New York State
Energy Efficiency Portfolio Standard
Case 07-M-0548

Final Report of Working Group 2

December 5, 2007

New York Energy Efficiency Portfolio Standard (EPS)
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I. Executive Summary

Working Group 2 (WG2) included a broad cross-section of the active parties in Case 07-M-0548 representing investor-owned utilities, State Agencies and Authorities, the City of New York, energy services companies, energy efficiency service delivery organizations, and other stakeholders. A participant list is included as Attachment 1. The working group made significant progress toward its goals and is pleased to submit this report in response to the charge issued by the Administrative Law Judges.

WG2's Charge

Certain questions were issued to each Working Group. In response to those questions, and as further developed by WG2, the group was to produce the following:

- Inventory of existing electric and gas programs including estimates of cost, energy savings, and Total Resource Cost Test performance, where available
- County by county (or some other specific geographic unit) potential for each program type identified or inventoried or an assessment of the extent to which that data is not available, including recommendations for follow-on research
- Identification/assessment of program barriers, gaps and opportunities
- Description of potential new or expanded energy efficiency programs further refined to identify program attributes, characteristics, ramp-up potential, and limitations to achieve broad based energy efficiency implementation.

Summary Findings and Recommendations

WG2 has compiled an inventory of energy efficiency program information on current New York programs and other significant existing, new, pending and/or proposed efforts, both in New York and elsewhere. Programs sponsors, including NYSERDA, utilities, ESCOs, and others, have provided data for this compilation, which includes program descriptions, costs, energy savings, and discussion of ramp-up potential and barriers. The program inventory is discussed further below along with recommendations which include a review of potential programs, an assessment of current and emerging best practices and, importantly, further efforts to maximize data consistency and uniformity, in terms of costs, savings and various cost test performance data.

WG2 has also examined related program data issues. The main conclusion reached is that it is imperative that data needs continue to be evaluated in a coordinated manner to best support the implementation of expected broader, more extensive program efforts. Efficient collection and coordinated use of data among the utilities, NYSERDA, NYISO, and other program providers and participants will help ensure the most efficient delivery of energy efficiency services, and the optimal measurement and verification of energy savings. In addition, WG2 recommends that a technical potential study, or studies, be completed that assesses geographic and sector

differences, and helps guide program designs to the most significant targeted energy efficiency opportunities.

Perhaps as important as the program inventory and data assessment efforts are the energy efficiency principles discussed in this report, which focus on program attributes, gaps and opportunities, and the barriers to achieving savings goals. As the State's energy efficiency program development and design efforts move forward, these principles provide a rational and clear means to help policy makers and program designers implement the best set of programs in our State portfolio and maximize the realization of energy savings targets.

Program Inventory

The group established a consistent framework for the description of programs, developing and quantifying a comprehensive inventory of current and potential programs. The program inventory is provided at http://www.dps.state.ny.us/07M0548_programs_inventory.htm and provides descriptions of New York's current programs and a variety of other energy efficiency efforts (e.g. National Grid's current New England programs, Reliant Energy's energy efficiency efforts in Texas, potential solar hot water/heating programs submitted by Earthkind Energy, etc.). In general, there was insufficient time to review and fully assess pending and proposed programs.

The program inventory sets the stage for future consideration of programs that could be implemented under the EPS proceeding. Given the timeframe, size and dynamic of WG2, it became clear early on in this process that developing a consensus based EPS program plan was not practical. Instead, WG2 established program attributes that should be used in developing an EPS program plan, as described below.

The inventory should continue to be updated to ensure that all programs currently offered in the State are documented and that a broad spectrum of programs offered throughout the country are represented. Many of the State's current programs have been developed over many years of practical interaction with New York customer markets and incorporate successful approaches developed elsewhere. In addition many are recipients of exceptional performance awards from organizations such as ACEEE, AESP and EPA/DOE ENERGY STAR®. Many programs offered outside of New York have likewise received such recognition. A summary description of several recognized best practices and programs has been compiled and is available in the program inventory. This compilation describes sixteen best-practices programs in eight program categories. For the various programs, the document identifies the provider(s) and outlines the eligible technologies, targeting methods, delivery means, incentives, and M&V approaches. In general, these programs rely on substantial incentives, careful targeting of decision-makers, and delivery methods that minimize market barriers.

Although the program inventory provides energy and non-energy benefits, WG2 did not correlate program data with EPS efficiency targets, nor did WG2 attempt to assess program administration roles.

Potential

WG2 examined several sources of data to determine to what extent the potential energy savings are known within various geographic areas and demographic sectors. In addition, the group identified other sources of information that are not currently accessible, or from which data extraction is not straight-forward. As described in the recommendations below, it is anticipated that data collection, given its many complexities, will be an on-going need throughout and beyond the course of the EPS proceeding.

Gaps, Opportunities and Barriers

As an outcome of the program inventory process, and with the input of organizations with extensive experience in marketplace issues, WG2 identified numerous barriers to program design, delivery and participation. In addition, gaps and opportunities related to underserved sectors, underutilized technologies and processes, and other marketplace characteristics were identified. These barriers, gaps and opportunities are described in this report and, although fairly comprehensive in nature, these observations should not be considered exhaustive. Further, many of these issues are dynamic in nature and will need to be continually monitored to ensure that targeted gaps and barriers are reduced over time as new and currently unforeseen issues come into focus for needed attention. They can be used to form a basis for program changes or additions when considered in the context of efficiency potential and other program design factors.

Program Attributes

WG2 has developed a list of program attributes that are desirable in selecting or designing EPS programs. It is unlikely that any one program or approach will exemplify all of the attributes, but each should exhibit many attributes to some degree. In using the program attributes to make decisions, it is important to weigh them against each other based on goals of the EPS, equity issues, geography, different customer characteristics and other market considerations, to identify programs that have promise within the portfolio. These attributes are described in some detail in this report.

II. Recommendations

Both general recommendations and those for ongoing work are offered below.

General recommendations

1. Consider the potential for multiple delivery systems and supporting roles by utilities, energy service companies, community-based organizations, State Agencies and Authorities and other entities. These roles can and should be complementary to maximize participation and minimize marketplace confusion.

2. Design and administer EPS programs' considering the program attributes and barriers described in this report.

3. Give consideration to programs, initiatives and activities that capitalize on the gaps and opportunities described in this report. Further effort should be made to continue to identify additional gaps and opportunities.

4. Establish and use consistent metrics across all programs.

5. Build a comprehensive plan to develop workforce capacity as a critical element in implementing a portfolio of programs. Coordinate with existing economic development, utility, program administrator and other programs to develop infrastructure and provide training and education. Develop and implement programs to appropriately expand and provide depth to service delivery and program management infrastructure.

6. Maximize and provide long-term commitments of resources to programs to ensure sufficient staffing, funding and support needed to reduce duplication, ensure continuity and stability, encourage commitments by the private sector, and allow for implementation of programmatic changes.

