

BEFORE THE NEVADA PUBLIC SERVICE COMMISSION

Application of NEVADA POWER COMPANY)
for approval of the Eighth Amendment to the Action)
Plan of the 2007 - 2026 Integrated Resource Plan,)
for authorization to modify the schedule and development) Docket No. 08-05014
budget for the Ely Energy Center, acquire the Bighorn)
Power Plant, construct a combined cycle facility at the)
existing Harry Allen site, construct two transmission)
projects, and increase its Gas Supply Portfolio)
_____)

Direct Testimony of

Ezra D. Hausman, Ph.D.

On behalf of

Nevadans for Clean Affordable Reliable Energy (NCARE)

August 12, 2008

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List of Exhibits

- Exhibit EDH-1: Resume of Ezra Hausman
- Exhibit EDH-2: Synapse Energy Economics, *Synapse 2008 CO₂ Price Forecasts*, July 2008.
- Exhibit EDH-3: Synapse Energy Economics, *Coal Fired Power Plant Construction Costs*, updated July 2008.
- Exhibit EDH-4: Western Resource Advocates, “Comments to the Western Electricity Coordinating Council Regarding the Coal Price Forecast Applied in Resource Planning Evaluations”, whitepaper, June 2008.
- Exhibit EDH-5: Aspen Environmental Group, (C. Linvill, C. Cooke, S. Phinney, and R. McCann, Authors,) *Laying a Foundation for Nevada’s Electricity Future: Generation Facility Uncertainties and the Need for a Flexible Infrastructure*, report to the Energy Foundation, February, 2008.
- Exhibit EDH-6: Goggin, Michael, “Memo Regarding the Results of Renewable Integration Studies,” Memorandum to NCARE, August, 2008.
- Exhibit EDH-7: U.S. Environmental Protection Agency, “CHP in the Hotel and Casino Market Sectors”, December 2005.
- Exhibit EDH-8: U.S. Environmental Protection Agency, “CHP in the Hotel and Casino Market Sectors - Addendum I: Market Update”, November 2007.

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **1. Q. What is your name, position and business address?**

3 A. My name is Ezra D. Hausman, Ph.D. I am a Senior Associate at Synapse Energy
4 Economics, 22 Pearl Street, Cambridge, Massachusetts 02139.

5 **2. Q. Please describe Synapse Energy Economics.**

6 A. Synapse Energy Economics ("Synapse") is a research and consulting firm
7 specializing in energy and environmental issues, including electric generation,
8 transmission and distribution system reliability, market power, electricity market
9 prices, stranded costs, efficiency, renewable energy, environmental quality, and
10 nuclear power.

11 Synapse's clients include state consumer advocates, public utilities
12 commission staff, attorneys general, environmental organizations, federal
13 government and utilities. A complete description of Synapse is available at our
14 website, www.synapse-energy.com.

15 **3. Q. Please summarize recent work experience and your educational
16 background.**

17 A. I have been employed by Synapse since July of 2005. In this position I have
18 served as an analyst and expert witness in numerous cases involving electricity
19 and ancillary service market design and analysis, electricity price forecasting,
20 and economic analysis of environmental regulations. I have also prepared reports
21 on these topics for clients including the American Public Power Association and
22 the U.S. Environmental Protection Agency. In addition, I have facilitated and
23 served as an expert analyst for state-level stakeholder processes aimed at
24 mitigating greenhouse gas emissions associated with the electricity sector.

25 Prior to joining Synapse, I was employed since 1997 as a Senior Associate
26 with Tabors Caramanis & Associates (TCA), now part of CRA International,
27 performing a wide range of electricity market and economic analyses and price

1 forecast modeling studies, including asset valuation studies, market transition
2 cost/benefit studies, market power analyses, and litigation support studies. I have
3 extensive personal experience with market simulation and resource planning
4 practices and software.

5 I hold a B.A. from Wesleyan University, an M.S. in civil engineering from
6 Tufts University, an S.M. in applied physics from Harvard University and a
7 Ph.D. in atmospheric chemistry from Harvard University.

8 A copy of my current resume is attached as Exhibit EDH-1.

9 **4. Q. On whose behalf are you testifying in this case?**

10 A. I am testifying on behalf of Nevadans for Clean Affordable Reliable Energy
11 (NCARE).

12 **5. Q. Please describe NCARE.**

13 A. NCARE is a non-profit cooperative association of public interest entities with
14 members, donors and supporters who are Nevada residents. As described in
15 NCARE's First Amendment to Articles of Association, it is "formed for
16 environmental protection purposes to participate in member selected forums to
17 present information to promote the expanded use of energy efficiency, renewable
18 energy, and other clean energy technologies in Nevada." Joined by that common
19 interest, NCARE consists of the Nevada Chapter of American Institute of
20 Architects, Bristlecone Alliance, Citizen Alert, Natural Resource Defense
21 Council, Nevada Conservation League, Progressive Leadership Alliance of
22 Nevada, , Sierra Club, Southwest Energy Efficiency Project and Western
23 Resource Advocates."

24 **6. Q. Have you previously testified before this Commission?**

25 A. Yes. I filed testimony and appeared before this Commission under Docket 07-
26 06049 in October, 2007.

1 **II. SUMMARY AND RECOMMENDATIONS**

2 **7. Q. What is the purpose of your testimony?**

3 A. NCARE was granted leave to intervene in the instant proceeding on issues
4 “regarding and related to the EEC project development schedule and timeline as
5 established in Docket Nos. 06-06051 and 06-07010 that are subjects of this
6 proceeding.” [Order granting petition for leave to intervene, ¶25]. My testimony
7 relates to this matter. Specifically, the delay in the Ely Energy Center (EEC)
8 schedule has important implications for the continued economic viability of the
9 EEC, and for the Companies’ planning processes, that the commission should
10 consider. These are:

- 11 • That any previous projections of EEC capital cost, already significantly out
12 of date, will be so dated as to be meaningless for planning purposes on the
13 revised schedule;
- 14 • That the delay will allow greater clarity in likely regulation of greenhouse
15 gases and costs for greenhouse gas emissions, and that these costs should be
16 taken carefully into account in evaluating whether or not the project should
17 go forward;
- 18 • That the delay will provide an opportunity to evaluate carbon emission
19 mitigation technologies, for example by implementing technology to
20 facilitate carbon capture and sequestration (CCS), and that the Companies
21 and the Commission should hold open the possibility of changing the plant
22 technology accordingly should such a change prove beneficial for ratepayers
23 and for the environment;
- 24 • That the delay will provide an enhanced opportunity for the consideration of
25 alternative technologies such as renewable energy, demand resources,
26 combined heat and power, transmission solutions, and other strategies for
27 meeting Nevada’s power needs which may be economically superior to the

1 EEC, and that this opportunity should not be squandered at the expense of
2 Nevada's ratepayers and the environment;

- 3 • That actions taken during the intervening period, from now through the date
4 when the ultimate decision is made whether or not to move forward with the
5 EEC, should be taken with due consideration of the possible benefits of
6 alternative strategies for meeting Nevada's power needs and should not "lock
7 in" one strategy that may ultimately prove to be suboptimal or worse.

