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Page	Comment
Chapter II: Electric LCP Summary	
II-1	The PSE Load forecast is a single point forecast -- in each year, the Company is planning for a specific level of customer demand. NWPPC has long rejected notion of a single forecast, in favor of uncertainty modeling of low - medium - high scenarios. PSE does this with gas, but not electricity. In fact, electric demand is subject to variation due to weather, economic conditions, population growth, and other factors. PSE needs to have a more sophisticated forecasting method. **Recommendation: Direct PSE to develop a forecasting methodology that explicitly takes uncertainty as to loads into account.**
II-6	The graph in Exhibit II-5 of monthly load/resource balance is misleading. First, it uses a single forecast of demand, not one with an uncertainty band due to weather and other factors. Second, it does not include the energy that the existing CTs are capable of producing. This is as much as 600 mw. If included in the graph, the existing CTs would create a surplus in each and every month of the year for 2004 (this would not be the case for 2013, after load growth and resource expiration occurs). **Recommendation: Direct PSE to include the energy capability of its existing combustion turbines in all depictions of its load/resource balance.**
II-8	Here, PSE has depicted, in Exhibit II-7, peak demand based on both 16 degree temperature and a 23 degree temperature. It describes 23 degrees as having a 50% probability, but there is no discussion of the probability of 19, or 16 degree probabilities. This does reflect the uncertainty due to weather, but only on peak; none of the analysis reflects the impact of cold years or warm years on weather.
II-9	The fixed fuel cost per kw is shown in Exhibit II-8 as the same for SCGTs and CCGTs. Since CCGTs use 30% less fuel per kw, this is not logical. Intuition is that it would be lower for CCGTs than for SCGTs.

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Page	Comment
II-11	The coal additions shown In Exhibit II-10 after 2010 are not appropriate, given the high environmental costs and economic risk of the coal option. The fact that the acquisition is assumed to occur in the distant future leaves time to evaluate these options further. As long as no commitment to coal is made in the first few years, while DSM, Environmental Cost, Wind Integration, and other studies are ongoing, it is not harmful to list these, but these are probably not appropriate. **Recommendation: Direct PSE to more thoroughly study the quantifiable environmental costs of coal generation before taking any steps which would lead to acquisition of a coal resource.**
Chapter	**III: Planning Issues**
III-4	The text says that Washington, Oregon, and Idaho have 68,000 mw installed generating capacity, including 23,516 mw of gas generating capacity. Table III-5 shows this also. These figures appear highly inaccuratet for the NW states. It's hard to know what is being portrayed by these numbers, but it's definitely NOT what it says. There are only about 5,000 mw of gas generators in Washington, Oregon, and Idaho. See Table 1.1 of Convergence, attached. It shows 4,629 mw existing and under construction at that time. In addition, it shows 2,936 mw permitted, of which some are now in service.
III-21	The text expresses concern about PSE creditworthiness and how it will affect the Company's ability to achieve least-cost goals. Puget's poor credit rating is the result of deliberate decisions by PSE's previous management to finance all capital projects with debt, rather than with the approved capital structure being paid for by ratepayers. This credit quality deterioration is certainly not the "fault" of the ratepayers, and ratepayers should not be denied least-cost solutions because of this management decision. As discussed above, the Company has the tools to deal with this issue. **Recommendation: Put PSE on notice that any deviation from the least-cost path that is the result of management decisions to allow the Company's credit quality to deteriorate will not be the responsibility of ratepayer.**

Section V: Stakeholder Interaction

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Page	Comment
V-5	PSE was directed in the August, 2001 letter to update and complete it's DSM evaluation. It has failed to do this, and we are still waiting for this data. The Company has been working on this with the Conservation Advisory Group, and results are anticipated in August. However, absent this section, the Least Cost Plan does not comply with the requirements of WAC 480-100-238, and should not be considered as complete. **Recommendation: Remand the Least Cost Plan to Puget for completion of this missing element, and resubmission of the document when complete, not later than August 31, 2003.**
V-5	PSE was directed to study fuel switching opportunities as a part of DSM. It has not done so, and cannot rely on the NWPPC for this analysis, as they don't do it at all. This is a MAJOR resource opportunity, particularly for on-peak capacity. We roughly estimate the potential at 100 average megawatts and 400 peak megawatts, as shown on the attached worksheet. **Recommendation: Remand the Least Cost Plan to Puget for completion of this missing element, and resubmission of the document when complete, not later than December 31, 2003.**

