Draft
December 1, 2017

Governor's Committee on Energy Choice
Technical Working Group on Generation, Transmission and Delivery
Issue Statements

THIS IS A WORKING DOCUMENT THAT CONTINUES TO BE REVISED AND MODIFIED

A. **Issue:** Energy choice requires resource adequacy, including required reserves, to exist within the wholesale market region at the time Energy choice is implemented (i.e. there must be ample generation in the wholesale market area to meet expected loads in the market region served in order to foster competitive wholesale pricing of that generation). If Nevada elects to join an existing organized wholesale market such as the California Independent System Operator (CALISO) or the Southwest Power Pool (SPP), the wholesale market region is that of the organized wholesale market. If Nevada elects to create its own organized wholesale market, the wholesale market region is that of Nevada.

TWG Findings:

- Currently resource adequacy exists for the CALISO (see presentation by Stacey Crowley, April 26, 2017). Installed generation capacity is reported at 71,740 MW. Nevada native load peak of 7,961 MW occurred in 2016 (native load is only that of NV Energy affiliates and does not include balancing area loads of rural Nevada utilities, municipal utilities, and 704B customers) and would add approximately 11% (excluding reserves) to the CALISO resource requirement. CALISO has processes in place to increase generation and would presumably add generation resources to meet Nevada native load.
- Currently resource adequacy exists for the SPP (see presentation by Carl Monroe and Bruce Rew, August 8, 2017). Installed generation capacity is reported at 50,622 MW. Nevada native load peak of 7,961 MW occurred in 2016 (native load is only that of NV Energy affiliates and does not include balancing area loads of rural Nevada utilities) and would add approximately 16% to the SPP resource requirement. SPP has processes in place to increase generation and would presumably add generation resources to meet Nevada native load.
- Regional resource adequacy is verified by the Federal Energy Regulatory Commission (FERC) in its Winter 2017-18 Energy Market Assessment, Docket No. AD06-3, which states "Electricity capacity is adequate in all regions."
- At a state level, resource adequacy currently does not exist in Nevada and will not exist at the time of Energy Choice implementation in 2023 based on current NV Energy resources and plans (see presentation by Kevin Geraghty, September 13, 2017). By 2020 the shortage in resource adequacy is reported by NV Energy to be 1,178 MW, the equivalent of two large baseload/intermediate generating plants.
- Building out of new generation requires several years to plan, permit, finance and construct. Development of new baseload or intermediate generation resources within Nevada may not be possible within the available time frame. Buildout of new peaking or utility scale renewable resources may be possible in the time frame available.
- The decision on what organized wholesale market Nevada will participate in must be made several years in advance of the effective date of Energy Choice in order to provide time for the organized wholesale market to prepare for and adjust its resource mix for Nevada, or for

Nevada to construct additional generation should Nevada elect to create its own organized wholesale market.

Policy Recommendations:

- Pursuant to the existing authority granted to the Public Utility Commission of Nevada (PUCN) under NRS 703 and the requirement for the regulated utility to submit an integrated resource plan (IRP) to the PUCN every three years established by NRS 704.741, the PUCN should by written notification to the regulated utility issued promptly following approval of this recommendation by the Governor's Committee on Energy Choice, require the regulated utility to identify ways to increase electric energy supply within Nevada through the development of new additional, Nevada located generation in its next IRP filing due to the PUCN on or before June 1, 2018. The request to the regulated utility should specifically ask for inclusion within the supply plan portion of the IRP the identification of all Nevada located generation projects that could be reasonably constructed prior to the required date set for divestiture of generation assets by the regulated utility and with a bus bar generation cost that is equal to or less than that deemed "competitive with the wholesale market" by the PUCN. For each Nevada located generation option, the regulated utility should be requested to provide information on the estimated cost and time frame for implementation, permitting requirements, geographic constraints, and all other information required in NAC 704.9355 to 704.944 inclusive.
- Pursuant to the existing authority granted to the PUCN under NRS 703, the PUCN should establish an investigation to determine bus bar costs that would be deemed "competitive with the wholesale market" on the required date set for divestiture of generation assets by the regulated. Information gathered and analysis prepared by the PUCN should be made available to the regulated utility prior to submission of its next IRP.
- Operators of organized wholesale markets can and do establish operating procedures to create capacity and energy for areas served by the organized wholesale market. However, the PUCN should review these operating procedures and monitor resource adequacy levels for the organized market that is selected to serve consumers located within the service area of the regulated utility.
    - In addition to other amendments recommended herein, amend NRS 703.153 to require the PUCN to analyze the operating procedures of any organized wholesale market serving consumers located within the service area of the regulated utility to determine that the procedures of such market adequately establish and maintain resource adequacy levels appropriate for Nevada; and to further authorize the PUCN to file motions, protests, comments, testimony, requests as appropriate with the operators of the organized wholesale market or FERC to remedy procedures not adequate or appropriate for Nevada.