8 **8. Q. Please summarize your recommendations for this Commission.**

9 A. I recommend that the Commission allow the Companies to modify the EEC
10 schedule as proposed. However, the Companies should not be allowed to delay
11 providing the Commission with the information required in the EEC
12 Amendment. Specifically, the Commission should order the Companies to re-
13 analyze and re-justify EEC for NPC's 2009 Integrated Resource Plan (IRP)
14 filing. The Commission should order the Companies to comply with their earlier
15 commitment, made under Docket 07-06049, to provide updated capital cost
16 estimates for the EEC, and to perform a comprehensive assessment of
17 alternatives for meeting Nevada's energy needs. This information must be
18 provided in a timely fashion for the Commission's consideration in the NPC
19 2009 IRP filing. The development and analysis of these alternatives must include
20 realistic cost projections for all resource alternatives, including realistic
21 assumptions about the likely carbon dioxide (CO₂) emissions costs associated
22 with each alternative. The EEC schedule revision should not be considered in a
23 vacuum, but must be considered in the context of the Commission's statutory
24 role in overseeing the costs of and opportunities for meeting Nevada's long-term
25 energy needs.

26 To ensure that all alternatives are considered, the Companies should be
27 required to model resource plans which do not include the EEC or any other
28 equivalent new coal-fired generating resource, so that the Commission and the
29 public may be more fully informed of the costs and benefits of such a project.

1 Such resource plans should consider much greater reliance on renewable energy
2 in excess of Nevada's RPS requirements, on demand resources, on combined
3 heat and power, and on transmission solutions to meet Nevada's energy needs.
4 Given the near certainty of federal carbon regulation for most if not all of the
5 duration of the Company's plan, the Companies should ensure that a range of
6 realistic projections of carbon dioxide emissions costs are considered in selecting
7 and evaluating each alternative plan. Although these future costs cannot be
8 known with precision, a reasonable range can be and has been estimated by a
9 number of entities, including by Synapse. These ranges should be used to define
10 sensitivity studies, as would any other future cost driver, and should not be
11 discounted just because they are uncertain. Finally, because the CO₂ emissions
12 costs will be real economic costs of generation, and not externalities, they must
13 be considered as an integral part of the plan development in the calculation of the
14 Present Worth of Revenue Requirements (PWRR). Such fundamental and
15 quantifiable operating costs should not be treated as an afterthought for
16 comparing a small number of essentially identical resource plans.

17 Finally, I recommend that the Commission order the Companies to
18 demonstrate that ongoing transmission planning, including the development of
19 one or more north-south interties, will provide maximum flexibility for economic
20 resource development and will ensure optimal access to and deliverability of
21 renewable energy resources in the state.

22 **9. Q. Have you reviewed all of the testimony, exhibits, and data responses in this**
23 **proceeding?**

24 A. To the best of my ability. However, this Docket contains a voluminous record of
25 testimony, exhibits, and analyses, some of which are confidential and have not
26 been made available to me. In addition, this Docket builds upon previous
27 Dockets, each of which has its own voluminous and sometimes confidential
28 record. While I have done my best to review all of the pertinent information, it is
29 certainly possible that I missed important information or that such information
30 was not made available to me.

1 **10. Q. Are you prepared to revise your testimony and recommendations to this**
2 **Commission in the event that you are made aware of additional information,**
3 **or are given access to confidential information, that causes you to alter your**
4 **opinions or conclusions?**

5 A. Yes.

6 **III. REVISIONS TO THE ELY ENERGY CENTER SCHEDULE**

7 **11. Q. You refer in your introductory remarks to certain opportunities afforded by**
8 **the proposed delay in the EEC schedule. Please elaborate.**

9 A. We live in a time of transition and uncertainty in the electric energy industry, and
10 there are a number of factors which make the planning environment more
11 uncertain than it may have been in the past. These factors include:

- 12 • Rapid escalation in capital costs for all types of resources
- 13 • Deregulated fuel prices, particularly natural gas, leading to greater fuel
14 price volatility and uncertainty
- 15 • Globalization of the markets for all fuels, including natural gas and coal
- 16 • The near certainty of federal carbon emissions regulation, likely before
17 EEC comes on line following the revised schedule
- 18 • Rapid technological change, including advances in renewable technology,
19 coal-burning technology, possibly carbon capture technology, and
20 effectiveness in demand management programs
- 21 • A patchwork of deregulated and regulated electricity markets, meaning
22 that even regulated Companies are exposed to market risks but also have
23 opportunities to sell power into deregulated markets on behalf of their
24 ratepayers

- 1 • Changing climate with unknown consequences for water availability and
2 irrigation needs

3 At the same time, regulated utilities are still expected to make planning
4 decisions and investments, on behalf of ratepayers, that will affect their resource
5 mix, costs, and environmental profile for several decades into the future. This
6 situation calls for the most careful consideration of risks and the most
7 comprehensive possible scenario analysis in order to make robust decisions.
8 Under these circumstances, the best strategy would be to maintain flexibility, and
9 to try to leave open potentially beneficial options as new information becomes
10 available. Of course, this means that the opportunities for integrating better
11 information, such as that provided by the delay in the EEC schedule, must be
12 used by the utility and provided to the Commission to enable the best planning
13 decisions on an on-going basis.

14 If and when the EEC is built, it will face capital costs that bear little
15 resemblance to those that were estimated when the project was first proposed.
16 Further, there may be opportunities to redesign the project with new technology
17 for capturing carbon dioxide which does not yet exist—but this will assuredly be
18 less expensive and more efficient and effective than retrofitting an outdated
19 design. The project will face fuel costs and emissions costs that we can only
20 broadly estimate today. However, there will be greater certainty in emissions
21 costs, for example, once Congress acts on federal carbon legislation—an event
22 which may well transpire before any new coal plants can be brought into
23 operation in Nevada.

24 Alternatively, new developments in renewable resource technology and
25 greater experience with demand management around the country may have
26 already rendered EEC unnecessary and uneconomical in the face of carbon
27 emissions costs, or at least they may do so in the near future. An example of such
28 a renewable resource is concentrating solar thermal generation, which relies on
29 direct sunlight (a resource available in great abundance in Nevada), and
30 incorporates thermal storage so that it behaves more like a dispatchable resource.

1 A thorough analysis of these issues and options should be central to the 2009 IRP
2 filing.

3 **12. Q. Has the EEC been included in previous SPPC and NPC resource plans?**

4 A. Yes. NPC received approval for a “Preferred Plan” including the EEC in its 2006
5 IRP (Docket Nos. 06-0651 and 06-07010), along with approval for NPC and
6 SPPC to spend up to \$300 million on development costs, with expenditures
7 limited to \$155 million prior to obtaining a final air permit for the project.
8 (Order, ¶169) The project was then assumed as part of all of the resource plans
9 considered in SPPC’s resource plans in its IRP filing in 2007 (Docket No. 07-
10 06049).

