
Review of Union Electric Company

Electric Utility Resource Planning

Compliance Filing

Case No. EO-2011-0271

Prepared by

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PREFACE OF THE OFFICE OF THE PUBLIC COUNSEL

This report is filed by the Office of the Public Counsel (Public Counsel or OPC) pursuant to 4 CSR 240-22.080(6), which provides that Public Counsel may file a report that identifies deficiencies in a utility's compliance with the provisions of Chapter 22, and any other deficiencies that cause the utility's resource acquisition strategy to fail to meet the fundamental objectives of the planning process as set forth at 4 CSR 240-22.010(2).

4 CSR 240-22.080(8) requires Public Counsel to work with the Union Electric Company d/b/a Ameren Missouri (UE or the Company) in an attempt to reach an agreement, within forty-five days of the date that this report was filed, on a plan to remedy deficiencies. Should Public Counsel and UE be unable to reach such an agreement, Public Counsel recommends that the Commission find, pursuant to 4 CSR 240-22.080(13), that UE's filing does not comply with the requirements of Chapter 22 and that UE's resource acquisition strategy does not meet the fundamental objectives of the planning process as set forth in 4 CSR 240-22.010(2)(A)-(C).

This report is being filed with a companion document, referred to as the "Technical Report," prepared with the assistance of Synapse Energy Economics.[1] This companion document provides a more detailed, technical analysis of the UE IRP than provided herein. Readers are encouraged to refer to relevant sections of the Technical Report for more in-depth analysis of the deficiencies described below.

[1] Synapse Energy Economics is a research and consulting firm based in Cambridge, MA specializing in energy, economic and environmental issues.

Public Counsel's List of Deficiencies and Remedies

Introduction

The UE IRP contains several errors and deficiencies, as described below and as described in greater detail in the Technical Report. Each of these errors and deficiencies causes some concern regarding the outcome of the IRP. Furthermore, taken as a whole, these errors and deficiencies indicate several important themes that apparently have influenced the preparation and outcome of this IRP. First, the Company is not taking the necessary steps within the IRP process to plan for and respond to expected future environmental constraints, either in terms of EPA regulations for environmental controls on fossil plants or in terms of requirements to address climate change. Second, the Company is explicitly ignoring and rejecting the opportunities to reduce electricity costs, lower customer bills, and reduce environmental impacts through energy efficiency programs. Third, the Company is ignoring or downplaying the opportunities available from renewable resources, especially wind. Finally, the Company demonstrates a preference towards using new nuclear plants to meet future electricity needs, despite the risks and potential high costs of nuclear power.

Our overall recommended remedy is for the Company to correct for the deficiencies identified herein and re-run its analysis to select a Preferred Resource Plan and the other elements of a Resource Acquisition Strategy. In the absence of a new analysis, the current IRP results are unreliable and insufficient for planning purposes, thereby failing to achieve the fundamental objective of the resource planning process as set forth in 4 CSR 240-22.010(2) .

1. 4 CSR 240-22.010(2)(B) – UE failed to use the minimization of present value of revenue requirements (PVRR) as the primary selection criterion in choosing the preferred resource plan. The Company selects the Low Risk Portfolio of energy efficiency resources for its preferred resource plan, which includes efficiency savings that are lower than the program currently being implemented by the Company. The Company's own analysis indicates that higher levels of efficiency savings in the Reasonably Achievable Potential Portfolio can reduce electricity costs by $1.5 to $2.5 billion relative to the portfolio chosen by the Company. UE's decision to select the Low Risk Portfolio is directly in conflict with the IRP regulations that require demand-side and supply-side resources be evaluated on an equivalent basis and that the primary selection criterion should be the minimization of the present worth of long-run utility costs.

The Company explains several times in the IRP that the Low Risk Portfolio includes program spending and savings that are at "a level commensurate with the Company's growing concerns with the current DSM regulatory framework, especially lost revenues."[2] In other words, UE has expressed a clear preference for the Low Risk

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[2] UE IRP, Chapter 7, page 2.

portfolio, regardless of the fact that this scenario does not result in the lowest present value of revenue requirements, because the Company believes this scenario may be less favorable to the Company's financial interests. This approach to limiting energy efficiency resources is directly in conflict with the Missouri IRP rules, and undermines one of the fundamental goals of IRP.

