



# WESTERN RESOURCE ADVOCATES

Advancing Solutions for the Western Environment

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SUBJECT: Generic Investigation Into Electric Resource Planning  
Responses to Staff's Questions dated April 26, 2007  
**Docket No. E-00000E-05-0431**

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Attached are the responses of Western Resource Advocates and the Interwest Energy Alliance to Staff's resource planning questions issued April 26, 2007 in Docket No. E-00000E-05-0431.

**Western Resource Advocates  
Interwest Energy Alliance  
Response to Resource Planning Questions  
May 23, 2007  
Arizona Corporation Commission  
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**Introduction**

In these comments, Western Resource Advocates and the Interwest Energy Alliance provide responses to Staff's resource planning questions dated April 26, 2007 and provide additional information as requested by Staff.

A good resource planning process should incorporate the following principles:

1. The process should inform the Commission about resource issues prospectively, rather than after the fact when the Commission can do little to change the direction of resource commitments.
2. Consistent with this Commission's general practice, the process should be a public process, allowing full participation by intervenors. Citizens of the state, ratepayers, and other parties with a constructive interest should not be shut out of the process.
3. The process should encourage innovation and imagination. Resource commitments have long term economic and environmental consequences and risks that should not be passively accepted as the cost of doing business. Resource planning should go beyond technical analyses of a narrow set of issues.
4. Innovation and imagination are fostered through an open process that admits a wide range of ideas. Choices are created via the interaction of participating parties, and by seeking to mitigate or avoid environmental and other risks.<sup>1</sup> For example, an open resource planning process in Colorado led to the deployment of major wind energy resources.<sup>2</sup> Without that open process, the use of alternative resources would have been delayed.
5. The process should recognize the high degree of uncertainty about future streams of costs, especially fossil fuel costs and costs of complying with environmental regulations. Consequently, resource planning should not be an exercise in finding the "least cost" resource mix as any such result would be based on arbitrary cost assumptions. Rather, resource planning should seek strategies to limit the potential for bad outcomes by creating reasonable hedges.

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<sup>1</sup> See D. Berry, "The Structure of Electric Utility Least Cost Planning," *Journal of Economic Issues*, vol. 26, September 1992: 769-789.

<sup>2</sup> R. Lehr, J. Nielsen, S. Andrews, and M. Milligan, "Colorado Public Utilities Commission's Xcel Wind Decision," National Renewable Energy Laboratory, NREL/CP-500-30551, 2001.

## Responses to Staff's Questions

### A. Objectives of Resource Planning

1. What should be the primary objectives of a resource planning process?

**Response:** The resource planning process should pursue multiple objectives:

- **reliably serving the demand for electric energy services**
- **reducing the environmental impacts of power production, including the emission of greenhouse gases**
- **effectively managing cost, environmental, load forecast, and other uncertainties and risks.**

A mix of resources should be selected to provide reliable service (given operating resource characteristics), minimize air emissions and water use, and limit utilities' and ratepayers' exposure to high costs.

It is **not** the objective of resource planning to minimize the present value of future cost streams because of the great uncertainties about many of those costs. It makes no sense to minimize something that cannot be reliably projected<sup>3</sup> – the “benefits” of any resulting least cost plan would be illusory. Instead, uncertainty and its attendant risks should be effectively hedged and managed.

2. Arizona first promulgated planning rules in 1989 ... (a) Should the Commission look at using or “tweaking” these existing resource planning rules, or are they so outdated that we should design something new? (b) Do those rules accomplish the objectives of resource planning? (c) What conditions (if any) in the industry and market have changed fundamentally since 1989 that would impact the way IRP is conducted?

