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GOVERNOR'S OFFICE OF ENERGY

MINUTES

Technical Working Group on Innovation, Technology, & Renewable Energy

December 5, 2017

Technical Working Group on Innovation, Technology, & Renewable Energy held a public meeting on December 5, 2017 beginning at 1:00 P.M. at the following locations:

CARSON CITY

Legislative Counsel Bureau
401 South Carson Street, Room 3137
Carson City, NV 89701

LAS VEGAS

Grant Sawyer Building
555 East Washington, Rm 4401,
Las Vegas, Nevada 89101

- 1. Call to order and Roll Call:** The meeting was called to order at 1:00 PM by Chair Jennifer Taylor. Chair Taylor thanked all for attending and noted the agenda would be taken out of order. Agenda item No. 1 was opened for roll call and quorum was confirmed.

The following Board Members were present:

Committee Members Present

Jennifer Taylor
Steve Hill
Dana Bennett
Daniel Witt

Committee Members Absent

Adam Kramer

2. **Public Comment and Discussion**

Chair Taylor opened Agenda Item No. 2 and asked if anyone from the public sought to make a comment.

Dr. Sandra Cosgrove, Citizen, provided public comment in Las Vegas. Dr. Cosgrove introduced herself as the President of the League of Women Voters of Nevada and a History Professor at the College of Southern Nevada. These two positions involve interaction with a wide range of voters including many millennials and Generation Zs. Dr. Cosgrove noted these groups unequivocally want sustainable energy, in a variety of options, when it comes into plugging into any kind of grid. The current utility system is viewed as antiquated and inefficient and there is a demand for more choices personally and in the consumer market. As members of these groups register to vote and begin to run for public office, programs like community solar are inevitable. The only variable in this equation is whether we act now to move deliberately towards more sustainable forms of energy generation or whether younger Nevadans take the job into their own hands when they come to power. It's not a matter of if, it's a matter of when.

3. **Approval of October 10, 2017 minutes**

Chair Taylor opened Agenda Item No. 3 and asked if there was a motion to approve the October 10, 2017 meeting minutes. Mr. Daniel Witt made a motion to approve the minutes. This motion was seconded by Ms. Dana Bennett. The motion passed unanimously.

4. **Presentation: Overview of Energy Storage Technology and Status in Markets and Review of Specific Issues to Consider in Integrating Storage Technology under a Potentially Restructured Market in Nevada – Jason Burwen, Policy and Advocacy Director, Energy Storage Association (For Discussion)**

Chair Taylor opened Agenda Item No. 4 and introduced Mr. Jason Burwen, Policy and Advocacy Director, Energy Storage Association.

Mr. Burwen advised the Energy Storage Association (ESA) is the national trade association representing all parts of the value chain of the energy storage industry in the USA. ESA was established over a quarter century ago and its membership includes utilities, independent generators, developers, and power sector stakeholders. ESA engages in state policy and Federal and wholesale markets. Mr. Burwen noted his presentation would provide an overview of storage and trends, flexibility of storage, and barriers to storage and public policy.

Energy storage moves energy over time to precisely the moment when it is most needed. Transmission moves energy across space and storage moves energy across time. There is currently a variety of different technologies that can provide this functionality on to the electric system.

Energy storage is operating currently across the USA in a variety of different technologies and geographies. Older forms of storage have been around for several decades. The newer forms of storage, particularly battery storage, are providing functionality that has been previously unavailable on the electric system. These new storage technologies have different applications they are suited to. Battery storage is the fastest growing type of storage due to rapidly declining costs, the ability to be located on the grid at all levels of interconnection, the capacity to provide multiple services interchangeably, uniquely flexible and expanding performance capabilities, swift deployment, just in time capacity capability, and the reduced likeliness of units becoming stranded.

It is anticipated the market for energy storage will grow significantly. Projections from Greentech Media research indicate installations are expected to be 1.5 Gigawatts annually in the USA by 2020. This is seven times the new installation rates of 2016. Customer sited storage is projected to rise 19% of annual capacity to 50-plus percent of capacity by 2022.

