

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

In re: Establishment of rule on renewable portfolio standard	) ) )	DOCKET NO. 080503-EI  FILED: 12-08-08
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**IOUs' Post-Workshop Comments**

Gulf Power Company, Tampa Electric Company, Progress Energy Florida and Florida Power & Light (collectively, the “Investor-Owned Utilities” or “IOUs”) together submit these Post-Workshop Comments, following the December 3, 2008, Workshop of the Florida Public Service Commission (“Commission” or “FPSC”) in this docket.

The IOUs would again like to thank Navigant Consulting (“Navigant”) for the most recent draft of the Florida Renewable Energy Potential Assessment. The IOUs further appreciate the effort expended to gather and analyze the Florida-specific details associated with renewable technology required to produce the report within the limited time available for the assessment.

While we expect Navigant will produce a Final Report that clearly defines the limited scope of their assessment, the IOUs respectfully suggest that another section be added to the report outlining what is not included within the scope of the report and more clearly defining what is meant by the term “technical potential.” More specifically, the term “technical potential” should be redefined as the “theoretical resource potential” and the word “feasibly” should be deleted. Further, while the definition in Navigant’s current draft states that the “technical potential” accounts for “resource availability, land availability, competing resources or space uses, and technology readiness/commercialization level,” it does not appear, based on responses at the December 3, 2008, Workshop, that these factors were fully taken into account with sufficient and timely updated information to develop a complete determination of the technical potential. Finally, it should be made clear in the Final Report that the assessment does not fully

take into account the commercial availability of these technologies in Florida. It is clear that the Draft Report does not include an assessment of the practical implementation of these renewable resources and that there is no current market to support the labor and materials that will be needed to build these resources to the degree shown. The Final Report for the study should very clearly reflect the fact that the technical capability of industry to manufacture the generating equipment shown as being installed in the early years is limited.

Among the items that Navigant should specify as being not included in their Final Report are: an integrated resource planning analysis; an analysis of transmission and distribution impacts and costs that would be required to connect the various levels of renewable generation shown under the various cases; and a system operations analysis that assesses reliability requirements and future energy needs should the levels and type of renewable generation estimated come into being in Florida.<sup>1</sup>

#### Availability of Land and Water to Support Renewable Resources Identified

At the workshop, representatives of Navigant indicated their estimate of land availability did not include wetlands and other land unavailable for resource development. However, the IOUs remain concerned that the availability of land for photovoltaic (“PV”) development may be overstated due to its reservation for wetlands, ground water resource percolation areas or protected species’ habitat. Further, it is not clear from their comments at the workshop that Navigant’s assessment of land availability was appropriately adjusted to take into account

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<sup>1</sup> For instance, the report does not explain the difference between providing capacity versus energy, fossil fuel cost volatility and renewable resource availability during the peak hour when Florida residents are using the most electricity in any given year. One option Navigant could use is factoring in additional costs needed to provide backup power supplies for intermittent electric production of certain renewable sources.

“buffer zones” associated with such wetlands, groundwater resource percolations and habitat restrictions.

Further, the assessment for certain technology choices (most notably the use of biomass crops) does not appear to take into account that 90% of Floridians depend on groundwater for drinking and potable purposes, which would be competing uses for the amount of water that would be required in order to develop those technology choices in Florida. Water is becoming a very critical constraining resource associated with most electric generation expansion and for some renewable options even more critical.

#### Cost Analysis for Renewable Resources

The IOUs are also concerned with the cost analysis provided for the various renewable resources and the attached questions reflect those concerns. It appears the cost analysis is based only on the “installed cost” of the project. When evaluating the cost to Florida electric customers, the entire cost over the life of a project should be taken into consideration. These costs include not only the “installed cost” of the project, but also the cost of performance guarantees and other technical requirements. Not including all of the cost components and technical requirements understates both the costs and the risks to Floridians of increased reliance on renewable resources. Also, it appears that the Draft Final Report assumes that all renewable energy facilities will be owned by independent power producers. The IOUs believe this is unlikely. The study also assumes small power producers would have the same capital strength and cost structure as the IOUs. This is not likely to be the case in most instances. Certainly, the cost for renewable projects will be higher if a higher cost of capital for small power producers is assumed.

The cost of renewable resources is a critical aspect in the process of developing an appropriate Renewable Portfolio Standard (“RPS”). Therefore, the Final Report should be made more transparent by including the impacts to retail electricity prices in the six scenarios in a table in the executive summary.

