City of Gainesville, Gainesville Regional Utilities
Deerhaven Unit 2
Air Quality Control Systems Retrofit Project
October 16, 2006

BACKGROUND

In March 2005 the USEPA promulgated the Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR) to limit emissions of sulfur dioxide, nitrogen oxides and mercury from electric generating units via a 2-phase cap and trade system[1]. The Florida Environmental Regulatory Commission (ERC) opted into EPA's cap and trade model rule but made modifications to the methodology for allocating NOx and mercury emission caps to individual units to address Florida-specific issues. EPA has already allocated SO2 allowances based on the existing Acid Rain program.

On January 5, 2006 the utility received approval from the Gainesville City Commission to retrofit DH2, a 235-mw (nominal) coal-fired unit, with air quality control systems (AQCS) as one means of complying with the new regulations by the required Phase I deadlines[2]. It is anticipated that emission reductions that will be required of the utility's other affected units (i.e., DH1, DHCT3 and JRKCC1) will be generated via the DH2 emission reduction program.

DESCRIPTION OF THE AIR QUALITY CONTROL SYSTEM

The air quality control systems will consist of:

- Selective catalytic reduction (SCR) system supplied by Babcock Power Environmental, Inc. (BPEI)[3]. The SCR provides a high NOx removal efficiency (>90%).

- A Circulation Dry Scrubber (CDS) based on the Turbosorp technology developed by Austrian Energy and Environment and licensed to Babcock Power Environmental, Inc. (BPEI). The process provides a high SO2 removal efficiency (>95%), the ability to handle a wider range of coals and simplicity of operation and maintenance.

---

[1] These systems set up a supply- and demand-side based market for emission credits by assigning emission caps and costs to emitting. Emission caps are generally set lower than what will be required to operate a unit(s). Companies are given the flexibility to operate in the most cost effective manner available to them. They can reduce emissions and sell or bank excess credits or simply buy credits without reducing emissions.

[2] 2009 for Phase I NOx; 2010 for Phase I SO2 and mercury.

[3] BPEI and its affiliate Riley Power Inc. are collectively known as Babcock Power. The Deerhaven Unit 2 boiler was supplied by Riley Power Inc.

- Baghouse (BH) or fabric filter supplied by Hamon-Research Cottrell[4]. The baghouse is an integral part of the CDS. It will also function as a backup particulate emission control device to the existing hot-side electrostatic precipitator (ESP) which will remain in-service after the retrofit.

EMISSION MARKETS, ALLOCATIONS AND PROJECT CONSIDERATIONS

Current and Future Emissions Credit Markets

As stated previously, the utility has the discretion of meeting its emission caps for each pollutant through emission reductions, purchase of emission credits, limiting operations and/or other options. The emission trading program for SO2 and NOx is well established under the Acid Rain Program and the NOx State Implementation Plan ("SIP call"). The cost of emission credits can be estimated reasonably based on market activity, fuel price fluctuations and weather conditions. It is difficult at this time to estimate with certainty the future costs of emission credits under the CAIR and CAMR programs. This is due, in part, to the fact that formal NOx and mercury allocations have not yet been established and hence, neither have the markets and trading programs. SO2 allocations have been made but the markets still are subject to volatility and uncertainty as companies evaluate whether or not to install scrubbers and the timing of such installations. Currently, there is wide disparity in projected future emission credit costs ($/ton) depending on the source of the projections (e.g., EPA, industry) and the specific pollutant. The CAIR/CAMR market can be characterized as highly speculative at this time.

Current Emissions and Future Allocations

Currently, the system emits, on average, approximately 8,000 tons of SO2, 3,800 tons of NOx and 821 ounces of mercury per year. In Phase I of the CAIR and CAMR programs the system's annual emission allocation for SO2, NOx and mercury will be approximately 4,200 tons, 1,250 tons and 688 ounces, respectively. These allocations will be reduced further as the programs progress through time.

If an air quality control system (AQCS) is not installed on Deerhaven Unit 2, the utility will face a system-wide emission allocation shortfall beginning in 2009 for NOx and 2010 for SO2 and mercury and will need to buy emission credits to cover this deficit. Figure 1 illustrates the potential annual cost of these credits from 2009-2027 based on projections of *average* emission costs ($2006/ton)[5]. Table 1 below presents the estimated net present worth of the credit purchases during this period.

On the other hand, if the AQCS is installed on DH2, the utility system will likely have more emission credits than it needs to operate. These credits can be banked for the utility's future use or they can be sold in the marketplace. Figure 2 shows the potential revenue from the sales of excess emission credits based on the projections of average

---

[4] The existing hot-side electrostatic precipitator on Deerhaven Unit 2 was supplied by Research Cottrell.
[5] Black and Veatch (2006) and EPA (2005).

emission costs ($2006/ton) from 2009-2027. The net present worth of the credit sales over this period is shown in Table 1.

AQCS Costs and Considerations

The capital cost of the AQCS is projected to be approximately $ 141 million including an allowance for material cost escalation based on industry indices[6]. The estimated net present worth of the annual operation and maintenance costs is approximately $84 million[7].

Table 1 provides a comparison between the options of "status quo" (i.e., no retrofit, buy allowances), retrofit alone and retrofit with the sale of emission credits.