The issue of the lost revenues associated with energy efficiency resources was already addressed by the Commission in a separate rulemaking docket and the rule promulgated by the Commission in that docket becomes effective in the near future.[3] UE's concerns about how lost revenues will be treated under the DSM regulatory framework in Missouri are premature since neither UE or any other electric utility has yet filed an application with the Commission under the MEEIA statute or the soon to be effective MEEIA rule and learned from actual experience how the Commission will respond to DSM cost recovery proposals that include lost revenue recovery or DSM incentives (which can also mitigate the impact of lost revenues). Nonetheless, in the meantime the Company is obligated to comply with the IRP rules, and use the minimization of the present value of revenue requirements as the primary selection criterion, despite its concerns associated with lost revenues.

Proposed Remedy

This deficiency should be remedied by UE re-running its IRP analysis and then selecting a Preferred Resource Plan based on the results of the new analysis. After the new IRP analysis addressing all of OPC's deficiencies is completed, then the Company should use the minimization of the present value of revenue requirements as the primary selection criterion in selecting its Preferred Resource Plan.

2. **4 CSR 240-22.010(2)(A) and 4 CSR 240-22.060(3) – UE failed to develop alternative resource plans that capture the full range of demand-side resources. UE also failed to comply with the Commission's order in Case No. EO-2007-0409 wherein the Commission states that it "directs AmerenUE to model an even more aggressive approach to encourage participation in demand-side management programs in its next filing."** In addition to giving too much weight to the Low Risk Portfolio of energy efficiency programs, the IRP does not consider a sufficient range of demand-side resource portfolios to capture the full potential of demand-side resource options, and thus does not appropriately develop and evaluate alternative plans that could result in the minimization of the present value of revenue requirements.

The final candidate resource plans include only two levels of demand-side resources: the Low Risk Portfolio and the Reasonably Achievable Portfolio. The Low Risk Portfolio includes only a very limited amount of energy efficiency savings; fewer savings than in their current energy efficiency programs and fewer savings than the preferred plan selected in the 2008 IRP.

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[3] Case No. EX-2010-0368.

The RAP scenario understates the amount of energy efficiency savings that could be reasonably achieved by (a) assuming low financial incentives to participating customers, and (b) assuming low awareness of the efficiency programs. The Company has control over both of these factors, by increasing financial incentives and expanding outreach programs, and could significantly increase efficiency savings by adhering to best practices used by leading energy efficiency program administrators in other states.

The Low Risk Portfolio assumes that there will be no demand response programs before 2016, which understates the potential for demand response. The Reasonably Achievable Portfolio only includes an extremely limited amount of demand response resources (except for Plan R3), significantly understating the potential benefits from this important resource.

Proposed Remedy

This deficiency should be remedied by UE re-running its analysis to select a Preferred Resource Plan. In the new runs, the alternative resource plans analyzed should include a broader range of demand-side resource portfolios, including both energy efficiency and demand response, and including savings levels above those in the Reasonably Achievable Potential Portfolio. These additional portfolios are necessary in order to allow the model to identify the level of demand-side resources that will lead to the minimization of the present value of revenue requirements. UE should (1) conduct analysis to determine the optimal amount of energy efficiency and demand response that when combined with different supply-side resources will minimize PVRR and/or (2) use the capacity expansion module in MIDAS to determine optimal combinations of supply and demand-side resources for minimizing PVRR under a range of future scenarios.

3. **4 CSR 240-22.040(1) and 4CSR 240-22.060(3) – UE failed to properly characterize and model renewable resources, particularly wind resources.** There are three significant problems with the assumptions that UE used to model the potential for wind resources. First, UE assumes that 346 MWs of simple cycle gas turbines are built for every 800 MWs (nameplate capacity value) of wind turbines installed. These assumptions are entirely inappropriate. Wind turbines can be built for the energy that they contribute to the system; there is no need to include additional capacity to support them. Furthermore, UE already has a robust fleet of peaking resources; there is no need to add additional peakers simply because the wind resources do not operate all the time. This assumption inappropriately adds a significant amount of capital costs to the wind scenarios.

Second, UE applied "build thresholds" to their generation resources, whereby a particular generator would not be called upon until the reliability need (expressed in MWs) reached a certain capacity deficit level. The build threshold for the wind/CT combination was 205 MW of accredited capacity, under the assumption that average wind farm capacity would be 800 MWs of name plate capacity. Even large utilities like UE often build or contract for wind in 50 – 100 MW increments as UE has already done. One of the advantages of wind projects is that they are modular, and can be built in relatively small increments and need not be built all at once. Requiring a build threshold of 205 MW and

only considering 800 MW wind installations will significantly limit consideration of smaller wind projects, or large wind projects that could be built in small increments over time.

