estate here in Nevada. Among them are companies like Caesars Entertainment Corporation, Colliers International, Levi Strauss & Co., and public sector leaders like the University of Nevada, Las Vegas (UNLV) and the City of Reno. Actually, the cochair of our board of directors of USGBC Nevada, Lynne Barker, is here with us this afternoon. The cities here in Nevada have been doing a great job in their leadership roles as well.

From an energy perspective, green buildings are required to meet rigorous energy standards. Rewards are built into green building frameworks to then accelerate the adoption of beyond minimum efficiencies within those buildings. Some colleagues, partners, and I have analyzed 9,000 LEED-certified buildings between 2007 and 2013. We discovered the average LEED project beats the referenced energy standard by 29 percent. We are finding that energy efficiency is a standard outcome that comes from LEED-certified buildings, which is exciting.

By and large, however, green buildings are driven by market forces in competitive real estate environments. Building developers, like all of us, are looking for ways to compete with their peers. Energy savings, of course, matter, but energy savings alone do not drive investment in green buildings, especially in states like Nevada where, as you know, electricity is relatively cheap. Importantly, green buildings have to make sense on the bottom line. Green buildings lease out more quickly; they have a lower tenant turnover; they rent and sell for more; and at the end of the day, they are just better assets that have better value. Businesses across the world are also responding to demands from consumers, perspective employees, shareholders, investors, and policymakers for buildings that are comfortable, responsible, and save energy, water, and money. These are hospitals, universities, factories, offices, homes, stadiums, restaurants, and just about any building you could imagine.

I think you may have all noticed, but it is a beautiful day, and I bet we all wish we were outside. The average American spends about 90 percent of his or her time indoors. It is really not surprising that most of our energy use comes from buildings. Buildings are a major piece of the opportunity that we have here in Nevada to address our energy future.

Green buildings look well beyond the direct energy impacts of how much energy is consumed in that building over time. Using a more holistic approach to building design, construction, and operations, green building frameworks are slashing impacts across all of these areas. For example, in transportation, green buildings reward connectivity to the community. Mobility options help reduce vehicles miles traveled and promote low-energy transportation options. With water, for example, there is a huge amount of energy in the water we produce, develop, convey, process, heat, treat, and discharge. If we can save water, which green buildings do, we can save a lot of energy.

From a materials perspective, green buildings reduce construction waste and the hauling that is associated with it. Green buildings reward the use of building materials with a lower energy footprint, especially those that are produced and manufactured locally. Green buildings also reward more efficient and sustainable purchasing practices. From the human side, green buildings are really designed for the occupants. The design of a green building is often about making healthier and more productive spaces so that businesses through and through are finding they get higher quantity and quality work per unit of energy in that building, if you want to think about it as an engineering equation.

Energy is an interconnected resource throughout all of our daily lives. We recognize this interconnected nature of energy is a reason why we need to think in an interconnected fashion about how we can design solutions. After 17 years of LEED, we are now into a new phase of green building where we are continuing to set design standards, but we are also into serious efforts around performance measurement. You cannot manage what you do not measure. That is a major focus of what we are doing right now.

Through green buildings, we can flexibly deploy a set of solutions that support Nevada's energy infrastructure. For example, green buildings facilitate grid-supporting solutions, such as distributed generation, green power purchasing, demand response and stability, and

resilience in times of disruption. Green buildings can facilitate mobility solutions such as walkability, providing charging stations, and priority parking infrastructure for electric vehicles. Green buildings can drive demand and supply of low-energy technologies, materials, and methods up and down the supply chain. And of course, green buildings can use energy more efficiently and wisely.

Across the country, states like Nevada are leveraging the power of green buildings to address a number of goals. These typically fall into three buckets. The first is government leadership by example, so building green or funding green buildings. The second is things that state funds touch, like state universities, public schools, or affordable housing. States are setting incentives for the private sector to meet those leadership standards and helping to establish creative financing solutions such as property-assessed clean energy or so-called green banks, something I know will be discussed in this Committee. The third bucket is regulations that will require certain buildings to match a new elevated expectation for what buildings really should be.