Energy storage is about using electricity exactly when and where it most needed regardless of when it is generated. The three basic values this provides are cost savings to households and businesses, increased reliability and resilience of the grid, and increased integration of clean and distributed energy.

Regarding local capacity, since the storage can reduce local peak demands and increase circuit power quality it can also defer or avoid upgrades to substations and distribution circuits. This can come from storage either sited at the substation or sited at customer premises. In addition to providing this network capacity these assets act as onsite backup. This can have an important resilience value for municipal facilities and critical infrastructure. As containerized storage can be relocated over time there has been some experimentation, particularly by utilities, with reconfigurable grids and effective risk management.

Rates can act as a driver of customer storage. Customers are going to be responding to the rates they are given in making the decision to adopt energy storage. Previous studies have shown customers may be incented to start responding increasingly to things like demand charges. This might make the economic case for storage on its own.

In terms of the barriers to storage in grids, the ESA considers basic things: ensuring actual capture of the full value of energy storage, enabling competition in all grid planning and procurements, and ensuring fair and equal access for storage to the grid and markets.

The key areas to removing barriers in wholesale markets are: ensuring physical access, market access, enabling of multiple use, price signal for flexibility, inclusion in planning processes, and memorialization in tariffs and BPMs explicitly.

Focuses seen in different Regional Transmission Organization Market Designs includes PJM Performance Regulation: fast resources paid multiple of slower resources, reduces overall reserve, CAISO ESDER: framework for distribution storage to provide wholesale services, and CAISO FRACMOO: product for providing ramping services as renewables share increases.

Relevant Federal Energy Regulatory Commission (FERC) Activities which would have an impact on restructured markets include PL17-2 on multiple-use storage, RM16-23 on market participation of energy storage and DER aggregations, and RM17-8 on generator interconnection.

There are key focuses for Nevada as it considers the role of storage in its electric grid and what it means for Nevada to move towards a restructured market or restructured framework. The first key area is the concept of ownership and competitive framework. In a vertically integrated state anything front meter connected to the grid is often owned and operated by the utility. When restructuring occurs, generation is often considered something that should be outside the hands of the wires owner. Therefore, this raises the question whether buyers/owners can operate storage. This is also a competitive framework question. There is no natural monopoly on energy storage therefore it is necessary to explore different business models that work to provide storage costs effectively and competitively. The second key area is resource adequacy and capacity qualification. As storage is energy limited it is necessary to consider how this fits into resource adequacy. In a vertically integrated space the utility planning process usually determinations the requirements for providing effective resources adequacy once this is taken out of the hands of the utility. Other focus areas are interconnection rules and processes, DER provision of grid services, and rate design.

Mr. Daniel Witt requested Mr. Burwen circulate the content of slide 26 to Technical Working Group on Innovation, Technology, & Renewable Energy (TWG). Mr. Burwen confirmed this would be sent post meeting.

Chair Taylor advised one of the items TWG was looking at is potential legal or regulatory changes required under an open market. Chair Taylor noted Mr. Burwen was monitoring certain Public Utilities Commission (PUC) proceedings on storage and asked about some of the key considerations in this area.

Mr. Burwen noted two key considerations. Firstly, the question of where value goes when a move is made from a vertically integrated market to a restructured market. This is reflected in the 2016 report study commissioned by the state of Massachusetts called 'the State of Charge'. This report studied the net benefit of storage deployment in the Massachusetts market. The second consideration is the ownership and competitive framework question. Although this does not require immediate consideration if a move is made to an open restructured market it will be necessary to consider, at least with storage, what can a distribution utility own and operate. It is also important to consider the type of competitive regulatory framework necessary to ensure competitive provision of those solutions. Chair Taylor requested a copy of the Massachusetts 'State of Charge' report be circulated to the TWG. Mr. Burwen confirmed this would be circulated post meeting.