**Response:** Much of the purpose of resource planning has not changed since the 1980s. The intended impacts of resource planning have included: integration of demand and supply analyses, incorporation of demand side management alternatives, consideration of risk, regular review of resource issues, improved regulatory review of utility plans, prospective assessment of resource projects, an expanded set of resource options, and greater public

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<sup>3</sup> The Energy Information Administration *Annual Energy Outlook Forecast Evaluation 2004* reports that the absolute percent error for forecasts made from 1982 to 2004 was about 68% for natural gas wellhead prices and 48% for coal prices paid by electric generating plants. As a second example, R.W. Beck's third quarter 2004 Henry Hub gas price for 2006 was about \$4.00 per MMBtu. Actual Henry Hub monthly average spot prices ranged between about \$4.50 and about \$8.20 during 2006, averaging about \$6.50 per MMBtu for the year (EIA, Natural Gas Year-In-Review 2006). Given such a poor track record of forecasting, selecting resources based on fuel price forecasts is dangerous.

involvement in planning issues.<sup>4</sup> Shortcomings of resource planning are due to a lack of imagination and too narrow a focus on technical analyses supporting conventional solutions. To update Arizona's resource planning process, we suggest that Staff start with a clean slate simply because it will be easier (as was the case with the RES rule) and that participants in any process to draft a new rule review resource planning legislation, rules, and decisions from other states (e.g., New Mexico<sup>5</sup>).

3. To what extent have traditional resource planning functions been adopted by the Commission in other proceedings and rulemakings?

**Response:** Many resource planning issues (e.g., the role of energy efficiency) are now taken up piecemeal in rate cases and other venues if they are considered at all. The Renewable Energy Standard also has defined goals for renewable energy, but those goals are minimums and may not be adequate to fully reflect the benefits or role of renewable energy.

4. Are some traditional IRP processes best left to regional organizations rather than the state?

**Response.** No.

5. What role should the regional planning processes, particularly regional transmission organizations play in the process?

**Response:** Obviously, there has to be coordination between regional transmission planning and Arizona's integrated resource planning. But the Commission should not explicitly or implicitly delegate its resource planning to a regional transmission planning entity.

6. To what extent, if any, should a Commission decision "accepting" or "approving" a plan (or part of a plan) be regarded as a finding of prudence in subsequent rate cases?

**Response:** Commission approval or acceptance should apply only to the action plan portion of the resource plan (see response to item A7) or to any amendments or updates to the action plan filed, reviewed, and accepted by the Commission between resource planning filings. The action plan would

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<sup>4</sup> For a review of resource planning in the 1980s, see D. Berry, "Least-cost Planning and Utility Regulation," *Public Utilities Fortnightly*, vol. 121, March 17, 1988: 9-15. For a summary of current resource planning activities in the West, see Charles Goldman and Nicole Hopper, Lawrence Berkeley National Laboratory, "Review of Utility Resource Plans in the West," presented at the New Mexico Public Regulation Commission IRP Workshop, Santa Fe, June 8, 2006.

<sup>5</sup> As revised by the New Mexico Public Regulatory Commission, Case No. 06-00447-UT, March 1, 2007: 17.7.3 NMAC.

pertain to actions to be taken in furtherance of the overall resource plan during the 3 (or 4) year period following Commission approval or acceptance. In general, such actions would be presumed to be prudent unless they were imprudently implemented by the utility.

7. What types of information should be included in resource plans? Should this information be organized in a specific manner so that plans from each utility are consistent with each other, containing the same type of information, and in the same part of the filing?

**Response:** The following subjects should be included in all electric resource plans:

- Summary of the plan, including one or more load & resources tables
- Multiple objectives of the plan
- Summary of general industry conditions affecting the power sector
- Description of the public input process used to develop the plan (see item B14, below)
- Load forecasts and analysis of uncertainty of load forecasts, including the effects of weather; load forecasts should explicitly show the effects of energy efficiency programs
- Existing resources, their costs and operating characteristics, and uncertainties about these factors
- Determination of resource requirements (see item E1)
- New resource options, their projected costs, fuel sources, availability, efficiency, dispatchability, modularity, other operating characteristics, *and uncertainties about these factors*
  1. Resource options should explicitly include: energy efficiency, renewable energy, combined heat and power (CHP), and emerging advanced technologies which reduce greenhouse gas emissions and other pollutants
  2. Options should include transmission and distribution needs and take account of losses
  3. Uncertainty analysis should focus on extreme outcomes, not measures of central tendency, so as to identify vulnerabilities
- Reserves
- System reliability analyses (e.g., LOLP, unserved energy, and analyses pertaining to transmission and distribution reliability)
- Environmental impacts and uncertainties, including: air emission rates for carbon dioxide, sulfur dioxide, nitrogen oxides, mercury, particulates, and other air emissions subject to current or future environmental regulation; and water consumption
- Fuel price forecasts and uncertainties associated with future costs
- Capital cost forecasts and uncertainties associated with future costs