Section VI: Load Forecasting

VI-4	There is a discussion of the difficulty of a gas relight in the event of a gas outage, but no analysis of the cost or cost-effectiveness of eliminating this problem. The state of Hawaii prohibits pilot lights on gas appliances sold in that state. A similar change in the Washington State Energy Code would cause this problem to diminish year-by-year as appliances are replaced. Within a decade, the cost of a relight would be a tiny fraction of what it would be today. The Company should be directed to prepare a code amendment to this effect, and evaluate the cost and cost-effectiveness of this change, including the impact on gas reliability planning criteria, consumer energy consumption, and system reliability. **Recommendation: Puget should explore a ban on pilot lights in new gas appliances in it's Two-Year Action Plan, and if it is supported by the evidence, should request a code change in the next energy code cycle.**

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Page	Comment
VI-7	The retail rate forecast for gas seems wildly optimistic, given the current NYMEX prices for the next 6 years. Exhibit VI-5 forecasts a retail rate of $.71/therm in 2004/05, while the current wholesale cost of gas is nearly at that level. We have attached a recent NYMEX futures market report. This same comment applies to the wholesale cost of gas for electric generation incorporated in the report. **Recommendation: Direct PSE to update the forecast of rates to reflect current wholesale gas market expecations when it resubmits the revised document after incorporating the missing elements.**
I-9 / VI-12	At the time of the rate case, use per customer was forecast to decline at 1% per year, not 0.2% per year. See attached worksheet from response to data request of NRDC. Expected target of 11,054 kwh/year in **2020** shown in the Least Cost Plan compares to regression result forecasting **11,063** by 2006 supplied by PSE to parties in rate case. The table in Exhibit VI-9 appears to be inconsistent with the information that was presented in the rate case.

Section VIII: Existing Electric Resources

Page	Comment
VIII-2	PSE now counts utility-funded conservation as a resource, and recognizes that they are meeting 11% of loads with conservation. They have not estimated the savings that are accruing as a result of energy codes and appliance and equipment efficiency standards. Codes and standard improvement should be a specific part of the DSM evaluation, and the Action Plan, as it is the most reliable, lowest cost, and best load-matched resource available. **Recommendation: Direct PSE to estimate the energy savings for gas and electric systems being met with efficiency improvements incorporated in energy codes and appliance/equipment standards as an Action Plan item. In future Least Cost Plans, these should be reported as existing resources in the future. The baseline should be the codes and standards in effect when the Least Cost Planning rule was first adopted.**

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Page	Comment
VIII-4	There are no code improvement efforts identified as DSM programs currently underway. The Northwest Power Planning Council has identified numerous code improvements of value, and a number have been proposed to the Washington State Building Code Council. **Recommendation: Direct PSE as an Action Plan item to develop code amendments to achieve all cost-effective energy savings, and propose them as amendments to the Washington State Building Code Council.**

Section IX: Electric Load - Resource Outlook

Page	Comment
IX-1	The energy estimate is completely deterministic; PSE cannot be certain how many customers will join its system, or how much electricity they will use. The energy estimate needs to be more probabilistic -- 90% chance of being greater than 2000 amw, 50% chance of being greater than 2377 amw, 10% chance of being greater than 2500 amw, or something to that effect. **Recommendation: Direct PSE in its next Least Cost Plan to incorporate uncertainty into the load forecasting process.**
IX-4 II-9 E-1	Fredonia fuel efficiency is indicated to be 32%, which is 10,663 btu. Base assumptions for NEW SCGT power plants is 11,700 (Exhibit II-8). Clearly there are more efficient SCGTs available than those in the base assumption, and PSE just bought two of them. In Appendix E-1, the Company shows Fredonia 3/4 as 10,500 btu, which is 33% efficient. **Recommendation: Direct PSE in its next Least Cost Plan to compare the cost and efficiency of alternative peaking generating facilities as it has done in Exhibit XVI-1 for natural gas peaking resources.**