B. **Issue:** Resource adequacy issues in Nevada will be further exacerbated by generation units or purchased power agreements that are not marketable for various reasons including contract terms, cost of generation or age of generating units. NV Energy currently has approximately 6,011 MW of owned generation and 2,930.5 MW in purchased power agreements (including pre-commercial agreements)

(see presentation by Kevin Geraghty, June 21, 2017). Contract terms are reported as confidential in the October 17, 2017 presentation of NV Energy and not reported on further in this document.

TWG Findings:

- The two primary electric energy trading hubs available for Nevada markets are currently COB and Mead. The trading hubs serve as a proxy as to current competitive wholesale markets in the region. Generation assets held by NV Energy with bus bar costs above these trading hub prices or purchased power agreements (PPAs) with pricing above these hubs may be difficult to liquidate and will further add to Nevada's resource adequacy issues in the short term. Current pricing at Mead follows in the below table. Of the 61 PPAs identified by NV Energy, all but the Kingston, Mill Creek, Newmont, TMWRF, Techren 2, Hoover, Stillwater PV, NPC_SPCC, and Techren 1 PPAs have pricing in excess of the above Mead trading prices.

MEAD

Quote Date 10/13/2017

Forward Month	On Peak (6x16)	Wrap	7X24
Nov-17	$28.207	$23.281	$26.014
Dec-17	$29.105	$25.079	$27.244
Jan-18	$29.406	$26.852	$28.280
Feb-18	$28.939	$25.659	$27.533
Mar-18	$26.944	$23.139	$25.352
Apr-18	$25.268	$20.382	$23.096
May-18	$25.878	$21.455	$23.928
Jun-18	$35.404	$25.712	$31.312
Jul-18	$43.476	$25.919	$35.359
Aug-18	$42.315	$26.075	$35.505
Sep-18	$32.133	$23.894	$28.288
Oct-18	$28.801	$25.005	$27.209
Nov-18	$27.060	$23.228	$25.354

- Of the generation assets owned by NV Energy, its two coal resources - Navajo Generating Station (255 MW) and North Valmy Generating Station (261 MW) - are slated for retirement before or near the effective date of Energy Choice. These retirements will further add to the resource adequacy issues in the short term. Other units which were constructed prior to 1980 and may be difficult to market such as Tracy Unit 3 (1974, 108 MW), Fort Churchill Units 1 and 2 (assuming must run conditions eliminated)(1968, 226 MW), and Clark Unit 4 (1973, 54 MW).

Policy Recommendations:

- Pursuant to the existing authority granted to the Public Utility Commission of Nevada (PUCN) under NRS 703 and the requirement for the regulated utility to submit an integrated resource plan (IRP) to the PUCN every three years established by NRS 704.741, the PUCN should by written notification to the regulated utility issued promptly following approval of this recommendation by the Governor's Committee on Energy Choice, require the regulated utility to identify ways to increase electric energy supply within Nevada through the development of new additional, Nevada located generation in its next IRP filing due to the PUCN on or before June 1, 2018. The request to the regulated utility should specifically ask for inclusion within the supply plan portion of the IRP the identification of all Nevada located generation projects that could be reasonably constructed prior to the required date set for divestiture of generation assets by the regulated utility and with a bus bar generation cost that is equal to or less than that deemed "competitive with the wholesale market" by the PUCN. For each Nevada located generation option, the regulated utility should be requested to provide information on the estimated cost and time frame for implementation, permitting requirements, geographic constraints, and all other information required in NAC 704.9355 to 704.944 inclusive.
- Pursuant to the existing authority granted to the PUCN under NRS 703, the PUCN should establish an investigation to determine bus bar costs that would be deemed "competitive with the wholesale market" on the required date set for divestiture of generation assets by the regulated. Information gathered and analysis prepared by the PUCN should be made available to the regulated utility prior to submission of its next IRP.
- Operators of organized wholesale markets can and do establish operating procedures to create capacity and energy for areas served by the organized wholesale market. However, the PUCN should review these operating procedures and monitor resource adequacy levels for the organized market that is selected to serve consumers located within the service area of the regulated utility.
    - In addition to other amendments recommended herein, amend NRS 703.153 to require the PUCN to analyze the operating procedures of any organized wholesale market serving consumers located within the service area of the regulated utility to determine that the procedures of such market adequately establish and maintain resource adequacy levels appropriate for Nevada; and to further authorize the PUCN to file motions, protests, comments, testimony, requests as appropriate with the operators of the organized wholesale market or FERC to remedy procedures not adequate or appropriate for Nevada.

