

**Austin Generation Resource Planning Task Force
Information Request Responses
September 2, 2009**

AE answers provided in bold/italics

Submitted by Mike Sloan (8/25/09)

Q1 - REPLACE FAYETTE: Please assemble a long-term (from 1998 to 2020) historic and projected table & graph that compares the generation cost in \$/MWh of (1) FPP (2) Historical Renewables OR in the future the Additional Renewables in the “Replace FPP” scenario that are beyond the Staff Recommendation, and (3) AE Gas Generation OR in the future Gas as modeled by PACE (4) ERCOT Average Market Electricity. In the table, please track constituent costs as done by PACE for Capital & FOM, VOM, Fuel, Emissions. (Graph below is illustrative of type of graphic that is requested, except it depicts very rough data (\$/MWh) and no info for gas) *Detailed historical production cost data is confidential under the Austin Energy Competitive Matters Resolution (Austin City Council Resolution 20051201-002). The Pace analysis and Assumptions document reflect the expectations for future costs.*

Q2 - PACE ANALYSIS SUMMARIES: The PACE-developed costs for FPP and the renewable energy that displaces FPP in the “Replace FPP” scenario both seemingly cost about \$50/MWh after 2014 suggesting little bill impact difference UNLESS there were other cost factors that create a differential. As an aid to examining the apparent inconsistencies between PACE analysis and the 2020 bill impact, please develop a Year by Year summary of the (1) Staff Proposal (2) Replace FPP and (3) No New Builds (4) Nuclear PPA scenarios that show:

(A) Capacity (MW), Energy (MWh) and average cost (\$/MWh) for each technology type

(B) Purchased power amount (MWh) and average cost (\$/MWh)

(C) Any other factor that may be responsible for adding costs (such as accumulated cash reserves)

(D) Total by year for Energy (MWh) and Cost (\$/MWh) *Steve Machicek’s presentation to the Task Force on August 26, 2009 discussed the differences between the Pace analysis and Austin Energy’s 2020 bill impact analysis. This additional level of detail is considered confidential under the Austin Energy Competitive Matters Resolution (Austin City Council Resolution 20051201-002).*

Q3 - CURRENT PRODUCTION & RENEWABLES COSTS - Please comment on my assessment of 2008 costs (is this correct?) or provide a summary of costs (\$/MWh) by technology type. Please also provide these cost data (fuel cost, MWh & \$/MWh) historically by fuel type for 1998 to 2008. *Detailed historical production cost data is confidential under the Austin Energy Competitive Matters Resolution (Austin City Council Resolution 20051201-002).*

Q4 - CIP EXPENDITURE SUMMARY: CIP expenditures during the past 13 years (FY 1998 to FY2010) appear to be on the order of \$2.3 Billion. Please summarize what these funds have been or will be spent on, particularly with respect to production related facilities. Please summarize by major fuel type, preferably with subtotals by significant expenditure. For example: Coal (emissions control, railroad cars, etc), Gas (Sand Hill, Holly, Decker), Renewables (solar, etc), Efficiency (CHP & chilled water) *See attached chart that shows capital project expenditures from 1998 through 2008.*

Q5 - CHP - Combined Heat & Power / Chilled Water / Etc – AE’s experience in these areas seem to be very successful. Please elaborate on how much potential for expansion AE envisions in these area and explain how CHP & thermal energy services fit into the Efficiency target of 800 MW. *Austin Energy will be conducting a study on the potential of Combined Heat and Power in AE’s service territory. See response to Matt Johnson’s request on 8-26-09 regarding thermal energy storage as a component of AE’s efficiency target.*

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(1) In the summary of PACE results, why does AE characterize Biomass using the “Bio AD” technology rather than the lower cost “Bio Comb” technology? Is this because the Bio AD is superior environmentally or some other reason?

Biomass AD refers to anaerobic digestion which is a process in which microorganisms break down biodegradable material in the absence of oxygen. This is a more costly process for using biomass to generate electricity. Austin Energy is primarily looking at biomass combustion of materials such as wood waste that are more cost effective. The value provided by Pace for the levelized costs of generation for biomass combustion was 7.5 cents per kWh in both 2012 and 2020.