7. Use improved codes and standards to impact the energy efficiency of new construction. In addition, codes should better address buildings undergoing major renovations. Issues of training, tools, education and compliance need to be considered to support this effort. In addition, there is significant opportunity for energy efficiency improvements associated with new construction beyond what can be implemented realistically through codes.

8. Work with low income agencies and organizations to decide how expanded services can be delivered to the most vulnerable residents and households and determine a rate for a reasonable ramp-up serving more citizens each year. Coordinate within the residential market as a whole on an analysis of infrastructure, training, and workforce capacity to serve the low-income sector.

9. Investigate opportunities for thorough treatment of existing residential homes, as demonstration projects, to publicize the technical potential for increased efficiency and use of renewable resources.

10. Evaluate and consider a broad spectrum of programs, including direct installation services through vendors (commercial retrofit lighting) and/or market driven channels (e.g., suppliers, distributors, trade allies)

Recommendations for Ongoing Work (post-December 5, 2008)

1. Conduct a technical potential study, or studies, to the evaluate differing geographic and sector drivers to:
    - Focus on economic potential and regional characteristics that may impact that potential
    - Include electric, gas, oil and propane efficiency potential
    - Develop program designs that leverage the regional and sector drivers to maximize energy efficiency opportunity
    - Support the ramping up of best practices programs
    - Determine potential by sector and other demographic overlays (mixed use nature of "main street")
    - Include efficiency potential on the customer side of the meter
    - Coordinate with efforts underway to address potential on the utility side of the meter
    - Ensure that the study is adequately funded
    - Coordinate with studies that are already underway in some utility service territories for gas and electric opportunities. A statewide study should complement and fill in voids of those ongoing studies

2. Expand and refine program inventory developed by WG2:
    - Include a matrix to help summarize program data
    - Integrate and align information on national and international energy efficiency program best practices. Best practices should be reviewed in the context of the characteristics of the New York energy marketplace.
    - Include more information on proposed programs and initiatives
    - Ensure that data such as delivered savings and cost-benefit test results are presented as uniformly as possible where that is practical and easily done.
    - Where uniformity is not practical (e.g. primary data collection in evaluations is fundamentally different), the inventory should provide a description of the differences from the standard format.

3. Evaluate, define and source data needs beyond the scope of the WG2 work effort.

4. Identify and investigate data sources that could be used for program design and outreach.
    - Methods for summarizing, coordinating, and flexibly using data from utilities, non-utility service providers and NYSERDA should be developed.
    - Issues of confidentiality and propriety of data must be addressed.
    - Utility data collection systems must be examined to determine to what extent they can/do collect the necessary data that enables appropriate customer segmentation.
    - Data collection should be coordinated with and inform the potential study (and vice versa).

III. Program Attributes

Introduction

This section of the WG2 report describes a set of critical program attributes. These attributes have been fully discussed and represent consensus on the part of most of the parties involved in WG2. As programs from any sponsor are developed, designed, and implemented under the Energy Efficiency Portfolio Standard (EPS), these program attributes and the associated discussion should be integral to the process. Programs will need to balance many of these attributes and for some programs not all of the attributes will necessarily apply. The balancing of attributes will also depend on:

- The type and structure of the program delivered;
- The program administrator;
- Target sector (e.g. commercial new construction);
- Target market segment (e.g. hospitals, retail, commercial, colleges/universities, etc), if any; and
- Target region (e.g. downstate, upstate, etc.), if any.

The attributes are not presented in order of importance.

A. RESOURCE ACQUISITION EFFECTIVENESS

Given the aggressive goal established in this proceeding it will be critical that EPS programs be effective at acquiring energy efficiency resources (GWh, MW and mmBTU).

1. EPS programs should address energy efficiency opportunities for all customer sectors including: commercial, institutional, industrial, residential, low income and municipal
2. EPS programs should deliver comprehensive energy efficiency services that integrate life cycle costing to achieve maximum savings
3. EPS programs should support efforts by a variety of market participants to provide energy efficiency opportunities to customer sectors referenced above

B. COST-EFFECTIVENESS

In line with other attributes, EPS programs should maximize the return on investments of ratepayer funds and should be cost effective. There are several cost effectiveness tests that may be utilized for program design and evaluation. Tests vary in their perspectives, inclusiveness of component costs and benefits and other aspects. WG2 has identified the following indicators of cost-effectiveness that should be considered in program design.

1. One commonly used tool is the total resource cost test (TRCT). It is a screening tool that compares the cost of an energy efficiency measure, including the incremental participant costs, net of incentives provided by a utility, government agency or other entity, to the total resource benefits obtained over the life of the measure. The test quantifies and values the costs and savings of physical items such as fuel, hours of labor, and equipment installation and operation (e.g., energy efficient lighting). Each item included in the test must reflect real resources that are saved or incurred by society. For an energy efficiency program to be cost-effective on a total resource cost basis, its resource benefits to society should outweigh the resource costs of the program to society.

However, it is important to understand the limitations to the use of the TRCT as a program comparison tool. Since the TRCT includes all measure costs, TRCT results are largely determined by the cost-effectiveness of the mix of measures supported (i.e. a more comprehensive program that funds higher cost, longer term payback measures like chillers will have a lower TRCT result, yet are typically once in 20 year decisions). Such longer term initiatives may require a different perspective. TRCT results are relatively independent of incentive levels and program administrator. Working Group 3 is investigating the Benefit/Cost test issue in greater depth.

2. Given the aggressiveness of the EPS goal and its potential cost to ratepayers, program cost-effectiveness is a key criterion that should be considered in the selection and design of EPS programs. Program cost-effectiveness, measured in ratepayer cost per resource acquired (i.e. $/MWhr, $/MW, $/mmBTU), is highly dependent on program delivery mechanism, incentive levels, and program administrator.
3. EPS program design and selection should also consider the cost of program administration.

C. MEASUREMENT AND EVALUATION

EPS program design should support the ability to perform rigorous, credible and consistent program evaluation (including measurement and verification of resources delivered). It will be essential to coordinate tracking and performance measurement. Measurement and verification should be designed to directly support:

1. PSC requirements;
2. EPS governance;
3. Utility resource planning and NYISO system planning and;
4. Program quality control and verification needs.

D. FLEXIBILITY

EPS programs should have the flexibility to:

1. Shift resources to successful resource acquisition strategies within a given administrators' portfolio. This will be critical to maximizing the installation of cost-effective energy efficiency.[1]
2. Address customers' needs and technical efficiency potential. This flexibility should be balanced with project comprehensiveness achieved through whole building systems approaches.

E. SCALABILITY

In order to achieve the EPS goal, programs must be capable of significant scale-up. The following will be key to successful scale-up:

1. EPS programs must build market confidence through stable, multi-year funding commitments. Customers, contractors and energy suppliers need to invest time and resources to ramp up program participation.
2. Given a finite budget, the cost of resource delivery will directly impact program scalability.
3. Well defined roles for each program administrator, based on inherent strengths, will minimize customer confusion and maximize participation.
4. Investments in workforce and market development will be essential to success.

