4 CSR 240-22.040 Supply-Side Resource Analysis

PURPOSE: This rule establishes minimum standards for the scope and level of detail required in supply-side resource analysis.

(1) The analysis of supply-side resources shall begin with the identification of a variety of potential supply-side resource options which the utility can reasonably expect to develop and implement solely through its own resources or for which it will be a major participant. These options include new plants using existing generation technologies; new plants using new generation technologies; utility renewable energy resources pursuant to 4 CSR 240-20.XXX (1)(T)to comply with the renewable energy standard; life extension and refurbishment at existing generating plants; enhancement of the emission controls at existing or new generating plants; purchased power from utility sources, cogenerators or independent power producers; efficiency improvements which reduce the utility's own use of energy; and upgrading of the transmission and distribution systems to reduce power and energy losses. The utility shall collect generic cost and performance information for each of these potential resource options which shall include at least the following attributes where applicable:

(A) Fuel type and feasible variations in fuel type or quality;

(B) Fuel transportation and shipping;

(C~~B~~) Practical size range;

(D~~C~~) Maturity of the technology;

(E~~D~~) Lead time for permitting, design, construction, testing and startup;

(F~~E~~) Capital cost per kilowatt;

(G~~F~~) Annual fixed operation and maintenance costs;

(H~~G~~) Annual variable operation and maintenance costs;

(I~~H~~) Scheduled routine maintenance outage requirements;

(J~~I~~) Equivalent forced-outage rates or full- and partial-forced-outage rates;

(K~~J~~) Operational characteristics and constraints of significance in the screening process;

(L~~K~~) Environmental impacts, including at least the following:

1. Air emissions including at least the primary acid gases, greenhouse gases, ozone precursors, particulates and air toxics;
2. Waste generation including at least the primary forms of solid, liquid, radioactive and hazardous wastes;
3. Water impacts including direct usage and at least the primary pollutant discharges, thermal discharges and groundwater effects; and
4. Siting impacts and constraints of sufficient importance to affect the screening process; and

(M~~L~~) Other characteristics that may make the technology particularly appropriate as a contingency option under extreme outcomes for the critical uncertain factors identified pursuant to 4 CSR 240-22.070(2).

(2) Each of the supply-side resource options referred to in section (1) shall be subjected to a preliminary screening analysis. The purpose of this step is to provide an initial ranking of these options based on their relative annualized utility costs as well as their probable environmental costs and to eliminate from further consideration those options that have significant disadvantages in terms of utility costs, environmental costs, operational efficiency, risk reduction or planning flexibility, as compared to other available supply-side resource options. All costs shall be expressed in nominal dollars.

(A) Cost rankings shall be based on estimates of the installed capital costs plus fixed and variable operation and maintenance costs levelized over the useful life of the resource using the utility discount rate. In lieu of levelized cost, the utility may use an economic carrying charge annualization in

which the annual dollar amount increases each year at an assumed inflation rate and for which a stream of these amounts over the life of the resource yields the same present value.

(B) The probable environmental costs of each supply-side resource option shall be quantified by estimating the cost to the utility ~~—~~to comply with additional environmental laws or regulations that may be imposed at some point within the planning horizon.

1. The utility shall identify a list of environmental pollutants for which, in the judgment of utility decision-makers, additional laws or regulations may be imposed at some point within the planning horizon which would result in compliance costs that could have a significant impact on utility rates.

2. For each pollutant identified pursuant to paragraph (2)(B)1., the utility shall specify at least two (2) levels of mitigation that are more stringent than existing requirements which are judged to have a nonzero probability of being imposed at some point within the planning horizon. If the utility determines that only one level of mitigation is possible, the utility shall explain why only one level of mitigation is possible and provide justification for the selected level.

3. For each mitigation level identified pursuant to paragraph (2)(B)2., the utility shall specify a subjective probability that represents utility decision-maker's judgment of the likelihood that additional laws or regulations requiring that level of mitigation will be imposed at some point within the planning horizon. The utility, based on these probabilities, shall calculate an expected mitigation level for each identified pollutant.

4. The probable environmental cost for a supply-side resource shall be estimated as the joint cost of simultaneously achieving the expected level of mitigation for all identified pollutants emitted by the resource. The estimated mitigation costs for an environmental pollutant may include or may be entirely comprised of a tax or surcharge imposed on emissions of that pollutant.