I will close by saying the USGBC and USGBC Nevada are here to support you and the work you are doing this very busy session. We urge you to consider how green buildings can be a central piece of any solution you develop.

Chair Brooks:
Are there any state legislatures anywhere in the country that are LEED-certified for public buildings?

Jeremy Sigmon:
Yes, there are quite a few. I do not have a list with me, but I would love to get back with you on that.

Rose McKinney-James:
We are going to move over to Jessica Scott who is with Vote Solar to provide an overview of some key concepts related to solar. We will close with Mr. Balzar, who will bring forward the glossary.

Jessica Scott, Regional Manager, Interior West, Vote Solar:
Vote Solar is a nonprofit that has spent the past 15 years working on state-level solar policy. I like to preface that we are not a solar company and we are not a trade association. We are just a nonprofit that advocates solar policy.

My first slide discusses net metering [page 2, (Exhibit O)]. There is a lot of talk about net metering, which is a very broad term. What that really means is a solar customer is able to generate energy, and net metering is the amount that is credited back to the customer. The credits can then be used to lower their power bill. This is not a new concept in Nevada. Nevada's original net metering law was put in place in 1997 [*Nevada Revised Statutes* 704.766 through 704.775, inclusive] [page 3, (Exhibit O)]. It was then amended many times over the years. When you hear of people talking about fixing

net metering, what they are doing is referencing the last Public Utilities Commission of Nevada (PUCN) decision. On February 12, 2016, the PUCN affirmed a 2015 decision, which effectively created a separate rate class for solar customers. It increased customer charges for solar customers and then decreased the value of their solar. That is being phased in over 12 years. That is the net metering decision we hear people talk about.

In Nevada, we talk a lot about rooftop solar [page 4, (Exhibit O)]. I want to mention that there are different flavors of solar. In Nevada, we have an impressive amount of utility scale solar. We have had many conversations about rooftop solar. NV Energy is going to be introducing a subscription solar program. However, what is missing from the mix is community solar, which is a new policy for Nevada. The difference with community solar is customers will generally receive an average of a 10 percent reduction on their electric bills. This is a direct benefit that goes to customers. In addition, customers receive a credit on their electric bill and are able to tie their electric consumption to their bill. The credits are seen on the bill. In addition, community solar supports incremental additions of renewable energy, so you are getting more capacity and more jobs associated with that capacity. Typically, there is only about 20 percent of the market that can put solar on a roof. For everyone else, there is really not an option. Some people may be renters, some may have a home that is shaded by another building, some may not have a suitable roof, or some may just have the wrong solar orientation. Community solar provides access to all Nevadans.

How does community solar work? A community solar project is grid-tied and works with the utility [page 5, (Exhibit O)]. Participants in this program can buy one panel or up to 120 percent of their consumption. It is flexible in that people can participate to the level they are comfortable with or that they can afford. Importantly, they get the credit from that project directly to their utility bill.

Community solar is currently in place in 14 states and the District of Columbia, so this is not something new or different [page 6, (Exhibit O)]. This is something we are seeing across the country to provide more solar access.

Here are a couple of examples of what these projects look like [page 7, (Exhibit O)]. In Colorado, the lowest-funded school district in the state participates in community solar, with 100 percent of its electricity needs met by community solar. Community solar is very appealing to schools and municipalities. Frequently, streetlights are the largest line item in a bill, so being able to reduce those energy charges is really in the public interest. The program in Pueblo, Colorado, has 1.1 megawatts that come from nearly 2,000 solar panels. This is over two different solar projects. In the first year, the district is seeing over $35,000 in savings, and over the life of the project, it will be over $2 million.

I am frequently asked where would these projects be and what do they look like. Again, in Colorado [page 8, (Exhibit O)], because they were the first to have community solar gardens, these frequently are ground-mounted projects. They are grid-tied and three-phase transmission lines are required, but they do not have to be ground-mounted. We also see other projects, for instance a historic airplane hangar [page 9, (Exhibit O)] where the

community solar project is on the roof. People may not see it, but they can still participate. An important part of community solar is that it is not just for residential customers. Municipalities and school districts participate, but many businesses actually lease their facility and cannot put solar on the roof of the building, so commercial customers can participate in these projects as well.

