Consolidated Edison Company of New York

Integrated Long-Range Plan

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Chapter 1: Letter from the Chairman

Con Edison’s long-range plan is our guide to navigate the challenges of the next 20 years, and help us continue to provide safe, reliable, clean, innovative, and cost-effective energy services for a green and sustainable future.

In such uncertain times, our plan must be flexible and able to deftly adapt to unexpected developments. New technologies, techniques, and resources can change the energy landscape. We must prepare for how such changes may affect supply levels and prices. We must also be aware of and responsive to shifts in public policy, and local, national, and worldwide events that can affect our business. Because of these variables, we must revisit our goals, monitor key signposts, and correct our course as needed along the way.

We have already made significant progress since we last laid out our plan, including making positive changes to our corporate culture and managing costs more closely. We developed new planning tools to help us make the most strategic investments at the right time. Moving forward, we will work to strengthen our relationships with our customers and stakeholders, and to build trust in the communities we serve. We strive to continuously improve the way we do business, to strengthen the company and prepare to meet future challenges head on.

Our 20-year roadmap is guided by our EnergyNY plan, which is focused on energy-efficiency, smart capital investments, and our unyielding commitment to the environment.

Our long-range plan calls for an integrated approach across our electric, gas, and steam businesses to provide the best value for our customers, grow our company, and meet increasing demand. We will focus on three key objectives to achieve this vision.

First, we will help our customers use less energy and lower their energy costs. Our energy efficiency and demand response programs reduce our system peak and help us defer large capital investments. Focusing on oil-to-gas conversion opportunities will provide a path for growth in our gas business and heating cost-savings for our customers.

Second, we will improve our use of existing assets. Improved project management and work management processes will help us make more strategic infrastructure-planning decisions, manage costs, and lower maintenance expenses. Along with the implementation of smart grid technology, these efforts will help us to remain one of the world’s most reliable utilities for the nine million people who depend on us each day.

Third, we will minimize the impact bills have on our customers. We will do this through an array of approaches, including promoting our energy efficiency programs to save customers money and energy. We will also advocate on behalf of customers to minimize the supply charges, taxes, and fees that we do not control.

We strive to be sustainable in all that we do, to protect our company and preserve our planet for the years to come. No matter what the future holds, we are certain that Con Edison will meet all
challenges while remaining committed to safety as a first priority, and ensuring we deliver the world-class reliable service our customers expect.

Chapter 2: Executive summary

Energy is critical to New York City: our systems are among the most heavily relied upon in the world. Every day, about nine million New Yorkers depend on us for safe and reliable energy. We are responsible for energizing the financial and media capitals of the world, servicing more hospitals per square mile than any other city in the world, and maintaining critical infrastructure, including tunnels and subways. And over the next 20 years, energy use is expected to rise as New York City grows.

To meet New York’s extraordinary service needs, Con Edison operates a large, complex, logistically challenging underground and overhead infrastructure, which must meet the high reliability and safety standards that our customers have come to expect. We are committed to meeting this challenge, and to doing so in a way that ensures a green and sustainable future. In order to continue successfully operating, modernizing, and growing our system over the next 20 years and beyond, we need to make significant infrastructure investments. Our commitment to the environment also requires investments in innovative solutions.

By meeting both of these challenges successfully, we will fulfill our vision: to be a premier provider of safe, reliable, clean, innovative, cost-effective energy services and solutions that enhance the lives of our customers. We have expressed our vision in four distinct but interconnected objectives:

- Mitigate customer bill impacts
- Improve customer service
- Meet governmental and our own internal environmental standards
- Maintain reliability and safety

Achieving our vision will require Con Edison to make significant capital investments over the next 20 years. This integrated long-range plan provides a roadmap for us to achieve that vision by investing strategically while mitigating increases in our customers’ energy bills.

In our 2010 plans, we identified several opportunities for reducing increases in our delivery costs. In our current plan, we build on those opportunities by implementing a new framework focused on integration. To capture every opportunity to limit our growing delivery costs, we have applied this common, integrated framework to our infrastructure planning process. By using this framework, we aim to minimize the investments we must make over the next 20 years.
We have defined integration as ensuring that our actions across all three commodities we deliver—electric, gas and steam—are consistent, coordinated, and focused on the lowest cost customer energy solutions. More specifically, we aim to achieve integration by taking the following steps to bring together our electric, gas, and steam businesses:

1. Establishing a common vision, priorities and guidelines wherever possible and consistency with the rules and standards that govern us;

2. Establishing consistent beliefs and views of industry trends and demand forecasts that affect all three of our commodities;

3. Sharing best practices through a rigorous standard planning approach across all of our companies and services;

4. Incorporating lower cost customer solutions that shape and shift our customer demand wherever possible; and

5. Fostering a culture that focuses our 14,000 plus CECONY employees on providing our customers with a quality experience and engenders their trust, while continuing to deliver the world-class reliable energy delivery they have come to expect.

We believe this integrated approach will best serve our customers over the next 20 years. That is not to say, however, that one single plan will apply to all three commodities we deliver. Even under our integrated approach, significant differences among our three commodities require three different rate structures and three different capital plans. First, the physics of transporting electricity, gas and steam require different physical systems to transport each commodity. These different systems have different requirements for maintenance, expansion and operation. Second, the three systems have overlapping, yet distinct geographic footprints. Third, our customers’ end use for each of the three commodities is different, and customers’ need for integrated solutions varies according to factors such as their energy usage and their willingness to operate complex infrastructure on their premises. Finally, local, state and federal laws and regulations, such as fire department codes, city building codes, and state environmental and utility regulations, also drive how much integration is possible.

Within these limitations, our integrated planning focuses on three key efforts: minimizing customer energy use, improving our use of existing assets, and reducing all components of our customers’ bills. The first two goals are aimed at reducing our customers’ delivery costs, which make up one-third of their bills: we aim to reduce delivery costs first by reducing demand, then by using our assets more efficiently to meet that demand. The third goal addresses the remaining components of our customers’ bills—supply, taxes and fees. Although we do not have direct control over these portions of the bill, we have embraced efforts to minimize these charges that we are required to pass along to our customers.

*Customer usage*
Helping our customers reduce their energy usage is the first step in controlling our customers’ delivery costs over the next 20 years. In our 2011 planning effort, we made significant progress towards minimizing increases to customers’ delivery costs. In our current plan, we take a deeper look at opportunities to implement cross-commodity initiatives and to shape and shift demand. By pursuing these opportunities, we will reduce the need for large infrastructure investments, which will lower energy bills for our customers.

Understanding our customers and the way they use energy is critical to this effort. By gaining insight into the areas of overlap in how our customers use each of the three commodities we deliver, we are able to identify and take advantage of opportunities to provide cost-effective solutions that draw from all three commodities. We are embracing these opportunities by offering a broader range of cross-commodity solutions—such as combined heat and power, oil-to-steam conversions and steam air conditioning. These cost-effective solutions will reduce our system peak, and allow us to defer large capital investments.

Our efforts to reduce customer demand also include efforts to reduce our system peak by shaping and shifting demand. Our demand shaping and shifting efforts are focused on least-cost opportunities, such as energy efficiency and demand response, which will reduce our system peak and minimize our customers’ growing energy demand.

We have adopted an approach that will streamline our customer interactions and allow customers to access comprehensive information about all three commodities. Our efforts to better coordinate our existing customer processes balance the need for “one-company” with the need for specialized expertise to respond to certain customer inquiries. Our commitment to improving our interactions with customers reflects the value we place in our customer relationships.

Using our existing assets

In addition to exhausting all opportunities for reducing demand, we aim to reduce delivery costs by using our existing assets more effectively. These efforts focus on identifying the lowest cost solution that is consistent with maintaining safe and reliable service. Where possible, we look to use existing assets with spare capacity rather than make large infrastructure investments. To this end, we rely on refined system modeling and perform cost-benefit analyses on all of our projects so that we can make more informed decisions about which solutions will most cost-effectively meet infrastructure needs.

Just as we are streamlining our customer interactions, we are standardizing processes to ensure successful execution of our infrastructure plans. We are implementing improved, more coordinated processes for project management and work management. These new approaches, combined with an enterprise-wide common database and a common platform, will improve our financial, budgeting, and supply-chain processes. As a result, we will be better positioned to make strategic infrastructure-planning decisions and manage infrastructure costs. For example, our streamlined business processes will enable us to coordinate both internally and externally to consolidate street work such as trenching, which will lower our maintenance expenses.
Focusing on the whole bill

Finally, our current plan broadens our focus to include the total customer bill, including supply, taxes, and fees. In the past, we focused most of our efforts on containing delivery costs, but we are now pursuing wide-ranging initiatives to minimize the supply charges, taxes, and fees our customers pay. While we do not have direct control over these portions of the bill, we are increasing our efforts to advocate on behalf of our customers.

We are working on behalf of customers to influence supply components of the bill where possible. We maintain a strong presence in market- and transmission-planning forums, where we advocate for decision-making that keeps customer supply costs low while maintaining reliability and preserves the competitiveness of the wholesale markets.

Similarly, we are pursuing opportunities to lower the taxes and fees portion of our customer bills. We strongly support the position that the Public Service Commission’s 18a surcharge, one of the largest fees we are required to collect, must expire as planned in 2014, and should not be extended under any circumstances. Further, we are advocating for the City to eliminate the separate utility tax class, of which Con Edison is by far the largest taxpayer, and treat Con Edison as it does the vast majority of city businesses. This change would not only put us on equal footing with other city businesses, but it would also reduce property tax volatility and our incentive to litigate tax cases.

Looking ahead

Plans are inevitably based on projections of how the future may unfold. One thing we can be certain of is that the future will bring challenges we have not projected. Our planning is, and must be, a continuous effort, which involves monitoring signposts to determine if we need to correct our course. Our ongoing planning process anticipates the need to make adjustments that incorporate new insights we develop as we execute the plan. We are committed to executing our plans, and to continually improving our planning process—all with our ultimate goal of delivering the level of service our customers have come to expect.
Chapter 3: Integrated planning approach

In 2010, we published long-range plans for our electric, gas, and steam delivery systems. These plans laid out our expectation of customer demand on our systems for the next 20 years, and described the infrastructure that would be required to safely and reliably accommodate customer demand for each commodity. We also estimated the costs of the investments required to accommodate this demand, and resulting impacts on our customer bills. We projected bills to grow greater than inflation in real dollars over the next 20 years.

In an effort to reduce the impact of our projected infrastructure costs on customer bills, we have applied a common, integrated framework to our infrastructure-planning process across all three of our commodities. The process aims to minimize the investments we must make over the next 20 years.

Within that framework we have launched a range of initiatives. Several of those initiatives are based on the 2010 plan, which identified opportunities to reduce costs. We are building on those initiatives, as well as pursuing new initiatives aimed at reducing our delivery costs in all three commodities. We describe these initiatives in Chapters 7 and 8.

We have also refined our approach to long-range planning by adding more integration across our commodities. We started with our customers and how they ultimately use the energy we deliver. We looked for areas of overlap in how our customers use each of the three commodities we deliver, and we have been able to identify opportunities to integrate planning across those to lower our need for infrastructure investments.

We are also approaching the customer bill holistically, broadening our focus to encompass efforts to reduce the total customer bill, including supply, taxes, and fees. Whereas we originally focused our efforts on delivery costs, we are now pursuing initiatives to keep the supply charges, taxes, and fees our customers pay to a minimum. While we do not have direct control over these portions of the bill, we are increasing our efforts to advocate on behalf of our customers. We describe those efforts in Chapters 9 and 10.
The figure below summarizes our integrated approach to long-range planning. The discussion that follows describes our refined approach in greater detail.

Figure 1: Integrated approach to long-range planning

1. Corporate vision and mission
2. Common assumptions and view on industry trends
   - Electric demand forecast
   - Gas demand forecast
   - Steam demand forecast
3. Electric system capability
   - Implied electric infrastructure needs
4a. Integrated energy and customer management
   - Shape demand
     - Energy efficiency
     - Demand response
   - Shift demand by targeting customer resources
     - Electric → Gas (DG), Steam (AC)
     - Steam → Gas (CHP)
     - Gas → Steam (Oil conversion)
   - Modified electric infrastructure needs
4b. Common capital planning framework to deliver lowest marginal cost to our customers
   - Improve asset management
     - Implement enhanced system designs to enable increased utilization of existing assets
   - Increase information and improve decision making
     - Invest capital where most efficient
     - Maintain assets based on their condition
   - Cross commodity work planning
     - Coordinate street work
     - Increase efficiency in procurement
   - Modified gas infrastructure needs
   - Modified steam infrastructure needs
5. Taxes and Fees
6. Supply
Our integrated long-range plan is guided by our corporate vision:

Con Edison is a premier provider of safe, reliable, clean, innovative, cost-effective energy services and solutions that enhance the lives of our customers.

Our vision, which is described in more detail in Chapter 4, articulates our aspirations as a company. Our long-range plan serves as a roadmap for how we will accomplish our vision.

Our long-term forecasts are based on common views and assumptions about customer and industry trends.

We develop a 20-year outlook on customer behavior and energy usage that serves as the basis for our long-range plans. Our forecast for energy use reflects our views on the local economy, employment, demographics, and also considers shifts in energy use patterns. We also consider the regulatory landscape, technology improvements, and energy markets to forecast what it will cost to deliver this energy. To keep abreast of developments in these areas, we have developed signposts, which serve as metrics we use to track the assumptions in our plans. We discuss industry trends in greater detail in Chapter 5.

We then determine customer energy needs, the existing system capability and infrastructure investment requirements

Once we have developed our long-range electric, gas, and steam demand forecasts, we identify areas in our system that will need reinforcement to meet projected demand growth, and determine when that reinforcement will be needed.

We apply an integrated infrastructure planning framework to optimize our investment requirements.

4a. We then look further into what causes demand to grow and consider a broader set of solutions. First, we look for opportunities to shape, or shift, demand. We may look to shape the demand by implementing demand-side management programs (e.g., efficient lighting and demand-response programs). We look for opportunities to shift demand across commodities with solutions such as using gas or steam instead of oil, self-generation of electricity and using combined heat and power systems (See chapter 7).

4b. We then determine the infrastructure investments we must make. We review options available to us and identify the lowest cost solution that is consistent with maintaining safe and reliable service. Where possible, we use existing assets with spare capacity rather than make large infrastructure investments. To this end, we perform cost-benefit analyses on all of our projects before choosing the most cost-effective solution (See Chapter 8).
Once our infrastructure work is planned, we coordinate internally and externally to identify opportunities to consolidate street work such as trenching. Our goal is to reduce our presence on the street. We have been piloting a new mapping system that will help us identify locations where multiple jobs are planned so we can avoid visiting the same locations multiple times. We are also piloting a program with the City and other utilities that allows us to share our planned street work schedules.

We are focused on the total customer bill, targeting common cost drivers such as supply, taxes, and fees

Although we only have direct control over the delivery portion of our customers’ bills (approximately one-third of the total bill), our goal is to minimize the total customer bill. To that end, our expanded focus includes strategies for limiting the supply (or commodity) portion of the bill as well as taxes and fees.

The supply, tax, and fee costs we incur cut across all three of our commodity services, so we have adopted a holistic approach to these costs (See Chapter 9 and 10). Results of our 2011 planning efforts can be found in Chapter 11.

During our integrated plan development, we recognized the importance of customer insights, interactions and engagement.

Our goal is to improve customer experience and deliver a consistent, high quality customer experience as “one Con Edison” across electric, gas, and steam, while maintaining high levels of reliability and safety. We have included deeper thinking on our customers and their behavior. More specifically, how they use energy and how they make decisions to better understand our infrastructure planning needs. Customer insights developed through identification of evolving customer energy uses and emerging industry trends enable us to better serve our customers (See Chapter 5).

We strive to improve our interactions with our customers. An essential element of achieving our goal is that we continue to demonstrate to customers, through our interactions, that we are responsive and customer-focused, and an organization that provides high quality customer experiences in response to customer concerns and requests. We have multiple initiatives underway to improve our customer interactions (See Chapter 12).

We also seek to proactively engage our customers to help them make more informed energy decisions and direct them to the least cost energy solution (See Chapter 7).
Chapter 4: Our vision

Our corporate vision is the basis of our long-range plans: only by identifying our long-term goals can we devise an effective integrated long-range plan for achieving those goals. This chapter describes our company vision:

**Con Edison is a premier provider of safe, reliable, clean, innovative, cost-effective energy services and solutions that enhance the lives of our customers.**

We will achieve our vision when:

- Customers recognize us as a world-class, customer-focused organization that provides them with the best energy choices, enables them to cost-effectively manage their energy needs, and maintains the high level of reliability they expect;

- Our operations deliver value while providing reliable, cost-effective service to our customers, ensuring public and employee safety, managing risk, and responding to evolving customer needs;

- The communities we serve consider us a dedicated partner in their community-improvement and economic-development efforts, and in their commitment to creating a cleaner environment and more efficient uses of energy;

- Public officials trust us to meet the public’s substantial need for safe, cost-effective, clean, and reliable utility service. We are a recognized partner that provides expert and objective input on energy issues;

- We act quickly, responsibly, and flexibly to modify our strategies and plans as circumstances, needs, and public priorities change.

- Employees act as trusted business owners who recognize us as a preferred place to work. As business owners, we will be engaged, motivated, focused on stakeholder-value creation, and committed to excellence;

- Our corporate culture is one of respect and trust, earned through positive stakeholder relationships, intense focus on cost-consciousness, personal ownership of value-added contributions, professional excellence, and responsible behavior; and

- Investors consider us as a preferred utility — one that provides competitive, long-term returns by emphasizing stable and growing dividends for stockholders, and principal and interest payments to lenders, while demonstrating a proven record of capital management.
Chapter 5: Industry trends

We have conducted detailed research on industry developments likely to affect our plans for building, operating, and maintaining our infrastructure. We have developed a 20-year outlook that serves as the basis for corporate strategy and development of our long-range plans.

In assessing industry trends, we incorporated information gathered from both internal and external experts. We used this information to define the range of likely possibilities over our planning horizon. The sources we have drawn from include government agencies, specialty consulting firms, consumer groups, and our extensive internal expertise.

In projecting the evolution of the energy industry landscape, we considered a broad range of variables, including energy demand drivers, policy and regulatory efforts, technology evolution, infrastructure condition, and customer expectations.

Our outlook is based on the following major trends:

- Energy use will continue to grow;
- Customers will change the way they interact with us;
- Environmental focus will continue; and
- Technology advances will occur and distributed resources will grow.

1. Energy usage continues to grow

The New York City economy is expected to grow over the planning horizon. This growth is based on New York City’s continued role as a financial center of the world. Several other sectors are also expected to experience steady growth. These include professional services, educational services, healthcare, entertainment, government, and tourism. This economic growth will in turn drive population growth. The Census Bureau and the Department of City Planning expect the New York City population to grow from 8.2 million to 9.1 million over the 20 years our plan covers. Our customer energy use is also expected to grow, despite continued energy efficiency efforts.

Shifts in customer energy use

Customers use energy to meet needs in all aspects of their lives. Transportation, heating, cooling, and lighting make up the majority of energy use. Other applications, ranging from computers and televisions to large motors in elevators account for the remainder of that energy usage. As innovation and higher standards of living result in new end-use applications (e.g., new electronic devices, home healthcare, etc.,) that deliver increasing comfort and convenience, customer energy usage will likely continue to grow.
Our customers can choose how they meet some of their energy needs. Some examples of customer energy choices include:

- Meeting heating and hot-water needs with electric heat pumps or on-site boilers that use either natural gas or oil, or purchasing delivered steam from Con Edison;
- Meeting cooling needs using electric, gas, or steam driven air-conditioning systems; and,
- Meeting their power requirements by purchasing electricity from Con Edison or by generating their own power on-site, typically using natural gas delivered by Con Edison.

The figure below illustrates our customers’ total annual energy use in 2007, and how that energy was used by our customers.

Figure 2: CECONY customer end-use

Since Con Edison delivers multiple solutions to meet customer energy needs, the focus of this year’s planning effort is to understand how our customers make energy-related-decisions, and to help them make the right choice.
Our research shows that these decisions are motivated by five factors:

1. Codes and standards

   Codes and standards in certain locations encourage certain energy solutions, whether directly (by limiting the choice of solutions) or indirectly (by increasing the cost or complexity of certain solutions). These codes and standards typically embody environmental policies of federal, state, and local governments, as well as safety and efficiency requirements.

2. Economics

   Our customers' energy decisions are primarily influenced by the economics of which solution meets their needs at the lowest cost. Customers usually weigh the potential annual cost savings against the upfront investment required. Various customer segments value their energy related investments differently. Some require higher rates of returns, while others value how quickly they recover their upfront costs.

3. Comfort, convenience, and ease of use

   Several industry surveys indicate that customers place high value on comfort, convenience, and ease of use. This means they often place a high value on the reliability of the energy solution they choose. They are likely to choose solutions that will provide their heating, cooling, and electricity when they want it. Customers also value ease of use, or ease of operation. Operating boilers or generators on-site is typically not within our customers' expertise, so these solutions would not be appealing to those primarily concerned with ease of use.

4. Environmental impact

   Certain customers place a high value on the environmental impact of the energy solution they choose, and will likely opt for solutions that provide cleaner energy even though they may need to pay a premium for those solutions. In many instances, government subsidies reduce the 'green energy' premium that the customer pays.

5. Technology improvement

   Technology improvements over time may also change customer preferences as ease of use and reliability increase, while costs decrease.
The energy our customers use is delivered in the form of electricity, gas, steam and petroleum products for the most part. CECONY has three distinct systems that provide electricity, natural gas, and steam. Each of these systems is unique and distinct in physical layout, operations characteristics and infrastructure needs to maintain or grow them. We therefore need to understand how our customers will use them to effectively procure the energy they require. To this end, we have developed electric, gas, and steam demand forecasts. The growth of these three commodities is expected to be very different; electricity will grow at a slow pace, gas will grow at a faster pace, and steam is not expected to grow, possibly declining over the next 20 years.

Ultimately the energy solutions that customers adopt will drive the demand. While it is impossible to project precisely how the electricity, gas, and steam demand will change, Con Edison has used industry projections from EIA, CERA, and Wood Mackenzie, as well as internal analyses, to develop long-term forecasts that are the basis of our long-range planning efforts.

Despite energy efficiency and demand reduction efforts, electric demand will grow due to new uses.

Because investment in the electric system is driven by the need to meet peak demand, controlling that demand can result in major benefits to all our customers. Growth in the New York City economy and population has stimulated increases in peak electric demand and consumption over the last 30 years. We expect this growth to continue in the future, even though weakness in the local economy has caused short-term energy-demand expectations to be lower than earlier forecasts had projected. Economic recovery is now underway and is expected to result in increased energy use.

On one hand, technological advances have resulted in increased energy efficiency and cost savings. New lighting technologies require significantly less energy to provide the same amount of useful light. Modern appliances—such as refrigerators, heating and cooling systems, gas ovens, and home, office, and industrial equipment—use less energy than older models. These efficiency gains have contributed to increased efficiency in homes as well as commercial and industrial buildings. Advances in technology have also made it possible for Con Edison and other energy companies to implement efficiency programs and policies that save energy and reduce costs. In recent years, government efficiency initiatives have gained traction, with several states adopting efficiency goals and standards. At the national level, programs like “ENERGY STAR”1 help consumers save money and protect the environment. State-based programs such as New York’s Energy Efficiency Portfolio Standard, which creates incentives for investments in energy efficiency, also save consumers money and protect the environment.

On the other hand, the dramatic increase in commercial and residential use of electronic devices, including computers, televisions, and wireless devices, has resulted in a steady

1 ENERGY STAR® is a labeling program designed to identify and promote energy-efficient products to help consumers reduce energy bills and protect the environment. Computers and monitors were the first products labeled. The label can now be found on major appliances, office equipment, lighting, home electronics and even on new residential and commercial buildings.
increase in overall end-use over the last 30 years: the total electricity consumption in U.S. homes more than doubled from 1977 to 2006. (See Figure 3 below).

**Figure 3: U.S. residential electric end-use**

Understanding these trends in the way consumers use electricity helps us prepare our system for continued demand growth. Together with new appliances consumer electronics, which make up the majority of the growing “Other” segment in Figure 3, are expected to continue to cause the end-use of electricity to rise. Changes in health care practices are also likely to cause increased electricity consumption in American homes: as home-based medical technology improves and the population ages, we expect to see more sophisticated medical devices and machines in our customers’ homes, which will result in increased energy consumption.

Lastly, we expect the transportation sector to be a source of increased electric consumption as electric-vehicle technologies improve and are adopted by consumers. Several models of electric vehicles coming out in the next several years will rely either partially, heavily, or even exclusively on electricity. Experts estimate that by 2015, these new electric vehicles (EVs) will command up to 10% of new U.S. passenger-vehicle sales. New, electric-powered light-duty commercial vehicles are also beginning to enter the market. These innovations will also prompt further demand growth.
Electric demand is expected to grow 1.1% per year over the 20-year period (Figure 4). Potential influences, both positive and negative, are illustrated by the upward and downward arrows, and are discussed in greater detail at the end of this chapter.

**Figure 4: CECONY electric demand forecast**

This demand growth results in the need for additional infrastructure investment, as discussed in chapter 8.

**Demand for natural gas will continue to grow**

Like the demand for electricity, the demand for natural gas is expected to grow overall even as increased efficiencies reduce per-capita consumption. Efficiency-based consumption declines are expected to be offset by increased overall penetration of gas, given its low cost and relatively low environmental impact. We expect to see increased use of natural gas in electricity generation, distributed generation (gas-fired generators and micro–turbines that are used to create both electricity and heat simultaneously), and potentially transportation (natural-gas vehicles).

We also expect that government regulation, combined with compelling customer economics, will increase the demand for natural gas in the future. Our service territory presents substantial opportunities for customers to increase their use of natural gas in space heating and water heating, displacing less environmentally friendly fuels such as heating oil. Such a shift will soon be required by city ordinance. The New York City Department of Environmental Protection (NYCDEP) has recently passed rules to regulate the environmental characteristics of fuel used for space heating. The regulation requires that fuel must burn as clean as light fuel oil (#2 heating oil) or natural gas by 2030. We believe the lower price of natural gas makes it a more competitive alternative.
Similarly, natural gas vehicles (NGVs) will likely attract targeted segments and stimulate an increased demand for natural gas. New York State is on the forefront of this advance: the state has the second highest use of NGVs in the nation. However, meaningful market penetration by NGVs may be limited to specific segments of the transportation market, in particular the market for medium- to heavy-duty transportation vehicles. Privately - or publically -owned fleets of light trucks and vans already make up a large portion of the market share for compressed natural gas vehicles. The growth of the market for NGVs will also be limited by the timing and construction of the infrastructure needed to support these vehicles.