- Costs of complying with existing and potential future environmental regulations and uncertainties in these costs
- Other cost forecasts and associated uncertainties
- Risk management objectives and plans
- Description of proposed plan and the reasons for selecting the plan
- Action plan for approval/acceptance by the Commission; the action plan would apply to actions to be taken during the 3 (or 4) years following Commission acceptance/approval of the plan in furtherance of the approved plan.
- Procurement plan for resources (see item B13)
- Appendices with technical information, analyses, and data.

We caution against excessive organizational requirements. Our experience with plans that must follow a prescribed outline is that the plans are repetitive and verbose. Worse, a utility can become focused on strict compliance with the list of subjects to the detriment of understanding big issues.

## **B. Resource Planning Processes**

1. Which entities should be required to file resource plans (electric, gas)?

**Response:** All large jurisdictional electric utilities except electric distribution cooperatives should file resource plans. Thus, at present, APS, TEP, Unisource, and AEPCO would file resource plans.

Consideration of gas resource planning should be deferred until there is new experience with electric resource planning. Gas resource planning, if pursued, would pertain to gas supplies, gas storage, pipeline issues, and efficiency programs. In the absence of gas resource planning, gas planning issues, including energy efficiency programs, can be dealt with in gas utility rate cases.

2. Should resource planning consider transmission as well as generation resources?

**Response:** Yes.

3. What should the planning horizon be for a resource plan?

**Response:** Because of the long lead times for some resources, the planning horizon should be 20 years with regard to the addition of new resources. However, in order to provide a fair picture of resource options, the plan should comprehensively take into account the **lifetime costs** of resource options considered for operation during the planning horizon.

4. How frequently should a utility be required to file a resource plan?

**Response:** Every 3 years.

5. Should there be a “Biennial Resource Assessment” similar to the requirement for a Biennial Transmission Assessment contained in ARS 40-360-02(g)?

**Response:** It is not possible to respond to this question without clarification of the purpose of the “assessment” assuming that there is a resource planning process.

6. Should resource plans be filed simultaneously by the utilities as in the past so the Commission could focus on statewide issues, or should they be individually filed in alternating years or periods in which the Commission could focus on the specific issues for each utility?

**Response:** Having all utilities file in one year may assist understanding the statewide picture. However, staffing limits may not allow for timely review. It may be easiest to have APS file in one year, and the other electric utilities file in other years (e.g., TEP and Unisource in the second year and AEPCO in the third year of the cycle).

7. What time limits, if any, should apply to the Commission’s processing of a resource plan?

**Response:** A time limit of 5 to 6 months to complete processing is reasonable, including time for Staff and intervenor testimony, utility rebuttal, a hearing, and a decision. This time limit can be met if each utility conducts a comprehensive public input/advisory process prior to and during the preparation of its resource plan as explained further in item B14. The public input process, which would include Staff, can encourage the utility to include issues of importance to other parties so that less time will be needed for review after the plan is filed. A fast turn-around time can be further facilitated if utilities do not all file their plans in the same year.<sup>6</sup>

8. Should there be public hearings on resource plans? Should the rules allow for intervenors? Should parties be allowed to call and cross examine witnesses?

**Response:** Yes on all points, as explained in the introduction.

9. How can a resource planning process be developed which takes into account changes that occur between filings? How can flexibility to adapt to new, unanticipated situations be maximized? Should the utility file annual updates

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<sup>6</sup> Nevada has a 135 day time limit (NRS 704.751).

of resource plan? Should the utility file amendments to its plan as major decisions or changes are made?

**Response.** The utility should file amendments as needed between full IRP filings. Amendments would be needed if the utility wished to make a material deviation from an approved action plan. The Commission should review the amendments in a hearing unless all parties who participated in the formal review of the previously approved plan agree in writing to waive a hearing.

10. Should resource plans include a short term action plan (such as the time between filing of resource plans) in which utilities could obtain more direct Commission direction and/or approval for certain critical items that must be decided in the short term?

