COMMENTS SUBMITTED TO THE NEVADA PUBLIC SERVICE COMMISSION:
PROCEDURAL ORDER NO. 3
AND REQUEST FOR COMMENTS NO. 2

Submitted by the Nevada AFL-CIO
With the Assistance of the
Renewable Energy Policy Project
Jan. 18, 2002

I. Opening Comments of Nevada AFL-CIO

The Nevada AFL-CIO supported Senate Bill 382 and the establishment of the Renewable Portfolio Standard (RPS) for the state. At this time, we urge the Commission to adopt rules and regulations that will implement this legislation fairly and expeditiously. These comments first outline the broad reasons for this support and based on those reasons offer comments to the Commission on how the specific regulations implementing the law can preserve the important benefits the RPS offers. We believe the RPS can provide a stable source of reasonably and fairly priced electrical generation for Nevada. The renewable resources developed in response to the RPS will lessen our need for fossil fuels and enhance our national energy security. The renewable resources will provide important environmental benefits to the citizens of Nevada by lessening air pollution and saving water that otherwise would be consumed in thermo-electric generation. Finally, the RPS will provide an important source of economic and job diversification.

The RPS will create a major new market in Nevada for renewable energy and we believe will make the state of Nevada a national leader in renewable energy development. As each new target for renewable energy takes effect, jobs will be created related to project development, installation, servicing, O&M, and perhaps local manufacturing. The RPS driven markets will attract developers and manufacturers whose increasing demands for efficiency and cost reductions will in turn create a magnet for Research and Development efforts. The RPS holds out the promise of creating a cluster of businesses and resources that will spur an on-going cycle of improvement and development well beyond the initial concrete round of job creation that we identify in the subsequent sections of these comments. We have known for some time that Nevada has been blessed with outstanding solar energy and abundant wind and geothermal resources. Nevada should become a beacon for the development of clean, renewable resources rather than a repository for ever increasing amount of high-level nuclear waste.

Here are the principles we believe the Commission should rely upon to implement Senate Bill 382. First, the "just and reasonable" cost of an RPS must include more than a narrow, traditional regulatory definition using only embedded accounting costs. Second, this broader approach to the calculation of the net cost to the state of the RPS is necessary because the Legislation calling for the RPS recognized that renewable generation offers important, external benefits beyond those normally provided by traditional electricity generation technologies. For Nevada, those public benefits include economic diversification and job development, and environmental improvements including water conservation. Third, to the extent the public or external benefits of the RPS can be "identified and captured" by and for consumers in the state, those benefits should be considered a cost offset in the determination of the just and reasonable costs of the RPS. Fourth, any Order implementing the RPS and interpreting the "just and reasonable" standard must provide a renewable project developer reasonable and transparent standards in order to bid new renewable supplies to meet the RPS standard.

Senate Bill 382 and the RPS offer benefits to Nevada. The burden on the Commission is to develop regulations that not only identify those benefits but also capture them for Nevada.

II. REPP Review of the Nevada Order Implementing the RPS Standard.

Actions To-Date: On November 29th, the Nevada Public Utilities Commission issued a draft Order to implement the state's Renewable Portfolio Standard. The Legislative Commission reviewed this Initial Order and instructed the Commission to reconsider. In response, the Public Utilities Commission issued an Order asking in part that interested parties provide: "…comments regarding the beneficial and detrimental attributes that should be weighed in order to examine individual contracts for renewable resources or utility initiated proposals for renewable development."

Major Beneficial Attributes: The RPS will provide two major benefits for the citizens of Nevada: jobs and environmental improvements. Based on the initial calculations shown below and in Appendix A, the RPS will provide a diversified job creation potential. In addition, the RPS will allow the traditional suppliers of electricity to back out thermo-electric generation. According to national statistics, thermo-electric generation consumes 28 gallons of water for every kWh generated. According to Nevada specific figures for the year 1990, the state used 34.8 million gallons per day to generate 19,100,000 MWH. The Nevada figures show that approximately .6 gallons of water are used per kWh produced. These estimates produce widely differing estimates for gallons of water used per kWh generated. These comments calculate a cost offset for both figures and assume further clarification will rectify the difference. As part of the beneficial attributes of the RPS, its ability to save water for other uses in Nevada is surely important.