Our current plan projects gas demand to grow 1.7% per year over the next 20 years (Figure 5).

**Figure 5: CECONY gas demand forecast**
Steam demand shows modest decline

Compared to electric and gas, fewer customers use delivered steam as a source of energy. Steam is used mainly by large buildings for heating and cooling, and is only available in a portion of Manhattan south of 96th Street. We project the steam peak demand will remain relatively flat over the next 20 years (less than 5% decline for peak and sales over the 20-year period).

The expected slight decline in steam peak demand and steam sales results from the choices available to energy consumers as well as energy efficiency measures. Technological improvements have allowed our customers to create their own steam onsite. Our customers can install their own combined-heat power units (CHPs), boilers, and electric-driven chillers for cooling. Customers’ decreased reliance on our steam-distribution system will result in modest sales decline in the future.

Our current plan projects steam demand to decline by 0.2% per year over the next 20 years (Figure 6).

Figure 6: Steam demand forecast

In sum, we expect our customers’ total energy usage will continue to grow. This growth will reflect a growing economy and new end-use applications. These increases will more than compensate for the expected reduction in energy use that will come from conservation efforts and increased efficiencies. To meet this projected growth in demand for energy, we will need to continue investing in our infrastructure. We will review in greater detail in later chapters how we plan to meet our infrastructure requirements and maintain the reliability to which our customers have become accustomed, while minimizing the impact on their energy bills.
2. Customers are changing the way they interact with us

Customer expectations are changing. A significant portion of this change is driven by changing priorities and an increased ability to individualize services to one’s own needs. About three-quarters of the current U.S. population was born after the invention of the computer, and about one-fifth of the population was born after the emergence of mobile computing (smart phones and lightweight laptops). Roughly half of all Americans use computers extensively in their day-to-day activities such as banking, shopping, communicating, and researching and about one-fifth of the population use mobile computing extensively. The banking, telecommunications and retail industries have established an extensive online presence, including product offerings, customer services, and access to information.

Over the next 20 years, as the composition of the population changes and people’s experience with technology increases, we anticipate that our customers will expect us to interact with them electronically on a real-time basis. Further, we expect that the way customers make decisions will change. The immediate access to information through smart phones and the ability to connect with distant places and people through the Internet have given rise to electronic social networks such as Facebook, LinkedIn and Twitter. These networks are facilitating information flow and playing a key role in decision-making for individuals and businesses alike.

Each year the portion of the population that has experienced customized services and real-time access to information increases, all enabled by advances in technology that would have seemed far-fetched even just 20 years ago. In predicting how these changes in technology will affect the energy industry, we believe that our customers will want more customized value-added services. More specifically, as emerging energy technologies mature over time and reach the market, customers may adopt real-time energy management solutions and self-generation technologies. These systems and technologies can be integrated with grid electricity to create sophisticated, individualized real-time energy-management services for our customers to use. Customers will also expect to use technological devices to access the most current information on service work that may affect the area, as well as outage information and the estimated time for service restoration.

3. Environmental focus continues

In the energy industry and society as a whole, the definition of environmental sustainability has expanded to include energy efficiency, renewable-resource standards, emission reductions, air quality, reduction of other pollutants (such as mercury and particulate matter), and water usage.

Energy-efficiency regulation began as a loose set of guidelines but has increasingly incorporated defined goals and mandates. State and local governments are mandating specific reductions in energy usage for products sold to consumers, and requiring large buildings and other major energy consumers to meet stringent codes and conservation standards. New York State, for example, has adopted a goal of using energy-efficiency strategies to reduce electricity usage by 15% below the 2015 forecasted level.
Buildings large and small, residential and commercial will play a key role in meeting this goal, as they consume large amounts of energy to provide light, heating, and cooling. A number of states have instituted stricter standards for building envelopes, such as weatherization and energy-efficient windows. While improvements to heating and cooling often require significant investment, lighting standards can generally be implemented inexpensively.

State and local governments are developing their own energy plans that encourage the use of renewable resources, such as solar or wind power. Renewable energy is viewed as our cleanest electricity-generation technology because its operation causes no pollution and has very low (or nonexistent) emissions. However, certain factors present road-blocks to large-scale adoption of renewable energy: high capital costs, regional variations (less sunlight in the Northeast as compared to the Southwest), and intermittency (solar produces energy only when the sun is shining). State and local governments recognize these challenges and are offering subsidies to make it possible for businesses and homeowners to pursue renewable resources.

Government agencies and the public have also become increasingly sensitive to air emissions and the need to limit them. While federal greenhouse gas regulation has stalled, there have been new efforts to regulate other types of emissions such as sulfur dioxide (SO₂), nitrogen oxide (NOₓ), mercury, and other pollutants, and northeast states have acted together to use a market-based approach to reduce greenhouse gas emissions from electric generators.

The electricity generation industry, responsible for 40% of energy-related carbon dioxide (CO₂) emissions, faces significant challenges in complying with future regulations and acting responsibly with an eye toward environmental impact. The challenge is particularly acute for owners of coal-fired power plants, which accounted for 81% of CO₂ resulting from the generation of electric power in 2010. Indeed, potential regulation and the associated compliance costs will likely make higher-polluting coal plants too expensive to operate, forcing some to shut down. We expect natural-gas-fired combined-cycle plants will be the preferred technology to replace those coal plants.

Another area of interest to government regulators and those concerned about the environment is local air quality. Using oil to heat homes and buildings is increasingly recognized as detrimental to air quality. Asthma and other respiratory health problems have been linked to poor air quality. Natural gas is seen as a cleaner and less expensive substitute for oil in space heating. As measured by particulate matter, which is a byproduct of fossil fuel combustion, space heating, transportation and power-generation plants also adversely affect air quality and are being subject to increasingly stringent air quality standards governing sulfur dioxide, nitrogen oxide, particulate matter and other common pollutants. In response to air quality concerns, we expect to see greater regulation of heating-oil usage and fuel usage at power plants.

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2 Typical fuels used to heat and cool include electricity (electric heat pumps/air conditioners), oil (furnaces), steam (heating/air conditioning) and natural gas (boilers/chillers). Each of these fuel types has distinct advantages and disadvantages, including ongoing operating costs, initial construction and purchase costs of equipment, space required to house them, and environmental impact.
Legislators and regulators are also reviewing the quality of fresh water, its use in industrial processes and electricity generation, and the disposal of waste water. Like air quality, poor water quality has the potential to cause health problems. Water pollution also harms marine life. Traditional electricity generation requires access to large volumes of water, primarily for cooling. Hydro-fracturing, a process used in shale drilling for natural gas, has also raised concerns due to the volume of water it requires and its potential impact on groundwater quality.¹

Water-quality regulations, and in some cases water availability, may increase long-term energy supply costs. We expect to see new water-quality regulations implemented within the next several years.

In addition to activity at the national level, state and local governments have increased regulatory activities. Our long-range planning takes into account the potential for increased regulation at all levels of government: federal, state, and local.

Below we highlight several national regulatory schemes that are already in place, as well as New York State and New York City energy plans for the years ahead. The government energy plans described below address a wide range of initiatives designed to achieve long-term sustainability.

National environmental regulation efforts

The EPA has completed its endangerment finding, which concluded that greenhouse gases endanger public health and the environment. This finding provides the statutory basis for regulation of greenhouse gases under the Clean Air Act (CAA). Several legislative efforts have been debated, including The American Clean Energy and Security Act and the Clean Energy Jobs and American Power Act; however, these initiatives were not ultimately made into law. Due to the lack of action from all branches of government to address the risks associated with greenhouse gases, the EPA is implementing regulations that address those risks, such as the light-duty motor vehicle rule, which will regulate emissions from mobile sources. The EPA has also finalized rules and methodologies for when and how these emissions will be monitored and controlled.

The EPA is in the process of instituting four regulations focused on the power sector:

- **Cross-State Air Pollution Rule (CSAPR)** This rule requires states to improve air quality throughout the eastern half of the United States by reducing power plant emissions that contribute to ozone and/or fine particle pollution in other states. CSAPR requires a total of 28 states to reduce SO₂ and NOₓ emissions.

- **Mercury and Air Toxics Standards (MATS)** These rules finalize standards to reduce air pollution from coal and oil-fired power plants. Emissions standards set under the toxics program are federal air pollution limits that individual facilities must meet by a set

³ New York State has imposed a moratorium on natural gas drilling in the state's portion of the Marcellus shale.
date. These rules set technology-based emissions limits standards for mercury and other toxic air pollutants, reflecting levels achieved by the best-performing sources currently in operation. The final rule sets standards for all hazardous air pollutants (HAPs) emitted by coal- and oil-fired electric generating units (EGUs) with a capacity of 25 megawatts or greater. Existing sources generally will have up to four years to comply with MATS.

- **Cooling Water Intake Structure Rules** Cooling water intake structures may cause adverse environmental impact by pulling fish into a power plant’s or factory’s cooling system. The EPA is developing regulations under the Clean Water Act requiring that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

- **Coal Combustion Residuals Rule** Coal ash is the residue from the combustion of coal in power plants and is captured by particulate removal systems such as scrubbers. The EPA is proposing regulation of coal ash to address the risks associated with its disposal.

These rules and standards are expected to have an impact in the next five years. One likely result is a shift from coal to gas for electricity generation, which will cause a number of coal plants to be retired. Most analyst estimates forecast 40,000 to 50,000 MWs of retired coal capacity.

The federal government has also played a key role in the success of energy-efficiency efforts over the past 20 years. These efforts have saved customers from unnecessary energy expenses and lowered greenhouse-gas emissions. One of these efforts began in 1992, when the Environmental Protection Agency (EPA) introduced ENERGY STAR® as a voluntary labeling program designed to identify and promote energy-efficient products. Computers and monitors were the first labeled products; through 1995, labeling expanded to additional office equipment products and residential heating and cooling equipment. The EPA is currently raising the standards that products and equipment must meet to receive an ENERGY STAR® label. Today, labeling has expanded to include categories other than products and equipment: labeling is now available for buildings, such as homes and factories. We expect a continued heightening of the standards that products or buildings must meet in order to earn the ENERGY STAR® label.

*The New York State Energy Plan (NYSEP)*

The 2009 New York State Energy Plan sets forth a vision for a robust and innovative clean-energy economy that will stimulate investment, create jobs and meet the energy needs of residents and businesses over its 10-year planning horizon. To that end, the NYSEP provides a framework within which the State will meet its future energy needs reliably and in a cost-effective and sustainable manner. The NYSEP establishes policy objectives to guide State agencies and authorities as they address energy-related issues. It also sets forth strategies and recommendations to achieve these objectives.
The Plan's strategies and recommendations are designed to meet five policy objectives:

- Assure that New York has reliable energy and transportation systems;
- Support energy and transportation systems that significantly reduce statewide greenhouse gas emissions,
- Address affordability concerns of residents and businesses caused by rising energy bills, and improve the State’s economic competitiveness as a place to live;
- Reduce health and environmental risks associated with the production and use of energy across all sectors; and
- Increase the State’s energy independence and fuel diversity by developing in-state energy supply resources.

The Plan outlines five strategies for achieving these multiple policy objectives:

1. Produce, deliver, and use energy more efficiently;
2. Support development of in-state energy supplies;
3. Invest in energy and transportation infrastructure;
4. Stimulate investment and innovation in a clean-energy economy; and
5. Engage others in achieving the State’s policy objectives.

The NYSEP is currently under review, and a draft of the 2013 plan is expected in the fall of 2012. The 2013 plan will provide broad policy direction to guide energy related decision-making within New York State. New topics expected to be covered include:

- Issues associated with production and transportation of natural gas from New York’s Marcellus shale;
- Interdependency of the electric and natural gas systems;
- Issues associated with the unavailability of nuclear plants (i.e., Indian Point Energy Center);
- Effect of increased electrification of the transportation system and charging infrastructure; and
- Impacts of natural, technological, and human threats to the State’s energy systems.

Building on the prior plan’s objectives, the 2013 plan will seek to improve reliability of the State’s energy system, insulate customers from volatile market prices, reduce the overall cost of energy in the State, minimize health and environmental impacts, and maximize cost-effective energy efficiency activities.
New York City’s energy plan (PlaNYC)

The municipal government’s long-term objectives for the City of New York are set forth in its PlaNYC report. The plan was first published by the City in 2007, with specific objectives designed to improve the quality of life for New Yorkers, visitors and workers alike. The plan’s focus is on creating affordable housing, improving city infrastructure, and cleaning up the environment. PlaNYC specific energy-related goals for 2030 include:

1. Provide cleaner, more reliable power for every New Yorker by upgrading our energy infrastructure;
2. Reduce global warming emissions by more than 30%; and
3. Achieve the cleanest air of any major city in America.

Alternative fuels also play a significant part of PlaNYC’s strategy to reduce greenhouse-gas emissions from transportation. Specifically, PlaNYC has articulated the following transportation-related goals:

- Promote clean vehicles and reduce emissions from taxis, black cars, for-hire vehicles, school buses, and construction vehicles; and
- Reduce transportation emissions, currently at 22% of NYC’s total greenhouse-gas emissions, by 44% by 2030.

In April 2011, PlaNYC 2.0 was released as an update to the original plan. It identified progress made and built upon the plan for a greener, greater New York by reducing energy consumption and making energy supply cleaner, more affordable, and more reliable. The plan highlights considerable progress; in just four years greenhouse gas admissions had fallen 13% below 2005 levels.

In conjunction with the City Council, the Greener, Greater Buildings Plan was passed, impacting energy use in existing buildings. The Green Codes Task Force was launched and developed 111 specific proposals for sustainable improvements to the City’s municipal codes, many of which have already been enacted. The plan also accelerates the strategy to reduce greenhouse-gas emissions from City government operations 30% by 2017, and nearly 30 major institutions have agreed to match them.

Nuclear relicensing

An emerging energy topic has been the relicensing of the Indian Point Energy Center, owned and operated by Entergy, in Westchester, New York. In the recent past, there has been increasing concern over the relicensing of nuclear plants for environmental and safety reasons. These concerns range from water contamination, wildlife conservation, and the threat of terrorism. Following the earthquake and tsunami damage to the nuclear facilities in Japan, there has been a renewed push to reconsider licensing of nuclear facilities globally.

The impact of Indian Point retiring would be significant: it would create a deficiency of approximately 1,000 MW that would be required by as soon as 2016. The current energy output of roughly, 16,000 GWh would be replaced predominantly by fossil fuel generation that would
materially increase local and regional air pollutant emissions. CECONY estimated that increases in costs resulting from the retirement of this zero-emission, low marginal cost generator would range from about $5 - $15 billion (net present value), or an electric customer bill increase on the order of 5% to 10% or more for customers.

We have not assumed closure of Indian Point. At this time, it is not clear what the outcome for Indian Point will be or how the deficiency would be met if the plant were to close. We are conducting ongoing studies to evaluate a range of issues including demand side management, transmission projects that would debottleneck existing generation, and new generation to meet the potential deficiency.

4. Technology advances will occur and distributed resources will grow

As we have suggested, we expect technological advances to accelerate the rate of change in the energy industry over the next 20 years. Across the entire energy-industry value chain, emerging technologies have the potential to alter the way energy is produced, delivered, and consumed in fundamental ways.

Recent advances in drilling technology have opened up vast sources of natural gas. Along with being a cleaner fossil fuel, natural gas is now projected to be an affordable, domestic resource for all residential, commercial, and industrial needs, including combustion, power generation, and transportation. Concurrent advances in renewable-generation technologies have increased the potential to use energy sources such and wind and solar in power generation and distributed energy resources. Emerging storage technologies, if successful, could change the way energy is produced and stored. Such advances in supply technologies are increasing the country’s energy resource diversity, shifting us towards a cleaner, more evenly distributed supply portfolio.

Advances in the technologies involved in transmission and distribution have increased the efficiency and automation of the energy grid. Technological advancements in operations increasingly allow energy companies to monitor their networks for problems, and to achieve more effective isolation and quicker startup and shutdown in emergency situations. Other technologies, such as 3G in electric distribution and pipe liners in gas distribution, have the potential to significantly reduce capital expenditures and asset-replacement costs. Emerging technologies are also helping Con Edison and other energy companies monitor and minimize transmission and distribution leakages, thereby reducing wasted energy and increasing efficiency.

Newer technologies incorporate two-way wireless communication that makes the grid smarter, thereby enabling energy companies to manage such complex tasks as energy delivery from multiple centralized and distributed resources. Technology will also improve the efficiency of routine tasks, for example by automating meter reading.

Traditional consumer uses of energy, such as heating, cooling, and refrigeration, have become significantly more efficient due to advances in technology. Innovations in consumer applications have opened up new uses for energy, including alternate-fuel vehicles, ubiquitous digital
devices, and continued advances in televisions and other home electronics. Consumers will increasingly adopt home energy-management devices and 'smart' appliances to balance their economic, environmental and efficiency preferences.

Technological advances have strengthened core utility operations, and the industry is now poised to benefit from a wave of innovation that will increase efficiency and flexibility. Technological advances allow us to simultaneously simplify operations (for example, by remote monitoring) while our business grows ever more complex, incorporating multiple energy solutions, the smart grid, and customized products and services. The pace and extent of technological breakthroughs to come are uncertain, and require us to build significant flexibility into our long-term plans.

We will manage this uncertainty by monitoring emerging technologies, and focusing on technologies that have the potential to add significant value to our customers. Our priority is to deploy technologies that can reduce capital costs, incorporate customer-cited solutions, increase operations efficiency, and help us meet the reliability and safety needs of our customers. One example, our new work management system, will enable standardization of work-management processes across regions, which will enable Con Edison to obtain information in real time, manage work more efficiently, and better plan for future needs.

Key signposts

*We have chosen as key signposts data points that we believe will alert us to a need to make changes to our plans.*

Our views on energy demand, economic growth, consumer behaviors and technology advances have guided our long range planning. Although each of the three commodities we offer customers (electric, gas and steam) is a separate business, all three are often affected by similar drivers. When developing the scenarios for the long-range plans, we combined key assumptions in order to develop consistent visions of the future in which each business would operate. As seen in the table below, while the scenarios for each commodity are based on consistent assumptions, those assumptions do not impact each of our commodities equally or in the same direction.
Table 1: Common assumptions

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Our current long-range plans assume the outcomes identified in the Plan case within Table 1. We continue to monitor developments; and as the future unfolds, we will adjust our plan as needed. In addition to monitoring these assumptions, we bear in mind that the pace of tax collection will change, supply costs will fluctuate, new technology will be adopted and cost reductions will be needed and that each of these developments will impact our efforts to achieve our long-range plan. Each commodity’s long-range plan specifies its particular 20-year outlook and the signposts we are monitoring.

Implications

Industry trends help us form views and focus on areas that shape the way we think and plan for the future. Growing demand requires the expansion of our infrastructure. We need to make smart decisions on how to build out our systems to meet customer needs safely, reliably, and at a reasonable cost. We are focused on developing a plan that offers affordable energy solutions and supports long-term sustainability for us and our customers.
Chapter 6: Strategic priorities

We have identified five strategic priorities that will enable us to integrate our efforts and achieve our vision. These priorities reflect our focus on helping our customers control their energy costs, becoming more transparent as an organization, and continuing to provide safe, reliable energy. By maintaining this focus and following through on our commitment to achieving our vision, we will build better relationships with our stakeholders and customers.

1. **Reduce capital intensity through enhanced system design.**

Our ability to reduce the capital intensity of our system has a significant impact on the future cost of our operations. Our systems are designed to provide the highest level of reliability. However, reliable systems require a significant amount of capital investment. In order to reduce our capital needs in the future, we plan to employ innovative system designs, as well as improved integration of customer-sited solutions, including energy efficiency, demand-side management, and distributed generation. In addition, we expect that new network designs will allow us to lower the costs of safely and reliably meeting customer demands for energy — mainly by sharing assets between electric distribution networks. We will also pursue network designs that allow us to build out capacity in a sequence that more closely matches increases in customers’ demands.

We have also undertaken efforts to improve our processes for deciding when and where to expend capital. We have started an effort to prioritize our investments by designing and adopting a capital-optimization model that helps us select a portfolio of highest value projects. We continue to look for ways to better manage our assets and our programs to replace equipment. We are moving from time-based to condition-based maintenance, which will better direct maintenance expenditures while improving public safety. Another effort to reduce capital intensity targets our investments to achieve the best marginal improvements. Finally, we have also developed and are using an engineering tool called the “Network Reliability Index” to prioritize reliability-improvement investments in the networks with less reliability.

2. **Pursue opportunities for cross-commodity integration to lower customer energy costs.**

Not only in our capital expenditures but in all aspects of our work, we are committed to a planning process that maximizes the interconnections among our three commodities—electric, gas and steam. Capturing cross-commodity opportunities will help us meet our goal of helping our customers control their energy costs. By taking an integrated, cross-commodity approach to providing energy, we will moderate collective energy costs in several ways: by making the most cost-effective infrastructure investments; and by unlocking cost savings in operations.

In addition, our cross-commodity approach will confer other key benefits beyond cost savings. By creating a more integrated, streamlined organization, we will provide our customers with a single point of contact for their energy needs, which will improve their experience as energy consumers. The cross-commodity approach will also enable Con Edison to provide advice and support for our customers, ensuring that they have the information they need to select the best
energy solution for their specific need. Lastly, the cross-commodity approach will enable us to coordinate delivery infrastructure planning with available supply alternatives.

We believe that Con Edison’s integrated, cross-commodity approach will not only help customers control their energy costs, but also improve our business processes and execution across the company. To promote an integrated product approach across Con Edison’s organizations, we are devising new processes that will improve both internal and external communication and facilitate collaboration among our departments. To support these new processes, we plan to launch new information-technology systems that will streamline communication and workflow. This will help us improve work coordination and meet customer expectations.

3. Develop a broader portfolio of infrastructure solutions.

Given continued increases in the costs of maintaining and expanding the infrastructure on which metropolitan New York has long relied, we are developing a broader set of solutions to help us reduce our capital expenditures and meet our customers’ needs in a cost-effective way. This embrace of alternative infrastructure solutions is a central component of our integration efforts and is critical to our efforts to reduce capital intensity.

Fortunately, technological advances in our industry present opportunities to implement creative alternative systems, particularly by developing customer-sited solutions based on the latest technology. By employing these solutions, we are expanding our focus to include not only our traditional infrastructure, which remains an integral part of our network, but also the technologies of the future.

Among the customer-sited solutions that we have already identified as central to our plans are energy-efficiency, demand-side management, distributed generation, combined heat and power, and renewable generation. We have already begun to implement these solutions, and our customers are seeing benefits. We are actively planning to roll out more customer-sited solutions over the next 10 years. We are also engaged in ongoing research aimed at identifying additional new technologies that will further expand our range of solutions and provide more alternatives to our traditional infrastructure solutions.

Our priority is to use the lowest cost alternative to a traditional utility infrastructure solution, while maintaining safety and reliability, and doing so with minimal impact on the environment. We are committed to finding and implementing technology and programs that allow customers to realize the benefits of cost-effective alternatives, but do not inadvertently subsidize energy uses that benefit a few of our customers at the expense of the many others.
4. Improve customer interactions by streamlining our customer processes.

We envision a future where we continue improving interactions with our customers to meet their needs for the electric, gas, and steam commodities we deliver. Today, we are fully engaged in working with our customers to increase the efficiency of their energy consumption to help prepare for new and innovative technologies that are on the horizon, and to achieve state and local goals for environmental sustainability.

We envision a future where we work to implement customer-sited solutions that empower our customers by permitting them to be another source of energy supply to the delivery network, if they so choose. Currently, our delivery of energy operates largely in one direction; from upstream production sources to our customers.

We envision a two-way exchange of energy, in which we work with customers to carry out a unified energy strategy that aligns infrastructure investment with our customers’ needs for safety, reliability, and low costs. We are already well underway toward that collaborative future with some customers, in particular those who are sophisticated owners of large commercial real estate, and we are committed to developing similar relationships with the smaller commercial and residential users who make up the vast majority of our customers.

We see a future where we work together with our customers to balance system demands with available storage; one where our customers provide us with electricity generated from their own solar panels or other renewable resources for distribution and use by other customers. We envision a time when we may provide some customers with steam, and they may in turn send electricity back to our grid. Likewise, we may someday provide natural gas to a customer and receive electricity or steam in return.

While our traditional planning efforts have not taken a partnership approach to our customer relations, a shift to that approach is well underway. As we develop our integrated long-range plan, we will continue to build a two-way partnership with our customers.

We are also committed to providing clarity in our rates to facilitate new customer-sited solutions, like distributed generation. We will provide the level of service customers’ request. Our rates are designed to recover the cost of infrastructure we build to meet new customer needs and must balance the interests of new customers with those of all customers.

5. Promote a culture focused on transparency, customer needs, and cost management.

Underlying our efforts to lower customer costs, integrate our systems, and improve our customer interactions, we are working to strengthen our corporate culture. We are committed to building a more constructive business relationship with our customers and stakeholders, by taking a more proactive and engaging approach based on accountability and open communication. We envision an interactive relationship with the Public Service Commission by maintaining two-way communication and keeping them informed of our long-range plans and goals, as well as shorter-term projects and programs that we are implementing to achieve those goals.
We will also be more open in sharing our challenges and concerns with stakeholders. Ultimately, we seek a framework where our own internal decisions, and the regulatory decisions that affect us, are based on accurate information, a clear appreciation of desired results, due consideration of the regulation required to achieve the desired results, and an awareness of potential unintended consequences. We will engage in consistent, meaningful dialogue aimed not only at providing our stakeholders with information and context for our decisions, but also at receiving feedback that enables us to address stakeholders’ concerns—not only during rate proceedings, but before and after as well. Open and informative communication with our stakeholders should produce a better outcome for our customers and our company, as well as for policymakers and shareholders.

Our plan to improve our relationship with our stakeholders is part of a broader initiative to strengthen all aspects of our company’s communication, both internal and external. We want to build a culture that is better focused on our customers’ needs. In our efforts to become a better company, we have identified three core values as the starting point for strengthening our culture. These three cultural values will inform our efforts to articulate and implement our integrated long-range plan:

- **To be open, fair, trusted.** In the past, we did not always recognize the relationship between energy delivery service and information for those whose lives and businesses we affect. We will share more information with our customers and stakeholders, and do so more proactively.

- **To engage our customers and external stakeholders.** In the past, we have tended to focus on the work of providing reliable energy delivery. We will add to this work an effort to understand how our decisions and plans affect others. We will seek greater input, and integrate what we learn into our actions.