11 **13. Q. Have the Companies provided the Commission with any updated analysis of**
12 **alternative plans, i.e., plans which did not include the EEC, since EEC was**
13 **initially proposed in 2006, under Docket 06-06051?**

14 A. Not that I am aware of, and certainly not in SPPC’s 2007 IRP or in the current
15 amendments.

16 **14. Q. Were the Companies ordered to provide updated and detailed information**
17 **on EEC’s cost and other matters in their EEC Amendment, to be filed upon**
18 **receipt of their air permit?**

19 A. Yes. In paragraph 172 of the Order in Docket Nos. 06-0651 and 06-07010, the
20 Commission enumerated information which the Company was ordered to provide
21 including detailed engineering, construction, and cost estimates, environmental
22 costs, economic benefits, fuel costs, financial plans, and the status of securing
23 critical resources such as water, coal supply, and land. They were also ordered to
24 provide the Companies’ understanding of the status of CO₂ regulations and how
25 these might impact project costs.

1 **15. Q. Did this list include the requirement to provide an analysis of alternative**
2 **plans which do not include the EEC?**

3 A. Yes, but not explicitly. Sub-paragraph (f) requires the Companies to provide an
4 update of “environmental costs and economic benefits attributable to the EEC.”
5 It is hard to imagine how either the environmental costs or the economic benefits
6 could be established without providing a comparison to plans which do not
7 include this resource.

8 **16. Q. Have the Companies since made specific commitments to provide updated**
9 **cost analysis and comparison with alternative plans?**

10 A. Yes, under cross examination for Docket No. 07-06049 (SPPC 2007 IRP). In this
11 case both Roberto Denis, Corporate Senior Vice President of Energy Supply for
12 NPC and SPPC, and Charles Pottey, Manager of Long-Term Resource Planning
13 for NPC and SPPC, specifically committed to presenting this Commission with
14 such updated cost information and alternatives analysis.

15 For example, the following exchange may be found on page 421 of the
16 transcript, recording Attorney Robert Johnston’s cross examination of Mr.
17 Dennis:

18 Q Mr. Denis, is it Sierra's intent, with respect to
19 the EEC amendment filing, to model alternative
20 portfolios that include alternatives to EEC?

21 A Certainly.

22 Q And will you in that filing be modeling
23 alternatives that replace all or part of the EEC
24 proposed plant with geothermal generation?

25 A We will be modeling alternatives that will
26 replace or -- yes, it will replace the entirety
27 of the EEC generation period. I would hate to
28 say what those alternatives are now. Geothermal
29 could be a portion of those alternatives; it
30 could be a portfolio of alternatives. But I'm
31 hesitant to say right now what that is since it
32 has not been developed yet, the alternative plan
33 has not yet been developed. And that is the
34 subject of and the purpose of making that filing.
35 That work has not been done.

1 On page 427 of the same transcript Commission Chairman Kelly is recorded
2 as asking Mr. Denis to clarify his responses to Mr. Johnston:

3 Q Now what you just stated in response to Mr.
4 Johnston's questions was your understanding of
5 the Company's intent about the composition of
6 that 2008 filing. And rather than, as I
7 understand your comments and I want to get it
8 clear - as I understand your comments, rather
9 than just addressing the issues as set forth in
10 our previous order on the IRP as set out in
11 paragraph number 172, you indicated that it is
12 the Company's intent to model and reassess all
13 the alternatives to the EEC in that amendment
14 filing in 2008.

15 Did I understand your response to him in that way
16 correctly?

17 A Yes, you did.

18 On pages 660 and 661 of the same transcript, Chairman Kelly asked Mr.
19 Pottley to verify this commitment on behalf of the Companies:

20 Q ...Were you in the hearing room yesterday when Mr.
21 Denis testified?

22 A Yes, I was.

23 Q And did you understand him to say that the
24 Company was going to be providing modeling for
25 all alternatives to the EEC, which sounded like a
26 complete supply side plan in my interpretation?

27 A It is my anticipation that we will provide
28 modeling for a number of alternatives to EEC so
29 that the Commission has a comparison of the most
30 likely alternatives. I don't know that I would
31 necessarily say all alternatives.

32 ...

33 Q So it is your understanding, not only of what Mr.
34 Denis said, it is also your understanding and
35 your position that the Company is going to be
36 seeking approval of a supply side option in the
37 amendment, not an update to the approval they
38 have already given to the EEC?

39 A It's my anticipation that we will provide
40 information to support the approval of moving
41 forward with EEC assuming that the analysis still
42 shows with all the updated information that that
43 is the best alternative. If it turns out that as
44 we update the analysis and revised data suggested
45 some other alternative would be a better
46 alternative, then I suspect that we would present
47 that to the Commission as a recommendation, and

1 at this time I haven't completed any of that
2 modeling, so I don't know what that would show.

3 Q I'm interpreting your comments and then those
4 that I heard of Mr. Denis that you are providing
5 the Commission with that winter amendment a
6 supply side plan that leaves all of these
7 alternatives open to the Commission regardless of
8 what they stated in the prior opinion with
9 respect to accepting the EEC?

10 A That would be my anticipation. I think for the
11 Commission to make an informed decision on EEC
12 they need to know what the alternatives to EEC
13 are at the current cost estimates and performance
14 data. To just analyze EEC doesn't allow the
15 Commission to determine if it is the best
16 alternative or not. So it's our anticipation
17 that we will provide adequate analysis and
18 information so that the Commission can make an
19 informed decision if EEC is still the best
20 alternative to move forward with.

21 **17. Q. Why is this commitment relevant here, given that your testimony is focused**
22 **on the Companies' proposal to delay the schedule of the EEC, and the fact**
23 **that EEC has not received a final air permit?**

24 A. The Companies propose, along with their schedule revision for EEC itself, to
25 push the date of the update for the Commission on cost and alternatives back to
26 2010. In the interim, NPC is scheduled to file its next resource plan in 2009.
27 Unless the Commission directs them otherwise, the Company is likely to file a
28 plan which assumes the approval of EEC, despite the fact that the Commission
29 will not have been provided with updated costs or any comprehensive analysis of
30 alternatives. In fact, as in SPPC's filing in 2007 and in the amendments under
31 consideration here, it is likely that NPC will include EEC in every alternative
32 plan presented in their 2009 filing for the Commission's consideration.

33 At that point, the Companies' analyses justifying EEC for inclusion in the
34 preferred plan over alternative resource options would be several years out of
35 date, during a time of rapidly escalating capital and operating costs for generating
36 resources. It is unreasonable to expect the Commission to make a rational and
37 well-informed decision on the Companies' resource plans based on such obsolete
38 and incomplete information.