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Page	Comment
IX-7	The graphs and tables shown the peak demand based on a single forecast, without any uncertainty. They also show peak capacity requirements with reserves. The graphs and tables need to portray two important differences. First, what happens under typical dry conditions and wet conditions to available resources. Second, what contribution can the existing SCCT units make to meeting energy needs (as they did in 2000-2001). **Recommendation: Direct PSE in the future to incorporate uncertainty into its demand forecasts. Direct PSE to re-do the graphs showing the energy that can be provided by the existing combustion turbines when they are next re-submitted later this year after incorporation of the missing elements (DSM and Fuel-switching).**

Section X: New Electric Resource Opportunities

X-1	The language seems to recognize much DSM potential, but none has been analyzed or quantified. The Company is preparing this analysis now. The Least Cost Plan is incomplete (per the rule) without this. **Recommendation: Remand the Plan to PSE for inclusion of the DSM by August 31, 2003, and other missing elements, to be resubmitted no later than December 31, 2003.**
X-5	Landfill Gas is shown on Page II-8, but it is not portrayed here. The costs of landfill gas used on II-8 are very high, and not explained anywhere. Landfill gas fuel is typically free (it must otherwise be flared). Capstone microturbines can burn untreated landfill gas, with no natural gas co-firing. **Recommendation: Direct PSE as an Action Plan item to develop an inventory of landfill gas generating project characteristics in the Western United States, and an inventory of landfills and their gas potential for all of Western Washington.**

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Page	Comment
X-10	The fuel switching analysis called for by the Commission's August, 2001 letter was not performed. This is a truly huge resource, and one that provides 4 kw of peak load reduction for each kw of energy load reduction, per the NWPPC RTF analysis. It also eliminates reserve requirements for electric capacity. **Recommendation: Remand the Plan to PSE for development of the required analysis of fuel switching potential to be included in the revised Plan to be filed no later than December 31, 2003. No new capacity resources should be acquired (other than short-term contracts) until this is evaluated.**
X-17	The document discusses time of use as a demand-response program, but there is no mention of the recent successful demand response programs operated during the drought -- the all-customer and large-customer buy-back programs. There is also no quantification of the amount of demand response that can be expected in the form of moral suasion. In 1977, Puget estimated this at 5% (no surcharge in effect). In 2000-01, loads were down by a similar magnitude, partly moral suasion, partly the all-customer buy-back program. **Recommendation: Direct Puget, in its next plan, to examine the potential for both price-induced demand-response and suasion-induced demand response, and the incorporate this as a resource for meeting critical peak loads.**

Section XI: Electric Portfolio Analysis

XI-7	The "shared ownership" arrangement would have PSE pay less than a time-weighted share of the costs, because it would receive the power in the cheaper winter months, not the more expensive summer months. Note that the seasonal pricing pattern noted by the parties (and questioned by the Commission) during the hearing on the rate case stipulation continues. Summer prices are higher than winter prices. See also graph from NWPPC price forecast, showing VERY sharp spikes in summer.

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Page	Comment
XI-11	Gas price forecast is very different -- MUCH lower -- than NWPPC. This adversely affects relative economics of wind and DSM options. This is a very key assumption, and there is little support in the current environment for the very low gas prices assumed by the Company. **Recommendation: Direct PSE to revise the gas price forecast in the December 31 filing we recommend, and to then revise the estimated cost of natural gas fueled resources. Provide revised portfolio information incorporating this information plus the DSM and Fuel Switching data developed for that filing.**
XI-11	Compare the Puget very low gas price forecast to that released by the NWPPC. Also compare to the current NYMEX futures, attached. Puget's gas forecast seems unreasonably low, and acquisition of any gas-fired resources should be delayed until this is investigated by the Commission, the collaborative, and the Company.
XI-23	The analysis reads that "gas prices go up when hydro conditions are low. " Actually, the causal relationship is more complicated: When hydro conditions are low, gas is used to make up the lost generation, and this higher demand for gas puts upward pressure on gas prices. The bottom line is the same: gas is not necessarily the best or only option for firming up hydro in dry years. Other alternatives, including things like the irrigation buy-back of 2001, should be evaluated and considered.
XI-26	The table of emissions does not make a lot of sense. The new Fredonia turbines are shown as producing 2000 times as much Nox as the old ones or the Whitehorn turbines. It is also notworthy to see that the coal plant emissions are immensely higher than gas, not only for CO2, but also for SOx and NOx. **Recommendation: Direct PSE to price each of these emissions at a level consistent with market prices for these in areas where markets have been established, and to incorporate those emission costs into the analysis of the cost of power from each potential power source.**

