Nevada Renewable Energy Access/Export Report Outline
Synapse Energy Economics
DRAFT 7/6/2012

I. Introduction
   a. Purpose of this report
      i. Explore benefits of accessing Nevada's RE potential & export to CA
      ii. Opportunities to improve coordination with California
      iii. Number of scenarios considered in this analysis (similarities, differences)
      iv. Overall societal benefits of more efficient electric system, least-cost compliance with 33% RPS
   b. Report format
      i. Description of scenarios
      ii. Rate impact analysis approach
      iii. Economic impact analysis
      iv. Results
   c. Summary of Conclusions
      i. Overall cost impacts of export scenarios
      ii. Macroeconomic/employment impacts
      iii. Key differences among scenarios
      iv. Potential policy directions for Nevada
      v. Caveats, limitations of the analysis
      vi. Next steps
II. Background
   a. State of Nevada
      i. Current Status – Generation, Load, RPS
      ii. Renewable Energy Resources
   b. State of California
      i. Current Status – Generation, Load Growth, RPS, OTC, LCR
      ii. CA IOUs and public power entities - Renewable energy requirements, procurement process, resource adequacy accreditation
   c. Potential for RE sales from Nevada to California
      i. Abundant resources
      ii. Geographic Proximity
      iii. RE Generation Characteristics
      iv. Current Mechanisms – Bilateral Transactions
      v. Regional Market for Renewable Energy – CAISO, NV & UT Delivery Points
      vi. Transmission Needs for expanded access

vii. Obstacles
    1. Transmission (inter- and intra-state)
    2. Cost allocation & tariff issues
    3. Must realize mutual benefits (should be possible to split up larger pie with more efficient use of resources)

d. Development of mutually beneficial transmission, Applicable Rate Payer Mechanisms
    i. Who controls lines, who pays, implications for success and mutual benefits

III. Scenarios

a. Short term – export-only scenarios
    i. Scenario 1: Harry Allen to Mead, 1150 MW
        1. Projects
        2. Costs
        3. Benefits
    ii. Scenario 2: Valley Electric -El Dorado 500 kV, Clayton extension 1500 MW
        1. Projects
        2. Costs
        3. Benefits
    iii. Scenario 3: Harry Allen Transformer Replacement, 400 MW
        1. Projects
        2. Costs
        3. Benefits

b. Long term – NV infrastructure focus
    i. Scenario 4: The North Project
        1. Projects
        2. Costs
        3. Benefits
    ii. Scenario 5: The East Project
        1. Projects
        2. Costs
        3. Benefits
    iii. Scenario 6: The South Project
        1. Projects
        2. Costs
        3. Benefits

IV. Energy Exchange & Cooperation Rate Impact Analysis - Short-term scenarios

The basic construct behind our proposed analysis of short-term scenarios is as follows:

(a) California ratepayers are willing (or required) to purchase renewable energy at a market price, which may be the CEC threshold price, or other market indicator.

(b) One way to provide this renewable energy is to beef up the export capability from Nevada and develop Nevada renewable resources. Someone must finance each of these cost components and pay for them on a levelized basis, with an appropriate cost of capital.

(c) The difference between the price Californians are willing to pay (a) and the cost of providing this energy (b) is the surplus, or the value of developing Nevada renewables and delivering them to California. This surplus may be negative in some cases, in which case there is no market opportunity.

(d) The surplus (d), if positive, will be distributed in some way among California ratepayers, Nevada ratepayers, and private investors. The specific allocation will depend on who takes the investment risk, on who owns and controls the transmission components, and on the relevant transmission tariffs.

a. Cost Allocation I: No Cooperation
    i. NV (taxpayers or ratepayers) pay for transmission upgrades
        1. Use utility cost of capital assumptions
    ii. Private investors pay for RE
    iii. CA customers purchase energy and RECs at California market prices
    iv. NV ratepayers may benefit from some transmission charges for exports; private investors get the rest of the surplus.
    v. CA customers see no surplus, as they purchase energy at market price (except possible impact of greater competition in RE supply sector, not quantified here.)
b. Cost Allocation II: With Cooperation
    i. Renewable resources developed by (or under long-term contract to) CA utilities
    ii. CA Energy customers pay for RE at LCOE for their purchased quantity
        1. Calculate LCOE using private developer cost of capital assumptions
    iii. NV Energy customers may also pay for some RE for themselves, TBD.
    iv. Transmission upgrade costs allocated between CA and NV customers.
    v. CA customers save money relative to California market prices
    vi. CA customers benefit from delta between cost and CEC threshold

vii. NV energy customers pay for only a portion of transmission build out
    1. Less risk for NV, but state still gets the macroeconomic benefits

V. Energy Exchange & Cooperation Rate Impact Analysis - Long-term scenarios

Long-term scenarios are much more oriented towards strengthening the transmission infrastructure within Nevada, for example by providing a strong north-south link. This is projected to have benefits for Nevada ratepayers in terms of more efficient dispatch of resources, including access to low-cost renewables in the northern part of the state to serve load in the Las Vegas area. Thus it will be important to somehow characterize these benefits for quantifying the macroeconomic benefits of lower electricity rates in the state. These ratepayer benefits will be characterized based on existing analyses of the benefits of improving intrastate transmission in Nevada, but will not be quantified as part of this analysis.

a. General description of Nevada transmission system, point of scenarios
b. Description of studies, general benefits of cooperation
c. Aspects of rate impact benefit of accessing northern region renewables
    i. Low-cost resources
    ii. Long-term cost stability
    iii. Hedge against future emissions costs & regulations, including CO_2
d. Assume Nevada ratepayers pay for all transmission upgrades, but benefit from a portion of transmission access charges TBD

VI. Economic Modeling

a. Introduction
    i. Focus on short-term scenarios – and on impacts in Nevada
    ii. Near-term impacts – construction
    iii. Longer-term impacts – O&M and rate impacts
    iv. Sales & use tax revenue impacts
    v. Address (but do not quantify) benefits in CA associated with cost savings.
b. Assumptions, Methodology
    i. Transmission projects
        1. Location of activity – % in NV
        2. Labor costs - % using NV workers
        3. Material costs – breakdown of supplier industries, % of each located in NV
        4. Additional costs in NV rates
    ii. Renewable projects
        1. Labor costs - % using NV workers
        2. Material costs – breakdown of supplier industries, % of each located in NV

3. Additional costs in NV rates

iii. Sales and use taxes

iv. Cooperation between CA and NV

1. Additional costs/savings in CA and NV rates

c. Modeling

i. Industries used in REMI

ii. Rate impact levers – residential, commercial and industrial electricity spending

VII. Results and Metrics

a. Electricity System Benefits and Costs (derived from III)

i. Cost of Electric Service to NV and CA

ii. Electric System Reliability in NV and CA

iii. Value from Cooperation

iv. Incremental Impact of each change on NV electricity rates.

b. Economic Benefits and Costs (Derived from IV.) for all scenarios with and without cooperation

i. Employment

ii. Income

iii. Tax Revenue

iv. Gross State Product

VIII. Conclusion & recommendations

IX. Appendices

a. REMI PI+