C. **Issue:** In addition to other factors, resource adequacy is affected by planning reserves. Reserves are intended to assure sufficient generation resources are available to meet real-time operating requirements and to avoid the possibility that a load loss occurs no more frequently than one day in 10 years, commonly referred to as the "1-in-10 resource adequacy standard". Reserve margins directly affect reliability of the electric grid and cost of electric service.

TWG Findings:

- The concept of planning reserve margins is described by the North American Electric Reliability Corporation (NERC) as "…planning reserve margin is designed to measure the amount of

generation capacity available to meet expected demand in planning horizon. Coupled with probabilistic analysis, calculated planning reserve margins have been an industry standard used by planners for decades as a relative indication of adequacy."

- Reserve margins have been historically established by individual regulated utilities using various methodologies to achieve the "1-in-10 resource adequacy standard". Differences exist among utilities in their calculation of planning reserve margin under the "1-in-10 resource adequacy standard". For example, some system operators calculate reserve margins using the nameplate capacity of intermittent generation such as wind and solar, while others use a derated capacity value.
- For the regulated utility in Nevada, reserve margins are established as a percentage of net customer requirements for NV Energy's native load and are 12 percent for NV Energy's customers in southern Nevada and 15 percent for NV Energy customers in northern Nevada. These reserve margins amount to 941 MW of generation in the year 2020, again the equivalent of two large baseload/intermediate generating plants.
- In a post Energy Choice environment, the regulated utility in Nevada will no longer be responsible for generation development but will continue to remain responsible for the development of transmission and distribution facilities to deliver electric energy to consumers within its designated service area.no longer be responsible to establish planning reserve margins.
- Studies need to be completed to determine the adequacy of reserve requirements for Nevada. These studies need to be probabilistic in nature and take into consideration numerous factors including intra-Nevada transmission constraints, transmission import and export limits, and organized wholesale market structure.
- Reserve margins should be appropriate for Nevada specific circumstances.

Policy Recommendations:

- Operators of organized wholesale markets can and do establish planning reserve margins for geographic areas served by the organized wholesale markets in accordance with FERC, NERC, and the regional reliability coordinator (Peak Reliability) standards. However, Nevada should establish a process by which appropriate planning reserves for Nevada markets are identified, communicated to, and maintained by those providing wholesale energy and capacity for consumers within the service area of Nevada's regulated utility.
- The responsibility to recommend appropriate reserve margins for consumers within the service area of Nevada's regulated utility should remain with the regulated utility providing transmission and distribution service to those consumers.
    - In addition to other amendments recommended herein, amend NRS 704.741.3 to include a probabilistic study to determine recommended planning reserve margins to achieve widely-used one-day-in-ten-years (1-in-10) loss of load standard. The study shall contain probabilistic simulation modeling to examine how reliability metrics, customer costs, and system costs vary with reserve margin; and the regulated utility's recommendation regarding reserve margin.

  - In addition to other amendments recommended herein, the Attorney General and the PUCN should conduct a rule making process to amend NAC 704.9005 thru NAC 704.9525 inclusive to codify any legislative changes to NRS 704.741.3.
- Final determination and approval of the recommended reserve margins for consumers within the service area of Nevada's regulated utility should remain with the Public Utility Commission of Nevada (PUCN). Transmittal of planning reserve requirements to the operators of organized wholesale markets serving Nevada and monitoring of such markets to ensure adequate but not excessive planning reserve margins are maintained by the organized wholesale market should be delegated to the PUCN.
  - In addition to other amendments recommended herein, amend NRS 703.153 to require the PUCN to analyze the operating procedures of any organized wholesale market serving consumers located within the service area of the regulated utility to determine that the procedures of such market adequately establish and maintain planning reserve margins appropriate for Nevada; and to further authorize the PUCN to file motions, protests, comments, testimony, requests as appropriate with the operators of the organized wholesale market or FERC to remedy procedures not adequate or appropriate for Nevada.