#### Assessment of Renewables Available by 2020

Navigant has stated that 20% renewables by 2020 is reasonably possible. In addition to questions asked relating to the various assumptions and calculations used in Navigant’s assessment, two items affecting that estimate should be clarified. First, it is not clear that Navigant’s assessment that Florida’s IOUs can serve 6-27% of sales with renewable resources by 2020 took into account the fact that IOUs serve 77% of Florida’s load and a significant percentage of Florida’s renewable capacity can be expected to be secured by municipal and cooperative utilities. If this has not been properly accounted for, the error could be significant and should be corrected.

Also, given that the recent economic downturn has resulted in a downward adjustment in load forecasts, 20% by 2020 would likely require the reduced load growth be more heavily provided through renewable resources in order to get to 20% by 2020. Given the pace of access to renewable technology in the early years of the forecast and the lower load growth, Florida’s ability to achieve 20% of sales by 2020 will likely be negatively affected.

#### Process of Setting an RPS

While there is only limited time remaining before the Commission must provide a report to the Legislature, that time will be well spent continuing to seek input to confirm or improve

upon the analysis developed by Navigant. We ask that the IOUs and other interested participants be allowed to continue to engage in such activity.

At the workshop, the IOUs indicated that they would conduct a further review of Navigant's Draft Final Report. With these comments, the IOUs have attached a list of questions and concerns coming from the review performed so far of the Draft Final Report that, in our view, remain to be answered and addressed regarding Navigant's study.

The IOUs appreciate the opportunity to provide these comments and look forward to participating further in this process.

Respectfully submitted,

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## ATTACHMENT TO IOUs' POST-WORKSHOP COMMENTS

### General Questions/Comments Regarding Report

1. The IOUs agree with the Office of Public Counsel's ("OPC") observation regarding the information needed to conduct cost comparisons of renewable resources and suggest that Navigant re-run the scenarios without the constraint of a 75-25 split of the cost cap between solar/wind and other renewables and include the results of these additional scenarios in the Final Report.
2. A column should be added to the table on page 23 (and page 226, which is identical) showing the cumulative (2009-2020) cost and GWh of each scenario.
3. Navigant's report uses a 40-year life for nuclear plants; however, a more realistic assumption is 60 years, which would be consistent with recent nuclear need cases in Florida. The report should be revised using a 60-year life for nuclear plants.
4. Navigant assumes long-term cost reductions for renewable technologies and long-term cost increases for traditional technologies. Both technologies are exposed to the same labor and commodity price cycles, and, in addition, renewable technologies would be exposed to the rising land prices. Please explain the basis of this assumption. Also, please provide the escalation/inflation-deflation/credit market rates used, the material and commercial market assumptions made and population growth rates used.
5. The total installed costs of the renewable generating equipment for all scenarios are shown as reducing over time. While an argument can be made for this to occur for solar PV, all other technologies likely would have increasing costs over time. All other scenarios use generating technologies that are either mature or have little to no probable expectation of some major cost cutting technological breakthrough occurring. Navigant should provide support for their assumptions of installed cost.
6. The IOUs are unable to follow or verify the mathematical trail from scenario assumptions to conclusions or from technology cost assumptions to the levelized cost of electricity ("LCOE"). The calculations should be provided to stakeholders and put in an appendix to the Final Report.
7. Navigant appears to assume that all coal power supplied will be generated only from existing coal power plants and makes other assumptions that are not delineated in the report. It appears all scenarios assume that:
  - a) Fossil fired power CO<sub>2</sub> emissions are uncontrolled (i.e., no carbon capture and sequestration is being developed and implemented at existing plants that reduces the CO<sub>2</sub> costs of those plants);
  - b) A 100% allowance auction (i.e., every utility must pay \$50/ton for every ton of CO<sub>2</sub> emitted in 2020 under the favorable scenario); and
  - c) The revenue used in the percentage of revenue cap calculation is composed of base rates + fuel charges + revenue required to purchase all CO<sub>2</sub> allowances in a 100% auction (i.e., revenue in each scenario is different and is the highest in the favorable scenarios).

Please verify that these are the assumptions Navigant used in the report. If so, such assumptions should be described in the Final Report. Also, does Navigant agree that for utilities without nuclear power, such assumptions would require these utilities to spend 15% or more of their non-fuel, non-allowance revenues in order to achieve the favorable scenario outcomes? Is this a reasonable assumption?

8. No land costs (or lease cost for occupying rooftops) appear to be included in the total installed cost projections of any of the renewable technologies. Has Navigant estimated those costs and will such costs be delineated in the Final Report?
9. Navigant appears to use the higher range of capacity factors for most of the renewable technologies for this study instead of the mid-point. Please confirm what capacity factors are used, and, if it is the higher range, explain why this is a reasonable assumption.