[1] For example, if less activity were to be seen in a commercial new construction program and more activity in a commercial existing buildings program, a given administrator should have the flexibility to shift resources to the program that is acquiring more resources.

5. EPS programs will need access to the maximum customer penetration.
6. Programs should clearly define purpose, eligibility and goals

F. BENEFITS

EPS programs should recognize the importance of energy savings benefits and co-benefits (including non-energy benefits like improved building stock and improved comfort, system benefits, etc) for participants and society including mitigation of climate change impacts

1. Co-benefits often drive demand for efficiency (i.e. environmental benefits, lighting quality, comfort, product quality, transmission and distribution improvements)
2. System or societal co-benefits can outweigh direct customer energy benefits in some cases (e.g. targeted efficiency that addresses system reliability)
3. Environmental justice benefits should be considered as part of the development of the program portfolio.

G. CUSTOMER NEEDS

Customers require technical solutions, financial support, client education and quality assurance. EPS Programs should:

1. Provide customer, site and/or process-specific technical assistance to identify energy efficiency solutions that are cost-effective for customers. Where possible, analysis should include life cycle costing to inform customer investment decisions.
2. Provide client education and training to ensure lasting changes.
3. Provide financial support in the form of performance incentives, financing or rebates.
4. Ensure quality assurance is met through commissioning of equipment and systems, measurement and verification and other program specifications and processes.

H. CODES AND STANDARDS

Improvements to New York State's commercial and residential building codes and appliance standards will be an important step in meeting the EPS goals. EPS programs should coordinate, integrate and support these updates by:

1. Fostering market acceptance of advanced technologies and construction techniques;
2. Providing incentives for performance that exceeds that established by existing and planned codes and standards;
3. Providing research, analysis and support for regular updates;
4. Supporting training of code enforcement officers; and
5. Ensuring ongoing attention to program design and delivery to assess and adjust to actual market conditions.

I. MARKET ACTIVITY

EPS programs and administrators should investigate and support market activity that acquires EPS resources while minimizing and/or without requiring ratepayer funds. The development and maintenance of strong relationships with equipment and trade allies will be a key component of this effort.

J. NEW YORK STATE SPECIFIC

EPS programs should be designed and implemented to reflect New York State specific, and to the extent practicable region-specific, conditions and priorities, such as:

1. Customer demographics
2. Unique market conditions (e.g. New York City)
3. Robust competitive markets for commodity and demand response
4. Weather
5. Regulatory backdrop

At the same time, programs should look for opportunities for consistency of design across regions to minimize customer and trade ally confusion.

K. PORTFOLIO APPROACH

In the context of delivering resources, EPS programs should be part of a balanced and equitable portfolio. Serving a broad spectrum of customers with potentially different delivery mechanisms will be necessary to achieve the aggressive EPS goals. A portfolio approach can also serve to maximize public benefits.

L. COORDINATION

It is essential that programs, marketing and outreach be coordinated across direct administrators and other market actors to provide seamless access to programs by both customers, contractors, service delivery organizations and other market actors. This coordination will:

1. Integrate programs to ensure that customer needs are met and that ratepayer funds are spent wisely
2. Leverage additional resources for customer projects and outreach
3. Minimize confusion
4. Maximize broad interest and participation
5. Take advantage of opportunities to leverage complimentary resources/skills and customer contacts
6. Take advantage of media penetration that crosses utility and state boundaries

M. FUEL INTEGRATION/NEUTRALITY

To ensure maximum resource delivery and customer satisfaction, buildings and systems should be approached holistically, addressing all fuels.

1. At a minimum, electricity and gas should both be addressed simultaneously using the approaches listed above under G. CUSTOMER NEEDS.
2. Oil and propane consumption should also be considered in EPS program evaluations.

N. MARKET ACCEPTANCE

Customer and contractor acceptance and support for programs will be paramount to success. EPS programs should develop this market acceptance by:

1. Ensuring program accessibility to eligible users, especially those representing the largest potential resource.
2. Customers have preferences for those with whom they work (e.g., their utility, NYSERDA, local contractors and suppliers etc.) and how they are able to invest in energy efficiency (e.g., focusing on key systems, comprehensive projects, etc.). EPS programs should be designed, leveraged and administered based on an understanding of these preferences.
3. EPS programs should be focused on addressing customers' needs and efficiency opportunities.

4. To the extent practical, within and among program portfolios, customer participation should be seamless and simplify participation to minimize the potential for confusion.

O. OUTREACH

Outreach to customers of EPS programs should be comprehensive, well planned and consider the following:

1. Certain market sectors should be targeted using an account management approach which emphasizes a coordinated energy efficiency strategy for the entire account
2. Vendors, consultants and installers all play a vital role in program outreach. Consideration should be given to methods of motivating, energizing and assisting this outreach.
3. There should be close coordination with economic development agencies, trade associations, customer groups, and energy suppliers (e.g. Empire State Development, New York City Economic Development Corporation, Building Operators Managers Associations (BOMA), American Institute of Architects (AIA), Association of Energy Engineers (AEE), New York Energy Consumers Council, Multiple Intervenors, The Business Council of New York State, etc.) on outreach, especially for commercial, industrial, institutional and municipal customers.
4. The quality and capabilities of the firm or person interacting with potential customers of the programs is essential. There is never a second chance to make a first impression.
5. A key to outreach will be the ability to make the business case appropriate to specific market segments.
6. Approaches to outreach may need to be tailored to the region of the state and the target audience.
7. Mass marketing program outreach should have a common look and feel across utility territories, including LIPA, to minimize confusion and maximize the effectiveness of marketing efforts.

IV. Gaps and Opportunities

Introduction

This section presents gaps and opportunities related to underserved sectors, underutilized technologies and processes, and other marketplace characteristics. These gaps and opportunities were discussed by WG2, which reached consensus on the inclusion of these issues. This is not an all inclusive list, but rather is the beginning of an identification of existing gaps and opportunities. Work to identify, refine and determine how best to capitalize on opportunities should continue throughout the duration of EPS.

End-User Opportunities

A. EXISTING BUILDINGS

Existing buildings and facilities represent the largest resource acquisition potential.

1. Resource potential in small commercial business is not being fully captured by existing programs. Direct-install programs have been successful at meeting specific needs of this sector in other states (e.g. Massachusetts).
2. Other sectors with untapped potential include commercial real estate and multi-family buildings with rental units, where split incentives often inhibit energy efficiency investments and customers have generally not participated in large numbers in existing programs.
3. There is also untapped potential in 1-4 family residences.
4. The low-income sector has large potential due to the age of the housing stock, older equipment, less effective maintenance, rental issues, etc., and represents a significant proportion of the residential sector;
5. Work in existing buildings should focus on cost-effective, large scale efficient building upgrades.
6. A significant opportunity (currently under funded) exists for improving the performance of industrial and manufacturing processes. The customer driver for these improvements is most often product quality, but very large energy savings can result.