Methodology for Valuing Benefits: Nevada regulators have recognized for some time that the total impact of generating and using electricity involves consequences that go beyond the narrow, accounting definition of costs. The very reason for passing an RPS is recognition that a systematic development of renewal generation will provide benefits above and beyond those offered by existing technologies. These comments offer an initial methodology for measuring and capturing the extra, beneficial attributes that follow from the implementation of the RPS. The broad methodology we follow is to identify the beneficial consequences of the RPS and then evaluate them by looking at the costs Nevada is willing to undertake to capture similar benefits in other programs. For example, we document below that the RPS will provide economic diversification and jobs. The value of that attribute of the RPS should be equated to the expenditures the state is willing to undertake to capture similar results but through other means. We also believe that the RPS can provide significant water savings for the state, water savings that can be diverted to other uses. In this case, the value of the saved water is calculated based on recent cost estimates of prices the state is willing to pay for water form other projects. These estimates and calculations are initial ones and are subject to refinement but the basic point is made: the RPS will have substantial external benefits and the value of those benefits must and can be considered as the Commission assesses the just and

reasonable cost of the RPS. The Commission must also realize that it is important to structure the implementation of the RPS to assure that the potential benefits are indeed captured by Nevada. The Commission should provide incentives in the RPS for projects that use locally trained workers and/or locate manufacturing facilities in the state.

Job Benefits: The renewable technologies capable of meeting the RPS requirement are geographically diverse and modular. We believe that the majority of the RPS requirements will be met with solar, wind, geothermal, and biomass projects. Each technology will provide a different mix of employment. In addition, the job potential for Nevada will depend upon how much of the manufacturing activity locates in Nevada. In order to make an initial estimate of the job creation potential we rely upon recent work done by the Renewable Energy Policy Project to calculate the jobs related to renewable energy production. This survey work is attached as Appendix A to these comments. We believe the survey is useful for the Commission deliberations since it is based upon current industry practices.

In order to make an initial assessment of the job creation potential we had to make a number of assumptions. Those assumptions are presented in detail in the Appendix. Briefly, we assumed an initial retail kWh sales figure for 2003, calculated the required RPS generation for that year and assumed a breakdown for the various generation types to meet those requirements. Sales by technology type were then turned into installed capacity, which is used with the REPP jobs analysis to derive jobs. Jobs are broken down into a number of skill sets and also divided into broad categories. For these purposes, it is important to recognize that a number of the jobs calculated will be in the manufacturing process which may not be located in Nevada. The installation and on-going O&M jobs are also calculated and those are shown separately. The full calculations shown in Appendix A show that the RPS will create 8,092 FTE jobs in Nevada for the installation and O&M employment. Since the FTE calculation is for the entire ten-year period, on average the installation and O&M will add 809 jobs in Nevada for the period. Those are of course direct jobs and do not count any indirect employment multiplier. If the entire manufacturing process is added to the installation and O&M

employment, the total rises to 27,229 for the ten-year or 2,729 on average. Of course, the manufacturing will have to be relocated to Nevada and so it is unrealistic to consider the full employment figure. As will be explained below, the difference between the employment value with and without manufacturing can be used to measure the value and the importance of providing incentives to suppliers to locate employment in Nevada. In calculating the cost offset we use two figures: the avoided unemployment payments and the cost per job from the national survey of incubators as discussed below.