This slide [page 10, (Exhibit O)] shows some of the guiding principles. I believe it is important for these projects to be built in such a way that it is flexible so it really meets the needs of the customers. If customers move, it can go with them as long as they are in the service territory. It is important these projects add to the capacity for Nevada, making sure it is providing more access and options to Nevadans.

There are many resources regarding community solar [page 11, (Exhibit O)]. There is an entity we work closely with, the Coalition for Community Solar Access. They have a policy matrix. I did not want to print that out for you because it is a lot of pages. They also have core principles for community solar on their web page. Another resource is Shared Renewables HQ, which has a map of all the existing states and case studies for these existing pieces, including the legislation. It also has a link to the National Renewable Energy Laboratory shared solar report that provides a lot of literature and resources. I would invite you to use Vote Solar as a resource going forward, and I thank you for this opportunity and for your leadership.

Chair Brooks:
Do you know of any community solar projects in Nevada? I am familiar with two: one in a municipality and one in a cooperative. Do you know of any others?

Jessica Scott:
There are no community solar projects for investor-owned utilities, but there are several flavors within municipalities and cooperatives. We are working to get more information on that for you.

Rose McKinney-James:
This is the last presentation from Mr. Balzar with Bombard Electric, LLC.

Bo Balzar, Division Manager, Bombard Renewable Energy, Bombard Electric, LLC:
Bombard Renewable Energy is a division of Bombard Electric, LLC, a Nevada company since 1982 [page 2, (Exhibit P)], that currently employs nearly 500 employees working on renewable energy projects here in Nevada. All projects pay a living wage, with good benefits and health care. I was asked to talk about some energy terms that may be helpful in some of the policies and decisions this Committee will be discussing in the future. I thought I would put it in context between power and energy [page 3, (Exhibit P)]. To me, this is a very important concept in developing energy policy in the state. The term "energy" is typically referred to as power supplied over time and is typically expressed as kilowatt-hours. We have heard a lot of discussions today talking about the renewable portfolio standards

related to kilowatt-hours and what that means. Power is the rate at which energy is transferred, or the capacity for performance. When Ms. McKinney-James talked about the ability to perform work, that would be power.

A kilowatt-hour [page 4, (Exhibit P)] is the basic unit of electrical energy. This is how energy is typically bought and sold. The different stages or levels would be kilowatt-hour to megawatt-hour to gigawatt-hour, each being 1,000 times more than the previous. One way to think about a kilowatt-hour is if you had a one-kilowatt generator, that could provide one kilowatt of power. If it were to operate for one hour, that would provide one kilowatt-hour. If you had something half the size, a 500-watt generator, that operated for two hours, that would still be one kilowatt-hour. The kilowatt-hour is the way electricity is bought and sold and able to be measured.

A couple of other key concepts are related to demand [page 5, (Exhibit P)]. Peak demand is the maximum power used in a given period of time. Peak demand is different than what you may hear related to annual demand. Annual demand is the amount of energy used in one year. For power and peak demand, we are talking about kilowatts or megawatts. For annual demand, we are talking about kilowatt-hours or megawatt-hours over a period of time. To put this in perspective, a typical residential house in Nevada would have a peak demand of nearly 40 kilowatts. Very rarely would it ever achieve or demand that. There is a difference between the north and the south, but a residential house in Nevada would have an annual kilowatt-hour demand somewhere between 10,000 and 20,000 kilowatt-hours.

The grid is obviously a very important part of the electrical system [page 6, (Exhibit P)]. You will probably hear this quite a bit through your discussions, but the grid is basically a matrix of electric transmission and distribution systems. Transmission is the act or process of getting electric energy in bulk from where energy is produced to where it is needed. Distribution is typically referred to as the system of wires, switches, and transformers that serve neighborhoods and businesses. Typically, less than 69,000 volts or 69 kilovolts would be a distribution. You will probably hear a lot about the system. Typically, we are referring to the utility system. Each utility has its own system, but it would be all the actual physical connections within that given domain that operate as a single unit.