B. NEW BUILDINGS

EPS should seek to minimize lost opportunities in new building and major renovation projects.

1. Developing partnerships and incentives (financial and performance) to increase the percentage of projects where intervention occurs at the schematic design stage. The earlier in the building design process that energy efficiency is incorporated, the greater the benefit.
2. Identifying the first points of contact for new construction projects (i.e. local planning or zoning boards) and forming partnerships with those entities to incorporate energy and environmental planning into the construction process.
3. Using tax credits and incentives for achieving higher-than-code performance; and
4. Providing incentives to municipalities for instituting increased codes and standards or including specific energy performance targets in the approval process for new construction or major renovation.

C. LARGE COMMERCIAL AND INDUSTRIAL CUSTOMERS (C&I)

The energy efficiency opportunities at large C&I facilities are generally industry-specific, facility-specific and/or process-specific. Programs that address the needs of these customers should be flexible. These customers and projects are not well-suited to benefit from the typical programs offered for the mass-market customers.

D. RATE DESIGN

Rate design can be an effective way to motivate customer action by providing appropriate market cost signals.

1. New rate designs should be assessed that provide clear and direct market signals for customers to install energy efficient equipment and to foster the utilization of new, efficient technologies (e.g., thermal storage, etc.).
2. Consideration should be given to modifying or eliminating rate designs that may have the effect of reducing or delaying the customer benefit of installing energy efficiency (e.g., take or pay, demand ratchet, declining block etc.).
3. It is important that customers receiving lower-cost economic development power exploit cost-effective energy efficiency improvement opportunities, and that disincentives be addressed and mitigated.
4. New time-based rate designs should be examined that leverage capabilities of advanced meters to encourage energy efficiency.

E. MARKETING AND OUTREACH

Enhanced mass marketing and messaging along with coordinated local marketing and outreach is needed. Although both mass-media and local outreach activities exist, there is a need for far more messaging which can be best achieved through a comprehensive media plan that is both cooperative and coordinated with all parties. This plan should aim to develop close coordination with program administrators, utilities, local governments, transportation and other organizations.

F. TARGETED EFFICIENCY

Building on the concept of Con Edison's targeted demand reduction program, there may be opportunities for targeted energy efficiency programs designed to help address electric and gas distribution constraints and service/reliability issues in affected areas within a particular utility franchise.

G. BLOCK RFPS FOR ENERGY EFFICIENCY

Building on NYSERDA's Aggregated Load Reduction Program and Con Edison's targeted program, there is a significant opportunity to contract for large blocks of energy efficiency resources. Block contracts have the potential to provide funding certainty to participants and low cost resources to ratepayers. Existing initiatives have been focused on contractors (although the Con Edison targeted program does allow for direct customer participation) and consideration should be given to initiatives that allow large customers to participate.

H. FINANCING

Several innovative financing ideas exist. These financing methods should be investigated for their practicality and applicability. Financing can help address the issue of customers lacking capital for investment in energy efficiency. Experience has shown that coupling performance based incentives with financing can significantly increase motivation to invest in energy efficiency.

1. Utility on-bill financing has been implemented successfully for some smaller targeted market segments (e.g. NYPA's financing and Small Business Program in

Massachusetts). Some of the potential difficulties that would have to be addressed include:

a. The capacity for existing utility billing and customer accounting systems to include financing on the current bill.
b. IT investments are required to add the financing functionality to a utility bill.
c. Multiple billing systems are used for customers that take both electric and gas service.
d. Reluctance on the part of utilities and their shareholders to carry the risk of customer debt.
e. Mechanisms for guaranteeing recovery of capital in the event a customer defaults or leaves the system.
f. Transferability of debt from one owner or tenant with a sale or lease changeover.
g. Partial bill payment allocations across supply, distribution and financing entities.

2. Municipal lease financing could address significant barriers to energy efficiency faced by local governments. Generally, approval of capital expenditures due to advanced budgeting issues or increasing on-bill debt load is more difficult than payment of operating expenses.
3. Availability of tax exempt financing, and other financing methods that may be developed, could be expanded for use in Energy Service Companies (ESCO) performance contracts.

I. ADVANCED METERING

The installation of an advanced metering infrastructure that give customers, contractors and program administrator's instantaneous access to meter and pricing data has the potential to improve:

1. Project screening and provide unique energy use analysis for specific customers and customer classes
2. Customer acceptance and utilization of time-differentiated market-based rates
3. Customer real-time knowledge of their energy use and correlation to their total energy bill
4. Customer demand management
5. Demand response participation
6. Building O&M (continuous commissioning)
7. Measurement and verification of impacts
8. Load research and load profile information
9. Billing accuracy and overall customer response to billing inquiries
10. Meter readings, since this will eliminate the need for estimated bills. It may also provide immediate and accurate impacts to customers needed to make informed end-use choice decisions.

J. PROJECT PACKAGING

As a larger variety of energy efficiency funding and financing opportunities emerge, there will be an increased need for customer assistance with matching up incentives and financing with potential projects and installation providers.

K. CENTRALIZED DATA SHARING

A new EPS paradigm has the potential to dramatically improve data sharing and coordination. Data sharing could be used to:

1. Systematically track customer efficiency efforts
2. Improve measurement of program impacts
3. Target participation and identify market saturation or potential
4. Encourage whole building efficiency, sustainability and long-term relationships with customers

L. UNDERUTILIZED OR UNDERFUNDED TECHNOLOGIES

There are some technologies where significant potential exists such as:

1. Combined heat and power (CHP), particularly upstate. NYSERDA has supported CHP development in Con Edison territory using performance-based incentives. Support for CHP upstate has been limited to demonstration projects thus far, due to a lack of available funding.
2. Advanced lighting systems (Light Emitting Diodes, fixtures, daylighting and controls)
3. Solar hot water heating
4. Geothermal/cold climate heat pumps
5. Industrial process control technology
6. Industrial product purification and other separations technologies. Industry standards practice is often energy intensive (e.g. distillation). Reverse osmosis and ultra filtration are examples of commercially available technology that could dramatically reduce energy consumption and cost.
7. High efficiency commercial food service equipment

System Opportunities

A. WHOLESALE GENERATION EFFICIENCY

Similar to retail customers, generating power plant owners have competing priorities for capital investment. Consistent with New York's existing wholesale and retail market structure, opportunities should be explored, outside of and in addition to current energy efficiency program design, to provide incentives to power plants to identify and realize cost-effective and innovative energy efficiency improvements, to primary power generation cycle equipment, as well as for balance of plant and general facilities improvements.

B. T&D EFFICIENCY

Efficiency opportunities also exist beyond the customer meter in the electric grid, such as:

1. Power factor correction could be deployed within the system and at customer sites to reduce reactive power requirements.
2. Smart grid technologies can be deployed to improve the efficiency of power delivery, reduce system losses, and improve reliability.