1 The Commission ordered the filing of updated cost information and analyses
2 with timing related to the project's final air permit, and this may have been
3 reasonable given the expected project schedule at the time. However, given the
4 proposed schedule revision relative to NPC's IRP filing, the idea of tying the
5 timing of the updated EEC analysis to an event that will occur one year after the
6 Commission will have to rule on NPC's IRP makes no sense. This is
7 administratively inefficient and would needlessly impede the Companies' and the
8 Commission's ability to make fully-informed decisions going forward.

9 **18. Q. Do you have evidence to affirm that the Companies do not intend to file**
10 **updated cost information, and a complete alternatives analysis, as part of**
11 **the NPC resource plan to be filed in 2009?**

12 A. Yes. In responding to an information request from the Bureau of Consumer
13 Protection (BCP 13-01) in this Docket, the Company states:

14 In the 8th amendment to Nevada Powers 2006 IRP, the
15 Company has requested a revision to the proposed
16 schedule and spending plan for the EEC that the PUCN
17 authorized in Docket No. 06-06051 due to delays in the
18 licensing process for the project. **The company plans to**
19 **present updated project information in a resource plan**
20 **amendment no later than April 2010.** This amendment will
21 contain updated project cost information as well as all
22 the information required in the compliance items
23 contained in the final order for Docket No. 06-06051. It
24 will also contain a refreshed comparison of the EEC
25 project to other alternatives. Therefore, the Company
26 anticipates that all parties to this future case will
27 review the information presented there, and support or
28 oppose continued development of the EEC based on the
29 information presented there. (emphasis added)

30 Asked whether NPC anticipated "addressing any other aspect of Ely Energy in its
31 2009 Integrated Resource Plan filing other than providing a 'status update on the
32 EEC and the progress on permitting and development tasks'," the Company
33 responded in the negative (BCP 10-03):

34 No.

35 Mr. Denis stated that the Companies will file...an
36 Amendment to Nevada Power's 2009 IRP and seek final
37 approval for the EEC no later than April, 2010 once the
38 EIS process is complete, equipment and EPC bids are

1 updated, and revised cost estimates are prepared and
2 reviewed by the Staff, the BCP and the independent
3 third-party consultant. Since the filing of the 2009 IRP
4 will occur prior to these events, the Companies will
5 primarily focus on a status update of the EEC progress
6 in its 2009 IRP.

7 Finally, in Mr. Denis' testimony in this Docket, page 13, he notes that the
8 Companies plan to provide updated information on EEC "in a future amendment
9 to Sierra's 2007 IRP and Nevada Power's 2009 IRP," and to do so in April 2010
10 as they seek final approval for the project.

11 **19. Q. Should this schedule for an updated analysis and comparison of the EEC**
12 **project to alternatives be acceptable to the Commission?**

13 A. No. This proposed schedule would mean that the Companies would file NPC's
14 2009 IRP taking for granted that the Commission will approve the EEC project,
15 absent any kind of revaluation and re-justification, and without consideration of
16 alternative resources that may be economically preferable for ratepayers. The
17 Commission should not accept EEC as an integral part of Nevada Power's 2009
18 IRP, or of Sierra's amended 2007 IRP, before being provided with up-to-date and
19 comprehensive cost information and a thorough review of alternatives.

20 According to NAC 704.937, paragraph 7, the utilities must "fully justify"
21 their choices in identifying their preferred plan. For the Companies to ask the
22 Commission to accept a large base load resource which is justified based on
23 outdated information, and without a current and adequate consideration of
24 alternatives, falls far short of this standard and of good IRP practice in general.

25 **IV. INTEGRATED RESOURCE PLANNING**

26 **20. Q. Why is the issue of Integrated Resource Planning relevant to your testimony**
27 **on the proposed revisions to the EEC schedule?**

28 A. One significant impact of the proposed schedule revision is that it affects the
29 information that the Commission will have before it when it considers NPC's
30 resource plan in 2009. It also affects the viability of SPPC's resource plan as

1 filed in 2007 and amended thereafter. Because of this, the Commission should
2 consider the proposed schedule revision as affecting not just EEC itself, but also
3 the Companies' overall resource plans and the impact on ratepayers. The
4 Commission has the responsibility to ensure that the plans, as revised, will
5 provide reliable electric service at the lowest reasonable cost and risk to
6 ratepayers. Given this significant change in the Companies' plans, it is
7 reasonable and necessary for the Commission to expect additional and timely
8 information and analysis, consistent with standard IRP practice, to ensure that the
9 goals of IRP are met.

10 **21. Q. For context, would you please summarize the process and purpose of**
11 **Integrated Resource Planning (IRP)?**

12 A. IRP is a process by which companies develop resource plans for meeting the
13 state's electricity needs at lowest cost, considering risk and uncertainty, over a
14 time period of up to three decades. Of course, there is a great deal of uncertainty
15 in planning over this horizon, related to (amongst other things) changes in capital
16 costs, fuel costs, environmental regulations and constraints, and economic
17 growth and system load. Thus the goal of minimizing cost is generally broadened
18 to include minimizing risk, by producing a robust plan that has acceptable costs
19 over a broad range of realistic scenarios.

20 Under IRP, it is crucial that all resources be considered on a "level
21 playing field." This means that the development of the IRP must consider all
22 resources that may contribute to meeting need, and must not begin with a
23 prejudice for one type of resource or another. Today, these available resources
24 are generally taken to include energy efficiency and demand response (together,
25 demand-side management) resources, transmission and distribution resources
26 (including improvements to transmission and distribution efficiency), renewable
27 resources, and combined heat and power along with conventional fossil fuel-fired
28 resources. Each type of generation resource must be considered on an equal basis
29 with the others in order to produce the best plan overall; however, some
30 resources have certain costs or benefits in terms of risk or environmental and

1 economic externalities that are not as readily quantified, and these should also be
2 taken into account in judging the plans.

3 Another fundamental principle is that the planning process should result
4 in the integrated portfolio of resources that will provide adequate and reliable
5 service at the lowest life cycle cost, subject to uncertainty as noted above. Life
6 cycle cost comparisons should be made using either the Total Resource Cost
7 (“TRC”) Test or the Societal Test. Each of these tests has its own advantages, but
8 generally speaking the TRC Test is somewhat easier to implement, while the
9 Societal Test is more comprehensive in the costs and benefits that it considers.

10 **22. Q. What should the Commission look for in evaluating integrated resource**
11 **plans?**

12 A. In order to facilitate review by the Commission and other parties, and to promote
13 accuracy, the assessment and data gathering activities underlying resource plans
14 should be transparent (clear and understandable to the Commission, the parties
15 and the public), fully documented and supported by work papers and
16 methodologies that allow the Commission and the parties to determine their
17 validity, quantitative whenever possible, and treat all resources on a level playing
18 field. Cost-benefit comparisons of resources and portfolios should be carried out
19 using one or both of the two tests recommended above.

20 Further, the Commission should expect the presentation and analysis of a
21 number of alternative plans, reflecting the diversity of options for meeting the
22 electricity needs of Nevada and the range of uncertainty for future conditions.
23 These plans should explore a full range of conventional supply, renewable
24 supply, and demand-side resources and compare the costs and benefits of each.
25 The analysis should take into account risk and uncertainty in comparing the
26 alternative plans, for example through stochastic simulation of uncertain input
27 variables.