**Response.** Action plans should be part of the full filing (see items A6 and A7) and pertain to (approved) activities the utility will engage in over the next 3 or 4 years. As noted in response to item A6, Commission approval or acceptance should apply only to the action plan portion of the resource plan or to any amendments or updates to the plan filed and reviewed by the Commission between resource planning filings. The action plan would pertain to actions to be taken in furtherance of the overall resource plan during the 3 or 4 year period following Commission approval or acceptance.

11. How is the resource planning process affected by a building moratorium?

**Response:** Depending on the provisions of the moratorium, limitations on utility actions included in an approved moratorium would continue in place for the approved duration.

12. To what extent should the process be public? How much data can be discussed and or debated publicly given competitive considerations that are now part of the wholesale marketplace?

**Response:** The Commission's business is public and subject to the open meeting law. Moreover, the resource planning process should be public and open to the active participation of intervenors. Otherwise the process will have excluded potentially innovative ideas and may present only one side of an issue.

Based on experience in Arizona and elsewhere, reasonable accommodations can be made to protect confidential information while having a productive public dialogue about future resources. Most of the issues are or ought to be major planning decisions – what types of resources are needed and when? These issues can be publicly discussed without disclosure of confidential information.

13. Should standardized RFP/Solicitation procedures be adopted as part of the process?

**Response:** Yes, although they may be a follow up phase to the review of the IRP itself. Adoption of standardized RFP/Solicitation procedures is important and should be developed whether or not an IRP process is adopted.

14. **Additional issues: public input prior to utility filing of plans.** Each utility should be required to conduct a public participation process in the development of its resource plans. Public input can enhance the creation of choices and may allow for collaborative agreements among the utility and interested parties. Public input should be “advisory,” so that interested parties and utilities can have a dialogue as opposed to mere presentation of the public’s concerns without interaction with the utility. Where interactive public participation occurs during plan-making, utilities and interested parties can jointly identify better ways to analyze issues and invent a wider range of possible solutions to planning issues. Further, public participation during the plan-making phase can reduce disputes and misunderstandings after the plan is formally filed and shorten the time needed to formally review a filed plan. The New Mexico IRP rule provides for a public advisory process.<sup>7</sup>

### C. Need Determination (Load Forecasting)

1. How are load forecasts to be conducted? Should there be one consistent methodology used by all utilities or should each utility have the flexibility to use the methodology that it prefers? Should the Commission specify the methodology by which forecasts are developed?

**Response:** Each utility should use the forecasting methodology it chooses. Forecasting is subject to error and there is no method that is error-free. The Commission should not specify a forecasting methodology.

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<sup>7</sup> 17.7.3.9 H, NMAC. At least one year prior to the filing date of its IRP, a utility must initiate a public advisory process to provide information to and to receive input from the public regarding the development of its IRP. The utility must provide notice to the intervenors in its most recent general rate case and to the participants in its most recent renewable energy, energy efficiency and IRP proceedings at least 30 days prior to the first scheduled IRP advisory meeting. The Commission may designate a facilitator for the process. The utility leads the process (as chairperson) but participants are allowed to place items on the agenda. Meetings are open to the public. Topics to be discussed include load forecasts, evaluation of existing resources, assessment of the need for additional resources, identification of resource options, modeling and risk assumptions, the costs and attributes of potential resources, and the development of the portfolio of resources.

2. What time period should load forecasts reference?

**Response:** The forecasting period should cover the planning horizon. However, in order to examine lifetime effects of resource choices (see item B3, above), the forecast period may have to be extended.

3. How can the Commission (or should the Commission) review load forecasts when considering a resource plan?

**Response:** The Commission should review all parties' load forecasts and analyses and underlying assumptions. Staff and other parties can compare a utility's load forecast with historical trends in electricity consumption (kW and kWh) and may prepare their own forecasts independently of the utility's forecast.

4. What is an acceptable margin of error in viewing actual, experienced, historic peaks compared with forecasted peaks? Should a significant, unexplained deviation between the historic and forecasted peak trigger an amendment or update of the resource plan?

**Response:** Error analysis pertains to a comparison of either: a) past forecasts with actual load, or b) actual historical consumption with consumption "predicted" by the current analysis for the historical period. The objectives of both types of error analysis are to identify misspecifications of the forecasting model so that the forecasting model can be revised, and to reveal the magnitude of uncertainty over future loads.