D. **Issue:** Must run generation units are those generation units that must run in order to provide for electric grid reliability under certain conditions. By definition a must run generation unit has no competition, it is the only unit that can be operated to meet/eliminate the condition giving rise to the must run unit (i.e. transmission capacity overloads and transmission outages).

TWG Findings:

- Anti-competitive pricing by owners of must run generation units can be eliminated by pricing controls enacted by the organized wholesale market, or by elimination of the must run conditions through transmission system modification, load shedding or peak clipping that allow competition to occur.
- NV Energy has identified four must run generation units which if sold without addressing the must run condition, could result in anti-competitive behavior by the owners of such units. These units are Fort Churchill Generating Station, North Valmy Generating Station, Clark Generating Station, and Clark Mountain Generating Station.

Policy Recommendations:

- Pursuant to the existing authority granted to the Public Utility Commission of Nevada (PUCN) under NRS 703 and the requirement for the regulated utility to submit an integrated resource plan (IRP) to the PUCN every three years established by NRS 704.741, the PUCN should by written notification to the regulated utility issued promptly following approval of this recommendation by the Governor's Committee on Energy Choice, require the regulated utility to identify must run generation units in its next IRP filing due to the PUCN on or before June 1, 2018. For each must run generation unit identified, the regulated utility should be requested to provide multiple options to eliminate the condition(s) giving rise to the must run status along with the estimated cost and time frame for implementation of each option provided. Options

considered and evaluated by the regulated utility must include non-generation options (i.e. options that involve projects other than those which produce electric energy including but not limited to voltage regulation, increasing transmission capacity and energy storage).

- Prior to divestiture of generation assets by NV Energy and to ensure the NV Energy transmission system is planned, developed and operated to prevent the future occurrence of must run generation units, require the regulated utility to specifically consider projects to eliminate must run generation conditions.
    - In addition to other amendments recommended herein, amend NRS 704.741.3 to require the regulated utility to include the requirement for the regulated utility to identify must run generation units in IRP submitted to the PUCN. For each must run generation unit identified, the regulated utility should be requested to provide multiple options to eliminate the condition(s) giving rise to the must run status along with the estimated cost and time frame for implementation of each option provided. Options considered and evaluated by the regulated utility must include non-generation options (i.e. options that involve projects other than those which produce electric energy including but not limited to voltage regulation, increasing transmission capacity and energy storage).
    - In addition to other amendments recommended herein, the Attorney General and the PUCN should conduct a rule making process to amend NAC 704.9005 thru NAC 704.9525 inclusive to codify any legislative changes to NRS 704.741.3.
- For each must run generation unit identified in a IRP prepared by the regulated utility and until a mitigation project has been implemented by the regulated utility to eliminate the condition(s) giving rise to the must run status; operating procedures must be developed by the operators of the organized wholesale market serving Nevada that prevent anti-competitive behaviors do not occur by an owner of a must run generation unit during a must run condition or event. Procedures may include the imposition of price caps on the price of generation output during must run conditions or events. Operating procedures for the organized wholesale market in this regard must comply with the Federal Power Act and the Federal Energy Regulatory Commission's (FERC's) exclusive jurisdiction over interstate wholesale electricity rates, but should consider Nevada specific objectives and policies.
    - In addition to other amendments recommended herein, amend NRS 703.153 to require the PUCN to analyze the operating procedures of any organized wholesale market serving consumers located within the service area of the regulated utility to determine that the procedures of such market adequately protect consumers in Nevada from anti-competitive behaviors by the owner of any must run generating unit serving Nevada, and to require the PUCN to provide comment to the operators of the organized wholesale market of any procedures not adequate or appropriate for Nevada; and to further authorize the PUCN to file motions, protests, comments, testimony, requests as appropriate with the operators of the organized wholesale market or FERC to remedy procedures not adequate or appropriate for Nevada.

E. **Issue:** Some of the advantages of joining an organized wholesale market include (a) to participate in economies of scale relating to generation development, (b) to take advantage of load diversity amongst market participants, (c) to minimize overall quantities of reserves held in the market region, and (d) to avail the natural resources of various areas (solar, wind, geothermal) to all participants of the organized wholesale market. To achieve these benefits will require sufficient transmission import and export capability from Nevada to the overall region served by the wholesale market.