- **To be vigilant in cost management.** We are implementing a philosophy of spending every dollar as if it were our own. This means that we review every project proposal by asking three questions:
  
  o Do we need this?
  
  o Are there more cost-effective alternatives?

  o Do the benefits of the project outweigh its cost?
Chapter 7: Opportunities for integration

Understanding our customers and the way they use energy is critical to this effort. By gaining insight into the areas of overlap in how our customers use each of the three commodities we deliver, we are able to identify and take advantage of opportunities to provide cost-effective solutions that draw from all three commodities. We are embracing these opportunities by offering a broader range of cross-commodity solutions—such as combined heat and power, oil-to-steam conversions and steam air conditioning. These cost-effective solutions will reduce our system peak, and allow us to defer large capital investments.
1. Heating

Customers have a number of choices to meet their heating needs. Within our service territory, customers primarily choose among three options: heating oil, natural gas, or steam. Electric heating is much less prevalent in our service territory than in other areas of the country due to relatively high electricity prices in the northeast.

Many oil users have been converting to natural gas service, largely due to fuel savings and recently enacted clean heat regulations in New York City. However, in some cases, steam is the economic choice for conversion. We will provide customers with access to information on how to achieve the least-cost space heating solution. A customer’s decision is important to Con Edison as it impacts our infrastructure planning and capital requirements.

Since we see the potential for many oil users converting to natural gas, we are faced with the challenge of meeting new natural gas demand and infrastructure needs. We also need to have adequate supply and pipeline capacity to operate our natural gas system reliably. Furthermore, we face logistical challenges in managing a significant number of natural gas service requests and effectively coordinating the work. We must complete the work in a way that minimizes disruptions to the community, is cost effective, and does not contribute to higher overall firm delivery rates for existing customers.

To meet these challenges, we have a business plan and marketing campaign designed to bring customers on to the system as efficiently as possible. In addition, we support projects, such as the Spectra pipeline, that offer access to new sources of low cost natural gas supply. To reduce the cost of work we must perform to supply new customers, and to avoid street disruption, we plan to coordinate and integrate our street work with concurrent Con Edison or City projects. Furthermore, we have created a new department dedicated solely to our natural gas conversion activities.
Clean heat regulations

In 2007, New York City’s Mayor Michael Bloomberg launched PlaNYC 2030. The purpose of this plan was to “prepare the city for one million more residents, strengthen our economy, combat climate change, and enhance the quality of life for all New Yorkers.” One of the findings was that 1% of buildings in New York City (approximately 10,000) produced 86% of the city’s soot pollution; more than all the cars and trucks in New York City combined. The buildings that were identified are unique in that they burn #4 or #6 heating oil (“heavy fuel oil”).

In April 2011, after two years of stakeholder engagement, Mayor Bloomberg adopted new clean heat regulations to improve air quality. The new regulations are targeted at heavy fuel oil and require the following:

- No permits for new #6 or #4 boilers will be issued, effective immediately (unless emissions are as clean as #2 oil);
- No certificate of operation will be renewed after July 1, 2012 for boilers burning #6 oil (unless emissions are as clean as #4 oil);
- All boilers must use the cleanest fuels (#2 oil, natural gas, or equivalent) upon retirement or by 2030, whichever is sooner; and,
- Compliance waivers will be considered.

There are approximately 7,000 buildings in Con Edison’s natural gas service territory that burn heavy oil (the remaining 3,000 are in the National Grid territory), with the greatest building density being in Manhattan and the west Bronx, as we can see in Figure 7.

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5 Source: NYC Department of Buildings
6 NYC.gov Press Release April 21, 2011 Mayor Bloomberg Presents an Update to PlaNYC: A Greener, Greater New York
Approximately 4,000 of the buildings are located in Manhattan, an area where our natural gas and steam service territories overlap. In the overlapping area (see below), we will assist customers in comparing natural gas and steam service and encourage them to choose the most cost-effective solution to meet their heating needs.

Figure 8: CECONY gas and steam service territory
Customer economics

Many potential space heating customers, particularly in Manhattan, can choose between #4 oil, #2 oil, natural gas or steam to meet their heating needs in the near term (No permits for new #6 or #4 boilers will be issued, unless emissions are as clean as #2 oil). A customer's decision is primarily based on economics, which is best evaluated as the levelized cost of energy. Customers whose annual energy savings offset the fixed carrying costs associated with the upfront equipment/building retrofit costs and utility connection costs will achieve the best economics. The figure below considers a sample of customers in Manhattan who are located in the footprint of both the natural gas and steam delivery systems. It compares the annualized unit cost of the four heating fuel choices mentioned.

Figure 9: Annualized cost of energy

As the figure shows, among the sample set of customers considered, natural gas is the preferred economic choice, which is typically the case. However, in some scenarios, steam is the preferred choice. The relative cost of converting from oil to natural gas or steam depends on specific outcomes for a number of key cost elements: delivered fuel costs, operating costs, equipment and building retrofit costs, and utility connection costs. Utility connection costs are the most variable and depend largely on the distance from the building to a main. When a customer is much closer to a steam main than to a natural gas main and/or reinforcement is required on the natural gas system, the costs for steam may be lower than the costs for natural gas and steam may be the least-cost energy solution.
1. Delivered fuel cost (fuel and fuel delivery)

Natural gas is expected to remain a low-cost fuel for space heating for the foreseeable future. The figure below compares forecasts for delivered natural gas and oil prices in constant 2011 dollars. The price of delivered natural gas has been below the price of delivered oil for the past couple of years, and is expected to remain so over the long-term, primarily due to the abundance of shale gas.

**Figure 10: Delivered fuel prices ($2011/dt)**

Fuel cost savings are significant for a customer converting to natural gas, but are not as large for a customer converting to steam. The fuel cost savings for steam are lower due to lower efficiencies for steam as compared to an on-site natural gas boiler. In addition, steam delivery rates are higher than natural gas delivery rates because steam rates recover the costs of the plants used to produce the steam.

2. Operating costs

A customer’s operating costs for steam service are lower than those for natural gas or other oil fuel alternatives. Operating costs for steam service are negligible and primarily consist of maintenance of the steam meter/regulator station. In contrast, natural gas and oil customers need to pay for boiler/burner maintenance.

3. Equipment/building retrofit costs

Converting to natural gas requires either a burner or boiler replacement. This decision is generally catalyzed by the age of the existing boiler. Owners of boilers that are more than 20-30 years old typically decide to replace the existing boiler as it nears the end of its useful life. Alternatively, an owner of a newer boiler can decide to replace the burner with one that burns #2 oil or natural gas. The cost of either burner or boiler replacement varies with the fuel choice and size of the heating demand. Oil burner replacements cost approximately $150,000 for a building over 150,000 square feet. Natural gas burner replacements for a building the same
size costs approximately $200,000. Similarly, oil boiler replacement costs approximately $235,000 for a building over 150,000 square feet, while natural gas boiler replacement for a building the same size costs approximately $270,000.

Customers choosing steam incur upfront costs as well. Steam service customers are required to install a meter/regulator station on-site for approximately $250,000 upfront to measure and monitor the steam.

Overall, as Figure 9 indicates, the upfront cost of the various fuel choices is about the same.

4. Utility connection costs

The cost of connecting to Con Edison’s natural gas or steam systems varies based on a combination of the size of the building, type of customer, expected revenue and distance from Con Edison’s existing gas or steam distribution mains.

Natural gas service:

Customer can choose between two types of service: firm gas service and interruptible gas service. New service typically creates natural gas main extension costs. Natural gas main extension costs are a function of the type of service connection (high pressure or low pressure) and the length of main extension (the customer’s property line to Con Ed’s gas main).

For natural gas firm service, main extension costs are allocated between the utility and the customer according to tariff. The utility bears the cost of the first 100 feet of gas main extension. When a gas main extension is greater than 100 feet, a revenue test is applied to determine whether or not the customer is obligated to pay the gas main extension cost beyond the first 100 feet.

- Pass the revenue test: In cases where the pure-based revenues (equal to new gas usage multiplied by the firm delivery rate) from all customers served from the main extension are estimated to exceed 40% of the cost of the extension in each of any two consecutive calendar years, the upfront gas main extension cost beyond the 100 feet is not charged to the customer but rather funded by the utility.

- Do not pass the revenue test: In cases where the pure-based revenues (equal to new gas usage multiplied by firm delivery rate) from all customers served from the main extension are not estimated to exceed 40% of the cost of the extension in each of any two consecutive calendar years, the gas main extension cost beyond the 100 feet are charged to the customer. If the customer failed the revenue test, they havetwo options, pay utility costs upfront or pay over a period of time in the form of a monthly charge.

For natural gas interruptible service, a customer must meet alternate fuel requirements and pay for utility connection costs upfront. The customer pays a discounted delivery rate but faces the risk of his/her service being interrupted when the temperature reaches a certain level, typically 20 degrees Fahrenheit. There are different classes of interruptible service that vary by level of reliability. The customer chooses a service class based on their needs for reliability.
Steam service:

Steam service is also subject to a revenue test.

- **Pass the revenue test:** In cases where the sum of two years’ estimated pure-based revenues collected from the utility are greater than the cost of the main extension, the cost is not charged to the customer but rather funded in rates.

- **Do not pass the revenue test:** In cases where the sum of two years’ estimated pure-based revenues collected from the utility are less than the costs of the main extension, the excess cost is charged to the customer.

5. **Chimney lining**

Owners of older buildings converting to natural gas may also have to pay for a chimney liner. Chimney liners are required for older buildings with unlined masonry or plain brick chimneys. The cost of a chimney liner varies with the size and height of the building. For buildings less than five stories, chimney liner cost per floor is $6,000. For buildings five to 15 stories tall, the cost per floor typically ranges from $7,300 through $9,300. For buildings that are greater than 15 stories, the cost is typically $10,000 per floor.

**Integration opportunity**

Con Edison is committed to supporting customers as they evaluate space heating solutions. In Manhattan, the overlap of our natural gas and steam service territories presents a cross-commodity integration opportunity. In this area, we will assist customers in comparing natural gas and steam service and encourage them to choose the most cost-effective solution to meet their space heating needs.

We screened the buildings located in the overlapping natural gas and steam footprint for the ones with the best potential for subscribing to steam service and compared the costs of steam service with that of natural gas. We determined that the best candidates for steam service had the following characteristics: the buildings must be within 250 feet of a steam main, pass the revenue test, and be greater than 250,000 square feet. Using this criterion, 777 of the 4,000 buildings burning heavy fuel oil in Manhattan are within 250 feet of a steam main, the distance from a steam main that a building must be within in order to require Con Edison to serve that building. Of the 777 buildings, 488 passed a revenue test that qualifies steam pipe to be installed from the closest steam main to the building at no upfront cost (collected in rates). Of the 488 buildings that are eligible to have steam service at no upfront cost, 135 were greater than 250,000 square feet. This sized building was chosen because it has a large enough oil boiler that, when removed, there is significant rentable space for the building owner to generate revenue.
Figure 11: Oil-steam screening process

Though these 135 buildings were screened for having the best potential for steam service, natural gas is still the most cost-competitive in the vast majority of the cases, with a few exceptions. These exceptions include when a building is far away from a natural gas main, causing the customer to pay upfront costs for a natural gas main extension and service connection. We found 20-30 buildings that fit this criterion and expect them to convert to steam service.

There is currently ample capacity on our steam system for these 20-30 potential steam conversions. The current winter steam peak demand forecast is about 9,650 Mlb/hr on average for the next five years. If steam were to sign on a total of 30 buildings, the coincident steam peak would increase by about 100 Mlb/hr for a total peak of 9,750 Mlb/hr on average. There is currently 10,000 Mlb/hr of steam capacity available to serve load.

Recent trends

Since the announcement of the clean heat regulation, we have seen a significant increase in new service requests for natural gas.
As the figure above shows, requests from #6 oil users have increased. This is likely because the regulation does not permit certificates of operation renewals for #6 oil boilers after July 1, 2012 (unless emissions are as clean as #4 oil). A similar number of natural gas requests have come from #2 oil users. Since #2 oil buildings are not affected by the NYC regulation, we believe that their interest is driven by the competitiveness of natural gas prices relative to #2 oil prices. There have been a smaller number of requests for #4 oil conversions, which we believe is because the regulations permit existing boilers to use #4 oil (or oil burning as cleanly as #4) until 2030.

Our challenge

Meeting natural gas demand

We expect a significant increase in natural gas demand from oil conversions. If all of the 7,000 buildings were to convert to natural gas, their aggregate peak demand would be approximately 600 mdt/day, or 55% of Con Edison's current natural gas peak demand. Our long-term forecast assumes that approximately 70% of the buildings will convert to natural gas service over the next twenty years. Of those converting, 74% are expected to convert to firm gas service. Accommodating this demand growth will significantly impact infrastructure planning and reinforcement.

As we can see in the figure below, we expect a 1.7% compound annual growth rate in peak demand over the planning period. A significant volume of conversions is expected in the next five years, with a 3.5% compound annual growth rate over that period.
Historically, peak demand growth has depended on the rate of economic growth. Following this same logic, growth, not including heavy oil conversions, would be 1.0% over the next twenty years, as shown in the figure above.

Logistics

New York City is one of the most densely-populated, urban environments in the world. In such a congested area, we are faced with many conversion customers in the same vicinity potentially requesting conversions to natural gas at different times. If this random conversion process were allowed to occur, it would require digging up the streets multiple times, causing disruption to the community and adding to the connection costs of many of the new customers.

As mentioned earlier, we expect a significant number of oil conversions in the near term. We forecast approximately 65% (3,200) of the expected conversions to occur in the next five years, largely due to regulatory deadlines\(^8\) of NYC’s clean heat rules, and the boiler age distribution in our service territory. A rapid number of conversions complicates matters because there will be many jobs scheduled for construction in a short period of time. We must have adequate resources to complete the work in a timely manner.

\(^7\) The increase in 2008 peak demand is due to New York City Housing Authority (NYCHA) switching from interruptible to firm service.

\(^8\) No #6 Certificate of Operation renewals after July 1, 2012, unless emissions are as clean as #4 oil. Certificates of Operation have duration of three years.
Our plan

Adequate infrastructure to meet growing natural gas demand

Con Edison manages a large, complex underground transmission and distribution system. The system consists of 4,323 miles of gas mains, with 86 miles of transmission mains and 4,237 miles of distribution mains. Of the distribution mains, 621 are large-diameter supply mains that connect the transmission system to 3,616 miles of smaller-diameter mains, which deliver natural gas to our customers at a variety of pressures:

- 32% is high pressure (HP)
- 9% is medium pressure (MP)
- Less than 1% is intermediate pressure (IP)
- 59% is low pressure (LP)

As we can see, a large portion of the distribution system consists of low pressure mains, which are adequate for our current customer needs, but will require reinforcement to accept the new loads from oil conversions.

The Bronx is an example of a system that is largely low pressure and is adequate for current customer needs but requires reinforcement for new loads. The figure below shows the current adequacy of the Bronx low-pressure distribution system and the inadequacy of the system if 100% of the heavy oil users convert to natural gas. The system is color-coded by pressure, with the color red representing inadequate pressure areas requiring reinforcement.
There are three techniques we could employ to reinforce an inadequate system:

- Install regulators, where possible. Where there is a high pressure main nearby, we can connect a regulator and associated main ties/extensions to provide an additional supply point to the low pressure area;
- Replace smaller diameter mains with larger diameter mains to add capacity; and,
- Install new mains to supply new customers.

In the Bronx, we would expect to install 16 regulator stations and over 38 miles of pipe if 100% of the heavy oil users converted to natural gas.

Adequate supply to meet growing natural gas demand

We also recognize that we must have adequate supply to meet growing demand. To this end, we support projects that give us access to new sources of low cost natural gas supply. In December 2009, the Company entered into an agreement with Spectra Energy to build a new supply pipeline from Northern New Jersey to the west side of Manhattan. Once the project is in service, it will deliver new, critically needed natural gas supplies to the New Jersey and New York areas, including Manhattan. The project, expected to be in service by the end of 2013, will have the ability to transport up to 800 Mdt/day of new natural gas supplies to the region. This pipeline alone would provide ample supply to meet the aggregate peak usage of all 7,000 heavy oil users converting to natural gas (600 Mdt/day).
Cost drivers

Expanding and reinforcing our system to meet new demand will require significant investment. Our natural gas infrastructure is located underground, with gas mains installed under almost every street and/or sidewalk in our service territory (aside from Northern Westchester). System expansion and reinforcement requires a significant amount of trenching in the streets, resulting in high costs for excavation, construction, and restoration. In some cases, potential conversion customers in close geographic proximity will request conversions at different times, and we are faced with the possibility of having to trench the same street multiple times. We plan to minimize these situations through customer aggregation and work coordination strategies, which we will discuss later in this document.

We will be installing regulator stations, replacing mains, installing new mains, and connecting services to customers to accommodate the new demand on our system. The infrastructure itself is costly, and in some instances, one infrastructure solution is more cost-effective than another while achieving the same level of reliability. Wherever possible, we will pursue the least-cost solution for high reliability.

Based on internal studies, if all heavy oil users convert to natural gas, we expect to spend approximately $1.6 billion, with $1.1 billion spent on our distribution system ($700 million in Manhattan, $287 million in the Bronx, and $111 million in Queens) and the remaining $500 million spent on our transmission system.

Managing costs of infrastructure investments

Using assets wisely:

We plan to manage growth in a way that does not raise rates for our customers. We must exercise sound judgment regarding the type of infrastructure we install in the ground to reinforce the system. In certain situations (such as when a high pressure main is in close proximity to the area experiencing low pressure), main reinforcement may be more costly and less effective than installing a regulator station. The regulator station provides an additional source of supply and allows us to utilize existing mains instead of having to trench a significant amount of street to replace or install new mains. As a comparison, a new regulator station typically costs $3 million, while the average cost per foot of main installed in Manhattan is approximately $2,000. If the main reinforcement required is greater than 1,500 feet and a high pressure main is nearby, a new regulator station installation would be a more appropriate solution than main reinforcement. The regulator would require less excavation, construction and restoration costs, and would be less disruptive to the community.

In approximately half of the expected regulator installations, we may be able to use a new, smaller, more efficient and cost-effective regulator than the traditional $3 million one. The new design will reduce the construction footprint and resulting cost to install. Smaller regulators are forecasted to save approximately $25 million over the 20-year period.
Aggregating customers:

To manage trenching costs, we will employ a customer aggregation or “clustering” strategy, whereby we encourage customers in close geographic proximity to convert at the same time. The objective of this clustering strategy is to trench the street once and connect as many customers at one time to minimize costs and disruption to the community. This avoids repeated trenching efforts that would occur if customers in the same vicinity converted at different times. By growing the natural gas system in a cost-effective manner, clustering helps to lower customer bill rate increases.

Coordinating work:

Another strategy we have to manage trenching costs is to integrate our street work with concurrent Con Edison or City projects. We can coordinate trenching schedules to complete work at a fraction of the price and time that normally would be required. One example we are pursuing this year is on the west side of Manhattan and parts of the Bronx, where Con Edison’s Electric Transmission Operations department will be trenching the streets to refurbish an oil-o-static line. This project falls in the vicinity of over 100 heavy oil users. To take advantage of this situation, Gas Operations and Electric Transmission Operations are coordinating a trenching schedule to install a high pressure gas main. In addition to connecting new customers, this project has the additional benefit of supplying more potential capacity into adjacent low pressure areas by building regulators off of this main.

A second example of work coordination involves New York City, which has a major public improvement project tentatively scheduled for 2013 on the Grand Concourse in the South Bronx. There are 29 potential heavy oil conversions in this vicinity. We are coordinating trenching with the City to save costs and reduce disruption.

A final example of work coordination involves our company’s main replacement program. We have an annual program to replace cast iron and unprotected steel distribution mains with plastic and cathodically-protected steel pipe to reduce leaks and maintain system integrity. Replacement footage is mandated by the Public Service Commission, currently at a rate of 40 miles per year. We are actively pursuing situations where we can combine and coordinate our replacement program efforts with our conversion activities to reduce trenching and save costs. For example, the main replacement program may be replacing pipe in proximity of natural gas conversion candidates. We will market the area prior to main replacement work and encourage conversions to natural gas. That way, when the streets are being trenched for main replacement work, we can appropriately size the mains we install, so that we do not later have to re-trench the same area and redo prior work.
Con Edison is dedicating resources to meet the challenges associated with oil conversions. We have created a department, called the Gas Customer Conversion Group, with responsibility for executing the company’s conversion activities.

The Gas Customer Conversion Group is comprised of a number of divisions:

- **Gas Customer Solutions** – serves as a single point of contact for the customer; responsible for the sales, marketing, and call center functions.
- **Planning** – makes engineering recommendations or gas service determinations for customers, and ensures all engineering work is consistent with new business processes.
- **Conversion Operations** - manages installations for conversion customers.
- **Analytics** – analyzes the financial aspects of conversion. Tracks conversion metrics, trends, and quantity.
- **Strategic Support** – coordinates with internal departments and external stakeholders such as New York City agencies, the Public Service Commission, and the Real Estate Board of New York.

The group has created a website (http://www.coned.com/gasconversions) for customer interaction, communication, and education. It also provides a link for potential customers to apply for natural gas service.

**Marketing strategy**

Proactive marketing will be critical to our conversion program for two reasons: to manage growth of the natural gas system in a cost-effective manner for both the Company and our customers, and to help the City achieve its clean heat goals. Our marketing strategy consists of mailings, town hall meetings, door-to-door canvassing, and presentations to real estate and building management organizations to educate customers on the benefits of natural gas.

We will employ targeted marketing to cluster customers in close geographic proximity to convert to natural gas at the same time. This is done for the purpose of reducing trenching costs and disruption to the community, and in some cases, to group customers for revenue test purposes. Sometimes customers do not pass our revenue test individually but they do pass it if we cluster them with a group. In one case in the past, we benefited from our relationship with a local community board to gather a group of potential customers into a meeting. We explained to the customers the benefits of being a group and were able to successfully convince them to convert at the same time.

Another marketing strategy involves targeting customer segments, which we show in the table below. These segments are customers who we can connect at a low cost. These customers are located close to natural gas mains with adequate capacity, or smaller-volume customers who do not require significant system reinforcement. By connecting these customers we
increase the usage of our natural gas system at low cost, thus helping to slow general delivery rate increases.

**Table 2: Customer clustering for conversion**

<table>
<thead>
<tr>
<th>Target Customer</th>
<th>Number of Potential Conversion Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 100 feet of &gt; 6” high pressure mains</td>
<td>600</td>
</tr>
<tr>
<td>Within 100 feet of &gt; 16” low pressure mains</td>
<td>700</td>
</tr>
<tr>
<td>Less than 4,000 cubic feet per hour</td>
<td>2,300</td>
</tr>
</tbody>
</table>

Similar to clustering, we are pursuing an area growth strategy that involves marketing to customers in close geographic proximity who are located on different mains, not the same main. This approach considers the revenues and costs of these customers collectively for revenue test purposes. If the collective group passes the test, Con Edison will fund the upfront connection costs, but later recover them through general rates. This concept creates an opportunity to connect customers who otherwise would not have converted due to them having to pay high upfront connection costs.

**Delivery rates**

*Lower increases to rates*

Our plan to manage the growth of our natural gas system in a cost-effective manner will help reduce the rate of increase in delivery charges over the 20-year period, as illustrated in figure below. This figure shows two firm delivery rate trajectories with the following capital and growth assumptions:

1. Firm delivery rate without oil conversions assume only demand growth of 20% and capital expenditures of approximately $6.6 billion over the 20-year period; and,

2. Firm delivery rate with oil conversions assumes traditional demand growth plus growth from oil conversions. This results in approximately 40% demand growth and $7.2 billion million in capital expenditures over the 20-year period.
The $600 million of capital required for heavy oil conversions is less than 10% of the total gas capital for the twenty-year plan. Since heavy oil conversions contribute an incremental 20% to gas demand growth, we forecast lower increases to firm delivery rates for existing customers.

**Next Steps**

These heating conversions are occurring even as finish writing our plans. Thus, it is important to note that we continue to define our oil conversion plan as we learn from our experiences and gain further customer insight.
2. Cooling

Our customers can choose among several energy solutions to meet their cooling needs. Like people in most other parts of the country, our customers must first choose between individual room air-conditioning units (i.e., window units) and a central cooling system. The most common solutions in our service area are electric powered room air-conditioning units, of which there are approximately 6 million units in our service area. These window units are widely used by our smaller residential customers because the units are modular and are needed for only a few months out of the year.

We do not expect this pattern of use to change much over the course of our plan, because the costs and inconvenience to switch from room air-conditioning to a centralized cooling system are too high for our residential customers. Because room air conditioners contribute about 20% to our peak electric demand, we have targeted programs to incentivize customers to replace older units with newer, higher efficiency units.

Within our service area, particularly Manhattan, there are also thousands of large, high-rise, mixed-use buildings that use a central chiller plant because their greater demand for cooling justifies the investment in a higher efficiency system. Central chiller plants are more efficient because they use water to absorb and transfer heat, while room air-conditioners use air-to-air heat transfer. A pound of water can transfer about five times the amount of energy as a pound of air. This added efficiency comes at a price though; central plants take up much more space and require piping and ventilation throughout the customer's property, so a larger cooling demand is required to justify this investment. In addition to the efficiency benefits, central cooling provides other benefits to many customers that are Class-A office buildings, whose owners are concerned with the aesthetics and environmental impact of their building.

Selection of central chiller equipment does not resolve the energy commodity decision since the equipment can be powered by electricity, gas, or steam. Customer decisions on cooling their homes and buildings are influenced by several factors. These include:

- Cost – equipment, installation, operating, and energy costs;
- Convenience – complex retrofit requirements vs. plug and run modular solutions;
- Aesthetics – owners of Class-A office buildings are concerned with the façade of the building and prefer central cooling systems; and,
- Other considerations – environmental impact.

Customers make cooling equipment decisions when their existing equipment is close to or reaches the end of its useful life, or when planning for the cooling needs of a new building. We are interested in how and when customers make these decisions because their cooling needs are greatest during our peak electric demand in the summer, so increased demand could result in significant infrastructure investment requirements.
Recent trends

We are seeing a shift in how our large customers meet their cooling needs using our delivered electric, gas, and steam. Since 2001, 78 customers switched from steam to electricity as the power source for their chiller equipment. This trend has developed mainly because of the age of our customers’ steam air-conditioning equipment. Most of our customers’ equipment is nearing 20 years of age, which is its expected useful life. Many steam chillers are much older than that. The figure below shows the age distribution of the chillers serviced by our steam system.