1 **23. Q. Is this approach to planning required in Nevada?**

2 A. NRS 704.741(2)(b) mandates that Nevada utilities “Determine the best
3 combination of sources of supply to meet the demands or the best method to
4 reduce them.” IRP practices are calculated to lead to adequate and reliable utility
5 service, minimizing cost and risk to consumers. The Commission should
6 interpret this requirement to mean that utility resource plans should abide by
7 those practices and, in general, the practices and guidelines for IRP.

8 **24. Q. How should “environmental costs” be treated in IRP? Please refer to**
9 **applicable Nevada statutes and regulations.**

10 A. There are two types of environmental costs that should be considered in IRP
11 processes. The first of these is quantifiable economic costs associated with
12 compliance with environmental regulations. These include the fixed and variable
13 costs of emissions control technology, as well as the cost of any emissions
14 allowances that must be purchased in order for the plant to operate. Under
15 Nevada law, these costs would be most appropriately included in the calculation
16 of the “Present Worth of Revenue Requirements”, or PWRR.

17 A different kind of environmental cost is a cost which is not readily
18 monetized nor borne directly by the utility, but which represents harm to the
19 environment associated with some type of supply resource. For example, a new
20 coal plant would emit mercury which may harm local waterways and ultimately
21 impair the health of individuals who consume fish from those waterways. This
22 would be a societal cost associated with the resource, but as it would not be an
23 operating cost borne directly by the utility, it should not be treated as part of the
24 PWRR. Nevada law describes these costs as “those costs, wherever they may
25 occur, that result from harm or risks of harm to the environment after the
26 application of all mitigation measures required by existing environmental
27 regulation or otherwise included in the resource plan.” [NAC 704.9359]

1 **25. Q. Should CO₂ emissions costs be considered as operating costs under PWRR,**
2 **or as societal costs?**

3 A. The emissions costs I am addressing here are quantifiable operating costs,
4 incurred by the utility for every MWh of energy produced and ultimately
5 included in the revenue requirements of the utility. Thus they belong squarely in
6 the PWRR calculations used to develop their resource plans.

7 There are also substantial societal costs associated with CO₂ emissions, from
8 Nevada's resources combined with all other resources and emissions sources in
9 the world, that far exceed the likely cost of emission allowances under federal
10 regulation. (The allowance price will reflect the marginal mitigation cost, or the
11 incremental cost of reducing CO₂ emissions.) These additional social costs of
12 emissions belong in the PWSC, to the extent that they can be estimated.

13 However, the cost of mitigation or allowance purchases is a direct operating cost
14 born by the utilities that belongs in the PWRR.

15 **26. Q. Have NPC and SPPC accommodated CO₂ costs adequately in their resource**
16 **plans?**

17 A. No. While they have asked Company witness Dr. David Harrison to analyze the
18 emissions costs associated with their resource plans, these analyses have fallen
19 far short of what is required for prudent planning in two ways.

20 First, the alternative plans were all developed without assuming any CO₂
21 costs, resulting in a number of alternative plans which all have very similar total
22 CO₂ emissions. Thus no plans were considered which relied significantly more
23 than the "preferred plan" on low- or zero-carbon resources, so there is no
24 information provided for Commission consideration as to what the costs or
25 savings of such a plan would be relative to the preferred plan.

26 Second, Dr. Harrison has relied upon a very limited set of, in my opinion,
27 unrealistically low projections of CO₂ emissions costs for his "illustrative"
28 assessment of CO₂ costs. For example, in presenting what he identifies as his

1 “EIA L-W Prices”, the highest possible carbon emissions prices he considers, he
2 has chosen only the most optimistic and lowest cost of EIA’s numerous scenario
3 analyses in the cited reference for the Lieberman-Warner bill. In so doing he
4 obscures even those differences which might truly exist between the plans he has
5 considered, and he minimizes the importance of this fundamental future driver of
6 electricity generating costs.

7 **27. Q. Did the Companies adequately represent CO₂ emissions costs in their**
8 **forecast of power prices in the region?**

9 A. No. The Company relied upon model runs from a third party, Ventyx, to project
10 power prices in the western United States. According to the testimony of Ms.
11 Judith Murray, Manager of Market Fundamentals for SPPC and NPC (page 8),
12 Ventyx routinely includes carbon prices in their analysis and did so for their
13 “Spring 2008 reference case”. However, at the Companies’ request, these carbon
14 emissions prices were removed for the Nevada Power runs.

15 **28. Q. Why is it important to include CO₂ emissions costs in analyses of future**
16 **electricity prices for resource planning purposes?**

17 A, The most likely scenarios of future electricity markets are strongly influenced by
18 carbon emissions costs, which should drive the economics of both resource
19 investment decisions and unit dispatch. Indeed, this will be the very purpose of
20 future federal greenhouse gas regulation, and the primary means by which it is
21 effective. Ignoring these costs in Nevada IRP is not prudent, and increases risk
22 for Nevada ratepayers.

23 **29. Q. Has Synapse Energy Economics prepared a recent report presenting**
24 **updated and more realistic projections of CO₂ emissions costs for use in**
25 **electric utility resource planning?**

26 A. Yes. The recent Synapse report entitled “Synapse 2008 CO₂ Price Forecasts,”
27 presented as Exhibit EDH-2, contains an analysis of a wide range of studies

1 projecting likely CO₂ emissions costs and presents what we consider to be a
2 reasonable set of forecasts to use for resource planning purpose.

3 **V. CHANGES IN THE PLANNING ENVIRONMENT**

4 **30. Q. You mentioned earlier that capital costs for new generating resources have**
5 **experienced “rapid escalation”. Does this apply to the cost of base load, coal-**
6 **fired resources such as EEC?**

7 A. Yes.

8 **31. Q. Has Synapse recently investigated trends in the capital costs of new base**
9 **load electricity generating resources?**

10 A. Yes. A copy of Synapse’ report entitled *Coal Fired Power Plant Construction*
11 *Costs* may be found as Exhibit EDH-3. This report has been updated as of July
12 2008.

13 **32. Q. Have the Companies indicated that they are aware of this rapid escalation in**
14 **capital costs?**

15 A. Yes. The recent escalation in capital costs for coal-fired resources is described in
16 the prefiled testimony of Roberto Denis (p. 14) and further discussed in the
17 prefiled testimony of Mr. David Sims. Mr Sims (p. 10-11) estimates that the cost
18 of construction is likely to escalate by 40% over the \$5 billion the plant would
19 cost “at the time of this filing” – this is already a \$2 billion increase in the cost.
20 However, the total cost projected by Mr. Sims was redacted from the version of
21 his testimony that I have reviewed.