(C) The utility shall rank all supply-side resource options identified pursuant to section (1) in terms of both of the following cost estimates: utility costs and utility costs plus probable environmental costs. The utility shall indicate which supply-side options are considered to be candidate resource options for purposes of developing the alternative resource plans required by 4 CSR 240-22.060(3). The utility shall include as candidate resource options utility renewable energy resources to comply with the Renewable Energy Standard as required by 4 CSR 240-2-.XXX (2). The utility shall also indicate which resource options are eliminated from further consideration on the basis of the screening analysis and shall explain the reasons for their elimination.

(D) The candidate resource options that the utility passes on for further evaluation in the integration process shall include candidate resource options with diverse fuel and generation technologies and renewable resources to comply with the Renewable Energy Standard as required by 4 CSR 240-2-.XXX (2).

(3) The analysis of supply-side resource options shall include a thorough analysis of existing and planned interconnected generation resources. ~~The analysis can be performed by the individual utility or in the context of a joint planning study with other area utilities.~~ The purpose of this analysis shall be to ensure that the transmission network is capable of reliably supporting the supply resource options under consideration, that the costs of transmission system investments associated with supply-side resources as estimated pursuant to 4 CSR 240-22.045 (3) are properly considered and to provide an adequate foundation of basic information for decisions about the following types of supply-side resource alternatives:

(A) Joint participation in generation construction projects;

(B) Construction of wholly-owned generation ~~or transmission~~ facilities; and

(C) Participation in major refurbishment, upgrading or retrofitting of existing generation facilities~~or transmission resources~~.

(4) The utility shall identify and analyze opportunities for life extension and refurbishment of existing generation plants, taking into account their current condition to the extent that it is significant in the planning process.

(5) The utility shall identify and evaluate potential opportunities for new long-term power purchases and sales, and short-term power purchases that may be required for bridging the gap between other supply options, both firm and nonfirm, that are likely to be available over all or part of the planning horizon. This evaluation shall be based on an analysis of at least the following attributes of each potential transaction:

(A) Type or nature of the purchase or sale (for example, firm capacity, summer only);

(B) Amount of power to be exchanged;

(C) Estimated contract price;

(D) Timing and duration of the transaction;

(E) Terms and conditions of the transaction, if available;

(F) Required improvements to the utility's generating system, transmission system as estimated pursuant to 4 CSR 240-22.045 (3), or both, and the associated costs; and

(G) Constraints, whether ~~on the utility system~~ caused by ~~wheeling arrangements, whether on the utility's own system, or on an interconnected system, or by~~ the terms and conditions of other contracts or interconnection agreements, or by transmission, as estimated pursuant to 4 CSR 240-22.045 (3), whether within the RTO's footprint, on an interconnected RTO, or a transmission system that is not part of a RTO.

~~(6) For the utility's preferred resource plan selected pursuant to 4 CSR 240-22.070(7), the utility shall determine if additional future transmission facilities will be required to remedy any new generation-related transmission system inadequacies over the planning horizon. If any such facilities are determined to be required and, in the judgment of utility decision-makers, there is a risk of significant delays or cost increases due to problems in the siting or permitting of any required transmission facilities, this risk shall be analyzed pursuant to the requirements of 4 CSR 240-22.070(2).~~

(6~~7~~) The utility shall ~~assess the age, condition and efficiency level of existing transmission and distribution facilities, and shall analyze the feasibility and cost-effectiveness of transmission and distribution system loss-reduction measures as a supply-side resource. This provision shall not be construed to require a detailed line-by-line analysis of the transmission and distribution system, but is intended to require the utility to~~ identify ~~and analyze~~ opportunities for efficiency improvements on its transmission and distribution systems and shall analyze, pursuant to 4 CSR 240-22.045(3) and (4), the feasibility and cost-effectiveness of transmission and distribution system loss-reduction measures in a manner that is consistent with the analysis of other supply-side resource options.

(7~~8~~) Before developing alternative resource plans and performing the integrated resource analysis, the utility shall develop ranges of values and probabilities for several important uncertain factors related to supply resources. These values can also be used to refine or verify information developed pursuant to section (2) of this rule. These cost estimates shall include at least the following elements and shall be based on the indicated methods or sources of information:

(A) Fuel price forecasts over the planning horizon for the appropriate type and grade of primary fuel and for any alternative fuel that may be practical. ~~as a contingency option.~~ Transportation and shipping costs to deliver the fuel shall be included as a specific item in the price forecasts.