**Figure 17: Age distribution of chillers in CECONY steam service area**

![Bar chart showing the age distribution of steam chillers in CECONY steam service area. The chart indicates that 43% of the chillers are 20+ years old.](image)

Source: American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

Most steam-driven chillers in our service territory were installed in the 1980’s and 1990’s because, during that time, the technology was competitive with electric and gas, steam rates were competitive with electric and gas, and Con Edison provided incentives for steam chillers because they relieved stress on the electric system during peak demand hours. Over the last couple of decades, technological advances have improved electric chiller efficiency from ~75% to ~95%, while steam chiller efficiency has remained at ~75%. These respective efficiency values are only for the drivers utilized for a centrifugal chiller.

As a result of the aging of the installed base of steam chillers, many customers are currently deciding whether to use electric, gas, or steam to meet their cooling needs. These customers generally choose from the following cooling applications:

- Electric chillers;
- Direct-fired gas chillers; and,
- Steam chillers.
As a result of the increasing efficiency of electric chillers relative to gas and steam chillers, coupled with the relative increase in steam delivery rates, customers tend to choose electric chillers.

To understand the economics of our customers’ cooling decisions, we developed a profile of a typical steam air-conditioning customer and compared the cost per unit of cooling for each technology, including the equipment and maintenance costs.

Figure 18: Unit cost of cooling technology

Our findings support the trend we are seeing towards electric chillers. Electric chillers are less expensive not only in terms of the annualized cost per unit of cooling, but also in terms of equipment and maintenance costs. The purple bars represent the equipment costs and associated maintenance costs. Electric cooling equipment is cheaper due to advances in electric chiller technology; as a result, several manufacturers have discontinued other types of chillers. Gas and steam cooling equipment has become more expensive because there are fewer manufacturers, and the majority of remaining manufacturers are no longer domestic.

In addition to greater availability and lower cost, electric chillers are smaller and cost less to install. Customers are converting from steam to electric chillers because the necessary auxiliary system is already in place; need only remove the steam turbine or absorption system and replace it with a smaller equivalent electric motor driven chiller.
In addition, electric chillers have lower energy costs because they are more efficient. As illustrated below, electric chillers require far less energy per ton of cooling created.

**Figure 19: Efficiency of various chillers**

![Efficiency of various chillers](image)

Source: Manufacturer provided data.

While the trend towards electric chillers is clear, several considerations indicate that steam chillers still provide a meaningful alternative for some customers:

- **Hedging energy rates**: Current steam rates are not competitive with electric rates. However, 38 of the 307 steam AC customers employ hybrid chiller plants – in other words, they use both steam and electric chillers to hedge time-of-use energy costs. Electric rates are lower during the winter and steam rates are lower in the summer, so the customer selects which equipment to run depending on when the respective commodity rates are lower.

- **Retrofit requirements**: Although converting from a steam chiller to an equivalent electric chiller requires minimal infrastructure modification, if the additional electric draw requires upgrades to the customer’s electric infrastructure, conversion costs may become prohibitive. A conversion from a steam chiller to an equivalent direct-fired natural gas chiller may require, for example, adding a combustion flue into an existing building. That expense may be too much for some customers.

- **Incentives**: The New York State Energy Research & Development Authority (NYSERDA) offers incentives for replacement systems that are water-cooled electric centrifugal chillers and that meet certain efficiencies. The incentives can be up to $2 million or half of the project cost. Con Edison offers a similar incentive for chiller replacements, but does not allow switching between energy sources.
Our challenge

The shift from steam to electric for air-conditioning poses a challenge to our electric system. We anticipate that over the next 20 years a majority of the existing steam air conditioning customers are likely to convert to electric powered chiller equipment. This trend doesn't affect steam demand because air-conditioning is used in the summer. However, these conversions would be coincident with the peak electric demand. Currently, the 307 steam air-conditioning customers account for 304 MW of coincident peak electric demand. Based on the projected attrition of steam air-conditioning customers, we believe that approximately 189 MW will be added to our electric system over the next 20 years. (The 78 customers that stopped using steam air-conditioning since 2001 account for 87 MW of increased peak electric demand.)

Of this projected shift to electric, approximately 43 MW will be in areas that will have a direct or indirect impact on the construction of a proposed substation on the Upper East Side of Manhattan (York).

Figure 20: Proposed York substation

To manage the additional electric demand, some of which will appear in networks that are already close to their maximum capacity, we will need to invest in our electric infrastructure. Estimated cost of infrastructure investments based on projected 20-year steam attrition over the next 20 years range from $175 million to $285 million. Incremental electric commodity costs are on the order of $30 million per year.
In addition to the capital expenditures required to upgrade electric infrastructure, we expect an increase in electric commodity costs. New electric demand, particularly in the summer, would increase costs of the supply portion of customer bills.

**Figure 21: Potential cumulative increase in supply costs**

The shift to electric air conditioning also has a direct impact on the steam system and the ability to operate associated assets. While conversion does not impact steam peak demand, it does decrease sales and may create excess steam capacity in the summer. We expect an 11% loss in steam sales by 2031. Also, with fewer steam customers, system costs will be spread over a smaller group, increasing overall costs on those who continue to use steam.

**Our plan**

We plan to prepare for these challenges by developing a proactive strategy to accommodate the additional electric demand. We are reaching out to all of our steam air-conditioning customers to get information about the condition of their equipment and their decision-making process for their cooling needs. We will maintain an up-to-date list of all steam air conditioning customers and use this information to monitor the timing and location of electric air-conditioning conversions so we can better plan our infrastructure needs.

To manage this additional electric demand and avoid or defer major infrastructure investments, we are working with customers to develop solutions that balance their needs with our system capability. We plan to assist customers in making informed decisions while promoting a more gradual shift from steam air conditioning to electric air conditioning over a longer period of time.

To support this goal, we have taken a two-pronged approach: we have undertaken energy efficiency efforts to reduce electric demand, and have launched a new “Stick with Steam” program, which incentivizes customers to stay with steam air-conditioning.
The energy efficiency efforts we have taken to reduce electric demand include:

- Improved lighting efficiency to reduce cooling requirements; and,
- HVAC systems that allow for the conditions of the inside air to be controlled for human comfort all the time based on a number of factors that fluctuate with building conditions.

Our “Stick with Steam” program intends to limit overall cost increases and reduce the need for near-term upgrades to strained electrical networks in Manhattan by incentivizing customers whose equipment is approaching its end of useful life to stay with steam air conditioning.

Under the program, Con Edison would fund incentives to cover some or all of the upfront cost of new steam chillers through the targeted DSM program. Installing new steam chillers for some customers would stave off electric growth for the life of the chiller (15-20 years). This program confers other advantages as well:

- Installing new steam chillers now will bridge a gap in the steam system’s evolution over the next 20 years. It will limit cost increases for both steam and electric customers and maintain steam-cooling revenues with minimal fixed costs.
- Maintaining steam-cooling use will mitigate the need for near-term upgrades to strained electric networks in Manhattan.
- Delaying the migration of large amounts of electric cooling demand will give Con Edison time to let other factors play out during this period of major systemic and regulatory change. Potential significant shifts on the horizon include Indian Point relicensing decisions, full adoption of the 3G optimization strategy, and Smart Grid technology rollout.
- Buy-down energy efficiency incentives are less time and labor-intensive than other measures, such as audits and direct installations.

In sum, maintaining the steam system preserves critical fuel diversity in Manhattan. The steam incentive program will allow us to prepare for a more gradual electric demand increase over a longer period of time while preserving the viability of the steam system.
3. CHP

Combined heat and power, or CHP, systems, offer some of our customers with the appropriate energy profile the opportunity to significantly reduce their energy costs. CHP systems funnel waste heat from on-site generation sources to meet the customer’s thermal needs. These systems thus allow customers to meet a portion of their thermal and electric needs through on-site generation, while maintaining standby service from Con Edison. We estimate that 152MW of customer-owned distributed generation (DG) is currently operating in our electric service area, all but 10MW of which is made up of combined heat and power (CHP) systems. (The remaining 10MW is made up of solar photovoltaic (PV) energy). CHP usage will accelerate as large-scale projects come onboard and incentives kick in. Natural gas prices, green initiatives and the desire of property managers to seek LEED certification will all contribute to the increase use of CHP systems.

CHP allows customers to use natural gas to meet both their heating and cooling energy needs. CHP is an attractive energy solution for certain customers, as it offers the potential to reduce energy costs significantly. CHP projects achieve their best economics when the customer’s base-load heating and hot water needs match their base-load electric needs.

There are downsides to CHP solutions: customer equipment may not operate as initially designed or as anticipated, and customers may incur additional costs if their usage exceeds contractual demand levels. CHP systems also present a risk that their operating burden will be transferred to other utility customers. To avoid that outcome, Con Edison will calculate CHP standby rates to recover the full cost of the facilities installed to provide standby service. Full costs include local facilities designed to serve individual customer needs, as well as a share of the upstream facilities that serve multiple customers, including those that require standby service as a backup to CHP systems.

In planning our electric infrastructure needs, we are examining the impact existing CHP installations have on our peak electric demand. When we find areas where CHP reduces peak demand, we apply a set of criteria to determine if load relief investments may be avoided. Criteria include an operating history of the CHP unit with high availability and a communications infrastructure that allows the utility to monitor real-time performance. Today, we account for 30MW of demand reduction from CHP in our plan, which helps defer costly infrastructure investments.

We are developing solutions to the obstacles that customers face in installing DG systems—financing, complex permitting, retrofitting and space constraints. These obstacles are real and will influence our customer’s ability to successfully install, operate and maintain CHP systems. To help customers overcome these impediments, we are developing an interconnection process that is more responsive to customers, and our recent improvements have made it easier to develop CHP projects. We have designated a DG ombudsman and published a handbook to guide customers through the installation process. However, there is more work to do, such as better integrating CHP into the grid and responding to CHP customers more efficiently and timely.
CHP systems also bring with them a need to consider environment policy. While more efficient, CHP emission pollutants are often higher than those of central station plants, and standards governing emissions are less stringent in the CHP context. Wide adoption of CHP could create the potential for increased emissions near high-density population areas. If regulators impose tougher emissions standards for CHP, customers’ capital and operating costs would rise, thereby making the economics of the CHP installation less appealing.

**Distributed Generation Trends and Forecast**

*Recent and historic adoption*

Distributed generation is growing in our electric service area. In the last five years, there have been more than 615 DG installations in our service territory, more than any previous five-year period.

Since 2004, both renewable and fossil fuel CHP technologies have grown. The renewable side has seen a significant increase in the number of solar photovoltaic installations. While the installed megawatts of solar PV is comparatively small, with individual systems ranging from an average of 6kW for residential installations to 60kW for commercial installations, the trend has generally been toward larger installations. Factors such as lower costs, incentives, a growing familiarity with the technology, and governmental policies are promoting the growth of distributed solar energy.

On the non-renewable or fossil fuel side, customer adoption has also increased with installation of several large (greater than 3MW) gas turbine and internal combustion engine (natural-gas fired) CHP systems. There has also been an uptick in smaller (65-400kW) installations at nursing homes, hotels, markets, and large residential complexes.

CHP continues to be the primary source of growth in distributed generation in our service territory. Since 2009, 90MW have come online (45MW at a single installation). This growth has been driven largely by NYSERDA and property tax incentives. An additional 75MW of large-scale CHP is expected to connect to the Con Edison electric delivery system over the next five years. As the table shows below, grid-connected CHP is expected to reach 150MW by 2016.
**Figure 22: CECONY grid-connected installed capacity (1991 – 2016)**

Forecast of DG capacity

DG installations are not new to Con Edison or its customers. DG adoption increase occurred in the early 1990’s, and installations have increased from 2004 to the present. In the 1990’s, the technology of choice was reciprocating engines, which provided diesel-fired emergency backup generation. The second wave of DG adoption, from 2004 to present, has produced more MW of capacity than was produced any previous period.

The best existing estimate of DG’s technical potential in our service territory is 3,300MW, based on a 2002 study conducted for NYSERDA. The study began with a database of commercial, institutional, and industrial sites and applied a series of filters, leaving only facilities with high load factors and high thermal utilization—both qualities that make for good CHP candidates. The actual market potential likely will be lower than 3,300MW, due to factors such as customer economics, risk aversion, and site restrictions.

The New York City government has expressed interest in clean DG in the city’s PlaNYC, and New York State recognizes the benefits of clean DG in the New York State Energy Plan. PlaNYC projects that clean DG will make up 10% of the greenhouse-gas reductions necessary to meet the mayor’s 30x17 goal, which aims to reduce greenhouse gas emissions by City government facilities by 30% by 2017. PlaNYC sets a higher target of 800MW of clean DG by 2031.

To maximize DG installations, we need to address known problems of power quality and interconnectivity. Though we have identified and put into place many solutions to address these problems, each installation presents its own unique set of issues.
**Combined heat and power (CHP)**

*CHP is an attractive energy solution in certain customer applications*

CHP is the dominant form of distributed generation in our service territory and will continue to be, barring any major shifts in the policy and regulatory framework that governs it. Many customers with large and consistent thermal and electric loads find CHP economic because of the efficiency advantage that comes from funneling waste heat from on-site generation to meet local thermal needs.

We predict that by 2030, CHP will make up the majority of new grid-connected DG—200MW of 320MW. Solar PV, based on market experience and anticipated NYSERDA funding levels, is expected to make up a small but increasing amount of this new generation—totaling 120MW by 2030. Today there are already nine CHP projects under development in our service territory, with installations ranging from 6MW to 14MW in size. Together, these projects represent up to 80MW of potential energy that we can count on as reliable means to lower customer demand in our demand relief plan.

**Figure 23: Commercial customer monthly demand profile**

CHP efficiency can reach 75%, compared to 35% efficiency for conventional central generation of electric and on-site burning of boiler fuel for thermal needs. Typically, CHP is installed in parallel with Con Edison supplied back-up electricity and is sized to meet the customer’s base thermal needs.
Select CHP technologies

Reciprocating engines are the most common technology employed for CHP. They are low-cost in comparison with alternatives, and they offer fast startup times, are highly reliable, efficient at recovering heat, and familiar to many customers as they are similar to most emergency back-up generation sources. Gas turbines, steam turbines, and micro turbines are other options. Fuel cells are an emerging CHP technology that offers very low emissions along with heat recovery.

Pollution and noise are significant concerns for customers considering natural gas fired distributed generation. In addition, space availability and the ease of renovating or expanding existing facilities are concerns in installing CHP.

Customer economics

A customer’s evaluation of CHP costs can be understood through a “levelized” cost of energy methodology, which calculates the average price a customer would have to pay each year, over the life of the CHP asset, to install and operate it. Customers must also consider the costs of planning and executing a project.

Many factors potentially influence a customer’s economic evaluation. The cost of the unit varies by technology type. Installation costs and on-going capital improvements will hinge on the complexity of design, grid connection costs, and the building retrofits needed to accommodate the CHP installation. High load factor buildings with efficient units yield the most energy savings by reducing the need for electricity purchases. In some instances, a customer’s back-up requirements, such as a boiler or steam stand-by service, may increase costs and erode CHP’s economic benefits.

Fuel costs are also an important factor, due to the uncertainty of future prices. However, recent developments in shale gas and the soon-to-be-constructed pipeline between New York and New Jersey are expected to keep natural gas prices low over the long-term. Low, stable natural gas costs will provide certainty to electricity-production costs.

Given customers’ focus on economics, the most widely adopted technology are internal-combustion and reciprocating-engine-based CHP. These systems offer a substantial cost savings and provide the value of utility-delivered electricity and separate on-site thermal generation.
Table 3: CHP customer economics

<table>
<thead>
<tr>
<th>Hotel Proxy Customer</th>
<th>System Size Evaluated</th>
<th>3,000 kW</th>
<th>Installed Cost ($/kW)</th>
<th>4,053</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Configuration</td>
<td>CAT G3615</td>
<td>Installed Costs ($)</td>
<td>$12,159,000</td>
<td></td>
</tr>
<tr>
<td>Heat Recovery</td>
<td>Heating Only</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Electric Peak Demand (kW) | 4,877 | 1,877 |  |
| Utility Electric Consumption (kWh) | 35,908,800 | 10,731,414 | 25,177,386 |
| Utility Electric Bill ($) | $6,501,768 | $2,177,993 | $4,323,775 |
| CHP Gas Consumption (btu) | 2,436,305 | (2,436,305) |
| Utility Gas Bill ($) (1) | $2,201,237 | ($2,201,237) |

**Customer Electric Benefit ($)**

| Boiler Gas Consumption (btu) | 736,532 | 216,973 | 519,559 |
| Utility Gas Bill ($) (2) | $783,820 | $219,895 | $563,925 |

**Customer Gas Heating Benefit ($)**

| Total Utility Electric and Gas Bill ($) | $7,285,588 | $4,599,125 | $2,686,462 |
| O&M Costs ($) | 0 | $252,124 | ($252,124) |
| Property Taxes ($) | 0 | $350,165 | ($350,165) |

**Annual Customer Savings ($)**

| Initial Capital Investment ($) | $12,159,000 |
| Simple Payback | 6 Years |

Notes:
(1) Utility tariff - Gas Rider H
(2) SC2 heating customer

Investment tax credits, available through 2016, further enhance the economics of most DG systems—both renewable and non-renewable. These credits favor lower-polluting fuel cells and emission-free solar PV at a rate of 30%, versus 10% for conventional gas- or diesel-fired DG.

Various government incentive programs are also available for owners who install and operate certain types of DG systems. The Federal Business Energy Investment Tax Credit allows eligible taxpayers to receive a grant for 10% of capital expenditures.
CHP’s role in utility infrastructure planning

CHP is a potential integration opportunity that allows customer to use natural gas to meet both their heating and cooling energy needs. CHP is a low-cost energy solution that will shift electric peak-demand, which in turn will help defer large infrastructure projects and lower capital investment. In our electric infrastructure planning, we count on CHP applications that fit certain criteria to lower customer demand.

In order to attribute lower customer demand to CHP, the unit must develop a track record of operating with high availability during times coincident with peak electric use. It must also have communications adequate to monitor real-time performance.

Table 4: Criteria to account for demand reduction associated with CHP installations

<table>
<thead>
<tr>
<th>Network considerations</th>
<th>Generator specific considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Area substation contingency design criteria</td>
<td>● Base load output (kW) of each unit</td>
</tr>
<tr>
<td>● Health of network</td>
<td>● Historical weekday outage rate and daily 24-hour output of each unit during the summer period (June, July and August)</td>
</tr>
<tr>
<td></td>
<td>● Telemetry for breaker status, kW, kVAR, V, amperes, power factor, etc. to monitor performance including time of peak output relative to the substation peak loads</td>
</tr>
<tr>
<td></td>
<td>● Communications (frame relay preferred, though wireless may be acceptable if cyber security requirements are not imposed)</td>
</tr>
</tbody>
</table>

The value of CHP applications as reliable means to lower customer demand should be compared to the cost of traditional utility infrastructure projects that would be avoided, such as building new transmission or area substations. Our approach to infrastructure investment seeks the least cost option while maintaining system reliability.

Recent CHP installations

Recent operating performance of CHP has been mixed, which may indicate that more experience is required in the design, performance, and operation of various CHP technologies. Customers have paid utility surcharges when equipment problems caused them to exceed the electric demand volumes they chose to contract for. In some instances, customer financials have been overly optimistic about equipment performance and controls during the period when the customer was learning how to operate the CHP new system and manage the building’s electric demand.
<table>
<thead>
<tr>
<th></th>
<th>Customer A</th>
<th>Customer B</th>
<th>Customer C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Perspective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Utility Perspective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Profile</strong></td>
<td>Year-round, 60% of peak electric</td>
<td>Proven resource for T&amp;D deferral</td>
<td>Year-round, 30% of peak electric</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Technical Design**   | 7.5 MW gas turbine  
Standby service  
Required to install current fault limiting protector (CLiP) | Connected to 13kV feeders  
Telemetry installed; reliable performance  
CLiP requirement eliminated by network upgrades | 4.4 MW gas turbine  
Export to 13kW | New 13kv high tension service  
Telemetry installed; needs maintenance  
Export netted against low tension services | 2x 13 MW gas turbines  
1x 17 MW steam  
Buyback service | Connected to 138kV feeders via four 138/27kV transformers  
Limited technical impact since exporting to 138kV system |
| **Customer experience and interconnection process** | Considering expanding  
Considering ConEd Steam service  
Recently allowed to remove CLiP | Standard standby service (SC14RA) | Granted a special provision to export energy to grid | Granted Special provision E under standby service  
High tension service with netting against low-tension accounts | Set own contract demand, purchased switchgear | Standard buy back customer (SC11)  
Exploring capacity market options |
| **Project Economics**  | $4m saved per year; five year payback;  
$1.6m from NYSERDA | Future T&D benefit to customers; standby cost recovery | Special netting provision and interconnection design eliminated system upgrade costs; monthly energy savings | n/a | Annual energy savings; views contract demand exceedance as punitive | Would not have incurred penalty if utility set contract demand, recovers costs |
Rate design

Our rates focus on cost recovery and must balance the interests of DG customers with those of all customers. We are committed to ensuring that the rates do not benefit DG customers at the expense of non-DG customers, and that we will fully recover the costs of the infrastructure we build to meet DG customers’ needs. At present there are DG-specific rates for all Con Edison–supplied commodities (electricity, gas, and steam), subject to specific eligibility requirements.

Electric rates

Standby rates are required for DG customers not eligible for net metering (which provides credit for a portion of the electricity they generate). Electric standby rates are applicable to all on-site generating customers who rely on the utility only for a portion of their load that they are not generating, and for back-up service.

Without standby charges, Con Edison would under-recover costs from DG customers, due to the intermittent nature of DG demand. Under-recovery would in turn lead to cross-subsidization, as non-DG customers would face additional charges to recover lost revenues from DG customers.

Gas rates

Con Ed introduced DG gas rates starting in 2004. Unlike standby rates, DG gas rates were instituted to incentivize use of DG technologies, which distribute use to off-peak gas-usage periods. When customers use gas-fired DG technologies during peak electric demand periods, the supply and distribution costs for the electric system are reduced while its efficiency, reliability, and power quality are improved. We introduced non-residential gas DG rates under Rider H in January 2004 and residential DG gas rates under Rider J in October 2005.

Similar to standby charges, Rider H also features a contract demand charge, which is a fixed, monthly, per-therm charge applied to peak demand regardless of usage. It compensates Con Edison for the infrastructure required to meet the customer’s peak demand. Rider H is optional for customers with DG equipment, but most opt in, finding it the most economic choice.
Table 6: Rider H natural gas rates

<table>
<thead>
<tr>
<th></th>
<th>Rider H Rate I</th>
<th>Rider H Rate II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator size</td>
<td>&lt; 5MW</td>
<td>&gt;5MW but &lt; 50MW</td>
</tr>
<tr>
<td>Minimum Monthly Charge - Fix Charge for first 3 therms</td>
<td>Varies with size of generating unit</td>
<td>Does not include metering cost, recovers other customer-related cost</td>
</tr>
<tr>
<td>Contract Demand Charge</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Meter Installation Charge</td>
<td>No</td>
<td>Yes plus ongoing maintenance</td>
</tr>
<tr>
<td>Annual load factor</td>
<td>50% minimum</td>
<td>50% minimum</td>
</tr>
<tr>
<td>Usage Charge (over 3 therms)</td>
<td>Flat seasonal</td>
<td>Flat seasonal</td>
</tr>
</tbody>
</table>

Steam rates

Steam standby rates exist for customers who install CHP but want to maintain steam service from Con Edison as a back up to their own thermal generation. This rate is available to all customers except for small residential or commercial customers. Like its electric equivalent, steam standby has both an as-used charge and a contract demand component that recovers local costs.

We will provide the level of service that CHP customer’s request. Customers who set their contract demand will pay standby service rates (i.e. contract demand and as-used charges). We will provide a higher level of reliability upon request, and charge accordingly for use of our facilities. We will buy back energy from customers at a rate based upon the Locational Based Marginal Price (LBMP) set by the New York Independent System Operator (NYISO).

Interconnection process

We are committed to building an interconnection process for CHP systems that is more responsive to customer needs. Recent process improvements have made it easier for customers to develop CHP projects in our service territory. However, we recognize that there is more work to do.

Technical interconnections considerations

The potential fault current produced by CHP installations could damage transformers and other equipment at area substations. This damage could be limited at either the customer or utility site (for example by installing fast-acting fuses for customers or replacing over-duty current breakers at substations). We believe customer-sited solutions are more cost-effective; they typically add about $100,000 to $150,000 to CHP installation cost, representing approximately 1% of the installation costs.

We are currently evaluating the cost effectiveness of the PSC-mandated primary distribution circuit breaker replacement program. This program addresses concerns of increasing fault current at overdutied substations. We can achieve the overall goals of this program at a much
lower cost by installing current-limiting fuses or reactors at the CHP facility, and/or current limiting devices at Con Edison area substations. The suggested modifications to the replacement program would save approximately $4 million annually over the next 15 years.

Interconnection process improvements

In an effort to enhance our communications with our customers, we have taken several steps toward providing timely, coordinated responses to their needs.

We have designated an Ombudsman as the central contact point to resolve technical and administrative issues. Con Edison’s Distributed Generation Customer Guide, published in September 2011, details information that CHP customers need to safely install and maintain their systems. The guide covers such issues as interconnection requirements and monitoring of CHP output and breakers status. In addition, we hold training seminars on Con Edison’s interconnection process, design requirements, schedules, and rates.

Other utility considerations

Losing large steam customers will have cost and reliability implications for the remaining steam and electric customers. When steam demand approaches minimum operating levels, our large most efficient cogeneration units are forced to run less efficiently or even be cycled, increasing the cost of production of both steam and electricity.

Uncertainties

Customer considerations

The customer’s primary interest in CHP is cutting costs, but the shift to CHP involves potentially large initial costs in equipment investment, interconnection and difficult permitting processes. Equipment capital costs are thus a major determinant of DG adoption. The internal combustion and reciprocating engines that have dominated DG have been on the market for decades and have fairly stable costs. However, newer technologies such as fuel cells and micro turbines are likely to come down in price significantly as they become more commonly manufactured. Solar PV prices continue to drop as production increases, falling between 30%-42% in 2010.