22 **33. Q. Why does the delay in the EEC schedule represent an “opportunity” with**
23 **respect to federal greenhouse gas regulations?**

24 A. While there is widespread anticipation that some sort of federal action regulating
25 carbon emissions is likely in the next few years, it is unknown today what that
26 action will be, or the exact implications for the economics of electricity
27 generation. However, better information is available today than was available

1 one year ago in terms of the likely form of federal legislation and analyses of the
2 cost, and information that is better still will be available a year from now. The
3 delay in the EEC schedule presents the opportunity for better information to be
4 considered with respect to this crucial driver of future generation economics.

5 **34. Q. What will be the key factors determining carbon emissions costs, and why**
6 **do you say that the available information keeps getting better?**

7 A. The key drivers, outlined in the July 2008 report *Synapse 2008 CO₂ Price*
8 *Forecasts*, (Exhibit EDH-2), include the numerical limits and timing of federal
9 carbon regulation; the flexibility with respect to trading and offsets; and the
10 ultimate cost of abatement through improved technology or zero-carbon
11 generating alternatives. As we have more opportunities to observe the progress of
12 proposals through Congress, we get a better sense of the likely form of federal
13 legislation. We also have an opportunity to study the progress of abatement
14 technology and make better estimates of the ultimate cost of abatement.

15 **35. Q. Has Synapse updated its carbon emissions price forecasts within the last**
16 **year in response to the factors you mention?**

17 A. Yes. For example, the report presented as Exhibit EDH-2 to this testimony is an
18 update of the report I attached to my testimony under Docket 07-06049 in 2007,
19 and the emissions price forecasts have been revised in response to these
20 developments.

21 **36. Q. Has Company witness Dr. David Harrison also revised his estimates of**
22 **carbon emissions costs?**

23 A. Yes, in response to similar developments. However, as discussed earlier, even his
24 “high” price forecasts are considerably lower than the prices that I and many
25 other analysts expect to result from most of the legislation that has been proposed
26 in Congress.

1 **37. Q. Dr. Harrison concluded that the differences in CO₂ emissions costs among**
2 **the Company's plans are "relatively small". Can you explain this**
3 **observation?**

4 A. The differences in CO₂ costs were small because the differences among the plans
5 were small. There was no plan, for example, that did not include the full Ely
6 Energy Center as a new resource. If the Company had considered plans that
7 included significantly increased contributions from zero-carbon resources
8 instead, I am confident that Dr. Harrison would have found a much larger
9 difference in carbon emissions costs even given his modest emissions prices.

10 **38. Q. Are there other ways in which the planning environment in Nevada has**
11 **changed or is changing that would affect the viability of EEC relative to**
12 **other resource options as a result of the delay in the EEC schedule?**

13 A. Yes, including two under consideration in this Docket. The proposed acquisition
14 of the Bighorn combined cycle power plant and the proposed construction of the
15 Harry Allen CC will affect the resource and operational needs of NPC and SPPC.
16 These two gas-fired generating resources reduce the open position for the Nevada
17 utilities, and they also increase the system's flexibility for accommodating
18 variable output resources such as wind power. Any new plans, including NPC's
19 2009 IRP filing, should be made taking opportunities raised by these factors into
20 account.

21 In addition, there have been enormous changes in fuel costs in recent years
22 and there is no sign of these settling down soon. Notably, the market for US coal
23 is becoming a global market, and prices for this fuel will now be sensitive to
24 global competition. (A recent whitepaper by Western Resource Advocates on the
25 upward price pressure on coal is included as Exhibit EDH-4 to this testimony.)
26 The EEC delay means that the Companies can and must revise their fuel price
27 forecasts, as they are doing in this Docket, and prepare and update their resource
28 plans accordingly.

1 Another area that is changing rapidly is the availability of water. Nevada is
2 largely a desert state with rapidly growing water demands, and available water
3 resources are likely to be adversely affected in the coming years as a result of
4 both global climate change and local resource depletion. The delay in the EEC
5 means that the Companies have more time to consider resources that are less
6 water-intensive than EEC, such as increased reliance on renewables and demand
7 reduction, in the face of greater scientific understanding of the future water
8 resource constraints in the state.

9 **VI. IMPLICATIONS OF THE REVISED EEC SCHEDULE ON**
10 **ALTERNATIVE RESOURCE OPTIONS**

11 **39. Q. How should NPC and SPPC use the time afforded by the delay in the EEC**
12 **project to best serve the resource needs of Nevada ratepayers?**

13 A. The principle that should guide the Companies in the intervening time is to retain
14 maximum flexibility to develop and deliver whatever resources will bring the
15 greatest economic benefit to Nevada and to Nevada ratepayers in the years to
16 come. In addition, the Companies should pursue resource management strategies
17 that are clearly economically justified but that may take some time to fully
18 implement.

19 **40. Q. What actions do you consider most critical to improving the flexibility of the**
20 **Companies for developing future resources?**

21 A. I do not have a complete list, nor have I personally performed the analyses to
22 identify these actions specifically. However, it is clear that strengthening the
23 interconnection between northern and southern Nevada, for example with the
24 proposed Eastern Nevada Transmission Intertie project (En-ti) or the Great Basin
25 Transmission project, makes a great deal of sense and probably should not be
26 delayed solely because the EEC project has been delayed. In addition to allowing
27 the Companies to better share reserves, this interconnection will facilitate the
28 development of northern Nevada's copious renewable resource potential to serve

1 load in the south. The Companies should be required to initiate engineering and
2 economic studies toward developing these renewable energy resources and the
3 transmission infrastructure to support them, as well as on resolving any
4 integration issues that may arise.

5 **41. Q. What evidence can you present that strengthening the north-south**
6 **interconnection in Nevada will have the benefits you claim?**

7 A. I have presented a February, 2008 report from the Aspen Environmental Group
8 (Aspen) authored by Dr. Carl Linvill, Mr. Christopher Cooke, Dr. Suzanne
9 Phinney, and Dr. Richard McCann, entitled *Laying a Foundation for Nevada's*
10 *Electricity Future: Generation Facility Uncertainties and the Need for a Flexible*
11 *Infrastructure*, as Exhibit EDH-5 to this testimony. The Aspen report details the
12 benefits of improving the north-south interconnection and other ways to maintain
13 and enhance flexibility in Nevada.

14 **42. Q. Do you consider the Aspen report to be a credible guide to infrastructure**
15 **development in Nevada?**

16 A. I consider the report to be highly credible and well researched, and the authors
17 have excellent credentials for the research they have performed and presented.
18 However, I see the report as more of a guide to planning than a guide to
19 infrastructure development. In fact, it seems to me that the conclusions reached
20 in the report regarding the potential for various types of economic, zero carbon
21 resources are highly conservative, and the Commission should view these
22 estimates as closer to a lower bound for what could be achieved in these areas.
23 While the EEC schedule is delayed and uncertain, the utilities and the
24 Commission should engage immediately in thorough research and engineering
25 studies in the areas identified in the Aspen report to determine more specifically
26 the potential and cost of the various resource alternatives described.