Chair Taylor asked Mr. Burwen to provide an overview of the Maryland incentive as this was a tax incentive bill and Nevada has also operated a successful renewable development tax abatement program. Chair Taylor also requested further information on the New Jersey incentive program. Mr. Burwen advised the Maryland incentive is an income tax credit and will be implemented in 2018. The program provides an income tax credit up to 30% of the installed costs of the unit or per project caps. The program is available to battery storage, thermal storage, and mechanical storage. No state has deployed a state tax credit associated with these assets and therefore the uptake and effectiveness is still to be assessed. New Jersey's program is a resiliency premised program where New Jersey's Board of Public Utilities (BPU) administers a fund that provides grants competitively applied to electric customers wishing to install storage when paired with solar at over 100 kilowatts in size. California and Massachusetts also had incentive programs of note. California's implements a self-generation incentive program which is a dollar per kilowatt installed rebate. Massachusetts 'smart regulations' provides an incentive adder to solar projects for installation of on-site storage with solar. This incentive varies depending according to the size and duration of the co-located storage. There is a different set of programs across the United States and, apart from California, they are all relatively new and outcomes are yet to be assessed.

Chair Taylor asked about larger scale incentive programs as opposed to residential or small commercial. Mr. Burwen noted the only program applying to front of meter installations is the Massachusetts Smart Program. The Program is premised to effectively increase the utilization of solar power.

Chair Taylor asked Mr. Burwen to provide examples of implemented policies that allow storage to interact, or have a contribution, to a Renewable Portfolio Standard (RPS). Mr. Burwen advised a few places in the world had sought to include storage directly in the RPS. South Korea has created a multiplier in its system for storage however this will lower the amount of wind and solar that is procured. USA States, such as Vermont and Massachusetts include storage in their alternative portfolio standards. These are parallel programs which are similarly premised on existing RPS Programs and contain non-conventional assets.

Arizona has raised the idea of a clean peak standard whereby a certain percent of energy delivered to customers during peak load hours must be derived from clean energy sources. This could create an energy storage framework separate from the RPS.

Chair Taylor thanked Mr. Burwen for his time and presentation.

5. Presentation: Overview of Community Solar Programs, Implementation of Community Solar Programs in other Restructured Markets, and Review of Issues to Consider in Integrating Community Solar Programs under a Potentially Restructured Market in Nevada – Marta Tomic, Program Director, Community Solar, Vote Solar (For Discussion)

Chair Taylor opened Agenda Item No. 5 and introduced Ms. Marta Tomic, Program Director, Community Solar, Vote Solar

Ms. Tomic advised her background was in energy and environmental fields with a focus on solar energy development, project management, program management, and policy. Since 2002 Vote Solar has been working to make solar energy a mainstream energy resource across the USA. The Community Solar Director role entails promotion of best practices through education, technical analysis, and leadership across the country.

Ms. Tomic noted her presentation would include an overview of Community Solar and a comparison to other solar offerings, benefits of Community Solar, Community Solar in restructured markets, and key recommendations.

Community Solar refers to locally sited solar facilities shared by multiple community members who receive credits on their electricity bills for their share of the energy produced. The key element of Community Solar, distinguishing it from other offerings such as community choice aggregation and green tariff programs, is that individual subscribers can directly participate in the Community Solar facility and receive the energy or kilowatt hour credits on their electricity bills. Community Solar subscribers maintain the relationship with their electric utility but also create a new relationship with the Community Solar system owner. Product offerings available are upfront payments and ongoing subscription models. Individuals or businesses can choose to pay an upfront fee for their share in a Community Solar facility and receive a return on their investment for that share or pay an ongoing monthly subscription, ideally at a lower rate, to be able to provide tangible economic benefits from their share in the Community Solar facility.

Providing customer focused solutions is a critical element of successful business models and individuals want to select products to best fits their needs and personal preferences. As a result, several different models have emerged providing customers with renewable energy offerings including Community Choice Aggregation (CCA), Green Tariffs Programs (GTP), and Community Solar.