Cost Offset: The job creation related to the RPS should be considered a desirable attribute of the RPS and a value associated with that job creation potential should be calculated and used to reduce or offset the calculated cost of the RPS. In general, the calculation of public benefits from renewable energy relies on the notion that the development of renewables allows the public to avoid other payments or public costs. States use public funds in a variety of ways to both create and protect jobs that provide a viable way to assess the dollar value of the job potential offered by renewables. The estimates given for the public subsidies required to create jobs vary tremendously. Some studies place the cost in subsidies at over $100,00 per job. This analysis uses a much more conservative approach. The primary approach would calculate the avoided unemployment payments and use those to determine an offset to the cost of the RPS. The second approach would use a "typical" incentive provided to companies to locate or create job in a state or region and use the avoided incentive payments as a way to assess the value of the job creating potential of the RPS.

Avoided Unemployment Payments: In a time of high unemployment, it is obvious that any program that adds new jobs to the state will avoid unemployment payments. According to federal statistics, Nevada offers base unemployment insurance of $228 per week. (Figures are for 1997) In addition, the state of Nevada recently announced supplemental payments for unemployed workers. This plan, announced by Gov. Guinn on November 11, 2001, provided $430 per month to unemployed workers.

If the state of Nevada can avoid $1,342 per employee per month or $16,104 per Full Time Equivalent job created as a result of the RPS, then that amount can be used as an offset against the cost of the RPS. (Note: A Full Time Equivalent job is equal to 2000 hours of employment.) In this way the full public cost of the RPS can be assessed. To simply calculate the cost of the RPS without this offset would miss the important benefits provided as a result of the RPS.

Avoided Incentive Payments: States offer incentives through low cost loans, infrastructure investments, business incubation programs, or tax abatement schemes to attract industries that in turn create jobs. According to one national study undertaken by the National Business Incubation Association (NBIA), the average cost to create a job through an incubation program was $1,109. This study also claimed that other public programs ran three to six times as much as the incubation programs. The argument here is the same as with the avoided unemployment payments discussed above: if the RPS avoids the $1,109 expenditure necessary to create a job through a program of incubation, then that value can be used to offset the cost of the RPS. It should be noted that the figure of $1,109 to create a job through an incubation program seems to be unrealistically low. Indeed, if the figure represented a reproducible result it seems to beg the question of why any state would offer unemployment compensation since an incubation program could create a replacement job for a fraction of the cost of unemployment.

Cost Offset for Job Creation Related to RPS: Using the assumptions listed above a total value for the job creation related to the RPS can be calculated. The calculations discussed here will only consider the avoided unemployment compensation. Appendix A has the full set of calculations but REPP does not recommend using the incubator cost per job estimate. At the high end, the calculation assumes that all jobs, i.e. manufacturing, installation, and O&M are located in Nevada and that the value to Nevada of each FTE equivalent job is $16,104. Based on that calculation, the total offset for the ten year implementation period is $438,503,429. That can be converted to a kWh figure by dividing the total offset by the RPS kWh's supplied for the period. On that basis, the value of the job creation potential is $.001368 per kWh. Alternatively, if only the

installation and O&M jobs are assumed to be in Nevada, the total cost offset is $130,311,537 and the offset per kWh is $.00407. This analysis clearly shows that manufacturing adds to the job benefits of the RPS. It supports favoring bids to meet the RPS requirements that also locate manufacturing in the state.

Water Savings: In Nevada, water is scarce. To the extent the RPS can save or avoid the consumption of water used at present in the generation of electricity and redirect that water for other uses in Nevada, then the value of that saved water can be determined and used to offset the cost of the RPS. According to a national survey, undertaken by the Department of the Interior, the average thermo-electric generating plant consumes 28 gallons of water per kWh generated. On the other hand, figures from the USGS show that Nevada used only .6 gallons of water per kWh produced. In each case the RPS will save water although the total saved and the cost offset associated with the savings will vary widely. With the exception of some solar thermal electric and biomass co-firing technologies, none of the renewable technologies used to meet the RPS will use water to generate electricity. If the RPS generation can be used to back out thermo-electric generation, then the water not consumed by those plants can be considered a desirable attribute of the RPS. The value of the water saved should be based on the cost of acquiring new resources. According to recent press accounts, Nevada is negotiating to purchase new water rights at a cost of $150 to $200 per acre-foot. (An acre-foot is equal to 326,000 gallons of water.) To put this in terms of the RPS, if thermo-electric generation uses 28 gallons per kWh, every 11,600 kWh's generated through the RPS will save an acre-foot with an average value of $175. (Alternatively, if thermo-electric generation only uses .6 gallons per kWh, then it will take 540,000 kWh to save an acre-foot of water.) According to these calculations, the value of the water saved is $.015086 per kWh for RPS generation that does not use water and backs out thermo-electric generation. Alternatively, if thermo-electric generation only uses .6 gallons per kWh the cost offset will drop to .3 mils per kWh ($.0003 per kWh). In both cases, this cost can be used to offset the cost of the RPS.