1. Fuel price forecasts shall be obtained from a consulting firm or firms with specific expertise in detailed fuel supply and price analysis or developed by the utility if it has expert knowledge and experience with the fuel under consideration. Each forecast shall consider at least the following factors as applicable to each fuel under consideration:

A. Present reserves, discovery rates and usage rates of the fuel and forecasts of future trends of these factors;

B. Profitability and financial condition of producers;

C. Potential effect of environmental factors, competition and government regulations on producers, including the potential for changes in severance taxes;

D. Capacity, profitability and expansion potential of present and potential fuel transportation options;

E. Potential effects of government regulations, competition and environmental legislation on fuel transporters;

F. In the case of uranium fuel, potential effects of competition and government regulations on future costs of enrichment services and cleanup of production facilities; and

G. Potential for governmental restrictions on the use of the fuel for electricity production.

2. The utility shall consider the accuracy of previous forecasts as an important criterion in selecting providers of fuel price forecasts.

3. The provider of each fuel price forecast shall be required to identify the critical uncertain factors that drive the price forecast and to provide a range of forecasts and an associated subjective probability distribution that reflects this uncertainty;

(B) Estimated capital costs including engineering design, construction, testing, startup and certification of new facilities or major upgrades, refurbishment or rehabilitation of existing facilities.

1. Capital cost estimates shall either be obtained from a qualified engineering firm actively engaged in the type of work required or developed by the utility if it has available other sources of expert engineering information applicable to the type of facility under consideration.

2. The provider of the estimate shall be required to identify the critical uncertain factors that may cause the capital cost estimates to change significantly and to provide a range of estimates and an associated subjective probability distribution that reflects this uncertainty;

(C) Estimated annual fixed and variable operation and maintenance costs over the planning horizon for new facilities or for existing facilities that are being upgraded, refurbished or rehabilitated.

1. Fixed and variable operation and maintenance cost estimates, if applicable, shall be obtained from the same source that provides the capital cost estimates.

2. The critical uncertain factors that affect these cost estimates shall be identified and a range of estimates shall be provided, together with an associated subjective probability distribution that reflects this uncertainty;

(D) Forecasts of the annual cost or value of ~~sulfur dioxide~~ emission allowances to be used or produced by each generating facility over the planning horizon.

1. Forecasts of the future value of emission allowances shall be obtained from a qualified consulting firm or other source with expert knowledge of the factors affecting allowance prices.

2. The provider of the forecast shall be required to identify the critical uncertain factors that may cause the value of allowances to change significantly

and to provide a range of forecasts and an associated subjective probability distribution that reflects this uncertainty; and

(E) Annual fixed charges for any facility to be included in rate base or annual payment schedule for leased or rented facilities.

(8~~9~~) Reporting Requirements. To demonstrate compliance with the provisions of this rule, and pursuant to the requirements of 4 CSR 240-22.080, the utility shall furnish at least the following information:

(A) A summary table showing each supply resource identified pursuant to section (1) and the results of the screening analysis, including:

1. The calculated values of the utility cost and the probable environmental cost for each resource option and the rankings based on these costs;

2. A determination of whether each supply resource qualifies as a utility renewable energy resource;

3. Identification of candidate resource options that may be included in alternative resource plans; and

4~~3~~. An explanation of the reasons why each supply-side resource option rejected as a result of the screening analysis was not included as a candidate resource option;

(B) A list of the candidate resource options for which the forecasts, estimates and probability distributions described in section (7~~8~~) have been developed or are scheduled to be developed by the utility's next scheduled compliance filing pursuant to 4 CSR 240-22.080;

(C) A summary of the results of the uncertainty analysis described in section (7~~8~~) that has been completed for candidate resource options; and

(D) A summary of the mitigation cost estimates developed by the utility for the candidate resource options identified pursuant to subsection (2)(C). This summary shall include a description of how the alternative mitigation levels and associated subjective probabilities were determined and shall identify the source of the cost estimates for the expected mitigation level.

AUTHORITY: sections 386.040, 386.610 and 393.140, RSMo 1986 and 386.250, RSMo Supp. 1991.* Original rule filed June 12, 1992, effective May 6, 1993. *Original authority: 386.040, RSMo 1939; 386.250, RSMo 1939, amended 1963, 1967, 1977, 1980, 1987, 1988, 1991; 386.610, RSMo 1939; and 393.140, RSMo 1939, amended 1949, 1967. Add RES