(2) **I need a refresher course on how PACE levelized costs.** Over what period are the PACE numbers levelized for technologies shown as 2012 and those shown as 2020? For example on “Coal” emissions values there is a suprisingly large differential between the 2012 technology (levelized as 8.8 \$/MWh) and the 2020 technology (levelized as 21.5 \$/MWh). I also thought that PACE said that FPP would have an enviro cost of about \$25/MWh starting in 2014. It would be helpful to see for both 2012 & 2020 PACE analyses a year by year illustration of what environmental values were assumed, over what time period, and how they were levelized back to a single number.

The levelized cost estimates provided by Pace for 2012 and 2020 are provided for illustrative purposes. Pace’s screening process isn’t based solely on these numbers. These are intended to be an illustrative display of two particular years (2012 and 2020), with a set fuel, CO2 price, and capacity factor in each one. In reality, Pace’s analysis captures a wider planning horizon, where cost variables like these change over time. Pace’s risk analysis is intended to capture the uncertainty around such variables.

The 2012 assessment assumed \$10/tonne CO2 price for all years, and the 2020 assessment assumed \$25/tonne. In the actual screening analysis, the impact of year-to-

year variations in carbon compliance was captured (shown in Pace assumptions document and other presentations).

The \$25/tonne value is by 2020 in our forecast, which results in an approximately \$21.5/MWh cost to the new coal plant and a closer to \$25/MWh cost for existing units like FPP.

(3) Are there any additional costs for wind ? GreenChoice includes some charges that do not appear to be reflected in the LCOE numbers or AE's historical Renewable PPA charges. Please provide some description of the scope, scale and timing of additional wind related charges as AE considers appropriate to compare wind with other resources. *Pace did not explicitly include congestion costs in its levelized cost analysis, which was used for screening purposes and does not directly correspond with how things were analyzed with Pace's dispatch tools. In Pace's dispatch analysis, congestion was priced into the analysis by multiplying wind output by a projected congestion value per MWh. The screening analysis did this at an annual level, assuming all congestion charges were negligible beyond 2014, while the risk analysis quantified the congestion impact every hour throughout the study period by tracking differences in projected ERCOT South and ERCOT West clearing prices.*

Additionally, Pace did not include ERCOT fees and costs for any generation sources in any of the scenarios (fees and costs that Austin Energy does include for Green Choice). These are direct fees, such as the ERCOT Admin, Nodal and TRE fees and uplift charges. To both be fair to Pace and be accurate, with one exception these items are actually assessed to the load and aren't differentiated by generation type. They are rightly included in GreenChoice because that is a substitute for the Fuel Charge where these items are applied for cost recovery. So, while these charges contribute to the ultimate cost one pays they don't matter in terms of comparing generation types.

There may be other "uncertainty" costs that will be associated with wind due to its variability but that is arguably captured by Pace in their model. For example, if you have 1000 MW of load and 1000 MW of wind capacity how do you ensure your cost if something less than 1000 MW is produced? The answer of course is you buy "firm" power from the market in advance to lock in cost or take whatever the real time market has to offer while selling the wind production to the market. The net result from either option may be better or worse than the price you have for your wind power. You also have the same issue in reverse if for instance you have 1000 MW of wind but only 500 MW of load. Pace essentially does this in their model and the results are generally favorable with their market assumptions.

(4) Will AE's All-in generating cost summary be made available this Wednesday? (Note that I have made a rough estimate of generation costs based on some dated cost components) *Please see attached chart that shows a range of total costs of generation for all current generation resources. Additional level of detail is considered confidential under the Austin Energy Competitive Matters Resolution (Austin City Council Resolution 20051201-002).*

Comment: **Transmission benefit of Energy Efficiency:** Regarding Phillip's request number 2, I'll offer that it appears that AE's current average cost of transmission works out to about \$4/MWh (2008 Transmission = \$50,671,000, energy = 13,210,230 MWh, about 3.8 \$/MWh) and that new ERCOT transmission including CREZ will likely drive up the future cost of transmission somewhat higher (more than \$5/MWh). I was intending to comment on this very item during my presentation on Wednesday, that energy savings from efficiency (or behind the meter generation) should seemingly lower AE's transmission bill by approx. \$5/MWh (depending on timing of the savings).