CCA is a program allowing cities and counties to buy and/or generate electricity for residents, businesses and government electricity users. In contrast Community Solar facilities are typically locally sited whereas CCAs typically don't have the same geographic siting restriction. Instead of just replacing the type of energy supplied in a home or business, as with CCA, Community Solar allows individual subscribers to directly participate in the benefits of Community Solar. Customers receive a payback on their investment and new solar resource.

GTPs involve the sale of Renewable Energy Credits (RECs) from a renewable energy facility to individual subscribers. Many GTPs across the country use existing resources which allows for flexible customer terms. However, this also means these programs are not actually adding renewable energy to a particular state. GTPs are a premium product offering in excess of what individuals currently pay for their electricity.

Community Solar is additive to the amount of local renewable energy generated in the state and is intended to maximize benefits to individual subscribers and the local economy. A recent study by the Smart Electric Power Alliance and the Shelton Group indicated locally sited projects are what people want. The study shows the importance of local renewable energy projects compared to those large-scale facilities sited at the transmission level elsewhere in the state or region.

Another market segment is Utility Scale Solar (USS) and Large-Scale Commercial (LSC) Solar. From a demand perspective, USS serves a fundamentally different type of customer than Community Solar. USS projects are designed for a single off-taker and typically sell power directly to utilities. In contrast, Communities Solar projects are designed for multiple off-takers allowing individuals and businesses the opportunity to directly participate in these facilities.

Community Solar is a policy tool to address the 75% of homeowners and businesses underserved by onsite solar solutions. After considering homeownership states with net metering policies, individuals with high enough credit scores, and those with rooftops suitable for solar, there's only approximately 15% of the market that can be served by rooftop solar. In ensuring energy access and the ability for individuals to choose where their energy is sourced, it's imperative to have off site solar solutions to serve the citizens of the state and provide individuals and companies a choice to drive new renewable energy in their community. A recent analysis by the National Renewable Energy Laboratories, found 40% of businesses are unable to host rooftops or systems. This number represents just the technical limitations and does not necessarily address the commercial facilities with leased space or small businesses not deemed credit worthy for standard rooftop financing arrangements.

Benefits of Community Solar include promotion of competition to create low-cost customer focused offerings, expanded access to local renewable energy for entities that cannot install rooftop solar (e.g., homeowners, small businesses, businesses that lease space, commercial and industrial facilities, renters, apartment complexes, local governments), allows subscribers to directly benefit from offsite Community Solar installations, provision of opportunity for customer savings, re-investment in the local economy, driving economic development, and private investment.

Community solar is legislatively enabled in 16 states and the District of Columbia. The key takeaway here is Community Solar is compatible with every market segment whether it's a highly regulated market or a restructured market.

Community Solar facilities are interconnected at the local distribution system. Community Solar system owners are responsible for all maintenance up to the point of interconnection and Project interconnection is governed by a set of safety standards and regulations that apply to all distributed solar energy projects. There are clear rules and regulations for Community Solar project interconnection and queue management.

The key guiding principles of Community Solar are expansion of consumer access, provision of tangible economic benefits, putting consumers first, promoting fair market competition, and complementing existing programs within a particular state. These guiding principles can be applied to any program regardless of whether they are in a vertically integrated market or a restructured market.

Key recommendations when considering implementing Community Solar include creating a statewide community solar program to provide all customer types the opportunity to access solar energy through off-site solar installations, allowing for multiple subscribers to directly benefit from a single off-site solar installation, enabling subscribers to receive a bill credit for

their share of production from an off-site facility, and encouraging competition to create low-cost community solar offerings and expand access to all customer types.

Should Nevada decide to go in the direction of Community Solar, there really is no incompatibility within open markets. Community Solar is a tool to solve the current access issue and a way to help Nevada become the leading producer and consumer of clean renewable energy.

Mr. Witt asked about the merit of a statewide Community Solar program. Ms. Tomic advised a key element is, even in a restructured market, legislation is required to enable these off-site Community Solar facilities and to allocate the generation from these facilities on to individual subscriber's utility bills and allow for these offsite installations. This is not currently permitted in Nevada and had not been permitted in other restructured markets unless there was a policy change. Whether that's a Community Solar program or virtual net metering it achieves the same goal in enabling off-site Solar installations to directly take that generation, apply it to customer's bills and allow multiple subscribers to benefit from a single installation.

