CASE 07-M-0548 - EPS PROCEEDING
D&B's Responses to STAFF'S
QUESTIONS TO THE PARTIES

Intro:

D&B Engineering is an industry leading, 35 year old supplier, designer and installer of high efficiency HVAC systems. We have supplied over $500 million of efficient HVAC equipment in the New Jersey/Metro New York area . These, systems have resulted in more than $20 million of rebates under PSE&G Standard Offer 1 and 2, NJ Smart Start, NYSERDA and ConEd Solutions Demand Response Program., D&B is ConEd Solutions' Chiller Partner for identifying and installing energy efficient chillers in their Zone #1 on the west side of Manhattan. Products and systems we provide include:

- natural gas engine driven, (GED), absorption, and high efficiency electric water chillers
- thermal energy storage systems
- micro (60-100 kw) co-gen modules
- mini-split/VRV (variable refrigerant volume) unitary equipment
- high efficiency natural gas infra-red heaters
- Direct fired heaters that save 25% energy versus indirect fired heaters ….and more

We are suppliers, consultants, and/or development partners to most of the leading ESCO's in the New York metro area on dozens of high profile performance contracting projects; including the Meadowlands sports complex, scores of major hospital/medical centers in the region, schools, office buildings and industrial facilities. Our people are viewed as knowledgeable providers of HVAC expertise and have been called on frequently as speakers at industry conferences.

<u>GOALS</u>:

1. **What approaches hold the greatest potential to contribute to New York achieving the overall target of 15% electricity consumption reduction by 2015? Are there any energy consuming sectors and markets that are currently underserved by the existing available portfolio of energy efficiency programs and services in New York State? How should those deficiencies be addressed in implementation initiatives?**

D&B Response: *We believe that the Governor's 15 by 15 plan is achievable utilizing readily available technology if the appropriate combination of rebates and mandated measures are put in place by the State. Heating Ventilating and Air Conditioning ("HVAC") is the most significant and controllable r energy consuming system in buildings. The HVAC equipment and it's design (and selection) deserves special focus in a quest for energy savings, not only because of its electric , oil and gas, usage, but because the highest demand on the electric grid occurs , during the hottest days of the year as a direct result of concurrence of demand among electric air conditioning compressors. Put simply air conditioning in New York , is what causes the huge spikes in electric demand, stressing the electric grid.*

Our response is tailored towards suggestions to cut HVAC energy costs by as much as 50%, whether the type of HVAC system is made up of rooftop air conditioners, through the wall units, or large water chillers. Central chilled water units deserve special focus. Though a very efficient and cost effective means of air conditioning large buildings, electric water chillers are usually the single largest user of power in a typical office building, consuming approximately 25 watts per square foot. To increase efficiency and simultaneously improve the reliability of the electric grid, incentives should be given for fuel switching to GED's, off peak air conditioning with thermal storage, and High efficiency electric chillers. Side benefits include health benefits from reduced emission levels, safety benefits from reduced brown outs and power interruptions, lower energy cost to the public, reduction in electric reinforcement. The application of these technologies results in improved customer load profiles that can be served from the existing infrastructure eliminating the need for unpopular environmentally damaging transmission lines from outside the region, or construction of generation systems within the region..

HVAC systems that are efficient ***<u>and</u>*** *minimize air conditioning's impact on peak electrical consumption should be encouraged through a combination of targeted rebates and mandated* ***system*** *efficiency standards. System efficiency is an important concept. Though Federal and State standards are already in place mandating minimum "appliance" efficiencies, only a holistic process similar to the LEED approach to building design, will ensure buildings that operate efficiently. Installing air conditioning system components that are by themselves efficient does not ensure that the building itself does not operate inefficiently. New Jersey is one state among many that recognized that fact and mandated LEED qualified construction in its $8 billion school construction program. Appendix A is the NJ School Construction Corporation (NJSCC, a state agency) design criteria for their buildings. On Page 68 the HVAC section begins. That section details mandated standards for cost effective HVAC systems. Appendix B is LEED requirements listed for many states and municipalities.* ***It is D&B's opinion that these standards should be updated and incorporated into the State of NY's energy standards and building construction code for <u>new construction projects</u>. Rebates for new construction should be paid for achieving various levels of LEED certification, with the highest rebate being paid out for LEED Platinum, and smaller rebates for LEED Gold, Silver and Bronze, respectively.***