Customers must also consider the additional costs of planning and executing a project to install or retrofit distributed generation. This process can be time consuming and technically challenging.
Table 7: Summary of customer considerations

<table>
<thead>
<tr>
<th>Area of focus</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| Technical Implementation | • Complex design and added costs  
|                      | • Building retro-fit requirements                   |
| Economics             | • Payback                                           |
|                      | • Availability of incentives                        |
|                      | • Size of upfront cost                              |
|                      | • Fuel prices                                       |
| Operations            | • On-going maintenance cost                         |
|                      | • Operating at lower than design specification       |
|                      | • Exceeding contract demand                         |
| Other                 | • Space constraints in dense urban environment      |
|                      | • Environmental regulation and footprint            |

Environmental policy

Both customers and policymakers must weigh the trade-off between the increased pollution and the efficiency gains of CHP. Customer-sited CHP emissions are often higher than those of central station plants. Wide adoption of the technology could lead to higher levels of air pollution and fine particulates in the neighborhoods where they are installed in New York City.

At the moment, emission standards for CHP are less stringent than those governing central station plants. Large stations require New York State air permits, dispersion modeling for pollutant concentrations, and height regulations on stacks. Most CHP units, however, currently do not need to meet any of those standards or regulations.

The possibility remains that policymakers will impose more restrictive regulations on CHP. While proven technology exists to curb CHP emissions, installing these devices would raise customers’ capital and operating cost—altering the economics of CHP. Control technologies, such as selective catalytic reduction, add $250/kW to CHP projects. Thus customers must carefully consider the environmental footprint before installing a CHP system.
Chapter 8: Reduce increases in delivery costs

Background

Con Edison provides power, light, heat and cooling to the people of New York City and Westchester County through our electric, gas and steam systems. Life in New York City—its businesses, residents, and visitors—requires constant access to energy. Nine million New Yorkers rely on us each day. Seven million people commute by train, subway, bus or personal vehicle to New York City daily. The city welcomes over forty-five million tourists annually. Our service territory is also a critical commercial center: the New York metro area accounts for about 9% of the United States’ Gross Domestic Product, and as the financial capital of the world, it is home to over 40 Fortune 500 companies.

Our delivery systems are largely underground, keeping people safe and our equipment reliable, while operating in a dense urban environment. The age and complexity of our system makes maintaining, expanding, and replacing the infrastructure expensive. We spend capital in order to maintain our world-class reliability, meet growing energy demands, and function in a green and sustainable manner. Our capital expenditures currently total approximately $1.5 billion a year. The 2011 ILRP projects expenditures of $32 billion of capital over the next 20 years.

The majority of our infrastructure investments are aimed at maintaining the safety and reliability of the existing delivery systems. A significant portion of our investment program also goes toward expanding our systems meet growing customer demand. Our remaining capital investments cover things like work required by the city to move our infrastructure out of the way of public works, and investments in information systems projects.

Table 8: Categories of capital spending

<table>
<thead>
<tr>
<th>Spending Category</th>
<th>Definition</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Expansion</td>
<td>Infrastructure investments to meet the growing demand</td>
<td>44%</td>
</tr>
<tr>
<td>Reliability</td>
<td>To maintain the service levels customers are accustomed too, we make capital investments to maintain the reliability of our equipment and prevent service disruptions</td>
<td>31%</td>
</tr>
<tr>
<td>Replacement</td>
<td>As the age of our assets approach or reach the end of their useful life, we make capital investments to replace those assets</td>
<td>16%</td>
</tr>
<tr>
<td>Other</td>
<td>Costs to move our infrastructure for public projects such as subway expansions, water tunnel work and investments in information systems projects</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>
Integrated planning approach to reducing delivery costs

We are acutely aware that managing large infrastructure projects in a rising cost environment is complex, work-intensive and expensive, and we realize that these investments directly affect customer bills. Our challenge is to keep these customer costs down despite the cost pressures we face.

To meet that challenge, our long-range plan focuses on taking an integrated approach to energy solutions and cost reduction. We are committed to making the most of the opportunities presented by our work in three commodities we deliver—electric, gas and steam.

Our integrated approach embraces these opportunities, while recognizing that the specific solutions for the electric, gas and steam businesses are specific to the different challenges each commodity faces. The systems are unique in that one transports electricity while another transports gases molecules and the third transports steam. Further, they are unique in terms of geographic footprint and how they are operated.

Electric delivery is a low-growth, highly capital-intensive business. In our efforts to reduce electric delivery costs, we are focused on meeting incremental demand growth with less capital to reduce the growth in unit delivery costs to our customers. Gas, on the other hand, is a higher-growth business, which requires us to expand existing delivery capability to accommodate new demand. We are developing a strategy to best manage the new growth we expect to see on the gas system. The steam business is not expected to grow and may slightly decrease. As a result, for steam service we are focused on limiting the need for new capacity and reducing operating expenses through lower fuel costs.

Because each commodity must respond to different demand dynamics, each needs to maintain an individual commodity plan that scrutinizes capital expenditures, increases efficiency in operations, and manages costs effectively. Despite the distinct nature of each commodity’s challenges, each commodity’s efforts to reduce costs will be guided by the integrated infrastructure planning framework that we have developed. This section focuses that framework, which implements our integrated approach, and describes key examples of our efforts to reduce delivery costs for each commodity.
Our integrated planning approach to managing our capital investments in each of our systems has two components:

**Managing capital investments:**

Integrated energy and customer management:

- Shaping demand by integrating a diverse portfolio of energy solutions.
- Shifting demand by advising customers on energy solutions that may impact our infrastructure.

Asset optimization:

- Better managing our existing infrastructure and capital prioritization.
- Improving our information and decision-making with an eye toward lowering customer delivery costs.
- Accommodating new demand by using innovative system designs that allow us to use existing assets rather than make new infrastructure investments.

**Standardizing business processes:**

- Establishing standard processes that will allow for information sharing in real-time.
- Improving project and work management, and enhancing our ability to plan for future needs.
- Standardizing processes, implementing an enterprise-wide common database and a common platform, in order to enhance financial, budgeting, and supply chain processes for decision-making and cost management.
**Table 9: Integrated planning approach**

<table>
<thead>
<tr>
<th>Manage capital investments – Integrated energy and customer management</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>1) <strong>Shaping demand</strong></td>
<td>a. Demand Side Management</td>
<td>Managing demand will have the direct effect of reducing and/or deferring infrastructure investments. We aim to shape demand by integrating demand-side management and energy efficiency. This will help customers manage energy using usage, and give us more tools to meet customer demand.</td>
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<tr>
<td></td>
<td>b. Energy Efficiency</td>
<td></td>
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<tr>
<td></td>
<td>c. Clustering</td>
<td></td>
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<tr>
<td>2) <strong>Shifting demand</strong></td>
<td>a. Electric to Gas</td>
<td>Shifting demand by advising customers on energy solutions that may impact our infrastructure planning, for example distributed generation, Steam AC and oil conversions.</td>
</tr>
<tr>
<td></td>
<td>b. Steam to Gas</td>
<td></td>
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<tr>
<td></td>
<td>c. Oil to Gas and Steam</td>
<td></td>
</tr>
<tr>
<td>Manage capital investments – Asset optimization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) <strong>Use existing assets more efficiently</strong></td>
<td>a. System Design</td>
<td>Over the course of this plan, we intend to meet our service reliability objectives in less asset-intensive ways. By employing technology that allows innovative system design, we will improve sharing between assets and avoid major project investment.</td>
</tr>
<tr>
<td>4) <strong>Increase information and improving decision making</strong></td>
<td>a. NRI</td>
<td>Increasing our information and improving our decision-making will allow us to better manage our assets. Technology advancements such as equipment monitoring and in-field sensors will help us target investment to where it is needed. This targeted approach will improve asset performance.</td>
</tr>
<tr>
<td></td>
<td>b. MRP</td>
<td></td>
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<tr>
<td></td>
<td>c. Condition-based maintenance</td>
<td></td>
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<tr>
<td>Standardizing business processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) <strong>Install a work management system</strong></td>
<td>a. Electric Work Management System</td>
<td>Deployment of new CECONY processes that allow us to manage electric related work across business units. The end result: standard and efficient work management processes, access to real-time information, and the ability to plan for future needs.</td>
</tr>
<tr>
<td>6) <strong>Install a Enterprise Resource Planning (ERP) system</strong></td>
<td>a. Finance and supply chain system</td>
<td>Use one system with a common database and a common platform that will enhance financial, budgeting, and supply chain processes as well as cost management practices. More standardized business processes that improve controls and reduce financial reporting risk.</td>
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</tbody>
</table>

Our integrated approach is designed to meet customer energy demand by developing a broader set of utility infrastructure planning solutions. By combining least-cost customer and energy-management alternatives with traditional utility infrastructure planning solutions, we will be able to better manage our infrastructure investment plans, reducing delivery costs over the long-term.
We have established a set of guidelines so that as we implement our plans we continue to provide safe, reliable, and cost-effective delivery service. We plan to meet customer needs by deploying least-cost solutions that are equitable to all our customers. Our guiding principles are:

1. **Reliability** – Maintain the world-class reliability our customers have come to expect by leveraging new technologies, designs, and practices.

2. **Safety** – Maintain a safe environment for both the public and our employees.

3. **Non-subsidization** – Ensure that new technologies, designs, and practices do not burden existing customers.

4. **Total cost-benefit analysis** – Fulfill our commitment to promoting a cost-conscious culture. We assess the total cost and benefit of all infrastructure alternatives to determine the optimal solution.

5. **Customer experience** – Improve customer interactions by modifying our processes to meet their changing needs.
Results of Con Edison’s 2011 Long-Range Plan effort to reduce delivery costs

We have applied the framework described above to this year’s Integrated Long-Range Plan effort. By using the same approach across commodities and following our guiding principles, we can take a consistent approach to lowering customer delivery costs.

Electric Long-Range Plan initiatives

In our 2010 Long-Range Plan, we described steps we planned to take in an effort to mitigate increases to our customers’ electric bills. Our cost-savings efforts yielded $3.3 billion in savings over the 20-year planning horizon. This year Con Edison is enhancing its efforts to reduce capital infrastructure investments by integrating a diverse portfolio of energy solutions. The figure below represents the projected reductions in 20-year electric capital expenditures identified in the 2011 Integrated Long-Range Plan.

Figure 24: 20-year electric capital expenditure savings

We identified an additional savings of $4.2 billion in the current ILRP. The majority of the savings come from increasing asset utilization, which has deferred or avoided several large capital investments. This approach accounts for savings of $3.6 billion over 20 years. Improved asset-management practices, realized through enhanced monitoring and control, will allow us to defer additional capital investment of $600 million. The total savings of $4.2 billion is partially offset by $1.8 billion of capital needed to meet additional demand, yielding approximately $2.4 billion in net additional savings for this year’s ILRP initiatives. In addition to these savings, we have also identified potential opportunities like demand response and distributed generation that will reduce peak demand to further lower infrastructure needs. We continue to challenge ourselves, seeking more cost-effective energy alternatives to generate savings, working towards our goal of no more than $21 billion in capital spending, which according to current models will keep customer bills flat in real dollars.
Gas Long-Range Plan initiatives

In contrast to the electric business, which has a reduced capital expenditure forecast for the 2011 Integrated Long-Range Plan, the capital forecast for the gas business has an increase. The 20-year gas capital-expenditure forecast has increased by approximately 10% since the 2010 Plan. This increase is largely due to our recent expectation of additional oil conversions and public improvement investments, as shown in the figure below.

Figure 25: 20-year gas capital expenditures

Our goal is to manage and capture growing demand from oil conversions to minimize rate impacts to our firm customers without compromising safety, system integrity or reliability. We expect to reduce reinforcement costs and capital investment with new technologies and by using existing infrastructure capacity where available to expand our system. Our approach will improve air quality to help the City meet its environmental goals and will provide economic benefits to our customers.

Our plan to meet future growth requires a smarter approach to system design. We intend to bring customers on to the system as efficiently as possible. We plan to lower the cost to reinforce the system by installing regulator stations where possible instead of installing additional pipe in the ground. Further, we plan to pursue low-cost natural gas connection customers actively. We will target customers close to the same gas mains to convert simultaneously in a “clustering” strategy. This will minimize customer disruptions and reduce conversion and connection costs. Plus, we are implementing an “area growth” strategy for customers located near each other but on different mains. Both clustering and area growth will
boost usage of the natural gas system at low cost, helping to lower the rate increases for existing natural gas customers.

The figure below shows the expected impact on firm delivery rate over the 20-year period.

**Figure 26: Average firm delivery rates (2011$/therm)**

We recognize that capturing the growth opportunity arising from oil conversions presents challenges, particularly in a dense urban environment like New York City. Timing and work coordination are crucial to successful execution of our smart-growth strategy. We have dedicated resources to managing this process efficiently and in a cost-effective manner.
Steam Long-Range Plan initiatives

While capital expenditures are a material component of steam cost, they are less significant to the overall cost structure of steam service than they are to the cost structure of our electric and gas businesses. Our steam business therefore presents relatively fewer opportunities to reduce capital expenditures; rather, the opportunities to manage customer bills effectively largely arise from reducing operating expenses; which includes fuel costs. Our steam long-range plan thus focuses on such expenses.

Figure 27: 20-year steam savings

For the 2011 steam long-range plan, the estimated 20 year operating expense savings are approximately $1.8 billion. They include:

- O&M savings due to the shutdown of the Hudson Avenue Boilers and Management of Ravenswood A-House.
- Fuel savings resulting from:
  - Hudson Avenue Boiler Retirement
  - Revised Steam Production Plant Operating Criteria
  - Minimum Oil Burn Settlement at FERC
  - Gas Additions at the 59th Street and 74th Street Generating Stations
Managing capital investments: Integrated energy and customer management

1) Shape demand

Peak demand, or the maximum electricity, gas, or steam that our customers require at a single point in time, drives infrastructure investment: our system must be able to meet that peak demand even if it is a relatively infrequent occurrence. In our service territory, these peak demand periods occur only during the hottest periods of the summer for electric, and the coldest periods of winter for gas and steam, often for only several hours over the span of a few days. To meet peak demand, we plan to use a portfolio of solutions, including demand side management and other customer-focused programs, which reduce the system peak. These programs will allow us to defer infrastructure investments and lower customer bills.

Figure 29: Methods to shape demand

As customer demand grows over time, the energy delivery capacity to our various load areas begins to approach our system’s design capability. Traditional planning solutions to relieve stress on the electric, gas, or steam systems primarily entailed adding transmission and distribution infrastructure. However, by shaping customer demand and managing the peak demand in these areas, Con Edison could defer, or avoid altogether, the need to make new capital expenditures.

a. Demand-Side Management

Electric initiatives

Electric demand response (DR) programs provide the utility with some control over demand during the system peak (peak shaving and shifting programs) or during system critical periods (reliability programs). Such programs allow Con Edison to defer investments that would otherwise be necessary to increase capacity on the system. DR programs include emergency-based and forecast-based peak demand shaving programs.

We began to build DR into our infrastructure planning starting in 2011. We have developed a DR forecasting model that is robust but will be tested by performance over time. As we gain a
stronger understanding of the availability of DR resources, we will likely be able to include even more in our load-relief plans.

On our record peak-demand day (7/22/11), approximately 500MW of demand was reduced through demand response (according to our preliminary results, which are subject to approval from NYISO). This equates to a reduction of approximately 3% of peak demand. Total enrollment in the state programs is approximately 480MW (420MW Special Case Resource, 60-80MW Emergency Demand Response Program).

This peak-demand reduction will allow us to defer or avoid load-relief or load-transfer projects, which translates into potential capital savings.

Gas initiatives

In an effort to manage the expected growth from the heavy oil-to-natural-gas conversions, we are currently evaluating demand response programs to reduce peak demand and defer costly capital investments that will otherwise be needed to reinforce the natural gas system.

b. Energy efficiency

Our demand-response and energy-efficiency programs complement one another: while demand response is effective in reducing demand during peak usage periods, energy efficiency initiatives can help us achieve permanent demand reductions throughout the year. Our energy-efficiency programs provide our customers with tools that enable them to understand and manage their energy consumption, which allows them to reduce their energy usage and energy costs. And enabling our customers to reduce their direct energy costs ultimately reduces overall system supply costs.

We have undertaken energy-efficiency initiatives in all three of our resource areas — electric, gas and steam.

Electric energy efficiency

Based on our existing programs, we expect savings to grow from 1.4% in 2012 to 2.5% in 2013. In the long-term, we expect our energy efficiency programs to deliver energy savings of 4.5% annually in 2031 and 570 MW of peak demand.

Expenses associated with these programs, an average of $84 million per year, are consistent with Public Service Commission guidelines for costs of achieving the Energy Efficiency Portfolio Standard targets. Energy efficiency, carried out effectively, is generally regarded as a solid investment, due in large part to the fact that the savings from an investment in energy efficiency-technology last for the life of the technology, reducing energy costs for many years. For the individual consumer, participating in energy-efficiency programs can provide substantial bill reduction as well.

The reduction in energy consumption and peak demand from our energy efficiency programs lowers our infrastructure investment requirements. We identify the areas where investments are required and target energy-efficiency programs to reduce demand in these specific areas. Con
Edison is able to defer large capital investments into the future, which translates into dollar savings for the Con Edison and our customers. We have employed this targeted DSM Program to reduce demand since 2004. Though the current phases of the program are approved through 2012, we recently received authorization and funding to implement additional DSM contracts through 2015, in an amount up to $25 million annually. These contracts should allow us to further defer infrastructure investments.

**Gas energy efficiency**

Con Edison’s gas energy efficiency programs offer a wide range of rebates, incentives, and free efficiency measures geared towards reducing firm gas demand across our service territory\(^9\). Gas Energy Efficiency Portfolio Standard (EEPS) Programs are only available to customers who pay the Systems Benefits Charge (SBC); interruptible customers are excluded from participation as they do not pay into the SBC. We offer a number of options that aim to meet customer needs. Our current programs have offerings for commercial, multifamily and residential customers. Many of our programs promote the use of high efficiency equipment that permanently reduces energy usage.

Helping customers manage their demand and energy use is critical to our system planning. Energy efficiency helps reduce the peak demand and as a result lowers the capital requirements for infrastructure planning. Con Edison’s projected savings over the 2012-2015 period total approximately 665,000 Dth which would achieve 60% of the PSC goal as currently constructed.

\(^9\) Con Edison gas service is comprised of 4,340 miles of mains and 385,396 service lines delivered at various points in our service territory. The service territory consists of Manhattan, the Bronx, the 1st and 3rd Wards of Queens, and Westchester, Orange, and Rockland Counties.
Table 10: Con Edison gas energy efficiency programs

<table>
<thead>
<tr>
<th>Con Edison Gas Energy Efficiency Programs</th>
<th>Performance through November 30, 2011</th>
<th>Program Goals 2012-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009-2011 Goal (Dth)</td>
<td>2009-2011 Acquired* (Dth)</td>
</tr>
<tr>
<td>Commercial and Industrial Gas Rebate</td>
<td>96,916</td>
<td>11,116</td>
</tr>
<tr>
<td>Commercial and Industrial Gas Custom</td>
<td>64,468</td>
<td>29,360</td>
</tr>
<tr>
<td>Multifamily Gas</td>
<td>250,421</td>
<td>57,117</td>
</tr>
<tr>
<td>Multifamily Low Income Gas</td>
<td>31,349</td>
<td>786</td>
</tr>
<tr>
<td>Residential HVAC Gas</td>
<td>116,918</td>
<td>55,065</td>
</tr>
<tr>
<td>Totals</td>
<td>560,072</td>
<td>153,444</td>
</tr>
</tbody>
</table>

Although the programs were slow to realize savings in the early stages of 2009 and 2010, there has been an increase in participation and savings across all programs in 2011. With the extension of Gas EEPS programs through 2015 the Company expects programs to provide significant reductions in firm gas usage.

There is potential that a large number of conversions will lead to an increased demand for more efficient gas-powered equipment, such as boilers, burners, and chillers. This would provide many of our gas efficiency programs an opportunity to leverage the gas conversion process by offering our customers incentives and rebates that will encourage them to adopt more efficient equipment. To date, over 500 customers that converted from oil to gas have also participated in a gas efficiency program.

In addition to the programs that Con Edison provides, NYSERDA offers gas efficiency programs across New York State, including in New York City and Westchester. Con Edison works collaboratively with NYSERDA on statewide efficiency objectives. NYSERDA projects statewide energy savings goal from 2012-2108 of approximately 9.1 Million dekatherms. Based on acquisition rates from the 2009-2011 periods we believe programs in the Con Edison service territory will be able to achieve savings of approximately 1.8 Million dekatherms through 2018.

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<sup>10</sup> Program goals equal across all 4 years.
c. Clustering

Gas clustering initiatives

Meeting the growing demand from oil conversions has implications for our system planning and related infrastructure investment requirements. To meet growing demand, we need to reinforce and expand our existing infrastructure. Managing a large number of oil conversions within a short time frame in a concentrated area such as Manhattan, may be costly to customers. Meeting customer requests for service on an individual basis may result in trenching or digging up the same area multiple times, increasing the natural gas connection costs and the disruption to the community.

To address these concerns, we developed a clustering approach to manage demand growth. This approach is designed to bring customers on line in an efficient cost-effective manner without raising rates to existing customer. Our clustering strategy groups customers close to the same gas mains so we can connect as many customers at one time to minimize costs. The objective is that work crews will only have to trench the street once, lowering the connection costs for customers. Clustering will help lower rate increases by promoting natural gas growth in the right location and sequence. More details on this plan are provided in the Heating chapter of this document.
2) Shift demand

a. Electric to gas

**Combined heat and power**

Combined heat and power (CHP) is a form of DG that produces electricity and recovers the heat byproduct from the generator. The waste heat can be used for hot water production, space heating, or space cooling. Customers can use natural gas to meet both their heating and cooling energy needs (assuming the generation equipment is fueled by natural gas). CHP is one way to shift demand from our electric system to our gas system.

CHP is a low-cost energy solution that will shift electric peak-demand, which in turn will help defer large infrastructure projects and lower capital investment. As part of our new integrated planning approach, we now consider CHP a means to lower customer demand and to provide system capacity. Our infrastructure plan counts 30MW of CHP as a reliable resource.

Going forward, we will look to include additional DG in our infrastructure plans, as adoption of the technology is expected to grow. We have nine projects under development in our service area, with installations ranging from 6MW to 14MW in size. Together, these projects represent up to 80MW of potential means to lower customer demand in our infrastructure plan (See: Opportunities for Integration – CHP).

b. Steam to electric

**Steam air-conditioning**

Air-conditioning makes up 17% of our customers’ electricity usage, and is the main source of our peak electric demand. As a result, customer decisions regarding cooling will have a direct impact on the electric demand we must plan for. Our larger customers have the greatest impact on our infrastructure requirements because their cooling needs are so high. These customers, however, are more likely to invest in higher efficiency equipment and have a choice between electric, gas, and steam to power their equipment. About 300 of those customers are currently using steam to power their cooling equipment; however they will likely convert to electric when their equipment reaches the end of its useful life. We estimate that we would need to invest between $175 and $275 million to meet this additional electric demand. This scenario presents an opportunity to shift some of the electric demand for cooling to steam, where we have spare capacity during the summer. We are currently advocating for a steam air conditioning incentive to encourage existing customers to remain with steam (See: Opportunities for Integration – Cooling).
c. Oil to gas and steam

Oil conversions to steam integration opportunity

Potential heavy oil conversion is an opportunity to shift demand for natural gas to demand for steam. In most cases natural gas is the most cost competitive solution relative to #2 oil or steam. However, for some customers, it may make economic sense to convert to steam. This would generally be true in limited cases where the customer has an attractive large heating load profile and low utility interconnection costs. The ideal steam-conversion customers would be buildings larger than 250,000 square feet, such as hospitals, hotels, large office buildings, that are much closer to a steam pipe (within 250 feet) than to a natural gas pipe.

Since we provide both natural gas and steam, we are well-positioned to meet customers’ energy delivery needs cost effectively. Whenever applicable, we will give customers access to information on how best to achieve the least cost solution to meet their heating needs (See: Opportunities for Integration – Heating).
Managing capital investments: Asset optimization

3) Use existing assets more efficiently

Con Edison has developed innovative designs that will enable expanded use of existing assets, thereby reducing the capital costs required for us to support new customer demands. By using existing assets and emerging technologies, Con Edison can increase capacity incrementally, which will allow us to defer or avoid major projects and their associated costs.

a. System design

Electric

Over the course of this plan, we intend to meet our service reliability objectives in less asset-intensive ways by implementing innovative third-generation (3G) designs. These designs are a critical component of our infrastructure-planning framework, allowing us to increase asset utilization and reduce our investment requirements. 3G designs enable us to use the spare capacity on existing assets to meet growing demand without sacrificing reliability. They are the result of years of research and development efforts and they are now fully integrated into Con Edison’s design process. 3G design concepts to address system expansion include asset sharing, transferrable feeder groups, and virtual substations.

Our asset-sharing approach achieves comparable reliability to our existing standards at lower cost than traditional infrastructure investments. Spare substation transformers are shared among multiple substations, thereby eliminating the need for separate spare transformers in each substation. The asset-sharing technology enables automatic transfers of customers between substations to provide interim demand relief and defer the need to construct a new substation.

With growing demand in a certain area, asset-sharing approaches would defer but not eliminate the need for infrastructure investment. The virtual substation is an innovative, responsive capacity expansion process that can be used to better match investment with demand. In a virtual substation design, a new substation is constructed with the requisite switchgear and protection equipment but without transformers. It is supplied via connections to two nearby substations. The necessary ducting and cables are built with the ability to supply future transformers, however the transformers are not installed until demand growth is sufficient to require them. This approach lowers the overall size and cost of incremental capacity expansion, thereby lowering costs and improving asset utilization.

Gas

To manage growing demand from oil conversions, we must have adequate infrastructure in our natural gas system. Most of Con Edison’s New York City natural gas infrastructure consists of low-pressure mains, which are adequate for our current customers’ needs, but will require reinforcement to accept the new demands from space heating customers converting from oil. We look to serve these new customers in a least cost fashion. Here are some examples of how we plan to increase asset utilization:
District regulating stations will be installed in lieu of piping installation or replacement when the estimated station cost is less than the estimated piping cost, provided that the options have similar reliability impacts. Using regulators will minimize the excavation, construction and restoration costs associated with main reinforcement or replacement/upsizing.

New services are connected to the highest pressure main available on the street to enable us to scale up quickly if a customer’s demands increase. This will save the extra costs of additional digging and a new connection.

Wherever economically justified, we will strategically replace small-diameter, low-pressure mains with larger-diameter mains to accommodate larger loads.

We will use smaller, more efficient and cost-effective regulator designs, to reduce the construction footprint and resulting installation cost. Approximately half of all regulator installations forecast for the planning period may be able to use the smaller new design. Smaller regulators would save approximately $25 million over the 20-year forecasted period.

