

**RESPONSES TO RESOURCE PLANNING QUESTIONS SUBMITTED TO TRI-STATE**  
**RESPONSE SET NUMBER 1 DATED APRIL 27, 2010**

**QUESTION NO. 1:**

What planning model does Tri-State use?

**RESPONSE:**

Tri-State uses Ventyx's System Optimizer and Planning and Risk modeling software.

**QUESTION NO. 2:**

In figures 1 and 2 on page 7 of the Annual Progress Report filed with the Colorado Public Utilities Commission, dated October 30, 2009, Tri-State plots resources against "total obligations." What are the categories of loads that comprise "total obligations?"

**RESPONSE:**

Total Obligations in figures 1 and 2 on page 7 are comprised of the following:

1. Member loads shown on pages 25 and 26 in Table 3606(b)1 and Table 3606(b)2 under columns Base Case, Economic Low, Economic High.
2. Sales to Non-Members
3. Planning Reserves, Operating Reserves and Losses

**QUESTION NO. 3:**

How, if at all, was DSM (energy efficiency, demand response, load management) taken into account in determining need for energy and need for capacity?

**RESPONSE:**

DSM was taken into account in two ways:

1. Existing member DSM and member use of Tri-State DSM credits programs are reflected in the member historical load growth and load patterns that are basis for the load forecast models.
2. Equipment and appliance efficiency standards, saturation trends and building structural trends are used in models for the residential use per account.

**QUESTION NO.4:**

Generally, in the development of load forecasts, what functions does Tri-State perform and what functions do Tri-State's members perform?

**RESPONSE:**

Tri-State and its members work together in developing load forecasts. Members provide historical load and large customer data. Members review and request forecast modifications, and members approve the forecasts. Tri-State builds the forecast models, adjusts forecasts per member inputs and summarizes the forecasts into reports. Tri-State also provides analysis and projections of forecast variances.

**QUESTION NO. 5:**

Does Tri-State review the load forecasts of its members?

**RESPONSE:**

Tri-State and its members jointly develop the load forecasts.

**QUESTION NO. 6:**

By name of unit or plant, what are the ages of all Tri-State's generation facilities?

**RESPONSE:**

**TRI-STATE GENERATION FACILITIES  
Station Ages**

**Craig Station:**

Unit 1 - COD 1980 - Age 30 years

Unit 2 - COD 1979 - Age 31 years

Unit 3 - COD 1984 - Age 26 years

**Nucla Station:**

COD – 1992 – Age 18 years

**Escalante Station:**

COD – 1985 – Age 25 years

**Springerville 3:**

COD – 2006 – Age 4 years

**Rifle Station:**

COD – 1987 – Age 23 years

**Pyramid Station:**

COD – 2003 – Age 7 years

**Knutson Station:**

COD – 2002 – Age 8 years

**Burlington Station:**

COD – 1977 – Age 33 years

**Limon Station:**

COD – 2002 – Age 8 years

**Laramie River Station (Tri-State 24.13% owner):**

Unit 1 – COD 1980 – Age 30 years

Unit 2 – COD 1981 – Age 29 years

Unit 3 – COD 1983 – Age 27 years

**San Juan Station (Tri-State 8.2% owner of unit 3):**

Unit 3 – COD December 31, 1979 – Age 30 years

**QUESTION NO. 7:**

Tri-State has indicated that it is partly insulated from the risk of coal price increases by virtue of its ownership of coal-producing resources and transportation facilities:

- (i) What percentage of Tri-State's coal fuel resources are owned in whole or in part by Tri-State over what period of time in the future?

**RESPONSE:**

Tri-State views this information as proprietary and commercially sensitive.

**QUESTION NO. 8:**

Please identify Tri-State's coal transportation facilities.

**RESPONSE:**

Tri-State views this information as proprietary and commercially sensitive.

**QUESTION NO. 9:**

What is the status of the Carbon Footprint and Capture Study Tri-State said it was going to perform in 2009?