V. Barriers

Summary

This section examines commercial and residential energy efficiency barriers. As we look to identify best practices in program design and consider those that also have the potential for ramping up to large scale results, it will be important to understand across the different sectors the market barriers to rapid adoption of energy efficiency opportunities. There are many common barriers faced by both residential and commercial customers. The information identified below attempts to organize these barriers around different themes and suggest methods that address these market issues to enable more widespread adoption of better building energy performance.

Many of these barriers are believed to be obstacles to the implementation of the energy efficiency programs discussed and identified in the inventory of energy efficiency programs developed by WG2. The overarching challenge that WG2 has identified in its charge to inventory and recommend best practices or attributes for promising commercial and residential programs includes the need for improvements in both infrastructure and work force development. Most existing programs that can be enhanced to ensure rapid adoption by customers and achieve significant savings will require a robust market infrastructure and a well constructed implementation strategy. These portfolio-level strategies will be the platform for program expansion, quick ramp up, increased resource acquisition and accelerated program participation with additional funding.

Barriers to Promoting High Performance Commercial Buildings and Residential Homes

A. ECONOMIC BARRIERS

1. Energy-efficient technologies and design features often have higher initial (first) costs in comparison with standard technology and design options, compounded by the fact that developers have no financial stake in future energy operating costs of the building. Life cycle cost evaluations are foreign to many practitioners yet they are key to aligning the economic value of high performance buildings and homes with building owner needs. Similarly, residential builders do not regard energy efficiency measures as value added features that may have higher first costs but lower long term operating costs as a result of better home construction and higher performing appliances and products.
2. Architectural and Engineering (A&E) fee structures discourage the investment of time examining innovative design options. Fees can be fixed as a percentage of overall construction costs, resulting in “cookie cutter” designs that minimize A&E design time and client (developer) costs.
3. Customers lack upfront investment capital to address higher first costs. The financial industry is not familiar with how to price or incorporate energy efficiency financing into their lending portfolios
4. Energy efficiency competes with a customer’s core business for both attention and funding.

B. FLAWS IN THE MARKET STRUCTURE

1. Those ultimately responsible for paying energy operating costs (e.g., future owners, occupants, tenants, etc.) are often disengaged from, and have little influence over, the process and decisions involved in constructing buildings.
2. No single party on the typical building design team has responsibility for maintaining the integrity of the entire interactive operating system of the building throughout the design and build process (including commissioning).
3. Accepted routine channels for introducing and accepting high performance, energy related equipment and design innovations into the building development process need strengthening. There is need for increased availability of energy efficiency information along the supply chain and installation and maintenance services for manufacturers, wholesalers, retailers, energy efficiency service providers, consulting, engineering services and maintenance providers.
4. Limited availability of building related products associated with high efficiency homes (e.g. construction grade air sealants, high efficiency ventilation fans, and heat recovery equipment)
5. Tight construction schedules, driven by the costs of financing and other competitive pressures, discourage examination of efficient design options.
6. To some extent standard design practices use "rule-of-thumb" approximations that significantly oversize equipment as a form of insurance against future problems.
7. Some energy efficient technologies are not readily available from manufacturers and suppliers, leading to time delays or design specification alterations.
8. Larger developers, national chains, and other entities who construct facilities in multiple utility service territories do not want to be confronted with an array of differing utility program, each with its own participation requirements, forms and procedures, measurement criteria, incentive levels, etc. Hence, they find it difficult to effectively participate in the many available programs.
9. Reluctance of consumers, architects, engineers, and contractors to purchase, specify, and/or install high performance efficiency equipment and systems and /or consider newer technologies due to uncertainty of savings, reliability, or performance
10. Customers frequently do not have the ability to use building energy metered data for screening potential projects and to accurately project savings and effectively measure and verify performance of installed equipment and systems

C. LACK OF AWARENESS

1. It is essential to continue and expand efforts to make energy efficient design work the norm for designers and developers.
2. Many members of the design community lack knowledge of high performance technologies or advanced design practices.
3. There is little recognition on the part of building owners, managers, and maintenance personnel of the need for routine procedures to inspect, maintain, and recalibrate building systems and equipment**.**
4. There is a lack of general product knowledge by customers of commercial energy efficient equipment and systems (including high performance mechanical and electrical systems and green buildings).
5. Lack of industry sponsored training on high efficiency equipment and systems and familiarity by facility personnel about the need for inclusion of these systems into ongoing operation and maintenance practices

D. LACK OF EXPERIENCE

1. Many design professionals have little direct experience with high performance design practices, and may lack the skills necessary to thoroughly examine alternatives.
2. In some cases performance data is lacking on new technologies such as LEDs and design techniques that may affect long-term performance.
3. Insufficient training and incentives are directed to those who actually operate and maintain building operating systems. Maintenance personnel often focus only on tenant problems or complaints, or on malfunctioning equipment, and often are not given the time or tools to maintain the overall efficiency of the building systems**.**

E. OUTREACH AND EDUCATION

1. Need for mass media outreach that helps improve statewide program coordination and integration. A comprehensive media plan is needed to identify the urgency to take action and build on the momentum to promote energy efficiency as a means to reduce customer energy costs, advance system reliability and address climate change impacts.
2. Necessity of training and educational programs that develop continuing education for design professionals and build on current efforts in the design community to promote better buildings including the American Institute of Architects and US Green Building Council's Leadership in Energy and Environmental Design criteria. These efforts should lead to expanding workforce capacity to design, construct and operate higher energy performing buildings and homes.

F. RESISTANCE TO CHANGE

1. Architects and engineers are concerned about client (developer) resistance to experimentation with innovative design techniques and technologies.
2. Developers are concerned that occupant comfort or productivity will be impaired, thus affecting their ability to sell or lease the building, or satisfy the future owner or tenant.
3. Simple inertia and unwillingness to depart from proven principles of design and accustomed features and equipment, trading certainty for efficiency, are common to the industry.
4. There is a lack of reliable information and support infrastructure for energy efficiency. The building industry is struggling to transform to high sustainable energy efficiency practices that would lead to creating increased value to customers and better electric system reliability

VI. Data Examination in Furtherance of Efficiency Program Development

Value of Data Resources

It is generally accepted by the energy efficiency community that a number of existing programs are over-subscribed, while others remain underutilized. No system is going to eliminate estimates that are off the mark on the scope of a particular market, but the application of data gathering resources may permit more precision in determining the market potential for a particular program in a given area. The Public Service Commission, in apportioning the existing funding for NYSERDA's SBC-supported programs, is called upon to implicitly render judgments on the market potential of various programs. In fact, the same is true for any party seeking to establish or recommend a funding level to support present or future efficiency programs: there is a necessary calculus made on the optimal funding level, and on the best allocation of the resources that are ultimately employed.