4) Increase information and improving decision-making

Another aspect of our effort to reduce capital expenditures is our use of new technologies (e.g., real-time monitoring and equipment diagnostics) to improve our decisions about infrastructure investments. By using technologies that give us new, valuable information, we can successfully prioritize which infrastructure investments to make and when to make them. As we add more advanced monitoring to our components, we will be able to move from an age-based approach to maintenance towards a condition-based approach. By gathering and analyzing data from infield sensors, we are better able to understand the performance of our assets. Better data will allow us to alter maintenance cycles, increase the life of various components, improve the design of specific assets, and predict and prevent failures.

a. Network Reliability Index (NRI) Electric

We have developed sophisticated models to understand the performance behaviors of each of our electric networks based on their specific characteristics. The key output from these models, the Network Reliability Index, is a probabilistic measure of performance risk. NRI is defined as the state where four or more feeders supplying power to one local portion of a network experience failure at the same time under standard peak-demand operating conditions. We use NRI to invest in the infrastructure that minimizes the level of risk for all networks at a given level of spending.
Our objective is to focus investment where it will have the greatest impact. While all investment should have some impact on reducing risk, three targeted programs most directly and significantly reduce the risk of the loss of a network as measured by NRI:

- Removal of selected paper-insulated lead cable (PILC);
- Installation of sectionalizing switches on network feeders; and,
- Increasing the number of primary distribution feeders serving a network.

The figure below illustrates the ranked NRI measures of our electric networks over time. Of particular note are the annual improvement in total system NRI in each year from 2007 through 2011 and expected improvements based on planned investments through 2016. We determined the planned investments through 2016 by weighing the benefits of reducing the risk of a large-scale, prolonged network outage against the cost of implementing the programs. We are spending 91% of our reliability capital budget on the networks that are at the highest risk for persistent performance problems. You can see that in a relatively short period of time, as we have applied budgets to highest ranking networks, the overall reliability risk levels decrease dramatically. The other 9% of the budget is spent on networks that, at this point, are below the target risk score, but still justify capital expenditure to maintain their performance and prevent backsliding. We think of this group as a “risk buffer.”

**Figure 29: Network reliability index**

By 2016, the marginal benefits of these existing NRI improvement programs will begin to diminish, and the effective lifecycles of these programs will begin to end. Consequently, we will conduct a re-evaluation of our approach in this area in 2016, again carefully weighing risk-reduction benefit against the cost, considering new tools, programs, or innovations that may be available. These new tools may include modification or application of demand-side management or other advanced methods. We have already started to evaluate these future options, and will continue to do so.
Further, a number of technologies will enable us to predict with far greater accuracy the condition and capability of various components of our infrastructure. With the detailed information these technologies provide, we will be able to improve our forecasting and modeling by reducing, and in some cases eliminating, the contingencies that we have historically built into our models. Eliminating these contingencies will enable us to create more accurate, and lower, projections of our costs.

With a better understanding of the condition of equipment on our system we will be able to focus maintenance efforts on equipment that needs it most, rather than base our maintenance schedules on age of equipment.

b. Main Replacement Program (MRP) Gas

The main replacement program involves condition-based replacement of cast iron and unprotected steel distribution mains with plastic pipe to reduce leaks and maintain system integrity. To help reduce risk and avoid incidents, we have developed a pipe selection process that addresses risk and prioritization for the replacement of approximately 60% of the distribution assets (the remaining 40% is already plastic piping). This process and other planning efforts come together as an integrated capital program to address an aging system and provide for load growth.

A study was conducted by ZEI Inc. to establish the required annual replacement levels for cast iron pipe and unprotected steel gas mains to maintain system integrity. The study determined the point of diminishing returns for main replacement. The study concluded:

Leak reduction rates increase as the rate of annual main replacement increases to 50 miles per year but the incremental, quantifiable benefits are negligible from 35 to 50 miles of main. Beyond 50 miles of annual replacement (20 miles of unprotected steel and 30 miles of cast iron main replacement), we would start to see diminishing improvement in leak reduction rates. The green line shows the 2009, 2010 and 2011 actual main repairs made. This number was lower than projected in 2010 and 2011. However, the trend must be evaluated on an on-going basis and is anticipated to have fluctuations from year-to-year.
c. Condition-Based Maintenance

Electric

We have already determined that the following technologies will enable us to improve our modeling by removing uncertainties:

- **Smart Grid** – We are implementing various Smart Grid technologies that will provide greatly enhanced control over the grid, more control of electricity use by our customers, and better system performance. We anticipate that the change in information and telecommunication technologies will continue to help reduce overall costs and improve the performance of our electric system. Our long-term objective is to develop a smarter grid that will capture the full benefits of improved and additional monitoring, modeling, and control.

- **Primary-feeder diagnostics** – We are proactively monitoring for symptoms that may indicate a potential cable failure. This will allow us to repair cable prior to failure, and allow us to save on cable replacement expenditures.

- **Distribution cable consolidation** – Con Edison and Orange and Rockland have developed a joint strategy to consolidate their distribution cable specifications where they serve the same purpose. This initiative will reduce capital costs by limiting the total cable inventory of the two companies. With consolidation, we believe that more manufacturers will bid on our cable contracts, which will increase competition and drive down unit costs.

- **Arc fault detection** – The use of arc fault detection may allow field crews to find and repair secondary faults before they become manhole events. By reducing the number of...
manhole events, we would reduce the associated mains that are cut in order to clear the event and the capital cost incurred to repair those mains.

- **Network transformer improvements** – We expect to reduce the number of network transformer replacements by increasing our efforts to prevent corrosion of network transformer tanks. We expect to reduce the number of network protector replacements because of improvements in the design of network protectors. This reduction should reduce both the capital expenditures and maintenance costs.

- **Reduction of conduit obstructions** – We are investigating available technologies and process improvements aimed at better locating obstructions, including: using smaller, localized excavations, boring devices, instrumentation and sharing of best practices among various stakeholders.

- **Secondary main prioritization** – Using new software tools, we discovered that our existing methods used to rate cables are conservative and that unused capacity exists within the secondary system. In addition, laboratory studies conducted on field-aged cable have shown that it can withstand substantial overloads for short periods of time without failure. Based on this information, we will be able to supply the same demand with fewer cable sections. This rating change would increase the normal cable loading by 10% and the emergency loading by 25%. Diagnostic techniques will be developed and applied to secondary cable in an overall condition based maintenance strategy. This initiative will reduce the amount to secondary main reinforcement required and associated conduit, structure, and cable installations.

### Gas

The gas system’s reliability is highly dependent on appropriate pressure levels and controls throughout the system. We are incorporating smart controls to optimize system operating pressures, which enhance reliability as well as reduce leaks and methane emissions. Automatic regulation, which involves the installation of control systems to adjust district regulator set points, is more economic than labor-intensive periodic pressure regulation and provides near-real time pressure control. We have a prioritization system in place for upgrading older stations with smart controls and specify that new stations must be capable of accepting such controls.
Improving business processes

5) Install a work management system

a. Electric Work Management System (WMS)

This initiative will deploy new processes for planning and carrying out our work in three areas of electric distribution operations: maintenance and inspection, capital construction, and emergency follow-up work. The new process covers every stage of a project: forecasting, planning, design, prerequisite management, scheduling, execution and closure.

The objectives of the work management system implementation in electric distribution operations are to:

- Establish a process, organization and technology structure that manages work “end-to-end”;
- Increase our ability to forecast, plan, and schedule work, resources and materials;
- Improve the visibility and timeliness of work status, and our ability to compare current work progress and costs to design estimates; and,
- Increase our ability to bundle work for O&M and capital programs and projects.
- Help coordinate work and decrease our visible presence in the streets

The end result of electric WMS is the standardization of work-management processes across regions, which will enable Con Edison to obtain information in real time, manage work more efficiently, and better plan for future needs.

Figure 31: Work management system

The illustration highlights the components of the complete, end-to-end work management process, from initiation to closure.

Electric WMS is scheduled to be implemented between April 2010 and March 2014. The total authorized project cost is $160 million. Con Edison expects to realize $392 million in savings as a result of this system ($45 million annually starting in 2015), divided roughly equally between
capital expenditures and O&M. The savings are driven by a 65% productivity improvement in administrative efficiency and a 15% productivity improvement for engineering.

6) Install a enterprise resource planning (ERP) System

a. Finance and supply chain system

Our new enterprise resource planning system includes the largest technology investment in the company’s history. It will be implemented throughout Con Edison’s utility businesses, and will replace approximately 60 existing systems. One automated system using a common database and a common platform will enhance financial, budgeting, and supply chain processes. The new system, combined with new business processes being implemented as part of the project, will provide several benefits to the Company:

• Faster access to information for better cost control and decision making;
• More transparent information for such items as project spending, materials and services ordering, and inventory management;
• Reduced external financial reporting risks for the company’s financial statements; and,
• More in-depth analysis available through standard and customized reports.

The standardization of business processes, coupled with enhanced cost management practices and an increased ability to manage risks, makes Enterprise Resource Planning a key initiative to reach our goal of reducing increases in customer costs.

b. Cross-commodity street work coordination

This initiative is based on the need to improve project planning and relationships with internal and external stakeholders by consolidating street work and decreasing our presence in the streets. Our ability to coordinate street work across commodities is limited by a relatively narrow planning horizon for electric infrastructure. We are currently examining the benefits of extending the planning cycle to two years for each commodity. In addition to greater coordination of street work, an extended planning horizon may allow us to package multiple jobs into fixed price awards. An extended planning period should also result in tighter work scopes, which would improve our resource planning.

In terms of improving multi-commodity and multi-utility street work coordination, we currently participate in a “Utility Data Exchange Initiative” aimed at avoiding/minimizing conflicts with overlapping projects requiring excavation activity. This project was initiated in 2010, where Con Edison, National Grid and Verizon/Empire City Subway (ECS) voluntarily signed an agreement with the New York City Department of Transportation (DOT) to participate. In early 2011, Con Edison began participation by providing data on planned projects requiring excavations to the DOT on a monthly basis. The Construction organization has taken the lead in coordinating with other operating groups in the company (e.g. Electric, Gas and Steam Operations) to acquire and submit data to the DOT. A process for the resolution of conflicts is being developed.
The data being provided to the DOT is for street excavation projects in advance of project start dates (i.e. in advance of street excavation permits being ordered) so that if conflicts are identified, a plan for avoiding these conflicts can be worked out. The DOT and participants have agreed to make a good faith effort to revise schedules to alleviate conflicts.

Initial findings from pilot programs have not identified significant savings from street work coordination across commodities. However, better scheduling and coordination, supported by an extended work horizon, should eliminate the need for excessive capital and O&M overtime to meet specification or customer in-service date commitments and streamline the purchase order process for construction contracts for reduced competitive pricing. Opportunities for joint commodity planning in the front end of the planning and design process may identify opportunities for joint excavation, joint restoration and use of contractors with multi-commodity skills sets. This can reduce the Company’s construction footprint in a community and can reduce the disruption to stakeholders including the residential and business community as well as the street owners.
Chapter 9: Supply

As part of our integrated long-range plan, we are committed to taking a holistic approach to containing the cost of every portion of our customer bills, including those portions we don’t directly influence. Bills include three significant costs that we are required to pass along to our customers: supply costs, taxes, and fees. This section focuses on our efforts to better manage the supply portion of our customer bills, without compromising our reliable and efficient electric system. The next section addresses our efforts to control the taxes and fees that we are required to collect from our customers and remit to various government entities.

Figure 32: Typical monthly customer bills

As a company that distributes electricity, gas, and steam but does not produce either electricity or gas, Con Edison does not set the price of the energy we provide to our customers. Rather, we pass along to our customers supply costs that are set by the energy market or specified in our contracts with companies that produce electricity or gas.

Although we lack control over supply costs, we are committed to doing everything within our power to address these costs for our customers’ benefit. Our efforts fall into two categories: promoting energy markets that remain competitive; and pursuing infrastructure projects that increase and diversify energy supply to our service areas.

Con Edison supports fair and effective wholesale market rules that produce competitive results

Con Edison’s dedicated teams work with federal, state and local energy regulators to prevent unjustified increases in our customers’ supply costs. One key aspect of this work is our focus on promoting a market for energy supply that remains competitive and unrestricted. We believe that competitiveness in the wholesale market is critical to keeping supply costs reasonable.

To that end, Con Edison takes a proactive approach to working alongside regulators on the federal, state, and local levels to advocate for the lowest possible supply cost to our customers. We advocate for these principles before the Federal Energy Regulatory Commission and in our
regular collaborations with the New York Independent System Operator (NYISO) and the New York Public Service Commission (PSC).

In particular, Con Edison plays an integral role in developing rules for the administration of the NYISO’s capacity and energy markets. NYISO, a not-for-profit corporation, administers New York State’s wholesale electricity market and implements rules that set prices in that market. Con Edison representatives attend NYISO meetings to advocate against unjustified increased costs for our customers.

In 2010-2011, through its participation in a NYISO process to reset capacity prices, Con Edison played a key role in minimizing supply costs to customers. Every three years, the NYISO resets the demand curve, which is the mechanism used to set the annual capacity fees for generators that participate in the wholesale markets. The capacity payments are used to facilitate recovery of generators’ fixed costs, especially for generators that do not recover sufficient revenue from electricity sales, and to provide an incentive for new generators to enter the wholesale electricity market.

In the most recent demand-curve reset, we worked closely with the NYISO and its consultant to ensure that their model did not overestimate the costs of adding in-city generation by failing to account for property tax abatements available to New York City generators. In early 2011, FERC rejected NYISO’s proposal to reduce the estimated cost of building in-city generation, opting to disregard a property tax abatement generally used by generators because it was only available on a discretionary basis.

By working with regulators and politicians, Con Edison successfully advocated for legislation that made tax abatements for new power plants mandatory rather than discretionary. After the new legislation was enacted in May 2011, FERC reversed its initial decision and accepted the NYISO’s proposal to reduce the estimated cost of building in-city generation. Con Edison’s efforts thus could save customers up to $500 million per year over the three-year reset period.

Con Edison supports NYISO planning processes aimed at maintaining reliability and reducing supply costs

Con Edison actively participates in the energy planning process overseen by the NYISO, which not only administers wholesale electricity markets but also plans for the state’s energy future. The NYISO’s plan focuses on achieving long-term reliability by analyzing system reliability needs and identifying generation, transmission, and demand-side management alternatives to satisfy those needs if they exist.

The NYISO’s plan is anchored in a market-based philosophy, which Con Edison supports. The plan emphasizes market solutions as the preferred choice for meeting the region’s long-term energy needs and minimizing increases in supply costs. The plan seeks to promote market solutions by improving the structure and rules of the wholesale energy market.

The NYISO’s plans are embodied in the Comprehensive System Planning Process (“CSPP”); the NYISO’s planning process for developing both market-based and regulated backstop
solutions for reliability and congestion problems. The CSPP is a two-stage planning process: the first phase identifies reliability needs along with solutions to address those needs, while the second phase focuses on solutions to reduce congestion.

In the first phase of the CSPP, the NYISO identifies reliability needs through its Comprehensive Reliability Planning Process (“CRPP”), a formal, transparent, long-term planning process. As part of the CRPP, the NYISO performs a Reliability Needs Assessment, an evaluation of regional reliability needs over a ten-year planning horizon. This assessment is based on standards set forth by regional and national bodies, including the North American Electric Reliability Council (NERC) and the Northeast Power Coordinating Council (NPCC). Con Edison’s role in the CRPP is to verify that the NYISO’s modeling assumptions are correct, and to review the Reliability Needs Assessment as well as the overall Comprehensive Reliability Plan to ensure that issues are appropriately presented before voting on the respective studies and reports.

In the second phase of the CSPP, the NYISO carries out the Congestion Assessment Resource Integration Study (“CARIS”). Like the first phase, CARIS is a formal, transparent, long-term (ten-year) planning process. CARIS is itself conducted in two distinct stages: the first stage gathers detailed information on congestion issues and their potential solutions. During the first stage (the study stage), the NYISO:

- Identifies the most congested paths;
- Evaluates potential generic resource solutions aimed at mitigating congestion; and
- Considers all resources on a comparable basis (transmission, generation and demand response).

During the second stage, the NYISO and energy-industry stakeholders evaluate specific economic transmission projects, with an emphasis on cost-benefit analysis and cost allocation. Projects go forward only if a supermajority of beneficiaries votes in favor of the project, which enables the identified beneficiaries to decide if the project should receive regulated cost recovery.

Through the CSPP, Con Edison works with the NYISO to identify cost-effective, market-based and regulated projects, which will prevent increased supply and delivery costs while allowing for the construction of new infrastructure.

**Con Edison endorses private projects that solve reliability and congestion problems**

In addition to its close involvement with the NYISO’s market planning, Con Edison invests substantial resources in projects aimed at solving reliability and congestion issues, as well as reducing supply costs by bringing lower cost energy into our service territory. We examine many promising projects to endorse, and our internal research teams develop our own projects that support these objectives. Our commitment to solving reliability and congestion needs is illustrated by our current endorsement of projects like Spectra Energy’s New Jersey-New York
expansion project, the M29 cable, and the Hudson Transmission project, which are summarized here.

*Spectra: Long-term supply contract*

Con Edison has signed a long-term supply contract with Spectra Energy, which is expanding its existing gas pipelines systems to bring new natural gas supplies to the New Jersey and New York areas, including Manhattan. Spectra’s New Jersey-New York expansion project will add approximately 16 miles of new pipeline and five miles of replacement pipeline to Spectra’s network. The new line will begin supplying up to 800 MDT/day of new supplies of natural gas as early as November 2013. Con Edison has contracted for 170 MDT/day of this capacity.

Access to this increased pipeline capacity will provide increased reliability to our customers, increase our capacity to service new customers, and reduce gas and electricity supply prices. By broadening our gas supply base, we are increasing the likelihood that we will be able to continue reducing the supply costs of our delivery customers in the future. We expect that the Spectra contract will result in approximately $400 million of annual savings for our New York City gas and electric delivery customers. Gas customers will realize approximately $100 million of that savings, while electric customers will realize approximately $300 million in savings, as the influx of less expensive natural gas will reduce the cost of gas-fired generation, which sets the price of electricity.

*M29: reliability investment*

M29 is a 9.5-mile, 345 kV, high-pressure, fluid-filled, underground transmission cable that runs from Con Edison’s Sprain Brook Substation, in Yonkers, to the new Academy Substation in the Inwood section of upper Manhattan. M29 will increase reliability for our customers while conferring savings of energy and capacity costs.

This fully regulated investment allows us to expand our transmission and distribution system by approximately 350 MW of import capacity. The line provides transmission operating flexibility by adding phase-angle regulation. The project increases reliability and will enable the Company to continue to meet reliability as load grows. In addition to reliability improvements, this transmission cable will result in significant energy and supply-cost savings. For example, the M29 cable lowered the in-city locational capacity requirement from 81.9% to 81.0% in 2011 (the in-City locational requirement increased to 83% in 2012). It is currently estimated that the cable will reduce our electric-delivery customers’ energy costs by approximately $5 to $10 million annually, and will reduce capacity costs by approximately $100 million annually.

*Hudson Transmission Project*

The Hudson Transmission Project (“HTP”) is an eight mile transmission cable (including four miles of submarine cable) that runs from PSE&G’s Bergen Substation in Ridgefield, New Jersey to Con Edison’s West 49th Street Substation. The new Hudson cable will satisfy two key goals: enhancing our reliability and diversifying our customers’ electricity supply. It will also reduce New York City electricity prices. We anticipate that access to the markets to our west will result
in a savings for our customers. The HTP cable is under construction and expected to be in service in May 2013.

State Transmission Assessment and Reliability Study (STARS)

The NYISO planning process currently assumes that existing transmission infrastructure will remain intact through a ten-year planning period. With an aging transmission infrastructure however, some elements of the system will be approaching its end of useful life during this time period. Due to the interconnected nature of New York’s power system, the New York Transmission Owners (NYTOs) are coordinating a long-term transmission study, the New York State Transmission Assessment and Reliability Study (STARS), which is intended to:

- Complement and support the NYISO planning processes and the New York State Energy Planning Process;
- Support growth of renewable energy sources; and
- Maintain reliability of the power system.

This study will provide input to future NYISO Comprehensive System Planning Process (CSPP) analyses by addressing existing transmission infrastructure and transmission asset conditions as well as future investment needs.

STARS will:

- Assess infrastructure for the period through 2028, which will support and complement the NYISO planning process that evaluates the capability of the power system over the next ten years;
- Examine reliability needs, condition of transmission assets, and also focus on whether the system needs to be upgraded or enhanced to facilitate efficient power delivery;
- Focus on existing rights-of-way and how they may be utilized to mitigate environmental and community impacts;
- Explore synergies of transmission replacement and expansion in affected corridors;
- Evaluate upgrading, expanding, modernizing, including Smart Grid applications, of the power system; and
- Seek to enhance integration of renewable energy resources.

In addition to transmission capacity uncertainty, we also face generation capacity uncertainty. Since our last plans were published in 2010, several power generation stations in New York City have publicized their intent to mothball (i.e., they will be taken out of operation, however equipment will be protected for future use) for an indefinite period of time. The absence of some of these generators presents reliability issues in certain areas of our service territory; however we have developed a transmission solution to address the potential risk.

Source: NYISO. “STARS Key Points”.

11
Our flexible portfolio allows Con Edison to effectively manage energy supply costs

Our goal is to provide our default-supply customers with the lowest cost energy supply available at any given time while mitigating volatility. We achieve that goal by managing our long-term power contracts as a portfolio of assets. By maintaining a large portfolio of long-term contracts with various electric generators in New York, we are able to continually identify opportunities to reduce costs for our default-supply customers as market conditions change.

For example, some power contracts give us the freedom to decide whether or not to buy energy from particular suppliers during off-peak periods. By comparing the cost of electricity from our contractual suppliers to the expected market price, we can choose the lowest-priced option that meets our default-supply customer’s electricity needs.
Chapter 10: Taxes and fees

Taxes and fees currently make up approximately one-third of the typical Con Edison customer bill. The amount of taxes and fees Con Edison collects through customer bills has significantly increased over the past several years. During this period we have continued to advocate for our customers to mitigate further increases. The figure below illustrates the breakdown of those taxes and fees across various federal, state and local agencies.

Figure 33: Historical CECONY taxes and fees

As the figure illustrates, taxes and fees have gone up approximately 80% since 2004. Our property taxes alone have nearly doubled since 2004 from $700 million to $1.3 billion. In addition, in 2009 New York State imposed a temporary surcharge of 2% on utility revenues, which is scheduled to expire in March 2014. In 2010, the PSC collected $255 million for this surcharge from Con Edison’s electric, gas and steam customers.

Con Edison is committed to minimizing the taxes and fees we are required to pass along in our customers’ bills. If allowed to mount unchecked, these charges could ultimately prevent Con Edison from making other investments needed to maintain reliability, and encourage customers to invest in uneconomic energy projects in order to avoid these onerous taxes and fees.

As part of our current long-range planning effort, Con Edison has formulated a multi-faceted strategy for monitoring and seeking to reduce—or at least prevent continued increase in—the taxes and fees that our customers are required to pay as part of their monthly energy bills. Our strategy includes efforts to advocate for specific changes to legislation, both at the state and local levels. Our goals include reforming New York City’s property tax structure, which disproportionately burdens utilities. We are also working to reduce regulatory fees we are
required to collect from our customers. For fees that fund programs we support (like the State’s renewable energy, energy technology, and energy efficiency programs) we are focused on capping fees, and helping our customers benefit to the maximum extent possible from the programs.

**Taxes**

Con Edison is the largest taxpayer in New York City, paying about $3 billion per year in taxes and fees. Property taxes, totaling $1.3 billion in 2010, are the largest single component of that total, representing about half of the total taxes and fees collected from our customers. Property taxes make up such a large portion of our customer bill because our business is capital intensive: we own large amounts of property, including buildings and infrastructure, all of which are subject to property taxes. We expect property taxes to increase as energy demand—and the investments we will need to make to meet that demand—grows. For every dollar we invest in our system, we estimate that we will incur about $0.04 in property taxes each year over the next twenty years.

To minimize the impact of property and other taxes on our customers’ bills, we have developed a two-part strategy: First, we are reducing our capital intensity (i.e., the rate of increase in our tax base), which will effectively reduce the rate of growth in the amount of revenue collected from customers, and in turn, reduce the rate of growth of Company’s tax obligation. Second, we are pursuing legislative initiatives that would reform the property tax regime, which will provide tax relief to our customers. The company’s principal legislative strategy is to reduce taxes that are uniquely applied to Con Edison and the small number of private utilities remaining in the state.

We believe that New York’s state and local governments should reform utility taxes because they impose a burden on essential universal services. These reforms are needed so that in difficult economic times, states and major municipalities cannot simply raise funds through utility bills.

Con Edison customers’ bills are mainly impacted by four distinct types of taxes: property taxes, revenue taxes, sales taxes. The Company has proposed various legislative initiatives that would fundamentally change New York’s state and local public utility taxation structure, thereby reducing the amount our customers are required to pay for property taxes, revenue taxes, and sales taxes.

We are focused on achieving three key changes that will provide meaningful tax relief for our customers:

- Rate-base valuation and central assessment of utility property;
- Merger of commercial and utility property tax classes; and
- Elimination of the tax-on-tax effect.
By working toward these goals, Con Edison hopes that consumers’ utility bills will better reflect the actual costs of service, rather than extra fees and taxes to address government budget gaps.

**Rate base valuation and central assessment of utility property**

We believe that the current method used by tax assessors for valuing Con Edison’s utility-specific property overestimates the value of that property, and that Con Edison therefore pays property taxes that are inflated relative to the real value of its properties. Con Edison has advanced a proposal to implement a new formula for determining the value of utility-specific properties—one that more realistically and fairly approximates the value of those properties.

Like other private property, utility property on privately owned property is valued by local assessors, generally employees of the local municipality. The valuation of special franchise utility property, which applies to only a small number of companies having the right to situate equipment on the public highway, is the responsibility of a specialized state agency, the State Board of Real Property Tax Services (SBRPTS).\(^1\)

Con Edison’s land and certain company structures are valued according to market value, just as any other company’s land and structures are valued. For instance, the company’s headquarters building is treated the same as any other office building in the city for valuation purposes. Con Edison’s utility equipment, however, cannot be valued based on market prices, because no ready market exists for much of the Company’s unique utility equipment. Property is valued based on the cost of its reproduction.

