

RESPONSES TO QUESTIONS RELATED TO SCENARIO MODELING ASSOCIATED WITH TRI-STATE'S ELECTRIC  
RESOURCE PLANS  
JUNE 15, 2010

QUESTION NO. 1

Why does Tri-State propose to specify levels of DSM when Tri-State does not do so for other resources?

RESPONSE

Tri-State is modeling the specific levels of Demand Side Management that were used in the recent Nexant System-wide Energy Efficiency Study. Nexant studied 4 different levels of DSM that were set, respectively, at paying 25%, 50%, 75% and 100% of the incremental cost of enhanced efficiency measures above standard installations. Without additional investigation into DSM penetration levels beyond those modeled in the Nexant study, we would not have confidence in the associated modeling results.

QUESTION NO. 2

Could Tri-State's models produce outputs for the amount of DSM that is cost-effective under various scenario assumptions, like they appear to do for other resources, or is it necessary to specify DSM levels? Is the approach to modeling DSM a technical modeling issue or for some other reason?

RESPONSE

Tri-State is modeling the specific levels of Demand Side Management that were used in the recent Nexant System-wide Energy Efficiency Study. Nexant studied 4 different levels of DSM that were set, respectively, at paying 25%, 50%, 75% and 100% of the incremental cost of enhanced efficiency measures above standard installations. Without additional investigation into DSM penetration levels beyond those modeled in the Nexant study, we would not have confidence in the associated modeling results. Tri-State is not prepared to model additional levels of DSM above those included in the Nexant study. Tri-State is not able to model open-ended levels of DSM.

QUESTION NO. 3

If DSM costs were reduced, would the models be allowed to show the amount of additional DSM that would be cost-effective?

RESPONSE

Tri-State is modeling the specific levels of Demand Side Management that were used in the recent Nexant System-wide Energy Efficiency Study. Nexant studied 4 different levels of DSM that were set, respectively, at paying 25%, 50%, 75% and 100% of the incremental cost of enhanced efficiency measures above standard installations. Without additional investigation into DSM penetration levels beyond those modeled in the Nexant study, we would not have confidence in the associated modeling results. Tri-State is not able to model open-ended levels of DSM.

QUESTION NO. 4

Does Tri-State's modeling take into account potential capacity cost savings attributable to DSM?

RESPONSE

Yes.

QUESTION NO. 5

Are the modeled DSM levels based on utility expenditures or something else? If so, is this all Tri-State expenditures or is it assumed that Tri-State's members would participate in attaining the levels?

RESPONSE

The modeled levels of DSM reflect the 4 levels specified in the Nexant study. The models reflect various levels of incentive payments and administrative costs and result in various levels of annual energy and capacity savings. The expenditures included in the Nexant study are for both the costs of Tri-State and its Members; however, these costs are not broken out between Tri-State and the cooperative utilities.

QUESTION NO. 6

In its “default case” Tri-State uses the 25% or “low” level. Why was this level chosen? Doesn’t Tri-State already offer, or plan to offer, incentives that meet or exceed the 50% or “medium” level?

RESPONSE

The Business As Usual (BAU) cases Tri-State models include the existing Energy Efficiency Credit programs offered by Tri-State. The 25% level is an increase over the energy efficiency programs now offered by Tri-State to its Members and to end uses. Tri-State does not now offer incentives that meet or exceed the 50% incentive level.

QUESTION NO. 7

Are Tri-State’s values for the cost of carbon stated in metric tons or otherwise?

RESPONSE

The values are in metric tons.

QUESTION NO. 8

Is the 5% escalation rate for carbon-price values nominal or real?

RESPONSE

The 5% value represents a forecast of 3% inflation plus a 2% annual growth rate on top of inflation.

QUESTION NO. 9

Is the \$50/ton price of carbon a credible, if obviously high, price to Tri-State?

RESPONSE

The Resource Planning Process involves postulating scenarios and examining the results. The development of future resource expansion plans gives consideration to the reasonableness of the various costs, structured scenarios, the rate impact of the associated actions, and other factors.

QUESTION NO. 10

Are Tri-State’s natural gas prices stated in constant 2009 dollars?

RESPONSE

Yes.

QUESTION NO. 11

Is the “low” natural gas price a credible price to Tri-State?

RESPONSE

The Resource Planning Process involves postulating scenarios and examining the results. The development of future resource expansion plans gives consideration to the reasonableness of the various costs, structured scenarios, the rate impact of the associated actions, and other factors.

QUESTION NO. 12

Do Tri-State’s natural gas prices include “delivery?” If so, roughly how much does this add to a hub or other “non-delivered” price?

RESPONSE

The natural gas prices include delivery costs. The capital cost assumptions for building new gas transportation include capital for pipeline construction. At this time, we do not know if Tri-State will take tariff service from a pipeline company (or companies) or construct a privately-owned, dedicated pipeline, but the overall financial impact should be similar for either scenario.

QUESTION NO. 13

What does Kevin Cox's "blended coal price forecast" (Slide 175 on April 23) show? Is this "low," "medium" or something else?

RESPONSE

This represents "base-case," or "medium," coal pricing.

QUESTION NO. 14

What does the 2.8% to 4.5% per year, defining "medium," mean? Growth in price per year?

RESPONSE

Yes. The price increases 2.8% in the early years of the planning period, and then increases 4.5% in the remaining years.

QUESTION NO. 15

Generally, how do Tri-State's models handle a range of values in producing output? Doesn't the model need point-specific values for variables?

RESPONSE

Tri-State's production cost models contain fuel pricing and performance variables for each generating unit. Due to confidentiality concerns, the data we have shared represent blended system costs, but specific prices are used for each model run.