Third, UE assumed that all wind projects have an average cost of $2,000/MW with no variation in capacity factors for the entire amount of wind capacity. While this may be a reasonable assumption for average wind projects, there are likely to be some that cost less than the average and some that cost more. A more precise analysis would include a range of costs and/or capacity factors for the wind resources, in order to allow the model to choose the lowest cost options first and only pick the higher cost options if they turn out to be economic. These three assumptions (regarding average cost, additional peakers and the build threshold) are very simplistic and inaccurate ways to represent how additional wind could add value to the UE system, and significantly skew the Company's modeling against new wind resources.

Proposed Remedy

This deficiency should be remedied by UE re-running its analysis to select a Preferred Resource Plan. In the new runs the IRP should include a set of wind resources with (a) no associated peaking capacity required, (b) nameplate capacities in much smaller increments (*i.e.*, 50 MW), and (c) a reasonable range of costs and capacity factors representing the likely range of renewable options.

4. **4 CSR 240-22.040(8) and 4 CSR 240-22.070(2) – UE failed to properly identify the full range of likely construction times or project costs for its new nuclear units, and failed to conduct sensitivity analyses of these critical uncertain factors.** The IRP investigates a new nuclear generator as one of the primary resources needed to meet new load. The Company's assumptions regarding nuclear unit construction times and cost are very optimistic, and the Company has not adequately addressed the tremendous financial and economic risks associated with this technology type.

Proposed Remedy

This deficiency should be remedied by UE re-running its analysis to select a Preferred Resource Plan. The new runs should use more realistic assumptions regarding the cost and construction times of new nuclear generators. More importantly, the Company should run sensitivity analyses to assess the critical uncertain factors associated with the new nuclear units, including construction costs, financing costs and construction times, as required by 4 CSR 240-22.070(2). Prior to re-running its analysis, UE should consult AEO 2011 estimates for the costs of new nuclear plant along with other reliable up-to-date cost estimates.

5. **4 CSR 240-22.070(5), 4 CSR 240-22.070(2), and 4 CSR 240-22.070(2)(C) – UE failed to use an appropriate modeling technique to assess how future environmental scenarios for new EPA regulations affecting existing coal plants will influence the**

candidate resource plans. One of the most significant problems with the Company's integration and risk analysis and its Preferred Resource Selection Scorecard approach is that it is based on a direct comparison between two different, mutually exclusive futures; the moderate environmental scenario and the aggressive environmental scenario. UE displays the scorecard results of all 14 plans in one table, and applies its scoring metrics across all 14 plans. (See, for example UE IRP, Chapter 10, Figure 10.5.)
The first five plans (B1, B2, B3, B4, and R0) are all applicable only under the moderate environmental scenario. If future environmental regulations turn out to be like the aggressive scenario then none of these five plans are permissible – and in that case, UE would pursue one of the other nine plans (R1, R2, R3, C1, C2, C3, H1, H2, or H3). UE appears to have recognized the distinction between these two environmental scenarios, because the five resource plans associated with the moderate environmental scenario are colored differently than the remaining nine resource plans. However, comparing resource plans within one future environmental scenario with those within another environmental scenario in this way is inappropriate and misleading because the aggressive environmental scenario will be more expensive by definition as it will require additional environmental retrofits totaling nearly a billion dollars plus either the cost of additional retrofits to control Meramec or the cost of additional resources to replace it.

More importantly, applying the scorecard across the different environmental scenarios skews the metrics and leads to spurious results. Each of the six policy objectives is ranked from one to five, where the rank for each resource plan is assigned by the Company relative to the other resource plans. The Company develops ranks across all 14 resource plans – despite the fact that the five plans in the moderate environmental scenario are not comparable to the nine plans in the aggressive environmental scenario. The appropriate way to develop these ranks would be to rank the five scenarios in the moderate environmental scenario from one to five *relative to each other*, and then rank the nine scenarios in the aggressive environmental scenario *relative to each other*. This correction would dramatically change some of the scores.

This deficiency could have been avoided if the Company had complied with 22.070(2) and (2)(C) and modeled the two future environmental scenarios in the same way that it modeled potential future CO2 requirements; using the probability tree approach with two additional branches associated with these environmental scenarios. Each environmental scenario would have a probability associated with it, and the model would estimate the expected values associated with each resource plan. The expected values would properly account for the likelihood of each environmental scenario.

Proposed Remedy

This deficiency should be remedied by UE re-running its analysis to select a Preferred Resource Plan. In the new runs the Company should include the two future environmental scenarios as two branches within the probability tree analysis.

6. 4 CSR 240-22.060(4) and 4 CSR 240-22.070(6) and 4 CSR 240-22.080(6) – UE's analysis of alternative resource plans and its selection of its Preferred Resource Plan contains several errors and flaws that lead to misleading and

spurious results. These flaws are summarized below. Additional details are provided in Section 5 of the Technical Report.