Table 1

Option	Net Present Worth (million $)
Install AQCS, no sale of excess credits	225
No AQCS, purchase credits needed to operate	100-220
Sell excess credits	33-46
Install AQCS, sell excess credits	179-192

AQCS Project Benefits

The AQCS project will:

- Allow the utility system to comply with CAIR and CAMR regulations by the required deadlines.
- Provide environmental benefits to the community.
- Generate marketable emission credits.
- Provide greater operating flexibility (e.g., purchases of a wider range of fuels depending on cost, varying removal efficiencies).
- Minimize future regulatory risk.

In contrast, the purchase of emission credits will do none of these things and will leave the utility subject to the long-term uncertainty of the availability and cost of emission credits in the marketplace.

[6] Bid dated October 3, 2006

[7] GRU and Sargent & Lundy. The annual O&M is dependent on the amounts and costs of the reagents used by the scrubber (lime) and SCR (urea). The reagent amounts, in turn, are dependent on the fuels combusted and the desired removal efficiencies of the scrubber and SCR. This dependence provides an opportunity to achieve emission reductions in a manner that balances economic and environmental concerns.

Figure 1 - Potential Annual Cost to Purchase Emission Credits

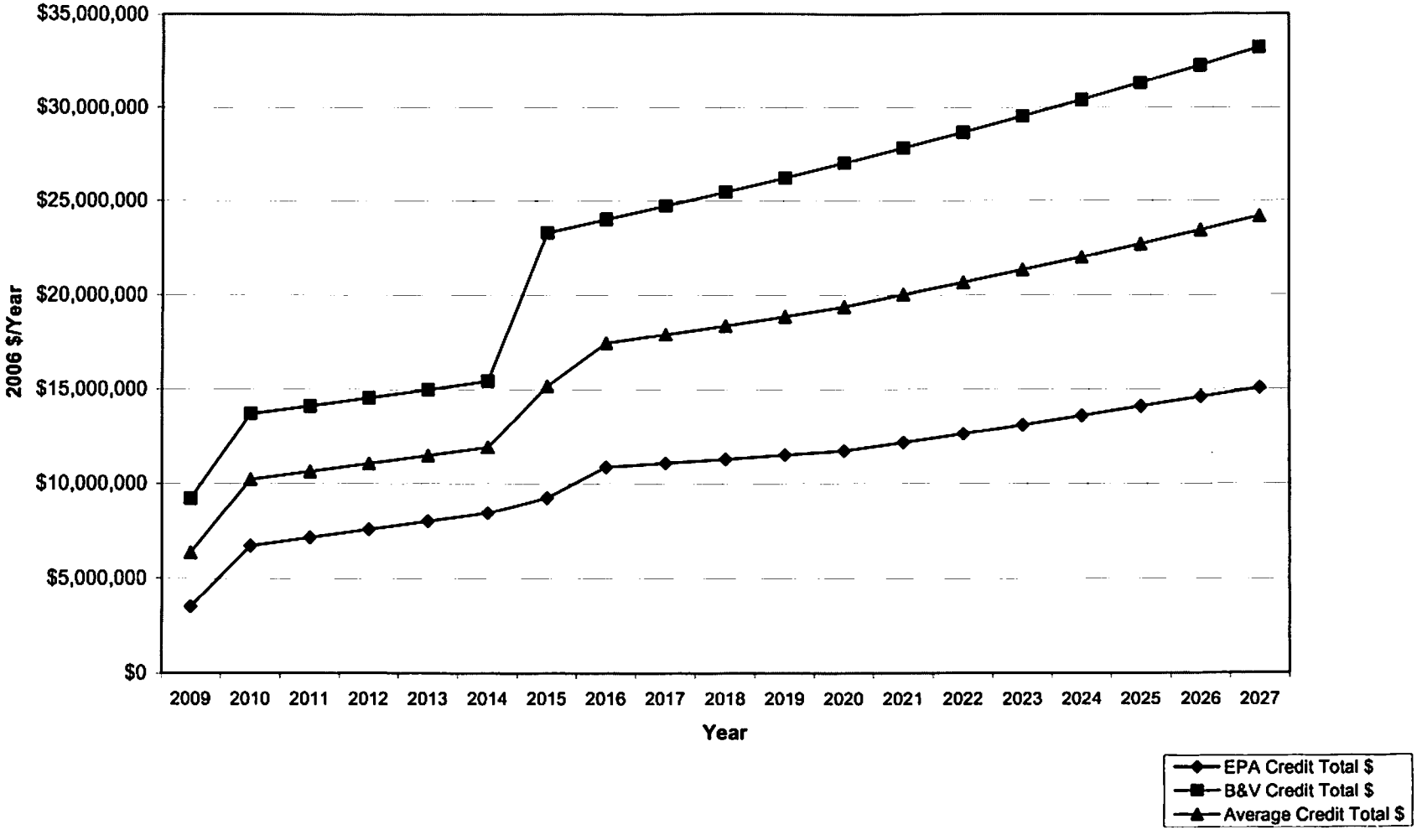

Figure 2 - Potential Annual Revenue From Sales of Excess Emission Credits