This is particularly important in an environment in which efficiency spending in New York State is likely to rise sharply, as DPS Staff suggested in its Report of August 28, 2007. A number of parties in this case have raised concerns about the expenditure levels that may be contemplated to realize the goals of the Governor, and those that the Commission articulated in the Initiating Order in this proceeding. Whatever one's ultimate view on the proper level of energy efficiency spending in the coming years; it is universally acknowledged that the funds should be expended in a cost-effective manner. A central part of the process of getting to that ideal level is the consideration of how best to target efficiency programs. In the view of WG2 members, extensive data collection beyond that which is done now is likely to be a critical element in achieving targeted goals.

Background

Among the charges given to Working Group 2 was a request for an assessment of demographic or other data that may be readily available or that can be accessed with specialized searches, in order to support development of optimal efficiency programs. The proposition supporting this request is relatively straightforward: if we can properly assess the nature of our energy markets in the State, we are better equipped to design, develop, fund and implement those programs that are best calculated to address the needs and preferences of the various energy user groups in the State.

In practice, however, WG2 has found that while there is a wealth of actual and potential information available in numerous federal, State, City, utility, and other private or proprietary databases, much of the most readily accessible data is out of date, or is of necessity more general in nature. Specialized searches can be designed and run in more extensive databases, and can be cross-referenced, but these are also more labor-intensive and time consuming as they require the use of extensive design criteria, multiple runs to produce data overlays, and also can raise serious data integration issues.

As a result, much of what WG2 provides herein is indexing and categorization of market and demographic data, and a guide to its accessibility. Much follow-up work will be needed to realize the potential that we believe the underlying data has.

In some cases, as noted below, databases were not designed to be queried in the manner needed for our purposes in EPS program development. This is often true of utility records, which are very extensive and contain many forms of potentially useful customer information, but were developed primarily for limited purposes, such as billing. As such, they may not be well adapted to the search purposes that are most useful in the EPS context. There are ways to address this problem, but the work and time involved in doing so should not be underestimated.

A compilation of databases viewed as being the most relevant is set forth below, along with a summary discussion of their characteristics, and where available, links are provided. Note also that some of the data sources are proprietary in nature, and others may require licensing or other contractual arrangements in order to access their contents. The discussion herein identifies those circumstances where they are known to apply.

The other recognized limitation we have discussed within the Working Group is that we have not sought any individualized utility or other customer data such as name and address account information that might raise potential confidentiality concerns. In our discussion to date, we have generally focused on general orders of magnitude that would inform program design and funding decisions. The ultimate purpose, as noted, is primarily to help design efficiency programs that are best suited to various ratepayer populations. Addressing such concerns as optimal program design and funding levels will depend to a great degree on having a better understanding of the extent and characteristics of potential program participants, which will not initially require particularized customer data.

However, customer privacy concerns are among the issues that may well have to be revisited by the Commission, or others, when addressing the ultimate marketing and outreach issues needed to maximize customer participation in expanded efficiency programs. Doing so may require the use of mechanisms such as voluntary opt-in provisions for those ratepayers willing to share their utility billing data in order to receive targeted efficiency program information. This issue is potentially very important, but it is beyond the scope of the mandate given to WG2

Con Edison Data Sources

To help WG2's efforts to assess data needs, Con Edison has provided access to its data management system personnel to provide guidance on the capabilities and limitations in the company's existing or planned data systems. To advance that discussion, we focused on the system's usefulness for our specialized purposes within the anticipated EPS program design structure. In particular, we have inquired how searches might be structured to try to reach underlying data that may not be directly available now. It should be noted that the Con Edison data system is a legacy system that was not designed to accommodate specialized searches. Rather, it has been primarily a billing, accounting and service work tool. It is nevertheless possible to make special queries, and multiple system runs that can potentially yield several layers of useful data that can be examined.

However, there are also several limitations, at least in the present form of the system. For example, it does not currently provide block and lot information for Con Edison accounts. There

is an ongoing effort with the company to incorporate that particular form of data into the system, but it is not expected to be in place much before mid-2008, and unexpected delays may alter that date. Despite this, the likelihood of such data ultimately being correlated with all company accounts across its service territory is very promising. A number of governmental and other databases utilize lot and block[2] or parcel data, and these systems offer the prospect of incorporating critical forms of information that a utility may have little or no reason to collect or compile. To cite one example, Con Edison noted that it does not collect information on the form of ownership that a company account has, *e.g.*, whether a multifamily building is composed of rental or owned units, or some combination thereof, and, if owned, the form of ownership that applies, such as cooperatives or condominiums.

Such issues are ordinarily of little concern to a distribution utility, but in the context of EPS program development, funding and marketing, they may become critical. DPS Staff and other parties in this proceeding have commented on the very different issues and barriers that apply to rental properties as opposed to owned multifamily buildings. The ability to, for example, access a New York City Planning Department database to identify by block and lot the form of ownership of particular buildings could be combined with utility account block and lot data to permit a highly targeted efficiency marketing program for owned buildings. As Census Bureau data reflects (see discussion below), some two thirds of City residences are rental units, but that still leaves approximately one million owned residential properties that may be the most fertile ground for the early expansion of energy efficiency programs.

One persistent analytic problem in planning efficiency programs for the New York City market is the reality of many mixed use properties. This is not simply a function of the fact that very many residential buildings have ground floor commercial activity, or include professional offices, although those patterns are common in the City and to an extent in other parts of the State. There are also utility or rate classification data criteria that can put a purely residential building into a commercial sector or a different rate class simply by virtue of its aggregate load. The hope is that the availability of more particularized information at the block/lot level will permit disaggregation of existing data, and thereby facilitate the far wider use of targeted efficiency programs.

Other Utility Data

Various utility service territories and even regions within service territories exhibit significantly different characteristics (prevalent form of housing stock, relative presence of industrial or commercial activity, radial vs. network systems, etc.), and in part as a reflection of these varying circumstances, individual load serving entities for gas and electric service also have varying forms of data management systems. National Grid, for example, has reported to WG2 that its KeySpan natural gas accounts currently include block and lot data. They can therefore be correlated with such data systems as FARES (tax parcel data, collected by counties or townships), which reflects block/lot information, and also identifies the type of the structure located on a given parcel by category, such as mixed use, residential, and the like.

Other utilities across the State may or may not have such forms of data at present or, as in the case of Con Edison, may have similar system expectations in the near future. While efficiency

[2] "Lot and block" refers to a system used in the United States and Canada to locate and identify land, particularly for lots in densely populated metropolitan areas. It is also sometimes referred to as the "Recorded Plat Survey System" or the "Recorded Map Survey System – Wikipedia definition".

programs can be developed without extensive consideration of the extent of various market sectors and their respective potential, WG2 believes that the most effective design and marketing of programs will ultimately be dependent at least in part on the availability of such specialized data in the respective utility service areas.

For areas such as New York City, portions of Westchester, and limited Upstate areas, the focus of likely demographic inquiries will primarily be directed at specific service class populations, improved characterization of commercial vs. residential customer classes, identification of direct metered multi-family units vs. direct metered single-family dwellings, the prevalence of submetered vs. direct metered or master-metered only, small vs. large buildings and the like. Upstate data sets will obviously be different, and other sources of information for the upstate utilities' data management services will need to be gathered.