10. Navigant's favorable scenario includes assumptions of increased coal pricing and at the same time that carbon credits are increasing to \$50 per ton. If carbon costs are high, it is likely coal commodity costs will be low. The IOUs believe Navigant's assumptions are contradictory and artificially increase the LCOE of coal, which makes some of the renewable energy technologies appear more economically favorable than they would be otherwise. Please confirm that these are the assumptions used and explain why they were used. (On page 193, coal pricing was based upon the 10-year fuel cost projections filed with the FPSC by the IOUs. These forecasts did not include the effects of climate change regulations and especially not carbon credit prices as high as \$50 per ton.)
11. Some Navigant scenarios appear to go beyond a 2% revenue cost cap. Mr. Ballinger's cost cap calculations for the various scenarios showed much higher percentages. Will the Final Report limit the percentages by any cost cap percentage, or will the Final Report show the sort of cost caps that would be required to achieve those levels?
12. Navigant does not provide any explanation as to what leads to higher percentage rates when a renewable energy credit ("REC") market is implemented. What is the source of this benefit and how did it increase the percentage?
13. On page 201, Navigant appears to assume that renewable energy facilities will only incur a 0.2% insurance premium over conventional facilities? Given Florida's geography and that all offshore wind facilities would likely be destroyed if hit by a major hurricane (making insurance premiums higher), please explain the basis for this assumption.
14. On page 210, please provide an additional explanation of the development of the REC values used.
15. Page 224 shows the potential to be 60,000 GWhr and page 181 shows a potential of over 400,000 GWhr. Please explain this discrepancy.
16. On page 246, Navigant assumes that all generation from coal during the study period will be from existing coal facilities only. The SO<sub>2</sub>/NO<sub>x</sub> emission rates assumed are significantly too high given that most of the existing facilities are equipped with flue gas desulfurization and selective catalytic reduction. Those few that are not so equipped will be retrofitting that equipment in the very near future. This leads to an SO<sub>2</sub> and NO<sub>x</sub> emission allowance annual cost for the coal facilities that is too high. Please confirm these are the assumptions used and explain why the annual costs for emissions are not therefore too high.
17. Please explain the source of the SO<sub>2</sub> and NO<sub>x</sub> allowance prices on pages 247 and 248. The IOUs believe the assumed prices are too high given that allowance prices have dropped considerably and are expected to continue to decline.

### Renewable Resource Specific Questions and Concerns

#### Solar

18. Please explain why Navigant suggests that solar becomes competitive when LCOE drops to parity with Combined Cycle Gas Turbines and why this assumption is reasonable when a significant percentage of solar output occurs during non-peak times.
19. The roofing data shown on pages 31 and 32 seem to reflect northern designs and conditions (e.g., snow is mentioned and high percentage of gable design) which might indicate the data is not reflecting Florida roofing. How has Navigant adjusting this roofing data for Florida?
20. On page 41, the costs shown for a tracking system PV is less than for a commercial fixed system PV (shown on page 39). Please explain this cost discrepancy and why it is reasonable to assume the tracking system costs less than a fixed system.
21. Navigant has included not only a summer peak kW benefit for PV, but also a winter peak benefit (a significant benefit for the ground mounted, single axis tracking) on page 42. Please explain how PV

provides a winter peak benefit in Florida when winter peaks are projected to occur on cold winter days very early in the morning (usually in the 7:00 a.m. hour) when there is little direct sunlight, if any, available. Also, for utility cost of service studies, coincident peak (“CP”) loads for outdoor lighting are assumed to be a component of winter peaks; therefore, if outdoor lighting, driven by a photo eye, is on during the winter CP, seemingly PV should not be.

22. On page 51, Navigant assumes that any natural gas combined cycle plant could use solar generated steam to augment the output, although Navigant also said that only those with duct heating could use the available steam. Many utilities in Florida do not have duct heating on their combined cycles. Given this, how did Navigant come up with this potential? Please provide the data that shows the plants having duct heating. (At the December 3, 2008, workshop, Navigant indicated they would provide this information.)
23. On page 265, ground mounted PV starts in 2009 with 627 MW installed with a capacity factor of 25%. Please explain the assumptions used in concluding this capacity would be available and the basis of the 25% capacity factor.

