Appendix E

Service Request Memorandum

The Secretary of Energy
Washington, DC 20585

June 24, 1999

MEMORANDUM FOR JAY HAKES, ADMINISTRATOR
ENERGY INFORMATION ADMINISTRATION

FROM: BILL RICHARDSON

Subject: Request for Electricity Restructuring Study

With increasing attention focused on the issue of electricity restructuring in both the Administration and the Congress, assessments of the projected impacts of competition will play an important role in ongoing discussions. The Department has already provided Congress with its *Supporting Analysis*, which outlines the likely benefits of competition for the economy, consumers, and the environment under the Administration's proposal. This analysis relies on many assumptions found in the Energy Information Administration's (EIA) *Annual Energy Outlook 1999*. It was developed using the Policy Office Electricity Modeling System (POEMS), which combines major sections of the EIA National Energy Modeling System (NEMS) with a more detailed representation of the electricity sector than is included in the standard NEMS model.

Notwithstanding our high level of confidence in the results presented in the *Supporting Analysis* document, a parallel analysis using the standard NEMS could provide further evidence regarding the benefits of competition under the Administration's plan. Accordingly, I am requesting that you use the NEMS to evaluate the effects of the Administration's restructuring proposal using the parameter settings and assumptions from the POEMS analysis. Your report should also include a discussion of major differences between the electricity modules of the POEMS and the NEMS. Please consult directly with Mark Mazur, Acting Director of Policy, regarding the appropriate parameters for the Reference and Competitive scenarios, as well as the types of topics to be addressed in the comparison of the POEMS and NEMS electricity modules.

Given that electricity restructuring is currently under active consideration, I am requesting that your draft report be provided to the Policy Office by the first week of September 1999. A reduction in the scope of your report may be preferable to

any significant delay in meeting this timetable This issue should be included in your discussions with the Policy Office if sufficient resources to provide a full and timely response are not available.

Thank you for your prompt attention to this request I am looking forward to receiving your report on this important subject

Department of Energy

Washington, DC 20585

August 18, 1999

TO: Mary Hutzler
Director, Office of Integrated Analysis and Forecasting

FROM: Howard Gruenspecht
Director, Office of Economic, Electricity, and Natural Gas Analysis

SUBJECT: Additional Information on *Supporting Analysis* Assumptions

This memorandum provides additional information regarding the assumptions used in the *Supporting Analysis for the Comprehensive Electricity Competition Act* that was published in May 1999. You had asked for this information to support your efforts to provide an analysis of the impacts of competition requested by Secretary Richardson, who asked that you use the National Energy Modeling System (NEMS) together with the parameter settings and assumptions from the modeling results presented in the *Supporting Analysis*.

Additional Information on Assumptions Used In the *Supporting Analysis*

1. Treatment of Operation and Maintenance (O&M) Costs for new units

The POEMS model results presented in the *Supporting Analysis* use O&M costs for new generating units that are below the levels assumed in the 1999 Annual Energy Outlook. This change, which applies to both the Reference and Competitive scenarios, assures that the O&M cost for new units is not assumed to be higher than the O&M target improvement levels for existing plants established through a benchmarking analysis of existing plants. While these target levels necessarily have wide uncertainty for technologies where the number of existing plants is small (i.e. combined cycle gas plants) we feel that our approach retains a plausible relationship between new and existing plant O&M costs for all technology types. In addition, we used relatively conservative assumptions about bidding strategy, by including 50% of the total annual O&M in the competitive bid price. Finally, we use the same O&M parameters for new units in both the Reference and Competitive scenarios, so that their impact is reflected in both of the cases whose difference is examined.

2. Demand foresight

The POEMS analysis incorporates a revised foresight algorithm which smoothes near term expectations of demand growth. We feel that this approach is appropriate for the purposes of capacity planning in both the Reference and Competitive cases, since capacity decisions involve long-lived capital.

3. Ancillary payments for capacity

As of yet, there are not clear indications how deregulated markets will value capacity, as distinct from energy. Various states have taken different approaches. The *Supporting Analysis* assumes an institutional structure in the Competitive scenario that provides payments to build capacity necessary to meet specified reserve margins in those regions where energy markets alone would not provide a sufficient incentive. In part because of the POEMS modeling structure, capacity for reserve purposes may not compensated sufficiently through high prices that might occur when random events cause extremely high peaks and short capacity. The payments included in the Competitive scenario are designed to insure that new necessary capacity is made whole and that customers are charged appropriately for this function. The payments are targeted to turbine and combined-cycle plants to preclude a windfall to existing baseload plants.