Attachment 1

Working Group 2 List of Participants

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Daniel S. LeFevers, Gas Technology Institute
Bob King, Good Company Associates
Stuart Taylor, Good Company Associates
Brian Dolan, Intellidyne
David Ahrens, Joint Supporters
Janja Lupse, KeySpan/National Grid
Amy Davis, LeBoeuf, Lamb for NYSEG & RG&E
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John Dowling,,Luthin Associates
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Frank Murray, Pace Energy Project/NRDC
John C. Jensen, Public Energy Solutions
Marolyn Davenport, REBNY
Mally Becker, Reliant Energy on behalf of RESA
Steve Romeo, Smilel, Anderson & Sacks

Attachment 2
Con Edison Data Inquiries by WG2

To provide an illustration of the process that might be used to seek utility database information, the following are recent requests made by the WG2 Data Subgroup and the company's responses. It is important to remember that some of the data requested may be confidential, proprietary and/or trade secret protected, and while Con Edison believes it will have the capability to develop information of this type, it may not be able to share the results with outside entities, or may face certain limitations in doing so. In addition, the costs associated with responding to certain requests such as these would require a mechanism for recovery.

A. Short Term Requests:

1. Disaggregate the market of rate class EL2 and EL9 customers to identify the number in buildings containing residential units (apartments), and for that data set, provide additional information, subdividing this total by various electric usage levels, and if possible, by size ranges of building (e.g.,-30; 30-100; over 100 units; <4 floors vs. 4 or more floors, # of apartment units, # of floors, and total square footage [These latter issues may ultimately require integration with City Planning data, to which we are attempting to gain access]

2. Disaggregate EL1 customers by unit size of buildings in which they are found (*e.g.*, single family, 2-4, 30-100, over 100 units)

3. Identify total number of EL8 and EL12 accounts, and number of same that have residential submeters (according to Con Edison data) installed at this time.

Responses:

Task 1 and 2 segmentation and sorting (SC2, SC9, SC1, SC7, and SC12) will encompass multiple passes employing a percent residential code from internal Con Edison systems as well as information from LotInfo/NYC Department of Buildings/First American to distinguish residential and commercial buildings. Building size (by units) will be drawn from the multiple fields and passes in Con Edison systems, and residential units indicator from LotInfo and First American. The number of floors will be extracted to the extent available from LotInfo and First American.

It is important to note that this kind of data has been shown in the past to contain errors. Consequently, the data once collected must be manually compared, scrutinized and corroborated via independent sources, usually through extensive internet searches and comparisons. Other proprietary real estate data sources such as LoopNet, Property Shark and Co-Star may be employed in segmenting and sorting the data. The work in question would require a minimum of 16-20 staff weeks but the task could extend beyond the initial 16 staff weeks if the data requires further validation.

This information for Task 3 will require a data search via internal Con Edison systems and also require a survey of nearly 2000 master-metered accounts to determine if sub metering was installed without CECONY notice or knowledge. This entire survey process and analysis may take up to 3 months from the point of commencement.

B. Longer Term Request:

Aggregate customer class data (including residential breakout of the EL2 and EL9 requested above) at the community district level, and block and lot level as the company system permits once that capability is in place.

Response:

Con Edison has under development a proprietary IT system that will allow it to drive down to the block and lot level to mine data. Once the GIS capability/Block and Lot appending is in place, the data can be sorted in accordance with the geographic boundaries noted above. However, the company will not have the ability to sort classes of customers down to the building level over the next 3 months. This ability may exist by the summer of 2008 if the GIS capability and Block and Lot appending process has been fully developed and tested, and is operational.

Attachment 3

Federal, State, City and Other Data Sources

- **Fed Stats – Centralized Federal Data Source**

  Primary link: http://www.fedstats
  Other link: http://www.fedstats.gov/qf/states/36/3651000.html

  Fed Stats (link below) is a compilation database that links at one central site numerous forms of federal data ranging from the Census Bureau sources to the Statistical Abstract to the Bureau of Labor Statistics, and many others. It is generally easily accessible by non-specialists, but is also limited in the level and sophistication of the searches it will support.

  It is somewhat valuable for EPS purposes in that it offers direct links to State information, some of it relevant to efficiency, and it offers readily used secondary links to data for every county in New York State, and to numerous cities across the State as well. This convenience, however, is qualified by the fact that the data may be some years old, and is offered in limited categories. The latter includes: population, percentage of owned housing, median income levels, low-income or very low income prevalence, and several other groupings. To the extent that the information is dated, there are periodic updates to the sub-databases, but the most extensive of these will follow the federal decennial census in 2010, and will not likely be disseminated in detail until 2011 and beyond. They will therefore have limited value in addressing the State's more immediate 2015 goals.

- **Census Bureau, Department of Commerce**

  Primary link: www.census.gov/

  There are numerous links within the Census Bureau site that are potentially relevant to numerous demographic and energy consumption issues. Some of these related to energy usage by sector, and may have application across New York State.

  For current City residential data, there is one particularly detailed Census Bureau site:

  New York City Housing and Vacancy Survey (NYCHVS)

  Link: http://www.census.gov/hhes/www/housing/nychvs/nychvs.html

  This is a very valuable tool for City housing data analysis, as it is updated every three years, and it therefore is more current than many other databases. It tends to capture emergent trends, such as the extremely rapid growth in recent years in the City residential sector. The latest update reflected on the website is the 2005 survey, but it will be updated (using extensive sampling methods) in 2008, and will therefore have very current information to inform program designs in 2009 and thereafter.

NYCHVS data survey microdata can be used to produce various tabulations, but unlike FedStats it requires familiarity and dexterity with statistical programs, including SAS and SPSS. Various record layouts are needed to find the desired variables and their positions on the data files to produce tabulations. Survey forms describe the questions asked, and using those, the record layout for various data sets, such as the age of housing stock and heating fuels used, can be accessed by those familiar with statistical methodology.

- **Energy Information Administration (EIA), Department of Energy**

Primary link: http://www.eia.doe.gov/

The EIA is a division of the federal Department of Energy, and serves as the principal source for compilation of wholesale and retail energy-related statistics at the federal level. These include a wide-range of production and consumption numbers, and also extend to such subjects as fossil fuel production, importation and consumption.