No acceptable margin of error should be proposed since the target would be arbitrary and possibly counterproductive. Residuals or errors may suggest additional factors to be considered in a forecast model but they also suggest that future loads are somewhat uncertain. Managing the risk associated with load forecast uncertainty can only be partially accomplished by seeking better forecasts. Flexibility in resource acquisition is also a necessary risk management tool.

An amendment to an action plan might be triggered by a dramatic revision in a load forecast after a plan has been filed or approved if the change in the load forecast materially affects resource choices or activities during the implementation of an approved action plan.

#### **D. Demand Reduction (Demand-Side Management)**

1. What role should DSM play in the resource planning process?

**Response:** DSM should be the first resource included to meet gaps between resource capabilities and demand. Large scale, cost effective DSM programs are feasible and furnish the lowest cost resources available.

2. Should existing Commission activities in DSM be brought within the realm of the resource planning proceedings?

**Response:** Existing activities (and future DSM programs considered in rate cases or other venues besides resource planning) should be taken into account in the resource planning process but should not be eliminated in the expectation that DSM will be fully implemented in the resource planning process. In other words, important issues, like DSM, should not be compartmentalized and disregarded in every matter before the Commission except for resource planning. We do not know how the resource planning process will function or if and when it will take effect. Transferring DSM to unknown processes could delay or undermine the progress being made.

3. How is resource planning affected by existing DSM programs and DSM proceedings presently pending before the Commission?

**Response:** Resource planning should take into account the magnitude and schedule of these DSM programs. The potential implementation of a resource planning process should not be used to derail or postpone existing or pending DSM programs.

4. Should the Commission adopt the following PURPA standards included in the Energy Policy Act of 2005: (1) Net metering? (2) Smart Metering?

**Response:** In general, yes. Net metering policies should be carefully prepared without needless caps and limitations.

#### **E. Filling Need Requirements (Supply-Side Planning)**

1. What are the supply-side resource requirements that must be planned and filled in the future and how do we decide what those requirements are?

**Response:** The requirements are the difference between existing resources (that will continue to exist in the planning period) and future load, adjusted downward by the effects of DSM, and adjusted for reserve requirements and losses. Requirements pertain to both energy and capacity. The requirements analysis should reveal the portions of the load requirements which are baseload, intermediate, and peaking requirements.

The Commission should compare the requirements analyses prepared by the parties to an IRP case. Requirements analyses may differ because of differences in load forecasts, planned DSM, reserve needs, loss estimates, and other factors.

2. What portfolio(s) of options are best for filling increased load demands?

**Response:** The answer to this question is the result of the resource planning process applied in specific cases. Based upon our experience elsewhere, the portfolio of supply-side resources should be much more diverse than it is today, with much more renewable energy resources. Moreover, the resource planning process should emphasize the role of advanced technologies which greatly reduce greenhouse gas emissions.

3. How should risk management be factored into the decision making process?

**Response:** Risk management is one of the central aspects of resource planning. Supply side resources typically have long lives and many factors can change over those lifetimes: for example, fuel costs, and costs of complying with environmental regulations, including possible future environmental regulations, can be dramatically different in 10 years relative to current values. Risk management must consider major changes from current conditions, especially if those changes will greatly affect the cost or viability of a particular resource. Risk management is not achieved by focusing on “base case” or average conditions. Rather, it is achieved by focusing on vulnerabilities and by limiting the potential for bad outcomes through a diverse set of resources that enable a utility to respond to changing conditions, including conditions that are very different than current conditions. In sum, risk management is factored into the decision making process by making the utility resilient to changing and unforeseen conditions.

4. How should fuel diversity be evaluated?

**Response:** See response to question E3.

5. Can an expanded use of utility-scale solar electric generation be integrated with existing coal fired generation?

**Response:** Yes. How well these technologies are integrated depends on the characteristics of the coal plant and the solar plant. If the coal plant output cannot be readily varied over the course of the day, the two technologies may be a poor match. If the utility would otherwise be burning natural gas at the margin, then the coal-solar match may not be particularly valuable unless coal generation were reduced as solar generation is increased.