Transparent Development Rules: In order to respond to the RPS, developers need rules and regulations that allow reasonable development terms, i.e. they need a clear price and they need access to contracts of sufficient length to allow them to offer reasonable and fair proposals. As a general matter, RPS bills passed before the Nevada legislation simply called for a certain percent of total generation to be supplied by qualified renewable resources. The Nevada bill required an escalating percent of generation to come from renewables and also required that the cost of meeting the RPS standard had to be "just and reasonable" as determined by the state Public utilities Commission.

Based on the initial Order, without clarification and careful attention to the standards set out, the regulations will not allow developers access to reasonable terms for bidding new resources. The Order first defines just and reasonable costs and states that the Commission will look at these costs before approving a renewable energy contract used to meet the RPS. The Order sets two standards for two time periods: one for the period of 2003–2004, the other is for the remaining years. For each time period the regulations set out two controlling conditions, which contracts must meet to be approved. It is important to stress that as written, the two conditions both apply simultaneously. One condition does not provide an exemption from the other. For the 2003-2004 period, the first condition is that: "…the cumulative cost incurred by the utility provider to acquire electricity pursuant to all new renewable energy contracts must not increase rates for those retail customers more than…$.0005 per kWh." For the period beyond 2004, the regulations state the costs are to be determined and that they can be "for each utility provider." Each time period is also governed by a second set of conditions which state that "for each non-solar renewable energy contract to meet specific base load, intermediate load, and peak load requirements" the renewable contract costs cannot exceed 140% of the costs of an equivalent "standard electric contract" for similar use for a term of ten years for a fixed price. Solar renewable contracts are subject to an identical standard except they can be 200% of the standard electric contract.

These terms are at the core of the Nevada RPS. The initial condition governing the years 2003-2004 has one important advantage: the $.0005 cost differential is leveraged. If for

example the RPS requires 5% renewables, then the just and reasonable cost for renewable contracts is $.01 per kWh more than the average cost of generation. (20 times $.0005). When the RPS moves to 15%, the leverage of the differential drops to only $.003 per renewable kWh (6 times $.0005). The RPS for the years 2003-2004 is a low percent but increases over time to 15%. If nothing else is changed, the "just and reasonable" cost differential will decrease over time. It is also important to note that the cost differential sets new renewable costs against the historic embedded costs of generation. If embedded costs are heavily depreciated and/or have grand fathered environmental waivers, the embedded cost per kWh will be low and the cost per kWh for renewable contracts will also be low. The cost can also vary by utility. The second condition allows solar and non-solar resources to cost up to 200% and 140% of the equivalent standard electric products, however, the total cost of the RPS contracts cannot exceed the $.005 increase. In addition, this standard calls for comparison to a levelized ten year contract but in no place in the regulations are utilities required top offer ten year contracts to renewable developers. The ten-year cost comparison is for purposes of Section 28 only. For the period beyond 2004, the regulations offer no guidance as to how just and reasonable costs are to be determined. At a minimum, effective implementation of the RPS requires allowing the Commission to review and approve contracts of at least ten years in length.