**RESPONSE:**

**Carbon Mitigation and Sequestration Analyses**  
**Tri-State Summary**

**Scope**

Tri-State in 2009 commissioned a study, referred to as the CO<sub>2</sub> Footprint & Monetization Analysis, to investigate (1) past, present and future projects at generation and transmission assets, headquarters and the operations center in terms of impacts on carbon dioxide (CO<sub>2</sub>) emissions, (2) costs of such projects in dollars-per-metric ton CO<sub>2</sub> and (3) potential for geologic storage of CO<sub>2</sub> in the vicinity of Tri-State's generation assets. The study was executed by a consultant based on site visits to coal plants, Tri-State-supplied documents, publicly available information including databases, EPRI and NETL documents, and the consultant's industry knowledge. The study was completed in November 2009.

The internal mitigation portion of the study focused on the following areas.

- Coal generation (Craig, Nucla, Escalante and Springerville 3) capital projects completed since 2005 and those in Tri-State's "10-year plan" that resulted or are projected to result in efficiency improvement, auxiliary power reduction, and CO<sub>2</sub> reduction. Although it occurred prior to 2005, the Yampa Environmental Project was included because of the breadth of that project.
- Potential generation capital improvements and changes in plant operating practices that, if completed, would prevent, reduce or mitigate CO<sub>2</sub> emissions.
- Transmission capital projects completed since 2005 and those in Tri-State's 10-year plan that result or are projected to result in power factor or line loss improvement.
- Potential transmission capital projects and changes in operating practices that, if completed, would result in power factor or line loss improvement.
- Supply side management projects at existing coal generation plant sites that, if completed, would result in CO<sub>2</sub> emission reduction.
- Past and potential future projects at headquarters/operations center that reduce CO<sub>2</sub>.
- Description of resources/tools that could be applied to manage CO<sub>2</sub> emission reductions.

The sequestration portion of the study included the following tasks.

- Evaluate generation facilities (Craig, Nucla, Escalante, Springerville 3, Limon, Knutson, Burlington, Rifle, Pyramid, Holly, and Brush) for site-specific opportunities for underground CO<sub>2</sub> geologic storage in saline aquifers, unmineable coal seams, and other geologic formations.
  - For each formation, describe well drilling requirements, storage capacity estimates, and measurement, monitoring and verification requirements.

- For each of the coal-based generation facilities listed above:
  - Evaluate site-specific potential to connect with operations for Enhanced Oil Recovery (EOR), Enhanced Natural Gas Recovery (ENGR), and Enhanced Coal Bed Methane (ECBM).
    - Describe nearest operations, market for additional CO<sub>2</sub>, pipeline requirements, well drilling needs, storage capacity estimates, and measurement, monitoring, verification and site closure requirements.
    - Determine linkage potential to existing CO<sub>2</sub> pipelines and infrastructure.
  - Perform a cross-cutting evaluation for the coal generation facility-based scenarios for CO<sub>2</sub> storage developed above, including risk assessment, permitting requirements, cost estimates, and development timelines.

**Carbon Mitigation - Summary of Results**

*CO<sub>2</sub> Emission Reductions To Date*

The study calculated and summarized CO<sub>2</sub> reduction since 2005. Tri-State views these results as commercially sensitive and confidential information.

**Carbon Sequestration - Summary of Results**

The study identified several sequestration options within a 200 mile radius of our facilities. Tri-State views the complete study as commercially sensitive and proprietary. Tri-State will not provide the complete study.

**QUESTION NO. 10:**

What is the status of the Generation Technical Assessment Tri-State indicated it was going to sponsor? See at pp. 63-64 and pp. 11-12 of Tri-State’s Initial Comments in the PUC investigatory docket.

**RESPONSE:**

The indicated study was completed. Tri-State views this information as proprietary and commercially sensitive. Tri-State will not provide the complete study.

**QUESTION NO. 11:**

Has Tri-State conducted a study of how it might meet the Governor’s Green House Gas reduction goals, i.e. 20% reduction from 2005 levels by 2020? If so, please provide a copy of this study.

**RESPONSE:**

Tri-State has not yet conducted such a study.

**QUESTION NO. 12:**

What is the status of the final Nexant Report on DSM potentials on the Tri-State system? Please provide a copy of the final report.