6. How could supply-side planning be affected by the new Renewable Portfolio Standard adopted by the Commission for Arizona?

**Response:** As utilities engage in resource planning, they would generally assume that they will meet the RES requirements with a reasonable mix of eligible resources. Any remaining supply side requirements would be in addition to the RES resources. The resource planning process should **not** assume that the RES defines the maximum amount of renewable energy to be deployed.

7. What is the risk of future carbon taxes or penalties on existing and future fossil fuel generation options? How can this risk be evaluated and quantified?

**Response:** The risk derives primarily from uncertain compliance cost as opposed to whether there will be greenhouse gas emission regulations. Common risk analyses include applying a range of adders to the operating cost of existing resources and of potential future resource options to reflect the impact of either purchasing allowances or offsets or undertaking other compliance actions.<sup>8</sup> Recent experience in Europe indicates that allowance prices can be quite volatile so the range of possible compliance costs should be commensurably large. The New Mexico Public Regulation Commission is considering a range of adders of \$8, \$20, and \$40 per metric ton of carbon dioxide starting in 2010 and escalating at a rate of 2.5% per year (Case 06-00448-UT); some utilities use a wider range of costs. A narrow range of cost is not informative regarding utility and ratepayer exposure to high costs.

Additional carbon risk analyses could also be performed. For example:

- At what carbon compliance cost would major changes in resource mixes occur (e.g., at what carbon dioxide compliance cost do new coal units no longer appear economical)? How likely are such compliance costs to occur?
- What are the effects on resource choices of various performance standards (i.e., greenhouse gas emission limitations applied to individual power plants)?

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<sup>8</sup> See, Karl Bokenkamp, Hal LaFlash, Virinder Singh, and Devra Bachrach Wang, "Hedging Carbon Risk: Protecting Customers and Shareholders from the Financial Risk Associated with Carbon Dioxide Emissions," *The Electricity Journal*, vol. 18, no. 6 (July 2005): 11-24. Galen Barbose and Ryan Wiser, Lawrence Berkeley National Laboratory, "The Treatment of Carbon Risk in Recent Western Utility Resource Plans," presented at a Workshop on Carbon Risk in IRP, Santa Fe, NM, March 28, 2007. Tom Wilson, EPRI, "What Will the Price of CO<sub>2</sub> Be?" presented to the New Mexico Public Regulation Commission, March 7, 2007.

- What are the effects on resource choices of various overall greenhouse gas emissions caps (applied to all power plants collectively)?

Moreover, a wide range of low-emission resources (e.g., renewable energy, energy efficiency, and advanced technologies which capture carbon dioxide and sequester it or use it to displace other fossil fuels), offsets, and early retirements of existing coal plants should be included as options in resource planning analyses. Otherwise, as has occurred in some resource plans, the carbon risk analysis may mislead a utility and the Commission to accept conventional fossil fueled power plants when better alternatives were excluded from consideration.

8. Should one computer production cost modeling program be utilized?

**Response:** No. Insightful use of a production cost model requires experience with the model, its inputs, and the way the model reflects operational reality at the utility. Switching models may reduce the accuracy of a utility's analyses in the short run.

All production cost models will reflect the quality of their assumptions, and among the most important of these is fuel price forecasts. Fuel prices cannot be accurately forecast so the insights offered by production cost models are limited. Better resource planning is not dependent on the selection of a production cost model. Rather, better planning depends on encouraging imagination and conversations with others who look at the world differently,<sup>9</sup> and on looking at big picture issues.

9. How should non-utility generation (i.e., merchant generation, distributed generation) be considered in resource plans?

**Response:** Distributed generation can be forecast, taking into account RES or similar requirements. CHP should be forecast considering both knowledge of its applicability to specific customers and development of Commission and other policies to encourage CHP. As for merchant generation, resource planning tends to identify resource needs by type (e.g., baseload, intermediate, peaking). The question of whether those needs are met by utility-owned resources or purchased power is determined through a resource solicitation process that allows for utility ownership of the plant as an option (see the response to item B13).

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<sup>9</sup> See, Richard Lester and Michael Piore, *Innovation: The Missing Dimension*, Harvard University Press, 2004.