Mr. Witt asked in terms of explicit recommendations to the legislature what key items should the TWG consider. Ms. Tomic advised there should be a clear goal of how much Community Solar or capacity is being sought in a particular state. There is model legislation outlining some of these key program design elements. When talking about Community Solar and expanding access to these people that cannot benefit from rooftop solar there are elements of program designed to ensure commercial customers, Non-profit private customers, and residential customers can participate. A single installation can benefit a large array of customers.

Chair Taylor asked in a restructured market particularly Nevada, where the main utility does not plan to be involved in generation, where will these projects be interconnecting to get a credit on the bill. Ms. Tomic advised the interconnection would be at the distribution level.

Chair Taylor asked Ms. Tomic to provide an overview on one of the states she felt had done the best job of implementing Community Solar and has allowed the most opportunities for development. Ms. Tomic noted some of the successful restructured markets are Maryland, New York, and Massachusetts. A key element of these programs is identifying a goal for how much Community Solar there should be. Some states have not capped the amount of Community Solar and have enable Community Solar and off-site installations as a new program offering. Providing a fair bill credit is another critical element. Massachusetts initially started with a full retail rate credit and, with the Smart Program, is going to start including specific adders in incentives for Community Solar facilities. Depending on particular policy goals there are certain states with adders for certain customer types to participate. Other important elements include making sure access is being provided, geographic location of these facilities, and transparency throughout the process.

Chair Taylor asked about examples of CCAs covering Municipalities or Co-ops. Ms. Tomic noted she did not know offhand however, she would be happy to look into this.

Ms. Tomic advised she would be providing, post meeting, a retail electricity flow and diagram showing responsibilities, transactions, the flow of money between power producers, the RTO, electric distribution companies, the retail supplier and Community Solar Facilities and the customer.

Chair Taylor thanked Ms. Tomic for providing a comprehensive overview.

6. Review of Past Presentations to the Technical Working Group – Committee on Energy Choice (CEC) Staff *(For Discussion)*

Chair Taylor opened Agenda Item No. 6 and introduced Mr. Matt Morris, Legislative Director, Nevada Governor's Office.

Mr. Morris advised he would be providing a brief recap of the presentations made to the TWG since it first convened. Recently, Governor's Office of Energy staff reached out to the past presenters and requested they summarize their presentations or draw the committee's attention to the notable slides and points from their presentations.

The TWG has met three times since the Committee on Energy Choice was formed. At the August 9, 2017 meeting presentations were heard from Ms. Maria Robinson, Associate Director, Energy Policy & Analysis, w/ Advanced Energy Economy and Ms. Amanda Levin, Climate & Energy Advocate, Natural Resources Defense Council. Advanced Energy Economy's presentation included RPS and a review of market structures including whether RPS encourages continued development of Nevada's renewable resources. The presentation also identified key decisions required, discussed how RPS comes into play, and how the state encourages forward contracting under a potentially restructured market.

Ms. Levin directed the committee's attention to Slides 11, 12, 14, 15, and 21. Slide 11 illustrates Ms. Levin's point that impacts of RPS on rates have been small and even negative in certain states and rate impacts are expected to remain low as RPS increase due to falling renewable energy costs. Slide 12 illustrates the point that RPS have helped mitigate wholesale power prices and slow rate growth and stated average electricity prices in RPS states have grown at a significantly slower pace than in non RPS states. Slide 14 comprised a timeline showing the history of RPS, in the US, is interconnected with the history of retail choice. Slide 15 provided a summary of the various histories of RPS and when they were established in 14 different restructured states. Slide 21 summarized challenges associated with retail choice, the role of RPS relative to those challenges and stated that customer choice does not by itself guarantee more clean energy, full market access, or innovative customer options.