**RESPONSE:**

The study is complete and the final version of the system-wide energy efficiency study has been posted on Tri-State’s website.

**QUESTION NO. 13:**

What is the status of Tri-State's inquiry into intermittent resource integration on its system?

**RESPONSE:**

The study is continuing.

**QUESTION NO. 14:**

Does the fact that Tri-State operates in five different control areas, none of which is managed by Tri-State, have an impact on intermittent resource integration on the Tri-State's system? If so, what effect?

**RESPONSE:**

Each of the control regions has differing opportunities to integrate intermittent resources. Tri-State also must purchase ancillary services to balance its load.

**QUESTION NO. 15:**

Does the support for local, community-based projects referenced on page 59 of the 2009 Annual Progress Report extend to wind projects?

**RESPONSE:**

Yes.

**QUESTION NO. 16:**

Is Tri-State involved in any National Renewable Cooperative Organization projects to consider the export of Colorado renewable energy to renewable-poor regions? 2009 APR, p. 60.

**RESPONSE:**

Not specifically.

**QUESTION NO. 17**

What is the status of the following various analyses and inquiries referenced at pp. 59-67 of the 2009 Annual Progress Report?

(i) the energy storage research project?

**RESPONSE:**

Extensive data on future estimated electric energy and natural gas prices has been provided to EPRI, and they are continuing with the Brush, Colorado area case study.

(ii) the nuclear site study by McCallum-Turner;

**RESPONSE:**

The nuclear site study was a fatal flaw analysis at the Holly, Colorado site for the potential of a nuclear generator. The study was completed last year and no fatal flaws were uncovered.

(iii) the solar augmentation project at Escalante;

**RESPONSE:**

EPRI has collected extensive site data, weather data and provided a detailed preliminary feasibility study. Estimated costs are high and Tri-State is reviewing the study and evaluating how solar augmentation may fit with corporate plans and portfolio standard issues.

(iv) the biomass augmentation at Nucla project;

**RESPONSE:**

The study is ongoing.

(v) the low-cost oxygen production project conducted by EPRI;

**RESPONSE:**

EPRI has issued the report “Summary of Test Results from Babcock & Wilcox’s 30-MW Oxy-Coal Pilot Plant.” The concept works and the pilot plant was able to change from normal to oxy-firing and back with good flame stability and emissions controls. The next step is to plan a 100 MW test in Wyoming to better evaluate the technology and economics.

(vi) Basin’s carbon capture project;

**RESPONSE:**

The study is ongoing.

(vii) the site characterization study for carbon sequestration near to the Craig station;

**RESPONSE:**

The study is ongoing.

(viii) the biological carbon capture demo project;

**RESPONSE:**

This study is on hold.

(ix) the Smart Grid work concerning some Tri-State members;

**RESPONSE:**

None of the Tri-State member proposals was awarded ARRA funds by DOE.

(x) the Commercial and Industrial customer process protocol pilot program

**RESPONSE:**

Tri-State provided funding for a member project. The research is on-going.

(xi) the Transmission Integration Operational Study.

**RESPONSE:**

The NRECA/NREL contractor V&R Energy has not yet heard from DOE on finalizing the scope, schedule and budget. Tri-State continues to support this as an important project and has informed the other partners that we are interested in helping guide the research and will provide necessary electrical system data.

**QUESTION NO. 18:**

Please provide a copy of Tri-State’s wholesale rate design.

**RESPONSE:**

Per Board Policy, rates are designed to recover approximately 42 percent of the Member revenue requirement from the Energy component of the rate and approximately 58 percent of the Member revenue requirement from the Demand component of the rate.

**QUESTION NO. 19:**

What percentage of Tri-State's total costs are recovered through rates on a MW, MWH and "other" charges, if any?

**RESPONSE:**

58% of costs are recovered in MW with the Demand rate and 42% of the costs are recovered in kWh's with the Energy rate.

**QUESTION NO. 20:**

Are all capital costs recovered through the MW charge? If not, what percentage of such costs is recovered through the MWH charge?

**RESPONSE:**

The rate objective states that 58% of total costs are to be recovered through the Demand rates in MW's and 42% of costs are to be recovered through the Energy rates in kWhs. There is no specific allocation based on classified fixed and variable costs.