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Page	Comment
XI-29	This table shows that NOx regulation ALONE makes coal non-competitive. In California, where NOx emissions are regulated, the price per pound exceeds $2.50, the point on the graph where coal becomes more expensive than natural gas generation. The later discussion in this section of the politics makes it clear that this NOx regulation is highly likely to occur -- it's a part of the Bush administration Clear Skies proposal. **Recommendation: Assume a default value for NOx emissions of $5/lb.**
XI-30	This table shows that CO2 regulation alone makes coal non-competitive at a trivial level of $3 per ton; the NWPPC Regional Technical Forum established a default value for CO2 of $15/ton. **Recommendation: Assume a default value for CO2 emissions of $15/ton in comparing potential new resources.**
XI-30	Wind generation is inappropriately penalized with the addition of CCCTs. Wind is variable, but because it provides capacity when it is running, it reduces the system loss of load probability in direct proportion to its capacity factor. It should be given a capacity credit equal to the capacity value. For example, if wind has a capacity factor of 30%, a 100 mw wind farm should be treated as a 30 mw firm capacity resource. **Recommendation: Include a capacity value for wind generation equal to the product of the capacity factor multipled by the cost of a simple-cycle combustion turbine.**
XI-34	The analysis shows that the value of DSM is extremely high. A 5 mw increment per year is worth $200 million on a present value basis. This suggests that ALL cost-effective conservation should be pursued, and that ANY alternatives that might displace conservation should be deferred and/or avoided. **Recommendation: Direct PSE to develop conservation programs designed to achieve all cost-effective conservation in order to secure these system benefits.**

Section XII: Analytical Results and Judgment

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Page	Comment
XII-2	The higher planning levels all cost significantly more. There is no analysis of how customers value cost versus volatility. It seems to be focused entirely on the Company's preference between the two. Some sort of focus group type analysis is essential, since under the PCA, it is the customer, not the company, that bears most of the volatility risk. **Recommendation: In the absence of a sound basis for doing otherwise, select the least-cost planning level. Any consideration of a higher-than-least-cost alternative requires substantial support based on sound analysis. In this situation, based on Exhibit XII-4, this would appear to be the "B Energy A1 Capacity" option.**
XII-5	This analysis shows that the Simple Cycle Gas Turbines are a very high-cost resource to meet peak demand, but despite this, the Company keeps assuming it must acquire these to "back up" wind, and in many of the portfolios in Appendix I, acquires as much as 975 MW of SCGT capacity in 2004. This is a crucial issue that must be resolved before any major resource acquisition can go forward. The case studies in Appendix I most have significant SCGT acquisitions shown in year 2004. This should be replaced with short-term contracts until the alternatives to this type of resource are fully explored. **Recommendation: Direct PSE to examine all alternatives to acquiring high-cost resources to meet peak demand, and to defer any long-term acquisitions until this analysis is complete and has been reviewed.**
XII-11	The text makes it clear that there may be MUCH more DSM available. The NWPPC release in May supports this. Further, PSE is required to consider cost-effective fuel switching, and this will greatly add to the available resource base. WNG, before the merger, had a great deal of experience with fuel-switching. **Recommendation: Defer any major resource acquisitions until after the required DSM and Fuel Switching studies are complete and have been reviewed.**
XII-15	PSE again discusses its lack of liquidity and availability of creditworthy counterparties. Company can address this and solve it in a matter of days, weeks, or months, with a combination of stock issuance, stock dividends, and DRIP discount equal to selling costs and pressure.

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Page	Comment
XII-18	More discussion about backing up wind with SCGT. No basis for this assumption. Exhibit XII-7 prices coal without ANY adder for either CO2 or NOx. This is imprudent, as these costs are reasonably expected to be incurred in the future. **Recommendation: Direct PSE to re-cast this exhibit with the default values for NOx and CO2 identified earlier.**

Chapter XIII: Electric Resource Strategy

XIII-4	No explanation of why they chose the 16 degree reliability standard. It is very strict, and needs more support. Needs to include analysis of consumer willingness-to-pay for rarely needed levels of service.