It is this alternative method currently used to assess the value of Con Edison’s specialty property that, in our belief, has resulted in regular overvaluing of that property. This cost-based method is prescribed not by New York State statute, but by New York court rulings that have attempted to fill this void.

Under these court rulings, "specialty property" must be valued according to a methodology known as Reproduction Cost New Less Depreciation (RCNLD). Under this methodology, Con Edison’s historic asset costs are assigned a reproduction cost based on a construction cost index, and then reduced for a depreciation allowance. The computed RCNLD is a specialty property’s market or full value. The Office of Real Property Tax Services and some local assessors use RCNLD to value utility property.

The reproduction-cost orientation of the RCNLD method is simply a poor fit for Con Edison’s equipment and other unique property. For a variety of reasons, the company’s energy system would not, and indeed could not, be reproduced in its existing state. Valuing property valued on an RCNLD methodology is also inappropriate because the Department of Public Service limits earnings to a return on rate base, measured by reference to historic asset value.

\(^1\) The work of the SBRPTS is carried out by the Office of Real Property Tax Services (ORPTS), which conducts the assessments of special-franchise property.
Con Edison strongly believes that the value of our system should be based on a “rate base” valuation, an alternative methodology that achieves a more realistic, fair valuation of our property, taking earnings limitations into account. Generally, rate base represents the property that is “used and useful” in providing energy service. It is based on prudent original cost investment and includes a deduction for accumulated depreciation.

A valuation based on rate base multiplied by our earned rate of return would represent the best measure of the value of Con Edison’s system. In addition, such a valuation would produce a fairer value because it is arbitrated by the Public Service Commission and is the basis upon which a utility is permitted to earn a specified rate of return.

The Company will pursue legislation that establishes a statutory formula for determining the full value of public utility property under the Real Property Tax Law. The legislation we support will provide for the value of Con Edison’s unique properties to be calculated according the company’s rate base, which is a more accurate reflection of the ongoing value of the energy system to its owners. In addition, the Company will support legislation providing for central assessment of all property by a single assessing organization (ORPTS), which would standardize the assessment practices used by the many individual local assessors in the state.

**Merger of commercial and utility property tax classes**

A second key strategy for containing property taxes that Con Edison must pass on to customers is the restructuring of New York City’s property-tax classification system. Under the current system, utilities are treated as a separate class from all other businesses, and carry a disproportionate tax burden as a result.

The City Council uses a multi-step process to determine property tax rates for New York City properties. First, the Council adopts the fiscal year budget amount and the estimated probable amount of all non-property tax revenues. The Council then determines the funds needed from property taxes by subtracting non-property tax revenue from the total budget amount.

New York City’s property tax is unique because it is the only tax that the City has the discretion to set without new legislation from New York State—the only tax that can be increased as needed to balance the budget. To assure sufficient revenue to balance its budget, the City also collects an additional amount calculated each year to compensate for items like uncollectible property taxes, refunds, and prior year tax collections, together known as the property tax reserve. Each year’s total property tax levy is thus determined by adding the property tax reserve to the amount needed to balance the budget.
After determining the total property tax levy, the Council authorizes and fixes the property tax rates. The Council can then determine a tax rate for each of the four designated classes of property that exist in the city, including one class that includes only utilities:

- Class 1 – small residential properties, such as one-, two-, and three-family homes.\(^{13}\)
- Class 2 – large residential properties, such as apartment buildings.\(^{14}\)
- Class 3 - utility real property owned by utility corporations, except land and buildings.
- Class 4 - all other real property (usually referred to as the “business class”).

About 90 percent of Con Edison’s property falls within Class 3; the remainder is within Class 4. Each class is responsible for a specific percentage of the property tax levy, known as the “class share.” The class share is determined by multiplying the total levy by the adjusted base proportion of each class.

The city’s property classification system, with its class specifically for utility real property (Class 3), imposes a disproportionate burden on Con Edison. The Company's property comprises approximately 80% of this class by assessed value. Given that so few other taxpayers share in any increase in taxes imposed on Class 3 property, the burden of those increases falls disproportionately on Con Edison and our customers.

Property taxes related to Con Edison’s plant and equipment are by far the Company’s largest tax expenditure; the Company pays over $1 billion per year in property taxes to New York City. These taxes are, in turn, passed along to our customers.

To reduce these taxes, Con Edison supports a New York State Assembly bill (A.8926) to eliminate the utility property tax class (class 3) and combine it with the commercial tax class (class 4). Combining the two classes would save Con Edison customers $173 million each year or $3.5 billion over the 20-year period. Additionally, merging these classes will help lessen Con Edison’s annual property tax volatility (as valuation increase and decreases are expected to be phased in over five years); reduce the Company’s incentive to litigate property tax cases; and place utilities on equal footing with most other businesses in the City.

The Independent Budget Office has confirmed that combining commercial and utility property tax classes would be revenue neutral for New York City. In other words, this change would result in no revenue loss to the City, as the new combined classes would generate the same tax revenue that classes 3 and 4 currently generate separately. This shift in revenue to other classes will keep the city whole.

\(^{13}\) Also included in Class 1 are (1) single-family homes on cooperatively owned land and condominiums with no more than three dwelling units and (2) mixed-use properties with three units or less, provided 50 percent or more of the space is used for residential purposes.

\(^{14}\) Class 2 also includes mixed-use property with four or more units, provided 50 percent or more of the space is used for residential purposes.
Elimination of the tax-on-tax effect

Revenue tax, or gross receipts tax, consists of a broad category of taxes that are imposed by a number of different state and local taxes and related surcharges based upon receipts. Public utilities in New York are subject to state and local gross receipts taxes that range from 1% to 3%. Con Edison pays over $300 million in receipts taxes each year, the majority collected on behalf of New York City. Although the rates in New York City have remained stable, the amount of the tax paid has continued to rise because the receipts themselves have increased. Con Edison’s state gross receipts tax has decreased due to the reforms in utility taxation enacted by the state in 2000.

Like other taxes, most of the sales and use taxes that Con Edison pays are collected from customers and do not affect earnings. New York State, New York City and local municipalities (including school districts) also impose a sales tax on energy sales to consumers.

As the following table shows, New York City energy customers pay higher sales and use taxes than customers in other large cities in our region.

Table 11: Sales tax on utility sales

<table>
<thead>
<tr>
<th>Sales tax on utility sales</th>
<th>Residential</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City, NY</td>
<td>4.50%</td>
<td>8.86%</td>
</tr>
<tr>
<td>Hartford, CT</td>
<td>Exempt</td>
<td>6.00%</td>
</tr>
<tr>
<td>Boston, MA</td>
<td>Exempt</td>
<td>6.25%</td>
</tr>
<tr>
<td>Newark, NJ</td>
<td>7.00%</td>
<td>7.00%</td>
</tr>
<tr>
<td>Philadelphia, PA</td>
<td>Exempt</td>
<td>8.00%</td>
</tr>
</tbody>
</table>

Like gross receipt taxes, sales taxes collected from customers have also been increasing in New York City, New York State and local municipalities, even though the sales tax rates over that time frame have remained stable. This increase, like the increase in gross receipts tax, is attributable to an increase in revenues. Compounding this increased taxation of customers is the “tax-on-tax” effect: sales taxes are computed on the total bill, including gross receipts, property taxes, and other taxes and fees. As a utility bill’s components and various levies increase, so does the sales tax, resulting in a double blow to our customers.

While New York State, New York City and local municipalities benefit from rising energy costs and the tax-on-tax effect, their residents and businesses receive higher bills for essential services compounded by higher taxes. For example, New York City imposes a 2.35% gross receipts tax (“GRT”) on all gas imported into New York City, or “city-gate purchases.” Moreover, the City imposes a 4.5% sales and use tax on all sales of gas and oil used to generate electricity or steam. Accordingly, when a generator makes a city-gate purchase of gas to burn in its plant, it pays a 2.35% GRT in the gas cost for generation, and then an additional 4.5% sales/use tax is computed on the gas purchase—which includes the 2.35% GRT. Because of this tax-on-tax effect, for every $1 increase in gas or oil prices, New York City receives an approximate 7-cent tax windfall for gas and 4.5 cents for oil.
That tax expense becomes part of the generator’s cost for producing electric or steam energy; that increased cost is then passed on in electricity supply costs on the utility customer’s bill. When a utility company or another energy supplier sells that energy to a customer in New York City, the energy cost is taxed yet again at 2.35% for the New York City gross receipts tax and at 4.5% for the New York City sales tax.

Our position is that no secondary tax increases should be imposed due to increases in other taxes. Repeal of the New York City gross receipts tax, the New York State gross receipts tax on residential customers, and exempting New York City residential customers from the New York City sales tax would be steps in the right direction.

**Fees**

In addition to the taxes that Con Edison is required to collect from customers, we are required to collect fees from our customers to fund a range of energy initiatives mandated by law and run by New York State agencies. Fees collected from our customers have gone up in recent years mainly because of increases in New York Public Service Commission fees. According to New York State law, the purpose of these fees is to fund the state’s oversight of the utilities providing service in the state. The recent temporary surcharge of 2% on utility revenues does not serve this purpose, but rather goes to the state’s general fund to help close the general budget gap. As part of our Integrated Long-Range Plan, Con Edison has estimated the future levels of fees that will likely be included in our customers’ bills, and developed strategies to reduce or eliminate those fees. We consider two major categories of fees that impact our customers’ bills:

- Fees that are authorized by the New York Public Service Commission under Section 18a, the provision of the Public Service Law that allows the PSC to fund its own costs, and that is temporarily being used to provide general revenues to New York State. These fees are currently set at two percent of utility revenues (including estimated revenues of energy service companies that provide commodity energy to customers). Con Edison is required to collect this fee from our electric, gas and steam customers, and to turn the revenue over to the PSC.

- Fees for public policy programs that have been authorized by the PSC, including the Renewable Portfolio Standard charge (RPS), the System Benefits Charge (SBC), and the Energy Efficiency Portfolio Standard charge (EEPS). The RPS and SBC charges are collected from Con Edison’s electric customers; the EEPS charge is collected from Con Edison’s electric and gas customers. Steam customers do not currently fund any of these public policy programs.

Con Edison also closely monitors—and in some instances attempts to reduce—a third category of fees: those that are not itemized on our customers’ bills but are embedded in our customers’ power costs, such as the cost of carbon emissions allowances resulting from New York State’s participation in the Regional Greenhouse Gas Initiative, and the fees charged by the New York Independent System Operator to recover its own costs.
Going forward: Strategies for controlling, reducing or eliminating Fees

As part of our effort to contain our customers’ costs, Con Edison has developed a plan for minimizing the amount of fees we are required to pass along to our customers. That plan is based on our estimates of the future levels of fees on customers’ bills; those estimates in turn are based on our assumptions about the programs that those fees are used to fund.

The following section summarizes our plan for reducing, or eliminating the fees that impact our customers’ bills.

Section 18a

When the temporary surcharge expires, the Section 18a fee on customer bills will be capped by statute at one percent of overall utility revenues. We expect that, because this fee is a product of total utility revenues, which are projected to rise between now and 2031, the dollar amount of this fee will also rise during that time period.

Con Edison’s goal is to eliminate the temporary surcharge early or, at a minimum, to bring the surcharge to an end in March 2014, when it is set to lapse under the statute authorizing it. To achieve this goal, Con Edison’s Government Relations group will lead an effort to communicate Con Edison’s concerns with the Section 18a temporary surcharge to key New York State legislators and their staff, and by proposing legislation that would result in an early termination of the temporary surcharge. Con Edison will also communicate its concerns to other stakeholders in New York State, including business organizations. In conjunction with our efforts to communicate our concerns to key decision-makers, we will monitor key signposts, such as State-level budget discussions, that may indicate whether early termination is feasible (or, on the other hand, whether legislators are likely to advocate for an extension of the temporary surcharge).

Fees that fund PSC-authorized public policy programs

The PSC has approved fee-collection schedules for three key public-policy programs: the Renewable Portfolio Standard (RPS), the System Benefits Charge (SBC), and the Energy Efficiency Portfolio Standard (EEPS). (The collection schedules are shown in Appendix A.) The collection schedule for one of those programs—the EEPS program—is particularly prone to alteration, because the PSC continues to approve energy-efficiency programs proposed by the

15 We assume that the PSC will collect the maximum amount of Section 18a fees that it is legally permitted to collect. Before the State imposed the temporary surcharge, the Section 18a fee was capped at one-third of one percent based on the amount needed to cover the PSC’s actual costs. Actual collections were generally lower than this cap, usually 0.15 percent to 0.20 percent. While it is possible that after the temporary surcharge expires, the PSC will revert to its prior practice of collecting solely its actual costs, and that those actual costs will be below one percent, we have concluded that the PSC will be legally permitted to collect the full one percent even if that amount is more than necessary to cover the actual costs of running the Commission.
State’s utilities and NYSERDA, and the PSC typically approves increased fees each time it approves a new program.

1. Renewable Portfolio Standard (RPS)

The State’s Renewable Portfolio Standard program aims to increase the percentage of electricity consumed in New York State that is generated from renewable energy sources. The program is overseen by the PSC and implemented by NYSERDA. The RPS program has a specific goal: by 2015, 30 percent of the electricity consumed in the state will be generated from renewable energy sources. To fund the costs of the RPS program, the PSC has imposed a fee collection schedule that is mandatory for all investor-owned electric utilities in the state.

While the program goal is to be achieved by 2015, the fee collection schedule approved by the PSC extends to 2024. This longer timeframe reflects the contract terms for many of the program-related contracts that NYSERDA has entered into with renewable energy developers; most of those contracts, which are central to NYSERDA’s implementation of the program, have terms of ten years. As a result, the PSC has approved a fee collection schedule that extends to 2024, although the fee peaks in 2015.\(^{16}\)

In 2010, Con Edison collected approximately $46 million in RPS fees from electric customers; under the current collection schedule, this fee will peak at $138 million in 2015. This NYSERDA-implemented program is currently on-target to achieve the goals set forth in the PSC order authorizing the program, and is slightly below its budgeted spending levels. NYSERDA staff has indicated that they anticipate costs of procuring renewable energy to rise in the near future, so it is likely that the current under-spending is only temporary.

Con Edison will advocate in regulatory proceedings for slowly declining collection levels beginning in 2016. Our position is premised on the notion that public support for renewable energy subsidies can be gradually reduced as technical advances begin to make renewable energy more cost-competitive with conventional resources.

Among the key signposts our Government Relations group will monitor are legislative efforts to increase the amount of renewable energy procured in the state. Con Edison has advocated against proposed legislation that would impose a solar renewable energy purchase requirement on utilities and ESCOs in the state; our opposition is based on the high costs of this legislation as proposed, and the fact that it would create a program that is duplicative of the current RPS program. Nevertheless, environmental advocates continue to push for such legislation. If they are successful, new legislation could significantly raise the cost of the state’s renewable energy programs.

Con Edison will also monitor the impact and focus of the RPS program. Of particular concern is the geographic distribution of the program’s spending: we will continue to advocate that a

\(^{16}\) Con Edison assumes that no new incremental renewable-energy fees will be approved prior to 2015, either via regulatory or legislative processes.
proportionate number of renewable energy resources be constructed in Con Edison’s service territory. If the geographic balance is poor, or if programs are not sufficiently attractive to New York City customers, Con Edison will advocate, through filings and other means, for changes to the RPS program.

Con Edison’s has recently had success in advocating for such changes: in 2010 and 2011, after receiving comments from Con Edison and others on the lack of significant renewable energy development in the downstate region, NYSERDA developed and implemented a new initiative within the RPS program, called the Regional Program, which reserved $25 million per year over five years for solar and biogas incentives in NYISO Zones I and J, which comprise the large majority of Con Edison’s service territory. This program serves as an example of changes to the RPS program that the Company will advocate for in the future should geographic balance continue to be an issue.

2. System Benefits Charge – Technology and Market Development Program (SBC T&MD)

The System Benefit Charge program (SBC)\(^\text{17}\) funds technology and market development activities (T&MD) relevant to the energy system. The PSC uses the SBC T&MD program to support research and development efforts that serve as a “feeder” of new technologies to be incorporated into the State’s energy efficiency and renewable energy programs.

NYSERDA implements the program under the PSC’s supervision. The fee for the SBC T&MD program is collected solely from customers of electric delivery service in New York State. In 2010, the SBC T&MD fee collected from electric customers totaled approximately $87 million. The SBC T&MD program was recently reauthorized by the PSC, with constant funding, through 2016.\(^\text{18}\)

SBC T&MD collection levels for Con Edison electric delivery customers will be lower in future years compared to past collections for two reasons. First, some energy efficiency programs previously funded under the SBC T&MD program will be moved to the EEPS program. Second, the cost-allocation methodology used by the PSC to apportion statewide collections among the utilities in the State is changing in 2013, and the new methodology will reduce collections from Con Edison’s customers.

Once the currently authorized collections expire in 2016, Con Edison will advocate to gradually reduce SBC funding over the next two decades. Our advocacy is premised on the notion that

\(^\text{17}\) The SBC program is sometimes called “SBC IV” to distinguish it from the PSC’s Energy Efficiency Portfolio Standard (EEPS) program.

\(^\text{18}\) Con Edison assumes that the state will adhere to the currently approved SBC collections schedule, and that New York State (through either regulatory or legislative process) will not approve any new SBC T&MD-type programs funded via utility customer collections to begin prior to 2015. Con Edison further assumes that the current funding levels (approximately $90 million annually from all electricity customers in the state) will remain constant in nominal dollars.
federal and market-based support for research and development funding will reduce the need to collect funds directly from New York State electric delivery customers.

Con Edison will also monitor the impact of the SBC T&MD program on our customers, to ensure that our customers benefit from the program. Like the RPS program, the SBC T&MD program raises concerns of geographic balance in the program’s spending. Of particular concern is whether the program addresses the unique needs of electric customers in New York City and downstate. For example, residential customers in New York City rely to a much greater extent on room air-conditioning units for their space cooling needs. Because these units are not controlled by a central thermostat, they present a particular challenge for demand-response programs. That challenge requires research specifically focused on bringing room air-conditioning units into demand-response programs. Another area of concern is the SBC T&MD program’s impact on Con Edison’s steam system. Con Edison will advocate that program funds not be used to support projects that would drastically reduce steam sales, as such projects would significantly raise costs for our steam customers.

Some of Con Edison’s concerns about this program have already been addressed. Recent changes in the way the costs of the SBC T&MD program are allocated among the state’s utilities have substantially reduced the geographic imbalance in the ratio of funding to spending. Additionally, the SBC T&MD program appears to be focused on a number of technologies of particular interest to New York City customers, including CHP.

Customer Sited Supply (CSS) could help to preclude the construction of new generating assets if the steam system peak grows to a point that increased generating capability is required. The company has a program in place to determine the practicalities of using Customer Sited Supply within the confines of the Steam System.

3. Energy Efficiency Portfolio Standard (EEPS)

The PSC’s Energy Efficiency Portfolio Standard (EEPS) program supports energy-efficiency initiatives, with the aim of achieving the State’s goal of a 15 percent reduction in energy usage by 2015. The program is focused on reducing the consumption of two key energy sources—electricity and natural gas—in New York State. The primary means of achieving these consumption reductions is the development and implementation of energy-efficiency programs. Since the EEPS goal was established in 2008, the state has approved more than 100 energy-efficiency programs. Some of the approved programs are delivered by the state’s electric utilities; others are delivered by NYSERDA. In all cases, programs that are chiefly aimed at increasing the energy efficiency of the state’s customers are funded through the EEPS fee collected from both electric and gas customers.

In 2010, approximately $150 million was collected from electric and gas customers through the EEPS fee. The program has been reauthorized by the PSC for the years 2011 through 2016. Con Edison assumes that the collections schedule approved by the PSC will be adhered to, and
that the EEPS program funding will increase by three percent annually through 2017 and by four percent annually from 2018 through 2031.\(^{19}\)

The PSC has strongly supported the use of public funding to support energy efficiency, and we believe that overall EEPS collections will rise at a rate slightly higher than inflation in future years, as the PSC authorizes additional energy efficiency programs. The EEPS program, particularly the portion implemented directly by Con Edison, provides benefits to Con Edison customers by reducing the need for additional electric infrastructure. As a result, Con Edison believes it is appropriate to support somewhat higher EEPS collections in future years, balancing the costs of the program with the impact of those costs on our customers.

**Fees embedded in our customers’ power costs: Regional Greenhouse Gas Initiative (RGGI) and New York Independent System Operator (NYISO) Fees**

In addition to monitoring the PSC-approved fees, Con Edison also monitors fees that are not itemized on our customers’ bills, but are embedded in our customers’ delivered energy costs. In particular, Con Edison monitors the cost of carbon emissions allowances resulting from New York State’s participation in the Regional Greenhouse Gas Initiative, and the fees charged by the New York Independent System Operator to recover its own costs.

*The Regional Greenhouse Gas Initiative (RGGI)*

The Regional Greenhouse Gas Initiative (RGGI) is a compact among ten northeast states, including New York, to require most wholesale generators to purchase carbon allowances from the state in which their generation resource is located. New York’s participation in the RGGI is mandated by public policy and legislative requirements. Approximately $50 million in RGGI allowance costs are collected annually via the energy charges in Con Edison customer bills.

Con Edison believes that the current RGGI prices for carbon-emissions allowances (as determined via auction) will stay at roughly their current level of $2 per ton of carbon. Given the expectation that the price of RGGI allowances will remain relatively low, Con Edison believes there is little current reason to advocate for a decrease in the cost of RGGI allowances. Should changes to the RGGI market occur that radically increase the price of allowances, the Company may need to alter its strategy regarding RGGI.

Con Edison’s primary interest in RGGI fees today is the way in which those fees are invested in the state. The New York programs that are funded by RGGI collections are implemented by NYSERDA. Con Edison believes that the Company’s best strategy regarding RGGI is to advocate for better use of RGGI funds by NYSERDA; the Company has advocated, and will continue to advocate, for such improved use via comments in public stakeholder forums.

\(^{19}\) In addition, Con Edison assumes that starting in 2016, the portion of the EEPS funds given to utility-delivered programs will increase by five percent each year, with the same amount deducted from NYSERDA-delivered programs, on the premise that utility programs will be more effective due to the closer relationship utilities will have established with their customers.
The New York Independent System Operator (NYISO)

The New York Independent System Operator (NYISO) manages the state’s wholesale energy markets, and includes fees to funds NYISO’s operations in energy, capacity and other services that Con Edison purchases to supply energy to full-service customers, or that energy service companies purchase to supply retail access customers. NYISO operations fees, like RGGI fees, are embedded in customers’ bills in their power costs. While NYISO fees have risen in recent years, Con Edison assumes that NYISO fees included in our customers’ bills will stay relatively constant or slightly increase over time on a real-dollar basis. The Company’s strategy for controlling overall NYISO fees is to participate actively in NYISO stakeholder groups that recommend and approve NYISO budget levels and processes. Under the stakeholder process at the NYISO, the NYISO’s budget must be approved by 58 percent of its members, and Con Edison vigorously participates in discussions of budgets, including details of planned expenditures. In 2011, Con Edison successfully advocated for a change in the allocation of NYISO operations costs. Under the new structure, generators must bear more of the costs of operating the NYISO. Con Edison will continue to look for opportunities to influence NYISO operations costs for the benefit of its electric delivery customers.
Chapter 11: Customer bill impact

We measure the success of our long-range plan initiatives by their impact on customer bills over the planning period. Our goal is to minimize increases in customer bills, and we have outlined in this document several initiatives to manage our infrastructure costs as well as work we have been doing with customers to manage their energy expenditures. In addition, we have described steps we are taking to mitigate increases on the supply, tax, and fee portions of the bill.

The customer bill reflects Con Edison’s tariff charges for delivery, supply, taxes, and regulatory fees. As the operator of delivery systems, we collect all components of the bill in a single customer payment and remit payments as required to appropriate parties. Our delivery charges constitute about one-third of the typical bill; the remaining two-thirds are attributable to costs of supply and costs of taxes and fees imposed by various suppliers and government agencies.

The delivery rate represents the cost of transporting energy from the point of supply to the Con Edison system, and ultimately to the customer. This rate covers costs to build and maintain our transmission and distribution assets, and also to maintain and operate customer billing and other operations that serve customers. As a regulated utility, we recover our costs of providing service through our rates. As we invest in our system, we recover the costs of those investments over time through accounting expenses, and earn a return on our capital. To reduce the delivery component of our customer bills, we have identified several opportunities to reduce the amount of capital we invest, thus reducing the costs we must recover from our customers over time.

The delivery taxes reflected in the customer bill are based on the total tax bill assessed to Con Edison. The customer bill also includes fees collected for external entities. The System Benefits Charge and Renewable Portfolio Standard surcharge are mandated fees that finance energy efficiency and renewable portfolio programs operated by the New York State Energy Research and Development Authority (NYSERDA). The System Benefits Charge funds programs that have been determined by the Public Service Commission “to be inadequately addressed by New York’s competitive energy markets.” In addition, there is an 18a Assessment, which is a fee imposed by the New York State Legislature for the support of the State’s General Fund. There are also supply taxes imposed on each customer, which are based on a sales tax rate applied against purchased supply and a general receipts tax applied against Con Edison total revenues.

Supply costs are also a major component of our customers’ bills. Although Con Edison does not own significant sources of supply, we procure energy for our full service customers and those costs are part of their bill. As much as practical, our supply comes from the least cost options available and is typically a composite of short- and long-term firm supply contracts, Con Edison production, and spot market purchases made by the Company. Consequently, the supply portion of our customer bill is directly related to the market price of electricity, which is itself highly dependent on regional fuel supply costs, fuel mix, environmental costs, and the
supply/demand balance. To mitigate increases on the supply portion of the bill, we invest, or support investment, in transmission projects that would give us access to lower cost sources of supply. We also support market-driven solutions, such as reforming organized markets to allow for new-entry of merchant generators who do not require long-term contracts. Finally, we support fair wholesale market rules and draw upon the flexibility of our portfolio.

As we will see, the 2011 Plan’s bill forecasts are lower than the 2010 Plan’s for all three commodities: electric, gas, and steam. Lower bill increases are due to various initiatives we have taken to lower costs, to different trends in the marketplace, and to policy changes that have affected the company.

**Electric**

To measure electric customer bill impact in our service area, we consider a typical New York City residential customer. This customer lives in an apartment building and consumes approximately 290 kWh per month. We assume a slight decrease in electricity usage over the planning period, with lower future consumption due to energy efficiency outweighing higher future consumption due to new end-use applications.

Each component of our typical monthly residential electric bill forecast is lower than the 2010 plan.