There are certain EIA databases that are of particular potential value to efficiency program development. These include the following:

Energy Information Administration - State Information

The new location for State Energy Data in general is at: http://tonto.eia.doe.gov/state/

For New York in particular, see:
http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=NY

Related reports:

- State Consumption, Prices and Expenditures (SEDS)
  Tables that display comprehensive State data and trends from as early as 1960 to the present
- State Electricity Profiles
  Tables that provide time series data from 1990 forward for key electricity indicators described by State
- Natural Gas Residential Choice Programs
  Written overviews of the status of natural gas industry restructuring in each State, focusing on the residential customer class
- Regional Energy Profiles
  Reports and maps that explore a number of regional variations in U.S. energy consumption

State Energy Consumption, Price and Expenditure Data site has recently been relocated. The new location is shown below:

Link: http://www.eia.doe.gov/emeu/states/seds.html

Residential Sector Energy Expenditures by Source

Link: http://www.eia.doe.gov/emeu/states/sep_sum/html/sum_ex_res.html

While this source dates from 2004-05, it is a useful listing of relative fuel usage among the various states, and breaks out in dollar expenditure amounts residential usage of fuels ranging from LPG to natural gas to wood. It also includes data on

Household Electricity Report (for New York State)

Table – http://www.eia.doe.gov/emeu/reps/enduse/er01_ny_tab1.html

Report – http://www.eia.doe.gov/emeu/reps/enduse/er01_ny.html

Figures – http://www.eia.doe.gov/emeu/reps/enduse/er01_ny_figs.html

New York Household Energy Survey (N.B. - 1997 data)

This survey compares New York State energy consumption to that of the U.S. at large, and to that of other states by various categories:

Link: http://www.eia.doe.gov/emeu/reps/abstracts/mid_atl.html#newyork

Annual Energy Review (AER)

Link: http://www.eia.doe.gov/emeu/aer/overview.html

This database contains data in a large number of fields reflecting state-level energy consumption, expenditures, and prices. It is updated annually, the last update having been completed in June of 2007.

State Electricity Profiles

Link: http://www.eia.doe.gov/cneaf/electricity/st_profiles/e_profiles_sum.html

This data a lagged by some two years (last update was March 2007 for 2005 data), but provides a wide range of retail sales data by State in MWhs and relative retail pricing information. It includes New York State specific information on a range of emissions by tonnage, and both retail sales of electric power by market sector, relative prices among service sectors.

- **New York State Department of Public Service**

  The Department of Public Service compiles sales data by "community"[3], based on data submitted annually by all electric and gas utilities. This information offers the considerable advantage of being contemporaneous, or at least very recent. For example, the current annual data dates from utility submissions made for the period through December 31, 2006.

  Gas and electric data are compiled separately, and reflect such categories as customer population by community as defined and identified in a particular territory. The communities are shown with, *e.g.*, their respective dekatherms or kWhs, and sales in dollars. The data is

[3] For this purpose, "communities" are defined in separate and distinct ways in each gas and electric utility service area, but across the State this term may mean cities, counties, townships, towns, incorporated villages, or some combination thereof.

also divided by market sector, thus distinguishing industrial, commercial, and residential information in the applicable categories as well.

DPS also maintains a geographic information system (GIS) that enables a range of data displays by physical location. Heretofore, the principal use of this system has been in tracking and assessing power outages to determine their geographic extent, but it may be adapted to incorporate forms of data that could be useful in developing and promoting energy efficiency programs. See general discussion of GIS below.

- **Geographic Information System (GIS) Resources**

The use of GIS systems, which involve various forms of visual mapping of data, has grown exponentially in recent years. GIS systems are being used in a number of applications that may ultimately prove to be invaluable in assisting in the realization of EPS goals, notably including the precise targeting of programs, and the establishing of funding levels that closely correspond to the size of the available market for various efficiency measures.

In addition to the DPS analysis of GIS data for outage and reliability purposes, many State agencies and other governmental units have a presence in this field. Information is shared by various means, including the New York State GIS Clearinghouse, the link to which is provided below.

Link: http://www.nysgis.state.ny.us/outreach/usergroups

The Clearinghouse User Groups cover four geographic regions: Western/Finger Lakes, Central/Southern Tier, Capital Region/ North Country, and Hudson Valley/NYC/Long Island. These groups comprise professionals who work with GIS, Global Positioning Systems (GPS), and related mapping technologies. In addition to a number of State agencies, participants include representatives of the City of New York, and counties in Long Island and other regions across the State, universities, and other private parties involved in GIS work.

Ultimately, the combining of GIS and utility data by service territory and by sector, or by various geographic subdivisions,[4] should offer an improved view of the potential for various programs, and for the funding and outreach needed to reach the goals that are ultimately established for them. GIS allows visual representation of as many indices as are currently catalogued, and in the future should permit an even wider array of information, particularly through the use of data cross references and mapping overlays.

- **Other Public and Private Demographic Resources**

Note: The following information is summarized from a number of sources, including company materials; contractual or licensing arrangements may be required to access data from these or other private or proprietary data sources

New York City - PLUTO –system (Primary Land Use Tax Lot Output)

PLUTO is operated by the New York City Department of City Planning. A licensing agreement is required to utilize this and companion systems.

[4] This might include counties in most of the State, and in New York City, boroughs or community districts

This database contains extensive citywide land use and geographic data at the tax lot level in ASCII-compatible format, cross-referenced to more than seventy fields derived from data maintained by City agencies. PLUTO Select allows access to specific tax lot data for Community Districts or tax blocks. Latest system information updates date from October-November 2006.

Tax Lot Base Map Files

This companion 2006 database system provides schematic representations of tax lot outlines, but not precise metes and bounds. Licensees can access files of tax blocks, Borough boundaries and Community Districts.

These systems can be queried for such criteria as square footage, number of dwelling units, owned properties, housing age data in some instances, and other Planning or Department of Finance compiled data.

NYCHANIS (New York City Housing and Neighborhood Information System)

Link: http://www.nychanis.com/ (password required)

Data indicators in the NYCHANIS database include:

- Housing Affordability
- Housing Creation
- Housing Stock
- Housing Values
- Land Use
- Population and Demographics

Data sources used in the NYCHANIS database include:

- Federal Financial Institutions Examination Council (FFIEC)
- New York City Department of City Planning
- New York City Department of Finance
- New York City Department of Housing Preservation and Development (HPD)
- New York City Housing Authority (NYCHA)
- United States Department of Commerce

Claritas (link: http://www.claritas.com)

Claritas is a marketing information resources company dedicated to helping companies engaged in consumer and business-to-business marketing. The company claims it is dedicated to maximizing its clients' profitability with targeted and measurable marketing programs and enterprise-wide technology solutions.

Claritas' Convergence Audit unit provides various consumer behavior data for the energy sector, including information on energy consumption and attitudes, including types of installed heating and cooling systems, major appliance saturation, and propensity to participate in new utility programs. Profiles are based on extensive survey responses. The

Convergence Audit unit collects detailed information on the telecommunications and energy industries that is updated annually.

Claritas also offers analysis and mapping of demographic and electricity information for electric distribution companies. Its electric and gas "Boundaries" products consists of databases, data files, and boundary mapping files, and enable examination of electric and gas distribution area characteristics.

Electric Boundaries
http://www.claritas.com/claritas/Default.jsp?ci=3&si=1&pn=eboundaries
Gas Boundaries
http://www.claritas.com/claritas/Default.jsp?ci=3&si=1&pn=gboundaries

Demographics Now (link: http://www.demographicsnow.com)

Applied Geographic Solutions (link: http://www.appliedgeographic.com