Chapter XIV: Existing Gas Resources

XIV-3	No code improvement efforts are identified as part of the gas DSM program effort.
XIV-8	No mention of industrial buy-back opportunities. PGSS is identified as a VERY small resource on XIV-9. Need more evaluation of this. **Recommendation: Direct PSE in its Action Plan to study all large volume customers in their service territory, and negotiate peak period buy-back arrangements where cost-effective.**

Chapter XV: New Gas Resource Opportunities

XV-8	Reserves are described a 1,186 TCF, compared with 231 TCF on Page 45 of Convergence. If you look in Appendix O, only 167 TCF of 1089 is "proved" reserves. This appears to be a highly optimistic assumption of untested and unproven gas supplies. The assessment done by CTED-Energy Policy in Convergence is attached. **Recommendation: Direct PSE in the future to rely primarily on proven reserves as a basis for natural gas market assessment. Any reliance on uncertain resources should include appropriate risk analysis.**

Chapter XVI: Gas Resource Analysis and Strategy

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Page	Comment
XVI-4	8.95% discount rate is completely improper. PSE net-of-tax discount rate is approximately 7.11% based on rate case stipulation, and this is the appropriate discount rate. **Recommendation: Direct PSE to consistently apply a social discount rate in evaluating consumer impacts. The company's net of tax cost of capital is a reasonable proxy for this.**
XVI-16	Here they use an 8.76% discount rate. These high discount rates appear to be based on the PSE original REQUESTED capital structure and rate of return, and have not been updated since the rate case stipulation.
XVI	There is no discussion of the impact of fuel-switching on gas demand, electric demand, or gas supply issues. Fuel switching means more gas retail load, lower gas generation load, and an impact on the net demand for gas that is dependent on the fuel mix that would be used to serve the electric load that could be attracted to gas. This is a relatively simple analysis, but it provides important information for both the gas and electric studies. **Recommendation: Direct PSE in future studies to examine the inter-relationship between fuel-switching, gas system gas demand, and electric system gas demand to determine if fuel-switching actually leads to lower gas demand and commensurately lower gas cost.**

Chapter XVII: Two Year Action Plan

XVII-12	There is mention of fuel-switching, but no substance. This needs to be analyzed from a customer perspective (is it cost-effective to switch), from a societal perspective, and from a gas system resource development perspective.

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Page	Comment
XVIII-14	A fuel switching pilot program is identified. The magnitude is not described. If the Company could convert 25,000 single family, and 100,000 multi-family electric heat consumers, it could reduce the energy load by 86 aMW, and the peak electrical capacity requirement by 430 MW, including both losses and reserve requirements that would no longer need to be provided. See attached worksheet. **Recommendation: Direct PSE to submit a comprehensive fuel-switching potential analysis with their resubmission, not later than December 31, 2003, and to develop programs to achieve all cost-effective fuel switching, both in their own gas service territory and in the areas in which PSE provides electric service and Cascade provides gas service.**

Appendices

E-1	Fredonia 3/4 identified as 10,500 BTU, vs. 11,700 assumption for generic simple-cycle combustion turbine. Clearly there are more efficient options available. Need some analysis of whether the higher efficiency justifies the (assumed) higher cost.
I-1	Nearly all of the scenarios have significant amounts of SCGT acquisition. Given the high cost of these resources, and the high cost of meeting peak in general, this should be approached skeptically. As indicated, a moderately aggressive fuel-switching program could eliminate 430 mw of need for peaking resources.
K-5	Cost of capital shown in this appendix is far higher than that allowed for PSE or any other regulated utility in Washington.

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Page	Comment
L-4	Company acknowledges that CO2 and NOx regulation is pending and anticipated. In addition to the possible federal imposition, EFSEC is considering CO2 regulation in Washington. It is irresponsible to not make prudent assumptions about the monetized value of these emissions. **Recommendation: Until a different value is developed and supported, use the default values of $5/lb for NOx and $15/ton for CO2.**

Example of Fuel Switching Potential

Number of Customers Possible:	Customers	kwh/year	Total mWh
Single Family	25,000	10,000	250,000
Multi-Family	100,000	5,000	500,000
Total:			750,000
Average MW:			86
Coincident Peak Load Factor (RTF):			0.23
Peak MW:			372
Adjust to generation level for losses @ 7%:			400
Reserve Requirement @ 7%			30
Total Peak Generation Avoided:			**430**