We talked earlier about demand management and demand side management [page 7, (Exhibit P)]. This is the ability to encourage customers to use power at different times; energy efficiency, obviously being one of those which would reduce the consumption of energy or reduce the user's annual demand in kilowatt-hours. Other demand side management programs could include load management, which is somewhat influencing the shape and demand for power so that the demand for power comes when supply is available. Load shifting could be another demand side management program where power is moved from peak demand times to off-peak times. A way to think about this might be a homeowner in Las Vegas who has a pool pump. He may operate that pool pump at night when demand is lower instead of operating it in the hot summer afternoon when demand is typically higher.

A couple of other key terms I thought would be helpful relate to rates and tariffs [page 8, (Exhibit P)]. A basic service charge includes charges for generation, transmission, and distribution that all customers must pay to retain electric service. A customer service charge is very similar and is the portion of the customer's bill which remains the same month to month and is not related to how much energy or power is used. Most customers are familiar with the energy charge, which is the amount of money owed by an electric customer and paid to the electric utility for the kilowatt-hours consumed. Again, we are talking about the energy being in kilowatt-hours. For large-scale users, there is a demand charge which is typically related to the power that is demanded over a period of time.

Ms. Scott spoke earlier about net metering and the difference between the energy supplied to the utility and generated by a customer [page 9, (Exhibit P)]. It is very popular to have solar systems as net metered systems in Nevada. There could also be wind-generated systems and some small hydro-generated systems. Another topic is net billing, which is a different approach to net metering. Users are actually given a credit for the energy they generate and provide back to the grid. This is a major difference in what happened in the PUCN ruling in 2016.

Other key terms related to rates and tariffs include a feed-in tariff [page 10, (Exhibit P)]. This would be a policy where renewable energy providers and other energy providers would be offered a tariff or a rate at which they could sell energy back to the utility. More common is what is called a power purchase agreement. This is typically a contract the utility would enter into with a power producer to purchase a specified amount of energy.

I thought it important for the Committee to also understand what time of use means [page 11, (Exhibit P)]. In northern Nevada and southern Nevada, there are different peak demand times of the year. There are two different peaks: one is October through June in the evening from about 5 p.m. to 9 p.m. This is mostly related to heating demands for energy and electricity. There is also a summer demand from about 1 p.m. to 6 p.m. This is related to air conditioners. In southern Nevada, the biggest peak is from June to September from 1 p.m. to 7 p.m. This is primarily related to air conditioners.

Renewable energy [page 12, (Exhibit P)] as defined by *Nevada Revised Statutes* 714.7811 includes different types of solar. Photovoltaics (PV) are solar panels. This is probably one of the most common forms of energy as far as it relates to solar, but there are other forms. Thermal is something used mostly on utility projects. It is a process that generates hot water to produce energy. Passive solar energy is something you would see with green buildings as far as the building design being changed to either take advantage or deflect the heat from the sun.

Other renewable energy systems [page 13, (Exhibit P)] include wind power. Windmills can be either net metered for small systems, such as residential, or for large utility projects. Geothermal power is primarily used for large utility projects where it takes steam tapped from the earth to turn a generator to generate electricity. Hydroelectric power, such as the

Hoover Dam, is a very common and acceptable renewable energy system. Biomass power is basically organic matter that can be converted into energy.

Rose McKinney-James:
We hope we were able to provide you with some basic information. We tried to touch as many of the concepts as we could and the major policies we anticipate this Committee will be required to review and ultimately process. We appreciate the opportunity to do so and we are certainly happy to take any questions you may have at this time.

Chair Brooks:
Are there any questions from the Committee? [There were none.] I would like to thank all of you for talking with us today about some of the issues we most certainly will see over the next 114 days. The glossary provided (Exhibit Q) will be helpful as we navigate the terms and acronyms associated with these industries. Is there any public comment?

Jon Lutz, Private Citizen, Washoe Valley, Nevada:
I was prepared to use only three minutes, but I do not need to. I will take part of a minute to express my appreciation for the opportunity to be in a place that allows me to comment. Also, in order to get it done in three minutes, I really have to get excited and talk fast, which does not effectively communicate my respect for everyone involved, including some of the people I am going to take issue with over the next few moments.