For commercial retrofit projects in existing buildings, rebates are the appropriate mechanism to encourage energy reduction. ConEd Ed's demand reduction program currently being offered in targeted zones, is an example of a rebate program that should be expanded. It rewards peak load reduction, and focuses on large projects like lighting, chiller replacement, "fuel switching" from electric air conditioning/heating, to gas, steam or oil, or thermal storage that uses the building chiller to "store" the air conditioning at night, when electric costs are low, to be used during the day without running the chiller. In the past, some utilities have not paid rebates for fuel switching, discouraging the installation of gas air conditioning. Thermal storage is discouraged when third party electric suppliers give flat rate pricing that disguises the societal benefit of load shifting. Both NYSERDA and a similar program offered by all the New Jersey utilities encourages "custom" energy savings measures that include fuel switching, off peak air conditioning through thermal storage, and heat pumps. Rebate programs should be designed to not de-incentivize owners that install the most efficient air conditioning

systems available, whether it be an efficient electric chiller, floor by floor self contained units, or water chillers powered by a natural gas engine, rather than an electric motor.

The gas engine driven chiller uses an internal combustion engine Using clean natural gas in conjunction with low emission catalyst technology they dramatically reducing the level of emissions from that of the inefficient Central Generation Station that produces electricity and transmits and distributes it on a long route to a conventional electric chiller.. Similar to a CHP generator, a gas engine driven chiller will also make hot water. In the right application it will save more than 70% of the cost of generating chilled water for large buildings, as much as $.40/sq-ft/year. Currently there are more than 3000 such engine's running in the US, with a large percentage being in the New York metro area where electric costs are the highest. Appendix C is a brief energy comparison done for a NYC hospital that shows that there can be as much as a 70% difference in energy costs between the most efficient chilled water system and the least efficient. ***We believe that no rebate programs offered in NYS should preclude fuel switching as a viable energy efficiency strategy eligible for rebates and that load leveling with thermal energy storage (TES) should receive high rebates for shifting electric demand.***

For space air conditioning and heating of warehouse, large open areas, and industrial buildings, the use of air turnover systems will cut between 25 and 40% of the energy usage of rooftop air handling systems. The air turnover units are a non-proprietary product offered by a number of manufacturers that can work with chilled water or DX units.

Rebates for residential projects, both single family and multi-family, have been based in the past of the efficiency of the individual air conditioning or heating unit. Again, this does not encourage efficient system design. Air conditioning and heating rooms that are unoccupied is a tremendous waste of energy. Commercial buildings have long been installing systems that give thermostats and controls to each individual thermal zone, using variable air volume (VAV) controls. In residential units, especially in single family dwellings, individual zoning of rooms has been cost prohibitive. Traditional residential central air conditioning and heating units were unable to utilize VAV technology. Newer, mini-splits and variable refrigerant technology being sold by several

manufacturers, is the largest growing sector of the air conditioning market. Highly efficient, quiet and cost effective, these units can be equipped with individual room controls, easily allowing a homeowner to change setpoints in unoccupied rooms. Many of these systems are designed with DDC Controls and can be networked and controlled by a central touch screen or can be Web based and controlled anywhere in the world. These advanced control systems make them ideally suited for dispatchable energy/curtailment programs. The result is a reduction in the peak energy required in NYS. ***Rebate programs along with mandated minimum system energy efficiency standards should be established to strongly encourage variable refrigerant volume (VRV) technology.***

For space heating in warehouses, large industrial spaces and garages; direct fired heaters, infra-red gas heating or air rotation heating units ***decrease heating cost by as much as 75%*** *over forced air heating systems, but with a 20% first cost penalty. Appendix D describes air rotation technology. In the competitive warehouse market, first cost often dictates that the less efficient system be installed, as the tenant pays the cost of heating, and paying the upfront cost for a high efficiency system is not considered by the building owner.* ***Rebates for commercial heating should encourage direct fired heating, infrared gas heating or air turnover systems and will greatly help the State achieve the Governor's 15 x 15 goal.***

2. What is a reasonable goal for natural gas energy efficiency programs?

No response

3. What are the most appropriate methods and processes for establishing program specific goals and for measuring progress towards long term goals (including program monitoring, measurement, and evaluation)?

No response

4. What load forecasting models and methodologies should be used in developing and refining the objectives of the EPS Proceeding?

No response

5. What other national, state, and municipal government and private initiatives would help New York meet the objectives of the EPS Proceeding? In what ways can we leverage the impact of these initiatives to help us meet the objectives of the EPS Proceeding? How should the impact of these initiatives be counted and measured?