### Wind

24. The offshore wind MW and MWh potential located within Florida state waters should be segregated in the Final Report from the offshore wind potential outside Florida waters.
25. The IOUs believe that the comment made in the note on page 12 (“To date, there are no high resolution wind maps that are publicly available. A high resolution wind mapping study is needed to confirm the availability of this resource.”) should be a separate note (i.e., not a part of note 1) and should apply to the offshore wind category as well as the onshore wind category.
26. Given that no offshore wind generation has been built (or even begun) in the U.S. due in large part to opposition, the IOUs would like clarification as to the basis of Navigant’s assumption that offshore wind can be constructed in the very large quantities suggested in the report, including what assumptions were made regarding social friction and its effect on project availability and the backup data for the following: available potential, capacity factor, turbine manufacturer and model, and cost assumptions, including how a 2008 price can be assumed when the FPSC rule making process has not been completed. Additionally, the IOUs would like the location of the 34-38% capacity factor project listed in the report.
27. Regarding onshore wind, please provide the backup data for the following: available potential, acreage, real estate assumptions, including where the turbines are estimated to be placed and whether these turbines will be placed on private or public land, as well as the cost assumptions (including why an inland price is being used for coastal projects).
28. On page 12, Navigant's forecast for onshore wind went up from 750 MW to 1,266 MW but notes that there have been no high resolution wind maps generated for Florida. Please explain the basis of this estimate and why the estimate is reasonable given that Florida is a low wind potential state.
29. On page 15, transmission is rated as the lowest impact driver. Please explain the basis for this assumption given that Navigant admittedly did not perform any analysis on transmission costs or impacts. The fact that the favorable scenario has up to 2100 MW of offshore capacity, which carries significant transmission costs, makes this assumption questionable. In addition, there are distribution impacts for the types of distributed renewable investment indicated that are not shown, which impacts should be included on page 15.

### Biomass

30. The annual net change in growing stock (page 84) of 3 million dry tons/year is held constant through 2020 despite the fact that “all else equal, future net forest growth will begin to decrease in the very near future,” as stated and discussed on page 85. The IOUs believe Navigant should estimate the



future decline and incorporate that decline into the assessment of potential for future growing stock. Two of the three “factors that would increase future net forest growth” listed on page 85 are not applicable to the growing stock category because they are already addressed and accounted for in separate categories – non-growing stock and intensive pine silviculture.

31. It appears that Navigant’s report assumes that biomass emits zero CO<sub>2</sub>. Please explain this assumption given the fact that at the point of combustion there are CO<sub>2</sub> emissions. Does Navigant have any view on the emissions and CO<sub>2</sub> cost associated with biomass generation? (At the workshop Navigant explained that the assumption of zero CO<sub>2</sub> emissions was because biomass is considered carbon neutral.) The IOUs believe the report should identify any CO<sub>2</sub> emissions from a biomass plant notwithstanding any netting against CO<sub>2</sub> absorption attendant to the growing of the biomass fuel.
32. Please explain the basis of the conclusion that 14% of total farm land in the state for biomass crops production (page 63) is feasible.
33. On page 109, Navigant states that Biomass Integrated Gasification Combined Cycle plants O&M will drop by 2% per year due to learning. What does Navigant mean by “learning”? The IOUs’ experience is that in almost all plant O&M goes up over time as the plant wears and ages, which likely will wipe out any “learning” decrease even if there was one. How does Navigant support its comment and data?
34. On page 112, co-firing of biomass in coal-fired boilers needs to have a caveat added about the loss of fly ash sales and the need to landfill large amounts of ash as a result of such co-firing. Note 5 refers to revenue loss of fly ash sales, but does not include the large scale landfill costs of \$30 per ton that would be incurred. Navigant should include this cost in the analysis or explain why it is not included.
35. On page 114, the escalation of the total installed capital costs shown appears to be rising too slowly as compared to commodity price increases, and the starting point appears too low. Please explain the bases of these estimates.
36. On page 124, Navigant’s report shows Hillsborough County as having a 3.5 to 9.6 MW of landfill gas potential and Dade County as having a 9.7 to 42.3 MW potential. Why is there such a large difference between the two estimates?
37. The landfill gas analysis appears to assume that the gas is free. This is not the case, as municipalities see this as a source of revenue. Please explain the basis for the assumption. The IOUs believe some value associated with the purchasing of gas should be included.
38. On page 136, Navigant states that it would cost \$750 to \$2,500 for the digester permit process. Although the impact is small, based on the IOUs’ experience with permitting, this estimate appears to be too low. Please explain the basis for the estimate.
39. On page 208, it does not appear that the full costs of co-firing of biomass were accounted for in the analysis. For example, there appears to be no cost included for the biomass fuel, impacts on fly ash quality hindering its reuse and the costs associated with modifying the boiler to burn biomass. Please explain why these costs are not included in the analysis.
40. The IOUs believe that the “Competing Resource Uses” on page 221 should also address the competition between municipal solid waste (“MSW”) and landfill gas (“LFG”) for the same resource, namely landfill waste streams. Will this analysis be included in the Final Report?

### Ocean

41. The IOUs believe that the ocean technical potential GWhs shown on page 14 may be off by a large amount and note that the numbers on page 14 do not agree with the ocean technical potential numbers provided on page 159 of the Final Draft Report.