The IRP scenario modeling starts with 216 plausible scenarios, and then applies a scorecard to rank them and reduce them to a much smaller set of "semi-finalists." There are several problems with the way the Company applied this initial scorecard approach:

- The metric used to measure customer satisfaction is overly simplistic and can potentially lead to illogical results, where scenarios with delayed rate impacts can be considered worse than those with constant rate impacts or equal to those with accelerated rate impacts.
- The metric to account for employment impacts assumes that UE will own 100 percent of the new nuclear unit, when it is planning to actually own only 30 percent or 50 percent.
- The probability distribution used to assess the likely costs of the nuclear plant does not sufficiently account for the likelihood of significant cost overruns.
- The scorecard uses a "unitized" scoring system where a scenario is given a score ranging from 0.000 to 1.000, for each metric. However, the Company does not apply this approach equally across the metrics in that they do not always score the lowest case at 0.000. Because of the math behind the scoring, this results in "effective weights" that are considerably different than the weights the Company claims it is using.

UE then identifies 14 candidate resource plans as finalists, and conducts a slightly different scoring approach to determine its Preferred Resource Plan. There are several problems with the way it applies its Preferred Plan Selection Scorecard.

- The Company applies scores based on whole numbers between one and five. In several cases, this requires using judgment about just what the score should be. In some cases the judgments do not make sense or are in error. In particular, (a) the RAP efficiency plan does not get a high score for environmental diversity based on the questionable logic that reducing demand does not increase resource diversity; (b) the RAP efficiency plans do not get the highest score for efficiency savings, apparently through an error; and (c) the economic development scores do not correspond to the economic development estimates associated with the different plans, with the energy efficiency plans being underscored.
- In applying the scorecard UE used different weights across the six categories than the weights they presented in Chapter 9 of the IRP. The weight of the energy efficiency metric was reduced from 10 percent to zero, and the customer satisfaction and cost metrics were each increased by five percent. It is not clear why the Company shifted these weights, but it results in a blatant reduction in score for the energy efficiency plans.
- The Company applied a weight of 25 percent (or 30 percent in the actual scoring) to the cost metric. The IRP regulations require this metric to be weighted at greater than 50 percent, as the primary criterion for selecting the preferred resource plan.

Proposed Remedy

This deficiency should be remedied by UE re-running its analysis to select a Preferred Resource Plan. In applying its scorecard approach to the new runs UE should correct for all of the errors described above.

7. **UE failed to comply with the Commission's order in Case No. EO-2007-0409 wherein the Commission states that it "directs AmerenUE to more realistically evaluate its IDR [Industrial Demand Response] programs in its next filing."** On page 46 in Chapter 7, UE states that "Non-Dispatchable Demand Response (NDDR) link prices in retail and wholesale markets." UE's IRP filing does not show that it has used NDDR types of demand response programs in the alternative resource plans that were developed and instead relied only on dispatchable demand response programs that are also referred to as direct load control (DLC) programs (See Table 7.17 on page 53 in Chapter 7). By modeling only DLC programs for industrial customers and ignoring the enormous potential of NDDR programs, UE has failed to realistically evaluate its IDR programs as directed by the Commission.

Proposed Remedy

This deficiency should be remedied by UE including a realistic evaluation of the potential for IDR programs to further the objective of minimizing PVRR when the Company re-runs its IRP analysis and then selects a Preferred Resource Plan based on the results of the new analysis.

8. **4 CSR 240-22.080(6) - UE provided insufficient and inaccurate information to critical decision makers in selecting and approving the Preferred Resource Plan.**

The Company demonstrated a clear bias against energy efficiency in its presentations given to the Union Electric Board of Directors and the Ameren Board of Directors. In presentations to both of these boards the Company refers to the Low Risk Portfolio of energy efficiency programs as the "Lowest Cost Resource Plan," when their own analyses indicate that the RAP Portfolio of energy efficiency programs results in lower costs when compared correctly with the Low Risk Portfolio. In addition, in both of those presentations the Company claims that the RAP Portfolio has a "moderate disadvantage" in terms of the cost criteria relative to the Low Risk Portfolio, when all of its analyses indicate that the opposite is true. While OPC is hesitant to infer bad faith on the basis of these two documents, it is difficult to understand how such an important point could twice be portrayed so dramatically inaccurately through inadvertence or inattention. The OPC is also concerned about this behavior as it calls into question (a) the ability of the Company as a whole to make important resource decisions based on accurate and unbiased information, and (b) the ability of the Company to achieve the fundamental objective of the IRP, as outlined in 4 CSR 240-22.010(2).

Corrected page 9