D&B Response: *LEED Certification should be part of State regulations for new construction, with rebates tied to various levels of LEED Certification.*

6. The Commission instituted a pilot natural gas efficiency program within Consolidated Edison Company of New York, Inc.'s (Con Edison) service territory.[1] As part of that pilot program, the Commission directed the New York State Energy Research and Development Authority (NYSERDA) to prepare a study of the natural gas energy efficiency potential within Con Edison's service territory. NYSERDA filed that study on June 22, 2006, and it was then issued for comment.[2] Subsequently, NYSERDA prepared a study entitled "Natural Gas Efficiency Programs Resource Development Potential in New York," which was issued on October 31, 2006 and is available on both the Commission's and NYSERDA's web sites. In considering issues associated with a Con Edison electric efficiency/demand management program, the Commission specified how the total resource cost test should be applied to measure the cost effectiveness of measures under that program.[3] In the statewide study, NYSERDA used a different benefit/cost approach to measure cost effectiveness.

a. Please comment on the appropriateness of the approach used in the statewide study.

b. If a different test of cost effectiveness should be used (i.e., other than the total resource cost test), what test should be adopted and why?

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[1] Cases 03-G-1671 and 03-S-1672, Consolidated Edison Company of New York, Inc. – Gas and Steam Rates, Order Adopting the Terms of a Joint Proposal (issued September 27, 2004).

[2] Case 03-G-1671, supra, Notice Soliciting Comments (issued August 14, 2006) (Con Edison Notice).

If you have not already commented on this previously, please provide your observations, critiques, and other comments on the data, assumptions, methodologies, and analyses used to develop the estimated potential savings and benefits in the statewide study.

No response

PROGRAM ELEMENTS:

7. What role should building codes and appliance standards play in reaching New York's energy efficiency goals and should such standards vary by geographical area (i.e., metropolitan New York City versus upstate)?

D&B Response *Presently the FDNY has a requirement for employing a person with a Certificate of Qualification on premises anytime an air conditioning system of a certain HP or amount of refrigerant is in operation. This is quite costly and often results in owners and specifiers selecting less costly, lower efficiency units that have very many small HP compressors. Another NYC code requires the application of an outdated ASHRE code for separation by fireproof barrier refrigerant and sources of combustion. Current ASHRE code provides for the existence of a Boiler (Combustion device) and Chiller in the same room provided the installation complies with safe design including, refrigerant venting system, alarm system, refrigerant detection and boiler flame interlock system. If the NYC Buildings Department and FDNY would adopt the most recent code Owners and specifiers would be in a position to select more efficient Heating and refrigerant Cooling Systems that could be placed in the same room with modern safeguards. Off-the- record conversation with decision makers at FDNY and NYC Department of Buildings indicates that they have no objection to the current ASHRE standard. However, they are in no hurry to adopt.*

8. What role should outreach and education play in an enhanced energy efficiency effort and what changes in approach should be made in various demographic or market segments from the methods now being used?
   The level of bureaucracy in applying for and receiving approval for incentives and rebates can be overwhelming for Owners and Specifiers. The process needs to be streamlined while maintaining safeguards to protect against fraud. Many Owners and Specifiers do not have the time to digest the rules, and take a chance on an incentive or

rebate for a measure that may not be approved or may take significant time for approval and payment. More prescriptive quick pay programs need to be made available.

9. What role could innovative rate design play in enabling greater penetration of energy efficiency and how might this vary by market segment? Should energy tariffs recognize and differentiate between the relative levels of energy efficiency designed into new buildings?

D&B Response: *A natural gas rate specifically targeted for gas cooling systems will encourage gas cooling and limit electric demand. For buildings where gas cooling is not feasible, real time pricing rates that encourage thermal storage and other demand limiting means will help improve electrical load factors.*

10. What programmatic and outreach efforts, within and beyond the current scope of the Commission's jurisdiction, that have not been generally considered as energy efficiency programs, should be integrated into overall strategies and plans to reach energy usage reduction targets?

D&B Response: *Outreach to system designers (architects and consulting engineers) and building owners about the positive impact of installing energy efficient systems should be conducted. In January, 2008 the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) will be hosting it's annual meeting at the Jacob Javits Convention Center for the first time since the 1980's. This is the largest convention of its kind in the world, with more than 50,000 attendees expected to converge for exhibits and lectures. If it is not too late, the State of New York should reach out to the ASHRAE officials to sponsor a lecture on efficient system design for New York State.*

11. Should customers of natural gas utilities served under value of service or market-based rates, such as interruptible customers, be included in the overall efficiency program? If so, what types of programs are appropriate for these customers? In what ways would a natural gas efficiency program affect the oil and propane competitive markets and what

steps could be taken to eliminate or minimize such impacts (e.g., limiting the program to non-dual fuel customers)?