Support for Trading: The Draft Initial Order does not allow for trading of credits related to renewable resources used to meet the RPS. We support trading. We also support allowing individual homeowners or small businesses to aggregate and trade the credits from home PV systems for example. The trading of these credits will reduce the net cost of the system to homeowners and increase the market penetration. For both of the systems discussed below, the Commission could offer to allow credit aggregation and trading for systems installed by "certified" installers. This would provide an incentive for homeowners to look for certified installers and would give certification programs a strong incentive to undertake the start-up costs related to program development.

Section 18: Definition of Solar Thermal System. A solar thermal system, that uses solar energy to heat hot water for example, is qualified as a renewable resource. However, the system must be located where natural gas service is not available. (This is actually

spelled out in Section 34.) In addition, the kWh equivalent generation is "attributed" to the (local) utility. "Attribute" is not defined, however it seems reasonable to assume it means that the utilities will receive credit for the generation without having to either invest in the systems or purchase the tradable credits from the owners of the system. The proposed regulations do not allow trading of credits. We support the trading of credit related to this technology.

Section 24: This section spells out the rule that "equivalent kilowatt-hours attributable to the provider during the compliance year from solar thermal systems" qualify for meeting the renewable production under the RSP. This section also allows for the use of "any excess kilowatt-hours fed back to the provider during the compliance year from net metering". This seems to allow the utility to capture the RPS credit at no cost and with no payment to the owner of the renewable system. We support the trading of credit related to this technology.

APPENDIX A: Renewable Energy Labor Calculator—Nevada RPS Example, 2003-2013

User Inputs

Generation	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Retail Sales (1000 KWh)	27,864,303	28,282,268	28,706,502	29,137,099	29,574,156	30,017,768	30,468,035	30,925,055	31,388,931	31,859,765	32,337,661
RPS Requirement (% of Total Retail Sales)	5%	5%	7%	7%	9%	9%	11%	11%	13%	13%	15%
RPS Generation Requirement (1000 KWh per year)	1,393,215	1,414,113	2,009,455	2,039,597	2,661,674	2,701,599	3,351,484	3,401,756	4,080,561	4,141,769	4,850,649

Renewable Generation Mix (%)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Wind	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
PV	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Biomass Cofiring	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Geothermal	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

Renewable Generation Capacity Factors	Capacity Factor
Wind	0.35
PV	0.25
Biomass Cofiring	1.00
Geothermal	0.90

Additional parameters	
Percent co-fire	5%
Hours per FTE	2000
Annual growth rate of retail sales	1.5%

Labor Totals, 2003-2013

Technology	Manufacturing Jobs (FTE)	Installation Jobs (FTE)	O&M Jobs (FTE)	Total jobs by Technology
Wind	2,476	530	751	3,757
PV	16,662	4,817	1,661	23,140
Biomass Co-firing*	n/a	n/a	89	89
Geothermal**	n/a	n/a	243	243
Total by Job type	**19,138**	**5,347**	**2,744**	**27,229**

*Assumes silvicultural wood only, no other biomass fuels. Biomass co-firing does not include O&M of the coal-fired power plant, only the growth, harvesting, transport, and preparation of biomass fuels

**Geothermal estimates include O&M labor only

Capacity Totals, 2003-2013

Technology	Cumulative Installed Capacity (MW)	Cumulative Capacity (%)
Wind	791	50%
PV	664	42%
Biomass Co-firing*	55	4%
Geothermal**	62	4%
Total	**1,572**	100%

Cost Offset, 2003-2013

All Jobs (10 years)	$/FTE	Jobs	Value of jobs	$/kWh
Unemployment	$ 16,104	27,229	$ 438,503,429	$ 0.01368
Incubator	$ 1,109	27,229	$ 30,197,485	$ 0.00094

Installation and O&M Jobs (10 years)	$/FTE	Jobs	Value of jobs	$/kWh
Unemployment	$ 16,104	8,092	$ 130,311,537	$ 0.00407
Incubator	$ 1,109	8,092	$ 8,973,888	$ 0.00028