My family is one of many Nevada families involved in the solar controversy with no representation in the public process. We have been intentionally hidden by NV Energy and the Public Utilities Commission of Nevada. We are contractually defined as owner/operators of our own solar arrays by NV Energy under the previous Public Utilities Commission regulation. NV Energy spent a lot of money and called in a lot of favors to hide us because the contracts we have with them easily prove that the claims that precipitated the recent rate structure change are false, and both the utilities and the Public Utilities Commission know it. To debunk the whole program would take me longer than three minutes, so I am only going to hit some high points as examples of what I am talking about.

NV Energy claimed very publicly and loudly that solar users did not pay their fair share for infrastructure and were subsidized by nonsolar customers. Both are false. These ideas are not new and they were mitigated by the previous Public Utilities Commission regulations. Power that my family's systems added to the grid was valued at the retail price—that is called the parity principle—so that the arrangement would remain fair and constant no matter how the rates changed. Before we got our array, NV Energy was given two large concessions so they were not hurt by the deal and not taken advantage of. First, they had the power to limit the size of the array I could buy so that we had to continue buying utility power. We pay for infrastructure like everybody else, and this is imbedded in the kilowatt charge. We got the biggest array that the utility allowed us to have. Last year, with that big array, we had only

two months that we were able to contribute power to the grid for credit. One was for $1.20 and the other was $4.95. One month our bill exceeded $75, which was greater than all of the credits we had earned in the life of our installation. Obviously, these claims that they needed to buy wholesale power and should not trade with us on a parity level were bunk.

Chair Brooks:
Mr. Lutz, I appreciate your passionate testimony, but your three minutes have come and gone. Could you briefly wrap up for me?

Jon Lutz:
The second concession is that we had to give them our green credits and deed them for the life of our array. They are paid not only when we are on the grid, but when we are not on the grid as well. We pay much more than the nonsolar people pay. I have a lot more facts, but I thank you for the opportunity I had.

Chair Brooks:
Mr. Lutz, I appreciate that and I appreciate you participating in this Committee meeting today. If you have written comments, could you please leave those with the Committee staff and we will put those on the record.

Jon Lutz:
You have them (Exhibit R).

Terry K. Graves, representing Retail Energy Supply Association:
Retail Energy Supply Association is an organization that represents 20-plus companies that supply energy in an open-choice market. We are here because of ballot State Question No. 3, which was mentioned previously. We want to offer our support to the Committee because our members do have a lot of experience in open-choice markets, how to form them, and how to supply them when they are completed. I thank you and we stand ready to help if we can.

Chair Brooks:
Thank you, Mr. Graves. I appreciate you making the resources from your clients available to us. That will be very important.

John Friedrich, Senior Campaigner, Climate Parents:
Climate Parents is a group of 90,000 parents, grandparents, and family members here in Nevada and across the country who strongly support clean energy solutions to climate change. Moving from dirty to clean energy and energy efficiency is a huge opportunity for Nevada today, as the speakers said. Clean, homegrown Nevada energy sources keep energy dollars local and keep jobs local rather than sending them to out-of-state corporations. Keep the pollution out and the jobs in. The more clean energy Nevada produces, the healthier will be our air, our kids, and the more economic opportunities they will have as they enter the workforce.

The market throughout the United States and worldwide is clearly moving away from polluting, climate-disrupting fossil fuels to clean, healthy energy sources. There is no downside to going all in on clean energy. The only real question is the degree to which Nevada will lead the way. In that spirit, we urge the Committee and the full Legislature to do as much as possible this session to maximize support for clean energy and energy efficiency. We are especially supportive of increasing the renewable portfolio standards and community solar as an opportunity to provide access to clean energy for all, and energy efficiency programs for low-income consumers. Our kids deserve a clean energy future and I commend this Committee for having this hearing and encourage you to be as bold as possible for the sake of all of our kids and their future.

Assemblywoman Benitez-Thompson joined us in a forum we held a couple of weeks ago. It was a packed audience. Assemblywoman Tolles was also there. People are very excited about what Nevada can do. The comments just kept coming. We want to have a chance to be part of this. We love community solar. We want Nevada to be as bold as we can possibly be given the stakes and given the opportunity. Nevada can really take the lead. Thank you for getting the ball rolling today.