**Figure 34: Typical monthly residential electric bill**

The delivery portion of the bill is lower because capital expenditures have been reduced by $4.2 billion and because we assume productivity improvements will keep O&M expenditures flat. Lower capital investment results in less property and less net income, which in turn results in less property taxes and less income taxes. Consequently, the taxes and fees portion of the bill is reduced.
The supply portion of the bill is lower due to lower natural gas prices, which in turn, determine power prices. The average natural gas price over the 2011 planning period is 10% lower than the average price from the 2010 plan. The average price of gas over the twenty-year period has declined from $8.67 to $7.77 per dth. This is a result of greater access to low-cost sources of gas supply, particularly shale gas. The supply component of the bill is also lower because we no longer assume there will be a federal carbon tax. As a result, we forecast that the average carbon price over the twenty year period will be $0.69 per MWh; this is down from the 2010 Plan average of $8.30/MWh.

Gas

As a proxy for our gas customers' bill, we look at a typical New York City residential apartment-building customer with constant monthly consumption of approximately 140 dth over the planning period. Each component of our typical monthly residential gas bill forecast is lower than the 2010 plan.

Figure 35: Typical monthly residential gas bill

The lower total gas bill forecast is largely a product of by lower gas prices, which directly affect the supply portion of the bill. As mentioned earlier, the average natural gas price over the 2011 planning period is 10% lower than the average price from the 2010 plan. This is a result of greater access to low-cost sources of gas supply, particularly shale gas.

There are both upward and downward pressures on the delivery portion of the bill, netting to a decrease as compared to the prior long-term forecast. The effect of the increased volume from oil conversions more than offset the $415 million increase in oil conversion capital expenditures and the $150 million increase in public improvement capital expenditures. While the delivery costs are growing, gas volumes are growing even more, so the delivery cost per unit volume is lower.
Steam

As a proxy for our steam customers’ bill, we look at a typical New York City commercial customer, which is much larger than the average electric or gas customer, with constant monthly consumption of 4,800 Mlb of steam over the planning period. The new monthly steam bill forecast is lower than that of the 2010 Plan.

Figure 36: Typical monthly large commercial steam bill

One reason for a decrease in the supply portion of the customer bill is the difference in savings estimates for the gas addition projects at the 59th Street and 74th Street steam production facilities. The gas addition projects consist of a conversion from oil to gas fuel, resulting in fuel savings. The 2010 Plan forecasted fewer savings over the 20-year period compared to the 2011 Plan forecast of $1,225 million based on current commodity price forecasts.

Another reason for the supply portion decrease is revised operating criteria for the dispatch of our steam production facilities. The revised method enables us to run more efficient gas-fired units by reducing the pressure required on the steam system. The result is savings of about $260 million over the planning period.

The decrease in the supply portion of the bill is partially offset by an increase in expenditures from the new East River 1 & 2 cogeneration. The East River Units 1 & 2 were constructed to meet electricity and steam capacity needs. The PSC concluded that the current fuel allocation method created an imbalance in the benefits and costs allocation between the electric and steam businesses in favor of the steam customers. The PSC ordered a revision of the cost allocation method, which is expected to increase fuel costs to steam customers by about $370 million over the 20-year planning period.
In addition, the 2010 Plan included a 2014 retirement date of the Hudson Avenue station, when in actuality it retired in 2011. The result is an operating savings of about $540 million over the 20-year planning period.
Chapter 12: Customer interaction

As a company that delivers electricity, gas, and steam, Con Edison’s relationship with its customers has many dimensions. They include:

- **Providing service to customers:** This includes several important process interactions such as, for example:
  - Working with customers during storms and area-wide emergencies
  - Responding to service-related requests on non-storm days
  - Responding to requests for new service requests

- **Engaging customers as a provider of energy information and advice:** In some circumstances, Con Edison interacts with its customers to provide information or advise them. As one example, Con Edison provides information to its customers on energy efficiency programs.

- **Engaging with the community:** Con Edison, as a service provider and member of the community, reaches out to the community it serves. This includes activities such as providing tips in dealing with weather events to working with communities such activities as tree planting.

An important element of performing the above roles is developing insight into customer trends (e.g., the use of new technologies and its impact on demand) as well as gaining a better understanding of customer decision processes and behavior. From an Integrated Long Range Plan (ILRP) perspective, we think of our customer work as falling into the following categories: insight; interaction; and engagement. Customer interaction is the principal focus of this chapter, although we identify future work that would fall into the insight and engagement categories.

The value proposition that Con Edison provides its customers includes reliability, safety, and customer service on the one hand, and the cost of providing that service, on the other. Reliability, of course matters greatly to customers since any loss of service has a direct impact on their lives, in the case of residential customers, and on the bottom-line for commercial businesses. For reliability and safety, Con Edison has a proven track record that customers recognize and take as a given. This chapter describes how Con Edison is building upon its work thus far to enhance customer experience. Con Edison recognizes the importance of holding down customer costs, and is taking steps to address this topic, as discussed elsewhere in this ILRP.

Con Edison’s customer satisfaction surveys show that its scores would place it in the category of best-in-class. The table below shows that in 2011 Con Edison exceeded its own performance targets for customer service.

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20 See also Chapter III

21 This is addressed in detail in Chapter VIII, IX, and X.
Table 12: 2011 Con Edison’s performance relative to customer metrics

<table>
<thead>
<tr>
<th>Performance Metric</th>
<th>Goal</th>
<th>2011 Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer satisfaction surveys (scaled score)</td>
<td>85.0</td>
<td>89.3</td>
</tr>
<tr>
<td>PSC complaints (per thousand customers)</td>
<td>2.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Representative calls answered within 30 seconds (percentage)</td>
<td>56.0</td>
<td>56.1</td>
</tr>
<tr>
<td>Meters read on cycle (percentage)</td>
<td>89.1</td>
<td>89.2</td>
</tr>
</tbody>
</table>

Con Edison has also reviewed other information on how customers view the company, including customer complaints, and concluded that there are opportunities to make further progress on improving customer experiences. Going forward, Con Edison can – and will – implement further customer service improvements, consistent with its vision which is “to be a premier provider of safe, reliable, clean, innovative, cost-effective energy services and solutions that enhance the lives of our customers.” An essential element of achieving this vision is that Con Edison demonstrates to customers, through its interactions, that it is responsive and customer-focused, and an organization that provides high quality customer experiences in response to customer concerns/requests, while maintaining the high level of reliability they expect. As discussed in this chapter, Con Edison has underway multiple initiatives to improve its customer interactions.

Existing customer service activities

Con Edison does many things today that foster positive customer interactions. This includes activities that range from providing energy efficiency information to mobilizing all its resources during a storm. Con Edison has also been actively pursuing ways to integrate customer interactions across the three commodities – electricity, gas, and steam (see Table 13). For example, Con Edison has a single phone number (1-800-75-CONED) and web interface (www.coned.com) through which customers can reach Con Edison for any number of different inquiries, requests, complaints, and actions.
Table 13: Existing customer service activities

<table>
<thead>
<tr>
<th>Type of interaction</th>
<th>Contacts per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Side Management¹</td>
<td>~500,000</td>
</tr>
<tr>
<td>Emergencies²</td>
<td>~875,000</td>
</tr>
<tr>
<td>Customer Billing</td>
<td>~8,450,000</td>
</tr>
<tr>
<td>Turn on/off</td>
<td>~725,000</td>
</tr>
<tr>
<td>Other³</td>
<td>~275,000</td>
</tr>
<tr>
<td>New Service Request</td>
<td>~25,000</td>
</tr>
</tbody>
</table>

Currently integrated

Integration underway

1. Number of Demand Response events called, tests, activation of DLC, visits to the energy efficiency website (YTD 2011), and participants in EE programs
2. Calls regarding service interruption, Con Edison notification of outages, and other emergencies
3. Retail choice customers, and information requests not requiring account changes

In looking at how best to integrate across electricity, gas, and steam, Con Edison has determined that having a “standard process” across all three commodities, whenever feasible, is effective. For example, a standard process to create a “ticket” in response to a customer complaint/request makes sense. Similarly, customers will appreciate the convenience of easy and user-friendly navigation on a single website for all three commodities. Con Edison will continue its work towards a “one Con Edison” model under which the customer has a similar high quality experience in dealing with the company on electric, gas, or steam matters.

Looking ahead, Con Edison is committed to build on its existing customer service activities and undertaking new initiatives to provide its customers with a high quality experience that is consistent across the three commodities.

Pursuing our vision: Enhanced customer service through improved interactions

At the core of Con Edison’s plan to deliver enhanced customer service across the commodities it sells to customers (i.e., as one Con Edison) it will have to help its employees think differently about their work (a “change in mindset”). This change in mindset will make the company more customer-centric. In practical terms, Con Edison will need to instill a strong sense of ownership of customer service in all parts of the company, a greater awareness of customer-related issues, a relentless focus on service, and a tone that is friendlier to the customer.

At the present time, the company has undertaken an initiative focused on changing the mindset by developing a proactive, customer-centric culture to foster trust and confidence among customers and to improve value for all stakeholders; recalibrate employee perspective and enable conditions to consistently exceed customer expectations. As part of this initiative, Con Edison will formalize and enhance company procedures and training related to improving
customer service within every department. The company will evaluate the attitudes and perceptions of employees toward customer service and develop a list of suggestions to help educate employees regarding customer service relations. Specific elements of this initiative to change the mindset include:

- Recruitment
- Training
- Communications – internal and external
- Customer Feedback
- Recognition
- Performance

Changing the mindset is a long-term initiative at the core of enhancing the customer experience. Achieving such a change will be a cultural journey. Even as it embarks on that journey, Con Edison is currently engaged in other initiatives that deal with understanding customer expectations, improved processes, superior execution, metrics, and training.

*Understanding clearly customer expectations*

Con Edison is reviewing many of its customer processes. A starting point for this work is looking at processes from the customer’s standpoint and asking several basic questions. As customers deal with Con Edison (or other similar service providers), they have some basic expectations such as, responsiveness, following through on commitments and so forth.

*Figure 37: Essential requirements to deliver a high quality customer experience*
Table 14 provides a list of these expectations informed by “universal customer expectations” as well as the experience of Con Edison. In the future, Con Edison expects to conduct additional focus groups targeted on customer expectations vis-à-vis service. The company will also examine what other utilities and industries are doing in the area of customer service, and move to implement best practices in different facets of customer service.

In specific terms, the experience of Con Edison employees as well as an analysis of customer complaints confirms that 4 areas of customer service offer the potential for substantial improvement. These areas for improvement are:

- Resolving problems or establishing a path for resolution (e.g., customers do not know what is needed to address their problems and when the problem will be resolved)
- Providing adequate information at each stage
- Making commitments and following through on a timely basis
- Restoring the site appropriately – e.g., no debris on site

Table 14: Universal customer expectations and key process questions

<table>
<thead>
<tr>
<th>Customer expectations</th>
<th>Questions to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Courtesy</td>
<td>• Has my request been acknowledged?</td>
</tr>
<tr>
<td>• Answers, not handoffs</td>
<td>• When can I expect a resolution?</td>
</tr>
<tr>
<td>• Follow through on commitments</td>
<td>• What am I responsible for?</td>
</tr>
<tr>
<td>• Accuracy</td>
<td>• What will it cost me?</td>
</tr>
<tr>
<td>• Resolution/closure</td>
<td>• How can I follow up/get the status of my project or request?</td>
</tr>
<tr>
<td>• Consistency</td>
<td>• My resolution did not happen when you said it would – what are the next steps?</td>
</tr>
<tr>
<td>• Communication and status updates</td>
<td></td>
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<tr>
<td>• Transparency</td>
<td></td>
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<tr>
<td>• Responsiveness</td>
<td></td>
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<tr>
<td>• Value of customer time</td>
<td></td>
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<tr>
<td>• Expectations in advance</td>
<td></td>
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<tr>
<td>• Choice and flexibility</td>
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</table>

**Improved processes for customer interaction**

An important part of improving customer service is to evaluate and modify internal processes so as to meet customer expectations and deliver a high quality customer experience. Con Edison
has accorded a high priority to its customer processes during storms. As discussed below, the company is now implementing its storm-related processes. Con Edison is also examining the ways in which it can improve customer interactions to deliver a high quality customer experience by focusing on two key areas outside of storms:

- New Business Customer Processes for electric, gas, and steam
- Existing Business (Non-storm) Customer Response Processes for electric and gas

Figure 38: Distribution of service-related PSC customer complaints by category
Sample size = 100 data points

22 A multi-disciplinary team cutting across many company groups, including electric operations, gas operations, steam operations, customer operations, energy services, construction management, public affairs, and strategic planning is looking at this.

23 The new business process for electric, gas, and steam is quite consistent

24 The process for dealing with non-storm customer responses for electric and gas is close to identical.
An analysis of these processes in the context of customer expectations resulted in several fundamental insights which, in turn, will inform the design of process improvements. In particular, Con Edison must:

- Set and manage customer expectations;
- Communicate early and often;
- Identify for the customer a clear point of contact who “owns” the customer relationship; customers should always know their point of contact;
- Maintain lines of communication with both the customer’s contractor and the customer;
- Be responsive to customer needs – accommodate those that we can and explain those that we cannot;
- Present customers with a “single Con Edison”, not individual departments;
- Improve transition of tasks between departments (seamlessness)

Con Edison’s first round of process analysis resulted in recommendations to change business processes in the two areas mentioned – new business; and non-storm customer response. The details of this effort are available in process maps and recommendations. Delivering the goal of high quality customer experience will also require systems and tools as enablers. Two major ongoing systems initiatives at Con Edison – the Work Management System (WMS); and the Customer Project Management System (CPMS) - will contribute significantly to implementing process changes.
Table 15 shows a sample of how the process at specific touch points can be improved for the new business process and the non-storm customer response process.

### Table 15: Examples of process improvements

<table>
<thead>
<tr>
<th>New Business Examples</th>
<th>Touch Point</th>
<th>Current process</th>
<th>Process improvements</th>
</tr>
</thead>
</table>
| Customer completes and application for new service through Project Center and awaits a response from Con Edison | | ● There is a tight target deadline to release a service determination (Service Layout)  
   ● This is an unrealistic target date and results in many Service Layouts that do not provide clarity to the Customer | ● At the time of application (on the web), the Customer has access to Handbook that provides a clear view of the process  
   ● The service determination is split into 2 pieces with clear metrics to measure our performance:  
     - An Acknowledgement Letter that lets the customer know his application is complete, and a clear time frame to get a service determination  
     - A newly drafted Letter (Service layout) that is delivered within a stated time frame and provides clear details on next steps |
| Internal assignment from Energy Services to Engineering to perform the Layout | | ● Lack of careful assignment results in Engineering working on Projects that are experiencing delays and may never be completed  
   ● No clear expectations or metrics between Energy Services and Engineering | ● The Customer Service Representative (CSR) within Energy Services is required to monitor the customer’s (or GC’s) progress on the project and assign projects that are “on track” to Engineering  
   ● Engineering has a standing commitment to complete Layouts within a fixed time frame. |

<table>
<thead>
<tr>
<th>Non-Storm Customer Response Examples</th>
<th>Touch Point</th>
<th>Current process</th>
<th>Process improvements</th>
</tr>
</thead>
</table>
| Control Center to call Customer after Customer has called in complaint to the Call Center | | ● Control Center may or may not call customer before dispatching crew to location  
   ● No time limit set | ● Customer is called by Control Center within 2 hours of receipt of ticket  
   ● Control Center receives more information by speaking with customer; Customer clearly informed if there is no Company Involvement  
   ● Customer is given an ETA for field mechanic to come to site |
| Call to Customer about permanent repairs, after the initial field crew has made a temporary repair and the job has moved to “construction” | | ● After temporary repairs have been made, the call to arrange an appointment for permanent repairs can come at any time. No time limits set. Typically leads to:  
   - Customer feeling that complaint is lost  
   - Repeated customer calls leading to generation of more tickets and electronic follow ups | ● Case Owner assigned to job as single point of contact after it moves to “construction;” Case Owner responsible for tracking status of job until completed  
   ● Time limit for phone call to Customer set at 2 business days from receipt of ticket by Construction  
   ● Case Owner schedules appointment for permanent repairs making sure that:  
     - Con Edison is reasonable and accommodating as to scheduling  
     - Gives Customer an understanding of what needs to be done at site  
   ● Tells Customer that he/she will serve as the “point of contact” |
Superior execution

Improved processes will not, by themselves, deliver the required results. Delivering results will require superior execution – i.e., all entities within the company modify behavior in such a way as to carry out the improved processes in a consistent, timely, and customer-friendly manner.

Con Edison’s approach to storm response provides one example of how improved processes have been meshed with the right behaviors to achieve positive results. Con Edison’s goal is to achieve excellence and industry leadership in emergency management performance. The basic processes that form the foundation of the company’s emergency management program for storm response include:

- Conducting effective risk assessments for operating and business functions;
- Developing appropriate prevention or risk mitigation strategies;
- Implementing comprehensive emergency preparedness programs;
- Responding with appropriate resources to address the emergency;
- Communicating timely and accurate information with customers and other stakeholders using voice, internet, media and other appropriate methods;
- Recovering from events expeditiously; and
- Improving continuously.

Some specific elements of those processes that result in performance excellence while providing safe and reliable energy services include:

- Consistent use of the standardized Incident Command System (ICS) that provides a flexible framework for incident response that can be scaled as needed for any type, size, and complexity of emergency response;
- Benchmarking of Con Edison’s emergency management procedures and practices against other utility companies, and also against leading companies in other industries;
- A Municipal Liaison program where company employees work closely with municipalities during storms and other emergencies to identify system damage, and then to prioritize and coordinate restoration efforts;
- Development and utilization of a corporate Crisis Communication Plan that sets specific requirements for communications with regulatory agencies, municipal authorities, media, and the public utilizing all forms of communication available, including social media;
- Continuously enhance the communication, accuracy, and granularity of the Estimated Time of Restoration (ETR) provided to customers following storm service outages; and
- Conduct comprehensive lessons-learned reviews after significant incidents to identify process strengths and areas needing improvement, and then implement appropriate changes to further refine the processes.
**Metrics: Continuous improvement driven by performance measurement**

An essential element of improving customer service is to strive for continuous improvement driven by measuring performance and providing feedback. As Con Edison makes changes to its processes, it will also institute new metrics to measure how effectively the new processes are being carried out. The new metrics will be tracked and used as a basis for continuous improvement.

**Training**

Training will be an essential element of changing the mindset. As noted, training helps employees think differently about their work as it relates to customer service. In addition, training will be an important part of the implementation of new processes as well as the use of new systems.

**Meeting changing customer expectations**

Con Edison’s customer-related work places new emphasis on clearly understanding customer expectations and meeting those expectations. Customer expectations, however, are not static. Technological advances, customers’ experience with new technologies, and major demographic changes all act to change customer expectations over time. Con Edison remains alert to the changing expectations of customers.

As discussed in Chapter 5, Industry Trends, our research shows that customers’ energy decisions are motivated by five factors:

1. Codes and standards
2. Economics
3. Comfort, convenience, and ease of use
4. Environmental impact
5. Technology improvement

Over the next 20 years, as the composition of the population changes and people’s experience with technology increases, we anticipate that our customers will expect us to interact with them electronically on a real-time basis. Further, we expect that the way customers make decisions will change. The immediate access to information through smart phones and the ability to connect with distant places and people through the Internet has given rise to electronic social networks such as Facebook, LinkedIn and Twitter. These networks are facilitating information flow and playing a key role in decision-making for individuals and businesses alike.
In predicting how these changes in technology will affect the energy industry, we believe that our customers will want more customized value-added services. More specifically, as emerging energy technologies mature over time and reach the market, customers may adopt real-time energy management solutions and self-generation technologies. These systems and technologies can be integrated with grid electricity to create sophisticated, individualized real-time energy-management services for our customers to use.

**Addressing evolving customer needs**

Con Edison sees this evolving landscape as a window of opportunity. Our plan is to continue to meet the needs of customers, which will require a new and revised approach to customer service.

*Leverage customer research*

It is important that we understand our customers’ usage patterns, attitudes towards energy conservation, new technologies, and the services that the Company provides. Customer research will be used to gather such customer information, as well as interest in specific programs, services, and customer satisfaction. A number of methods will be used including focus groups and surveys. We will also explore other ways to gather point-of-contact feedback, for example, on the web and on smart communication devices and utilize information gained from pilot programs and customer interactions. Knowing our customers better will help us better serve them.

*Continue to optimize communication with customers*

To improve our ability to communicate with our customers we need to identify the modes of communication that are best for reaching them. The ever-evolving world of electronic communications used by most of our customers to conduct the business of their lives means that we must improve our ability to quickly adapt to changes in the communications arena. It is important for us to stay current with developments in communications and employ up-to-date methods of communicating with our customers. Maximizing the use of electronic communications facilities will also reduce cost. In the near term we will:

- Develop email address lists of all customers email addresses currently on record
- Develop cell phone contact lists for text-based communication
- Identify and utilize established social networks such as Twitter and new and emerging communications services that can be used to get messages out to customers
- Explore the potential of text messaging including consideration of cost to target customers for specific programs and mobilize customers on issues and during contingencies
**Customized access**

Con Edison aims to provide more self-service options to our customers. We currently provide self-service options for bill payment and certain information requests, but we envision this expanding to many other areas. Also, a better understanding of our customers, as discussed earlier, may enable Con Edison to provide customized energy monitoring and control options to customers based on their individual energy usage. These types of improvements, though longer-term in nature, would provide customers with new ways to engage the utility and actively contribute to a positive customer/company relationship.

**Energy partnering**

Customer interest in energy issues is high across all customer segments and this offers us an opportunity to engage customers in developing energy solutions. Customers have particular interests and needs, and by working closely with interested customers we will be able to craft solutions that will be applicable to broader segments of customers. This partnership will help us to identify improvements that can be made to the services and offerings that we provide. It will also facilitate the development of new programs and customer participation in program pilots.

Similarly, we need to work closely with regulators and customer advocates to improve our awareness of customer issues and concerns. Valuable discourse has been held during recent rate case proceedings on a number of issues related to particular customer segments. Continuation of this dialogue is important and can serve to further identify areas for improvements.

**Technology**

The Company needs applications to support the collection of meter and customer usage data and customer communications. In some cases, the applications that are available are immature, not sufficiently robust, or do not provide the functionality that is needed. In such cases, we have the opportunity to collaborate with industry experts to develop solutions to our business and technology needs.

As costs decrease, we need to continue to identify ways to deploy automated meter reading on a saturated basis, that is, to continuous geographic areas, to reduce meter reading costs. Further, technology advances that result in reduced costs for smart metering will offer us the opportunity to provide customers with detailed information about their energy use and new rate and programs that should help support energy conservation and reduce customer energy cost.

Automated meter reading and smart metering technologies offer an array of benefits including opportunities for energy conservation and cost savings. While we will employ a cost benefit model to identify areas where automated meter reading will save meter reading costs, we will also explore the interest of individual customers in investing in metering equipment and services that will provide them with opportunities to better manage their energy costs. As necessary we will work with regulators to implement rates and programs that utilize advanced metering technologies.
Promote energy efficiency

Con Edison aims to develop more program offerings that support energy efficiency and the use of alternative energy sources and other new energy technologies. Customers will require greater information to manage their energy costs and support energy conservation. It is important that we keep them informed about energy conservation programs and developments in the energy marketplace. To increase customers’ awareness of Energy Savings Tips, Time Based Pricing, and Energy Efficiency Programs and encourage customer interest we will:

- Educate Call Center representatives on energy management program offerings so they can direct customers to Con Edison programs and resources
- Utilize Customer News, Spotlight and other bill inserts
- Develop Call Center IVR messaging
- Utilize the Customer Service Central website to direct customers to energy savings programs
- Engage customers through Outreach efforts
- Utilize email and text messages
- Explore different ways to use the web and smart communication devices to reach customers

Next steps

As noted, achieving a change in mindset, which is central to delivering an enhanced customer experience, is a cultural journey. Con Edison will continue to work on an ongoing basis to improve the ways in which it interacts with its customers. This will require additional research and analysis on customer expectations. Con Edison will also examine what other utilities are doing to improve their customer experiences, and delivering a high quality customer experience.

Con Edison will also do additional work in the future on what we refer to as customer insight and customer engagement in Chapter 3. This additional work will require more research and analysis on such items as customer demand trends, as well as developing an understanding of how customers make decisions on matters like distributed generation or oil-to-gas conversions.
Chapter 13: Next steps

We have invested considerable thought, time, and effort in developing our current long-range plans for electric, gas and steam. To keep those plans relevant, we will periodically review the key assumptions underlying the plans. To remain effective, our plans need to be living documents that are updated every two to three years. The updates will reflect changes in assumptions as the future unfolds and our increased knowledge as we execute on our long-range plan. We are committed to continue improving our planning efforts, in order to deliver more value to our customers and shareholders.

Communicate our plan

We have made a firm commitment to communicate our plans with stakeholders. Our outreach efforts are designed to generate discussion and elicit feedback from our audiences and partners. In order to make our process and information easily available to all interested parties, we have posted our current long-range plans on the corporate website. We have met with and will continue to communicate with regulators, community organizations, trade associations, and industry leaders, agency and regulatory representatives, as well as elected officials and other representatives of Westchester County, New York State, and New York City government.

To date, our briefings have included Public Service Commission commissioners and staff, members of the Association for a Better New York (ABNY), the New York City Energy Policy Task Force, the Building and Realty Institute of Westchester, representatives from NYSERDA, NYCHA, NYCDEP, and many large customers, such as hospitals, real estate companies, and cultural institutions. The Bronx Borough Board hosted a presentation for us, which was attended by representatives from community boards, local elected officials, and the borough president. Presentations hosted by the boards of the other four boroughs are being scheduled for the first half of 2012. We are continuing our outreach to all interested audiences.

Signposts

We will monitor periodically the assumptions that are identified as key signposts in each commodity’s long-range plan. These assumptions drive our investment needs and decisions. To the extent those assumptions shift, we will make necessary changes to our plans. For example, economic conditions may turn out to be much better than — or not as good as — assumed in the plan. As a result, the need for new infrastructure may be greater than or less than planned. Or, the commodity pricing assumed in the plan may be lower or higher than what we will encounter in the future, as new supply sources emerge faster or slower than anticipated. We will review these signposts and monitor for material changes in outlooks that may prompt us to revisit parts of our long-range plans.
Build on our long-range plans

Looking ahead to the next year, we plan to continue implementing the integrated, cross-commodity initiatives we have presented in this document. From a planning and implementation perspective, we will take successive and sequential steps to achieving integration across commodities.