D&B Response *Most dual fuel customer only utilize Fuel Oil when their tariff requires them to switch fuels or if there is an anomaly in the price spread between fuel oil and natural gas. During the summer months natural gas is plentiful and price competitive. The dual fuel customer tends to be the largest customer, have significant air conditioning needs and has the most potential to influence the consumption of electrons in the Summer. Therefore, access to these programs must remain open to these customers for Air Conditioning projects at a minimum.*

12. What role should a) distributed generation, b) demand response, and c) combined heat and power play in reaching New York's energy efficiency goals?

D&B Response *Central generating stations are most inefficient during the summer peak when the least efficient producers must be relied upon to produce those last few hundred MW of power. Our recommendations are to first address energy efficiency and supply by providing heavy incentives to projects incorporating GED's, and Thermal Energy Storage Systems, as well as demand response programs.*

Distributed Generation has the potential to lead to increased emissions since it will be very difficult for the regulators to monitor thousands of tiny sites following commissioning on a regular basis. In addition the efficiency gain with DG and CHP is as a result of heat recovery. Once the plant is commissioned it becomes difficult to determine how much thermal energy is actually being saved. Frequently generators are installed that produce the required kW without useful thermal loads to address. This will actually result in significantly reduced efficiency and greater emissions. Some DG/CHP technologies have inherent flaws such as Micro Turbines. These high speed generation devices loose capacity and efficiency dramatically when the ambient temperature rises. However when energy analysis is performed quite often it is done at constant ISO conditions and this flaw is never reported

Most customers do not wish to be in the power supply business and would much prefer worry free power that does not require maintenance, tie up space inside their buildings, and distract them from their corporate mission.

Removing load from the central generating plan during the winter and shoulder months makes the central plant even less efficient efficient, whereas removing load from the central generating station only in summer makes power production more efficient .

Therefore we recommend that GED, TES and Demand response receive the highest level of attention.

13. How can gas efficiency programs best compliment electric efficiency programs? Similarly, how can electric efficiency programs be adapted to serve the needs of gas customers?

D&B Response: *Electric efficiency programs should not discourage a facility from fuel switching to natural gas for air conditioning where appropriate. Rebates should permit and encourage electric load from being removed from the grid and switched to gas, or shifted to off peak hours.*

IMPLEMENTATION:

14. What could be an appropriate role for utilities with respect to the delivery of energy efficiency programs within their service territories? How might that role vary by market segment?

No response

15. What role should key stakeholders play in an enhanced energy efficiency effort (e.g., Staff, Departments of State and Environmental Conservation, utilities, NYSERDA, Division of Housing and Community Renewal, NYPA, LIPA, NYISO and energy service companies), and how should they coordinate their efforts? What factors should be taken into account in determining how the implementation of various program elements should be managed and monitored?

    D&B Response *Recommendation is made for LIPA to collect the SBC charge from it's rate payers so that those funds may be used by ratepayers looking to install energy efficient projects, as is available to others in the State.*

16. What role should the private sector (e.g., financing and educational institutions) play in program development and implementation? How should these efforts be coordinated with utility and government entities' programs? Are there additional incentives (or tax relief) that could be provided by Federal, State and Local governments which would enable greater penetration of energy efficiency initiatives?
D&B Response *ICIP and ECSP programs that have been made available to Owners for DG for producing energy should also be made available for alternate technologies that save energy and avoid the need to produce electrons.*

17. Should utilities (or other entities) receive incentives for implementing successful energy efficiency programs? If so, what is the appropriate level and form that these incentives should take and should such incentives be performance based?

No response

18. What are the best methods for ensuring that low income customers have access to efficiency programs?
No response

19. How should environmental justice be considered in program design?
No response

20. How should existing gas utility efficiency programs, and those under development in rate proceedings, be integrated into an overall energy efficiency effort?

No response

21. Are there any modifications or adjustments that could be made in the current Systems Benefit Charge portfolio that would achieve higher levels of energy efficiency market penetration and saturation?

No response

COSTS AND BENEFITS CALCULATION:

22. How should the expected benefits and costs of various design options be measured and compared? What externalities should be included and why? What expenditures or benefits should be characterized as transfer payments and perhaps excluded from the analysis? Why?

No response

23. What are the best methods for ensuring transparent and technically sound methods for evaluation of program energy savings (gross and net), non-energy benefits (e.g., economic, environmental) and program performance and administration?

No response

24. How should customer satisfaction and program design efficacy be assessed?

FUNDING:

25. What constitutes a reasonable level of funding for the electric and gas energy efficiency programs? How, and from whom, should the various program costs be funded, allocated and recovered?

D&B Response: *Building owners typically look at a 3 year payback as an acceptable return for installing more energy efficient equipment. Rebates should be designed that makes the installation of more costly, yet environmentally friendly systems pay back in that time frame.*