Chair Brooks:
Is there any other public comment? [There was none.] We will have our next meeting on Wednesday and then every Monday and Wednesday from here on out. Our presentation Wednesday will be on utilities. The utilities in the state will tell us about the business of utilities here. Our next session will be about the state agencies and how they pertain to energy. This meeting is adjourned [at 5:52 p.m.].

[Exhibits submitted but not discussed are Exhibit S, Exhibit T, Exhibit U, and Exhibit V.]

RESPECTFULLY SUBMITTED:

_____
Earlene Miller
Recording Secretary

_____
Lori McCleary
Transcribing Secretary

APPROVED BY:

_____
Assemblyman Chris Brooks, Chair

DATE: _____

EXHIBITS

Exhibit A is the Agenda.

Exhibit B is the Attendance Roster.

Exhibit C is a document titled "Introduction to Energy 101," dated February 13, 2017, presented by Rose McKinney-James, Managing Principal, McKinney-James & Associates and Energy Works LLC.

Exhibit D is a copy of a PowerPoint presentation titled "Nevada's Renewable Portfolio Standard," dated February 13, 2017, presented by Robert Johnston, Senior Staff Attorney, Western Resource Advocates.

Exhibit E is a map titled "Western Interconnection Balancing Authorities," submitted by Robert Johnston, Senior Staff Attorney, Western Resource Advocates.

Exhibit F is a map titled "Regional Transmission Organizations," submitted by Robert Johnston, Senior Staff Attorney, Western Resource Advocates.

Exhibit G is a document titled "California ISO EIM FAQ," submitted by Robert Johnston, Senior Staff Attorney, Western Resource Advocates.

Exhibit H is a document titled "California ISO FAQ," submitted by Robert Johnston, Senior Staff Attorney, Western Resource Advocates.

Exhibit I is a copy of a PowerPoint presentation titled "Energy 101: Economy, Electric Vehicles & Storage," presented by Jennifer Taylor, Executive Director, Clean Energy Project.

Exhibit J is a video titled Ta'ū Island, American Samoa, submitted by Jennifer Taylor, Executive Director, Clean Energy Project.

Exhibit K is a copy of a PowerPoint presentation titled "Energy Efficiency in Nevada," dated February 13, 2017, presented by Tom Polikalas, Nevada Representative, Southwest Energy Efficiency Project.

Exhibit L is a document titled "E2 E4 The Future," presented by Tom Polikalas, Nevada Representative, Southwest Energy Efficiency Project.

Exhibit M is a document titled "The $20 Billion Bonanza," presented by Tom Polikalas, Nevada Representative, Southwest Energy Efficiency Project.

Exhibit N is a copy of a PowerPoint presentation titled "U.S. Green Building Council USGBC," presented by Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council.

Exhibit O is a copy of a PowerPoint presentation titled "Solar Policy 101," presented by Jessica Scott, Regional Manager, Vote Solar.

Exhibit P is a copy of a PowerPoint presentation titled "Navigating Nevada's Renewable Energy Landscape," presented by Bo Balzar, Division Manager, Bombard Renewable Energy, Bombard Electric, LLC.

Exhibit Q is a document titled "Nevada Guide to Energy Speak," submitted by Bo Balzar, Division Manager, Bombard Renewable Energy.

Exhibit R is written testimony submitted by Jon Lutz, Private Citizen, Washoe Valley, Nevada.

Exhibit S is a document titled "State energy factsheet: Nevada," dated September 2015, submitted by Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council.

Exhibit T is a policy brief titled "LEED v4: A New Benchmark for Government in High-Performance Green Building," dated May 2016, submitted Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council.

Exhibit U is a document titled "State Market Brief: Nevada," submitted by Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council.

Exhibit V is a press release titled "U.S. Green Building Council Announces Nevada is Sixth State in the Nation for LEED Green Building in 2016," dated January 25, 2017, submitted by Jeremy Sigmon, Director, Technical Policy, U.S. Green Building Council.