QUESTION NO. 16

What does "85% of Springerville" mean on the technical cost sheet? Does this percentage override "low," "medium," or "high" coal costs?

RESPONSE

85% of Springerville indicates that the projected delivered cost of coal to the candidate coal-fired plants would be priced at 85% of Springerville delivered costs due to a savings in transportation expenses.

QUESTION NO. 17

Do the forward electric prices that Tri-State is using account for carbon costs? Doesn't this mean that these prices may be too low?

RESPONSE

Tri-State's subscription services that provide forward wholesale electric price forecasts all include some level of carbon costs; so every price forecast has some level of embedded carbon costs. The magnitude of the carbon effect varies based on the service provider. By embedding an additional carbon cost, we can project the discrete incremental impacts of the cost of CO<sub>2</sub> production by our generating units.

QUESTION NO. 18

What costs does Tri-State assign to transmission services?

RESPONSE

Certain transmission projects are assumed to be embedded in every case. These projects are assumed to be "sunk costs" and common to all scenarios. To the extent these "base" transmission projects are

not sufficient to support incremental additions of renewable or conventional generation resources, then additional transmission expense is assigned to the incremental generation additions. All costs are provided by the Tri-State's Transmission Services organization.

QUESTION NO. 19

How are these transmission costs handled in the modeling?

RESPONSE

Transmission is projected to be constructed to support generation as needed, to the extent needed overall and above the "sunk cost" transmission previously discussed. If load growth is low, or if DSM delays the need for generation, then the incremental transmission is delayed.

QUESTION NO. 20

What does it mean to specify a level of Renewable Portfolio Standard for a scenario?

RESPONSE

It means that regardless of economic impact, the generation expansion plan will provide sufficient renewable resources to comply with the RPS requirements. This is a "hard" requirement, similar to the requirement to construct sufficient generation to meet firm load obligations.

QUESTION NO. 21

Does this "hard" requirement mean that the RPS level will be modeled whether cost-effective or not?

RESPONSE

Yes.

QUESTION NO. 22

Does this "hard" requirement mean, even if a level of "eligible energy resources" higher than that modeled were cost-effective, a model run would not show it to be economic?

RESPONSE

No. For each scenario, the most cost-effective expansion plan is developed, including the projection of additional renewable beyond the Renewable Portfolio Standard requirements.

QUESTION NO. 23

The size of the generic fossil units Tri-State includes in its expansion modeling is much larger than that of renewable resource units. What was the basis of that decision?

RESPONSE

The modeling sizes and costs that Tri-State uses are based on EPRI and Black and Veatch data we assembled for candidate generic resources that we deemed to be commercially viable, proven and appropriate to the Tri-State system.

QUESTION NO. 24

Will modeling smaller unit sizes for renewable resource capacity deny them economies of scale which appear to be available to fossil units?

RESPONSE

Tri-State views renewable resources as more scalable than conventional resources. Based on experience, we have seen opportunities to develop small incremental expansions to existing wind or solar installation that do not seem to be financially disadvantaged compared to larger installations.

QUESTION NO. 25

If larger renewable resource units are too large for Tri-State at this time, did Tri-State consider building larger ones in partnership with other utilities?

RESPONSE

Tri-State is open to partnership arrangements for either conventional or renewable projects and has performed evaluations of specific partnerships for renewable and conventional projects.

QUESTION NO. 26

It is reasonable that total integration costs would rise with the amount of intermittent resources on the system, but what is the basis for concluding, as Tri-State has done, that these costs would rise on a per MWh basis?

RESPONSE

It is established in technical literature that the cost of integration of variable resources increases with penetration levels. Absent major changes in market structures with transmission constraints relief, control area changes, storage technologies or other innovations, such costs will increase. Tri-State's use of a cost per MWh seems reasonable based on industry and expert experience.

QUESTION NO. 27

Why did Tri-State model only 3 hours of storage for solar thermal?

RESPONSE

This was based on the assessment of commercially available and viable technologies previously discussed.

QUESTION NO. 28

Tri-State assumes a 3% escalation for all capital costs. Is such escalation reasonable for solar thermal when NREL and others forecast continually decreasing capital costs?

RESPONSE

There is considerable uncertainty regarding the future cost of solar thermal generation and the future cost will depend on the maturation and commercialization of the technology. Based on Tri-State's experience in attempting to develop solar thermal generation in 2007 and 2008, we found this technology to be uneconomic at this time.

QUESTION NO. 29

Why not allow early retirement of generation units when economic in all scenarios?

RESPONSE

Early retirements are allowed in all scenarios where they could occur. For example, if coal units are not retired in a "high coal cost" scenario, it is not necessary to model this condition in a "base" or "low" coal cost scenario.

QUESTION NO. 30

Did Tri-State consider Compressed Air Energy Storage (CAES) or other "storage" technologies beyond the storage considered with solar thermal? If not, why not?

RESPONSE

Tri-State does not have confidence in the commercial viability of CAES or Carbon Capture and Sequestration (CC&S) at this time. Tri-State is engaged in R&D efforts with EPRI on CAES and CC&S.

QUESTION NO. 31

Did Tri-State consider the cost of carbon capture and storage in modeling any of fossil generation technologies? If not, why not?

RESPONSE

Tri-State does not have confidence in the commercial viability of CAES or Carbon Capture and Sequestration (CC&S) at this time. Tri-State is engaged in R&D efforts with EPRI on CAES and CC&S.

QUESTION NO. 32

Did Tri-State consider post-combustion carbon capture technology for any of its existing or potential new coal units? If not, why not?

RESPONSE

No. Tri-State does not have credible pricing and performance information regarding proven, commercial CCS technologies to be applied to coal units. Tri-State is engaged in R&D efforts involving EPRI on CCS.