TWG Findings:

- The transmission system serving Nevada is electrically connected to all of its surrounding states. However, greatest connectivity from an import/export capacity perspective exists with California and Arizona (see presentation of Shahzad Lateef and Marc Reyes, November 7, 2017). This connectivity could support the deployment of the CALISO organized wholesale market into Nevada; however, development of a Nevada only or deployment of an SPP organized wholesale market could also occur with the adoption of interchange policies between adjacent organized wholesale markets as common in organized wholesale markets serving Midwest, east and northeast regions of the country.
- Transmission import and export capabilities into Nevada are less than NV Energy's existing native load. Southern Nevada import limits are reported at 5,331 MW and northern Nevada import limits are reported at 1,000 MW.
- Increasing transmission import and export limitations is currently a multi-year process involving numerous stakeholders including interconnected transmission owners, regional transmission operators, the Western Electricity Coordinating Council, public utility regulatory bodies, local planning commissions, federal land management agencies, land owners, environmental groups, and citizen groups.
- Until import and export limitations are increased, Nevada based generation serving NV Energy native load is required.

Policy Recommendations: To be determined.

F. **Issue:** Transmission planning in Nevada currently occurs in a vertically integrated utility environment in which one organization forecasts load requirements; and plans the generation and transmission to meet that requirement. Once approved by the regulatory body, the utility proceeds with development efforts. As pointed out by Pat Woods in his presentation on May 10, 2017; one of the critical components to ensure success of competitive wholesale markets (and by extension ultimately retail markets) is that the region covered by the market must have "robust" transmission infrastructure.

TWG Findings:

- The current process used in Nevada to plan generation and transmission resources is the Integrated Resource Planning (IRP) process. This process is codified in NRS and NAC. Under the IRP process, NV Energy files with the Nevada Public Utility Commission its IRP every three years and an energy supply plan annually. Much of this process may no longer be applicable to NV Energy in an Energy Choice environment.

- Using the IRP process, NV Energy historically has built the least-cost transmission option to meet local needs. In an Energy Choice environment transmission must be planned proactively as "highways" to benefit region covered by the organized wholesale market. This broader approach to transmission planning allows loads to be served and renewable generation options to be developed.
- In an Energy Choice environment responsibility for planning transmission to support local needs and to eliminate must run generation units may still fall to the utility.
- In an Energy Choice environment responsibility for planning transmission to support increases in Nevada import and export capabilities may need to placed upon the regional transmission operator and the organized wholesale market.
- In an Energy Choice environment responsibility to plan transmission to support development of localized wind, solar and geothermal resources may need to be placed upon an existing or new state agency.
- In a vertically integrated utility model transmission study costs under the existing integrated resource planning process are borne by electric utility rate payers. Transmission study cost responsibility in an Energy Choice environment will need to be addressed.

Policy Recommendations: To be determined.

Discuss FERC Order 1000, 2000 here

G. **Issue:** Currently, transmission development is funded by the regulated utility's investors who earn a rate of return on that investment once a project is approved by the Public Utility Commission of Nevada. Transmission development in an Energy Choice environment may occur in a variety of formats including transmission companies, existing utilities, and state funded projects.

TWG Findings:

- Texas instituted a program called the Competitive Renewable Energy Zones (CREZ) transmission development. Under CREZ, ERCOT identified areas of the state best suited for wind development. The Public Utility Commission of Texas then selected those areas as CREZ. ERCOT developed transmission plans to transfer future wind energy from CREZ to loads.
- A joint venture called Electric Transmission Texas (ETT) was formed to by several companies to construct approved transmission projects. Once a transmission project is constructed the ETT receives a return on its investment through transmission revenues collected by ERCOT.
- Use of the CREZ process resulted in the development of 18,500 MW of generation in Texas. Texas produces more wind power than any other state. Wind energy accounts for 12.63% of the energy generated in Texas.
- A variety of other methods to fund transmission projects are used by regional transmission organizations. One concept used by SPP for high voltage lines is identified as their "highway/byway" methodology. Under this concept cost responsibility is allocated based on voltage as follows:

Voltage	Region Pays	Local Zone Pays
300 kV and above	100%	0%
Above 100 kV and below 300 kV	33%	67%

100 kV and below	0%	100%

Policy Recommendations: To be determined.