27 On the other hand, the argument for strengthening the north-south
28 interconnection is fundamental to an extremely broad array of resource
29 development alternatives. The Companies should be instructed to immediately

1 perform engineering studies to determine whether the proposed En-ti, the Great
2 Basin Transmission project, or some other configuration represents the best and
3 most economic alternative for achieving this goal while moving toward
4 development of Nevada's renewable resources, or to come up with a better
5 transmission alternative that would achieve these ends. The Companies should
6 evaluate development of a north-south interconnection in NPC's 2009 IRP for all
7 of the other potential benefits it might offer independent of the EEC. The
8 Commission should not automatically accept a delayed intertie construction
9 schedule solely because of the proposed delay for the EEC.

10 **43. Q. For NPC's 2009 IRP and SPPC's 2010 IRP filings, should the Companies**
11 **evaluate levels of renewable resources in excess of those required to meet the**
12 **Nevada Renewable Portfolio Standard?**

13 A. Yes, absolutely. These resources mitigate the risk of both high carbon emissions
14 costs and volatile and potentially escalating electricity and fuel prices. The
15 Companies should not constrain their consideration of resources which are likely
16 to be economically preferable to fossil-fired generation in a carbon-constrained
17 world just because Nevada has established a floor in this regard. Renewable
18 resources in general emit no CO₂, consume no scarce water resources, and are
19 immune to rising or volatile fuel costs.

20 In fact, Nevada utilities can and should aggressively develop renewable
21 resources in the state not only to serve in-state load, but also to serve the growing
22 demand for carbon-free, renewable energy in neighboring states. Nevada is richly
23 endowed with renewable energy potential, and this potential should be developed
24 for economic and employment benefits in the state as well as for the avoided
25 environmental damages, both local and global.

1 **44. Q. Will Nevada-generated renewable energy be marketable in the surrounding**
2 **states, given that some of those states' renewable energy mandates express a**
3 **preference for in-state resources?**

4 A. Yes. It is true that some states place a premium value on in-state generated
5 renewables--in Colorado, for example, in-state renewable resources can receive
6 Renewable Energy Credits (RECs) for at least 125% of their output. But there is
7 still a very large opportunity to meet regional requirements and to help achieve
8 regional greenhouse gas mitigation goals through interstate trade in RECs. In
9 addition, federal greenhouse gas legislation will significantly increase the
10 demand for and value of all carbon-free energy sources. Nevada should be
11 prepared to seize this opportunity on day one.

12 **45. Q. Do logistical and cost issues preclude significantly increasing the**
13 **contribution of renewable energy sources to US electricity grids?**

14 A. No. A growing body of research and experience has demonstrated that U.S.
15 power systems can accommodate much larger shares of variable, renewable
16 energy resources with no technical problems and at modest cost. This research is
17 outlined in a recent memo from Michael Goggin of the American Wind Energy
18 Association to NCARE, attached as Exhibit EDH-6.

19 **46. Q. Are the studies cited in Mr. Goggin's memo applicable to Nevada?**

20 A. Mr. Goggin's memo deals mostly with integration of wind power, and in this
21 sense it is applicable to Nevada. However, Nevada is richly endowed with a wide
22 variety of renewable energy options, including wind, geothermal, solar thermal,
23 and solar photovoltaic opportunities. These resources are also spread out over a
24 wide geographic area. This diversity in resources and geography suggests that
25 integration of renewables into the Nevada grid would actually be easier and less
26 costly than it would be in many other regions, because the output profiles of the
27 various resources would tend to complement each other.

1 **47. Q. You also mention resources that are “clearly economically justified but that**
2 **may take some time to fully implement.” Please explain.**

3 A. The primary resource in this category is demand resources—both energy
4 efficiency, which is a base load resource, and demand response, which reduces
5 capacity requirements. Energy efficiency initiatives cost an average of 2-3 cents
6 per kWh avoided, compared with perhaps three or four times that for new
7 generating resources. They are located exactly where demand is, so they don’t
8 require any new transmission infrastructure and in fact can sometimes obviate or
9 defer expensive new transmission. This is the “no-brainer” of resource planning,
10 and in fact many states and Commissions, including California, Minnesota,
11 Massachusetts, and Vermont, now require that “all economic” demand resources
12 be pursued prior to approving any new generating resources.

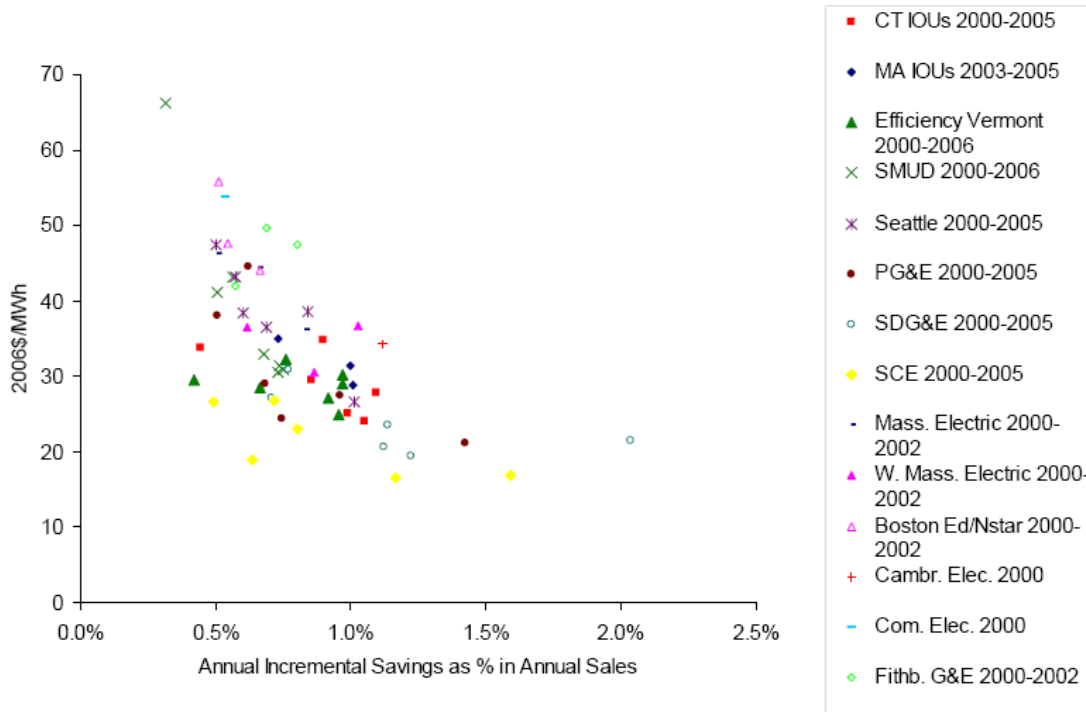
13 However, effective demand management requires careful planning and
14 analysis, and often involves a ramp-in period to reach the maximum achievable
15 and cost-effective savings. Also, every dollar spent on demand resources today
16 will continue producing savings for years to come (on average about 12 years,) on
17 top of whatever savings are produced by investment in demand management
18 in future years. For all of these reasons, the Commission should direct the
19 Companies to demonstrate in NPC’s 2009 IRP and SPPC’s 2010 IRP that “all
20 economic” demand resources are being pursued as quickly as feasible, and not
21 postpone full consideration of these alternatives until after the IRPs are filed.