During the October 10, 2017 meeting presentations were heard from Pat Egan, Senior Vice President of Renewable Energy and Smart Infrastructure, NV Energy, Mr. Anthony Star, Director, Illinois Power Agency (IPA), Mr. Phil Pettingill, Director, Regional Integration, California Independent System Operator (CAISO).

The IPA presentation included a discussion of the structure of the IPA, electricity procurement plans and programs by an independent agency in an open market, and an introduction to IPA's long term renewable resources procurement plan.

The slides selected by CAISO relate to Distributed Energy Resources (DERs) and electrical grid resources. These slides provided an overview of a DERs and discussed the connectivity of DERs Independent System Operations (ISOs), DER participation as a demand response, and facilitating distributed energy resources.

The NV Energy presentation discussed current NV Energy renewable energy programs, energy efficiency demand side management, demand response resources, and specific programs supporting renewable energy storage, electric vehicles and recently approved programs as directed by the 2017 legislature.

The December 5, 2017 presentations included RPS, electric vehicles, energy storage demand side management programs, energy efficiency programs, and community solar under the aggregation programs.

Chair Taylor thanked Mr. Morris, and his staff, for compiling the summarized information.

Ms. Bennett requested Mr. Morris develop a work session document compiling specific recommendations made to the TWG. The document would include recommendations from presentations and TWG members would review, make determinations, and provide input into these. Mr. Morris confirmed this document would be created.

7. Chair's Report *(For Discussion)*

Chair Taylor opened Agenda Item No. 7 and noted this would be taken out of order as it had originally been listed as Agenda Item No. 8. Ed Magaw, District Attorney's Office and Counsel for the meeting, confirmed this was acceptable.

Chair Taylor advised, after the previous Energy Choice full committee meeting, Chair Lt. Governor Hutchinson noted working groups should be starting to compile their recommendations. Chair Taylor proposed, going forward, the TWG meetings be structured to allow for important policy discussions and presentations. At the end of each meeting TWG would discuss recommendations and prioritize items for follow up. To allow for further discussions, a January 16, 2018 meeting would be scheduled in addition to TWG meetings already planned.

8. Committee Discussion on Past Presentations and Approval of Policy Recommendations to the full Committee on Energy Choice *(For Possible Action)*

Chair Taylor opened Agenda Item No. 8 and noted this would be a discussion on the presentations TGW had seen so far. The focus of the discussion would be specific key directives in the executive

order, identifying foundational recommendations and findings, and developing a statement to support these.

Vice Chair Hill asked if the recommendations could be provided in writing so the TWG could review and vote on these. Chair Taylor requested TWG members each submit a list of recommendations, to Mr. Morris, for discussion at the January 16, 2018 TWG meeting. This would provide an initial first draft of topics for the TWG to discuss and vote on.

Mr. Morris confirmed this document would be circulated to TWG Members for their input prior to the January 16, 2018 meeting.

9. Update from Committee on Energy Choice (CEC) staff on the progress of the CEC's request to the PUCN to open an Investigatory Docket (*For Discussion*)

Chair Taylor opened Agenda Item No. 9 and noted Mr. Morris would be providing an update on the progress of the CEC's request to the Public Utilities Commission (PUC) to open an Investigatory Docket.

The Full Committee voted on September 13, 2017 to open the investigatory docket and on September 27, 2017 the Chair forwarded a formal request outlining four key questions for the PUC to cover in its docket. The PUC Opened the investigatory docket on October 2, 2017. The docket is number 17-10001. Mr. Morris advised members interested could subscribe to the docket and receive updates when comments are received. The PUC is accepting comments through December 8, 2017. Through December 29, 2017 there will be a period of reply comments and the first workshop is scheduled for January 8, 2018 at 10:00 am.

10. Public comment and discussion.

Chair Taylor opened Agenda Item No. 10 and asked if anyone from the public sought to make a comment. No public comment was provided.

11. Adjournment. (For Possible Action)

Chair Taylor opened Agenda Item No. 11 and asked for a motion to adjourn the meeting. A motion was made by Vice Chair Hill. This motion was seconded by Mr. Witt. The motion passed unanimously.