**QUESTION NO. 21:**

Has Tri-State undertaken a study of its long-run marginal or incremental costs of providing capacity and energy to its members as they vary by time of day or season? If so, please provide a copy of such study.

**RESPONSE:**

Tri-State has not undertaken the indicated study.

**QUESTION NO. 22:**

On page 57 of the 2009 Annual Progress Report, Tri-State states that it will be "evaluating its rate structure and price signal...over the next two years...." What is the status of this evaluation?

**RESPONSE:**

The study has just begun and is expected to be completed in two years.

**QUESTION NO. 23:**

What is Tri-State's view of the magnitude of the risk that an economic penalty will be placed on the combustion of fossil fuels attributable to its contribution to climate change. Has Tri-State computed an estimate of this risk and, if so, what is it?

**RESPONSE:**

Tri-State has not quantified any such "economic penalty." Tri-State is closely following the public policy debates regarding the future treatment of carbon. Tri-State has developed a Greenhouse Gas Management Roadmap that is a step toward quantifying and mitigating future carbon emissions.

**QUESTION NO. 24:**

What is Tri-State's contractual relationships with PSCo for the sale and purchase of capacity and energy and whether they could or should be restructured?

**RESPONSE:**

The existing contracts with Public Service Company do not have any "reopener" provisions that would allow either party the unilateral ability to modify or terminate the contract early. As with

any contract, the parties could mutually agree to modifications or an alternative contract term. Contract details regarding capacity and energy amounts have been provided.

**QUESTION NO. 25:**

What is Tri-State's ability to integrate intermittent resources onto its system when Tri-State does not manage any of the control areas affecting its generation resources?

**RESPONSE:**

Tri-State is able to integrate intermittent resources to some extent onto its system, depending on the size of the resources. In addition, Tri-State will have to purchase some ancillary services to manage imbalances and provide regulation.

**QUESTION NO. 26:**

What has been Tri-State's progress on its Generation Technical Assessment, and what are the sources of data on the costs of various options?

**RESPONSE:**

See response to Question 10.

**QUESTION NO. 27:**

What is Tri-State's view of future baseload resource options, including pulverized coal, IGCC, etc. Does Tri-State have an analysis of the various options, including busbar costs? Will Tri-State provide this data?

**RESPONSE:**

Tri-State is evaluating each of these resource options. Certain of these data will be presented during the presentations regarding Tri-State's system expansion modeling.

**QUESTION NO. 28:**

What is Tri-State's view on regional transmission initiatives, including the High Plains Express.

**RESPONSE:**

Tri-State is participating in several regional transmission initiatives, including High Plains Express. Tri-State views these efforts as positive and hopes they will result in additional cost-effective transmission facilities of appropriate size and location to move power and electricity to our members and other users in a timely manner.

**QUESTION NO. 29:**

Tri-State says that it needs additional baseload generation, but figures in its planning documents indicate the greatest need is to meet loads in June, July and August, which may suggest the need for intermediate generation resources. What is Tri-State's view of this load-matching issue?

**RESPONSE:**

The resource planning process that is currently underway is intended to forecast Tri-State's system needs and determine the adequacy of existing resources to meet those needs. In the event additional capacity and energy are needed to meet the forecast demand, the expansion models present alternative types of capacity to meet the forecasted growth. Tri-State disagrees with the premise of the question that it "says that it needs additional baseload generation."

**QUESTION NO. 30:**

What are the rules for reserves, including spinning reserves, which Tri-State adheres to in its reserve-sharing arrangements? What are the operational and financial relationship between Tri-State and the five relevant control areas in which Tri-State operates?

**RESPONSE:**

Tri-State is a member of the Rocky Mountain Reserve Group and Southwest Reserve Sharing Group, and self-provides contingency reserves, half of which must be spinning. Tri-State purchases regulating reserves from balancing authorities.

**QUESTION NO. 31:**

Will Tri-State provide in Excel spreadsheet or similar format, a copy of Tri-State's current and projected resource plan, taking into account the dates of any increases or decreases in purchased power and any planned unit retirements?

**RESPONSE:**

No.