22 **48. Q. Nevada utilities already engage in demand management practices. Doesn’t**
23 **this mean that the cost of the next increment of demand reduction will be**
24 **higher than you say?**

25 A. No. While this is commonly assumed, it is quite the opposite of what Synapse
26 has found through our research into demand management programs around the
27 country. Figure 1 below, juxtaposing annual incremental savings with per-unit
28 cost of energy efficiency programs around the country, illustrates this point: the
29 higher the energy savings, the lower the per-unit cost of the program.

1 This observation, that per-unit costs decrease with higher penetration rates, is
2 probably due to greater economies of scale in more aggressive programs, and
3 increasing sophistication and effectiveness of the programs as they grow. A
4 likely cost reduction associated with economies of scale would come from
5 spreading out the cost of marketing, administration, planning, and measurement
6 and verification over a larger quantity of initiatives and customers. The
7 sophistication and effectiveness of the programs increase as providers fine-tune
8 the incentives to bring about the greatest amount of energy savings for the dollar,
9 and from developing innovative marketing strategies. Companies are more likely
10 to better manage efficiency programs when the scale of the programs increase,
11 and the Company can spend more time and resources on program design and
12 planning.

13 It is probably true that there is a level of demand management at which the
14 per-unit costs start to increase. However, I do not believe that any region in the
15 United States has come close to reaching this level of energy efficiency.



1

2 **Figure 1.** Energy efficiency program cost compared to annual incremental savings for various
3 energy efficiency programs in the United States.

4 **49. Q. Are there other resources that may be economically beneficial for Nevada**
5 **which the state and the Companies should develop?**

6 A. Yes. In particular, Nevada holds great potential for combined heat and power
7 (CHP) resources, also known as co-generation, which produce electricity while at
8 the same time powering a steam load for on-site purposes. This could be an
9 extremely efficient way to run air-conditioning in Nevada hotels, for example,
10 while producing power for other electricity needs. The large hotel and casino
11 industry represents an attractive CHP opportunity in the state that should be
12 developed aggressively with financial incentives and rules which facilitate and
13 encourage the interconnection of these resources.

14 **50. Q. Is there a recent study which reviews the CHP opportunities in hotels and**
15 **casinos in the United States?**

16 A. Yes. I have presented a 2005 EPA study entitled “CHP in the Hotel and Casino
17 Market Sectors” as Exhibit EDH-6 to this testimony. A more recent addendum to

1 this report, containing updated market information, is presented as Exhibit EDH-
2 7.

3 **VII. RECOMMENDATIONS TO THE COMMISSION PURSUANT TO THE**
4 **PROPOSED EEC SCHEDULE REVISION**

5 **51. Q. What are your recommendations to the Commission regarding NPC's**
6 **requested revisions to the schedule for the EEC?**

7 A. I recommend that the Commission allow the Companies to modify the EEC
8 schedule as proposed. However, the Companies should not be allowed to delay
9 providing the Commission with the information required in the EEC
10 Amendment. Specifically, the Commission should order the Companies to re-
11 analyze and re-justify EEC for NPC's 2009 Integrated Resource Plan (IRP)
12 filing. The Commission should order the Companies to comply with their earlier
13 commitment, made under Docket 07-06049, to provide updated capital cost
14 estimates for the EEC, and to perform a comprehensive assessment of
15 alternatives for meeting Nevada's energy needs. This information must be
16 provided in a timely fashion for the Commission's consideration in the NPC
17 2009 IRP filing.

18 This information and analysis should include updated assumptions for
19 capital, fuel, emissions, and other costs for all resources, including realistic
20 projections of CO₂ emissions costs, and a thorough assessment of alternative
21 plans. All operating costs, including emissions costs, should be treated as part of
22 the PWRR and applied in the development of the alternative plans. In contrast to
23 the "alternatives" presented as part of NPC's 2006 and SPPCs 2007 resource
24 plans and the instant amendments, the updated analysis should include a
25 consideration of alternatives that rely much more heavily on renewable energy,
26 distributed combined heat and power resources, and demand reduction instead of
27 the EEC or any other new coal-fired resource. In addition, the 2009 resource plan
28 filing should fully analyze what investments in Nevada's transmission system

1 will best serve Nevada ratepayers, among other benefits, by facilitating access to
2 the considerable renewable energy resources in the northern part of the state.

3 **52. Q. Do you have any further recommendations for this Commission resulting**
4 **from the revisions to the EEC schedule?**

5 A. Yes. The Commission should order the Companies to address both the increasing
6 costs and risks associated with new coal-fired generation, and the opportunities
7 presented by the delay in the EEC schedule. The revised schedule, and the
8 expanded resource opportunities arising from the revision, exist in a planning
9 environment has changed materially since the Companies first proposed and the
10 Commission gave initial approval for the Ely Energy Center. The outlook for
11 construction costs, fuel costs, and emissions costs have all changed significantly.
12 Technological options that were not available or were considered uneconomic at
13 the time of the 2006 filing may be or may become available or more
14 economically viable in the intervening period. The understanding and impacts of
15 climate change are becoming increasingly clear, and the role of coal-fired power
16 plants in exacerbating this problem is beyond reasonable scientific doubt;
17 similarly, the prospect of federal greenhouse gas emissions regulation becomes
18 more certain with each passing month.

19 This means that the economic and environmental costs of the EEC will be
20 much higher than previously estimated, as the Companies have acknowledged. It
21 also means that the Companies have an opportunity to identify and develop
22 alternative resources which are cost effective, environmentally benign, and will
23 produce lasting economic benefits to the state of Nevada. The Commission
24 should order the Companies to integrate a complete and updated analysis of all
25 resource options in light of these changes in the planning environment, and in
26 light of the opportunities for and benefits of developing Nevada's abundant
27 renewable resource potential. The Commission should not be constrained in these
28 directives by Nevada's RPS standard; to the extent that resources provide
29 economic and environmental benefits to the state, they should be aggressively
30 pursued. The Commission should order that "all economic" demand resources be

1 pursued as part of both Companies' resource plans, as well as the full economic
2 potential of combined heat and power resources in the state.

3 I have provided overviews of available renewable energy, combined heat and
4 power, and demand resources in my testimony and exhibits. These and other
5 resource potential studies should serve as guides for the Commission in judging
6 the resource development proposals presented by Companies.

7 Finally, the Commission should order the Companies to demonstrate that
8 ongoing transmission planning, including the development of one or more north-
9 south interties, will provide maximum flexibility for economic resource
10 development and will ensure optimal access to and deliverability of renewable
11 energy resources in the state.

12 **53. Q. Does this conclude your testimony?**

13 A. Yes.