4. Existing powerplant O&M and post-operational capital expenditures.

We have compared the average fixed plus variable O&M costs by plant type in POEMS and NEMS and found them to be very similar. There are some differences in the post-operational capital expenditures, because they are represented at a more disaggregated level in the POEMS than those used in the AEO99. The use of plant-specific capital addition costs should lead to better identification of economic plant retirements, but would affect the Reference and Competitive scenarios in the same manner. Because the two models represent the same underlying cost structure for each plant type, analysis using the existing NEMS data should provide a sufficient degree of parallelism to meet the Secretary's request.

5. Biomass (cofiring and production tax credit) and wind incentives.

The *Supporting Analysis* references inclusion of the co-firing and production tax credits that are outlined in the Administration FY2000 budget proposal. These proposals extend and expand a credit regime established in the 1992 Energy Policy Act. The Supporting Analysis assumes that these credits, which are proposed for extension through 2004 in the FY2000 budget proposal, would be further extended through 2015 through subsequent action.

6. Retirement cost hurdle for nuclear plants

A retirement hurdle rate was incorporated in POEMS for nuclear plants in the Reference scenario to represent the hesitancy of utilities in retiring plants before the end of their licenses because of risks associated with the costs of decommissioning and cost recovery. We think it is appropriate to draw a distinction between the strength of the economic factors in driving retirement decisions for this technology between the Reference and Competitive scenarios.

7. Firm Sales Between Regions

Available information on firm sales does not extend through the forecast horizon. Because agreements for firm sales will likely be negotiated or renegotiated on an economic basis as existing contracts expire, the POEMS analysis does not "force" firm sales to be maintained indefinitely beyond the last data point. However, an assumption that all pre-specified firm sales contracts were to lapse simultaneously at the point where our data runs out would also be unrealistic and distort decisions in the capacity planning module of the model by creating a large discontinuity at a single point in time. The POEMS analysis assumed a gradual phase-out of pre-specified firm sales.

8. Renewable Energy

Under the Administration's restructuring proposal, the level of the renewable portfolio standard (RPS) target expressed as a percentage of sales for years prior to 2010 is to be set through a rulemaking process. The Administration proposal also explicitly allows for banking of renewable energy credits, so that excess credits from renewable generation in one year can be carried forward to satisfy the RPS requirement in a future year. For these reasons, the POEMS analysis does not impose a "cap" on renewable electricity production along a straight-line path between its projected level in 2000 and the 2010 target level of 7.5 percent of retail sales.

The *Supporting Analysis* also notes that some consumers in Competitive markets will choose to purchase "green power" at a cost exceeding the 1.5 cent per kilowatt-hour cost cap applied in the RPS program. We allow for this demand, which in our results equals 0.3 percent of retail electric sales in 2010, by relaxing the cost cap in the capacity planning module.

Further Observations

We recognize that even when the assumptions documented in the *Supporting Analysis*, as clarified by the points listed above, are reflected in the NEMS model, there will still be a number of differences in assumptions between NEMS and POEMS. Indeed, because of differences in model structure and level of detail, there can never be exact comparability across models. For example, POEMS and NEMS handle intra-regional transmission constraints and opportunities for economic interchanges in a different manner. Also, POEMS does not calibrate to the Short-term Energy Outlook while EIA uses such a calibration in its default implementation of NEMS. In addition, POEMS as implemented in the Supporting Analysis, did not impose a retirement hurdle rate for fossil power plants, while NEMS has traditionally used such a rate, together with limits on "overbuilding," to significantly limit displacement of existing generating assets for economic reasons.

Notwithstanding the lack of complete congruence, we feel that incorporation of the assumptions documented in the *Supporting Analysis*, as supplemented by our previous communications and the numbered points outlined above, would provide an appropriate

basis for carrying out the parallel analysis. It is not necessary or feasible to turn NEMS into POEMS.

Of course, the ultimate decision regarding changes in NEMS assumptions to be made in response to the Secretary's request rests with EIA. However, whatever your decision in this regard, we would strongly suggest that any changes that EIA makes in NEMS assumptions and/or model structure from those used in the 1999 Annual Energy Outlook (AEO99) be thoroughly documented in your report. As noted in the memorandum from the Secretary requesting that EIA undertake this project, the *Supporting Analysis* relies heavily on AEO99. The results of your parallel analysis will necessarily reflect changes in NEMS since AEO99 as well as the assumptions and parameters that are documented in the *Supporting Analysis* and this memorandum. For this reason, documentation of all changes since AEO99, many of which may be completely independent of the *Supporting Analysis*, will be essential to users of your analysis in understanding your results.