
**THE ROLE OF LNG IN
SUPPLYING THE NEW YORK
AREA'S FUTURE DEMAND FOR
NATURAL GAS**

April 29, 2004

LONG ISLAND

U N I V E R S I T Y

**Center for Management Analysis
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TABLE OF CONTENTS

| | |
|-----------------------------------------------|-----------|
| SUMMARY | 5 |
| INTRODUCTION | 8 |
| DEMAND/SUPPLY BALANCE FOR NATURAL GAS | 11 |
| CURRENT UTILIZATION OF LNG IN NEW YORK | 13 |
| REGULATORY OVERSIGHT | 15 |
| PROPERTIES OF LNG AND SAFETY CONCERNS | 19 |
| OBSERVATIONS | 22 |
| APPENDIX | 26 |

THE ROLE OF LNG IN SUPPLYING THE NEW YORK AREA'S FUTURE DEMAND FOR NATURAL GAS

SUMMARY

Natural gas is a major source of energy that will play an increasingly important role in achieving the nation's economic and environmental goals. It supplies about 25% of U.S. energy; generating about 19% of the electric power, heating over 60 million households and providing over 40% of all primary energy for industries. The volatility in pricing and current high prices of this fuel resource are the result of a shift in the supply and demand balance. Where there once was a glut of natural gas, the country now is moving to a point where it will need to develop additional supplies to meet the need for this fuel. The annual demand for natural gas has grown by more than 40% between 1986 and 1997 with much of this growth due to its clean burning characteristics in generating electricity. The increase in demand in the New York metropolitan area follows this trend, with most new generation over about the last 5 years being gas fired.

In the longer term the demand for natural gas will increase to about 28 TCF by 2020, and additional sources of gas supply will be required, since North American supplies will only account for about 75% of total requirements. Potential new sources include increased access to non-traditional U.S. resources, Arctic gas and the expanded use of LNG, which is the liquid form of natural gas cooled to a temperature of minus 265 degrees F. LNG is already a primary source of fuel for many foreign countries, however, there are only 4 import terminals in service in the U.S. with none located in New York State.

Presently, the primary use of LNG is by local distribution companies (LDC's) of natural gas for peak shaving. Peak shaving refers to the reduction in maximum demand on the coldest days through the use of alternative fuel sources. Without Peak shaving capabilities LDC's would be obligated to contract for additional and very costly interstate pipeline capacity. In the metropolitan area there are 3 existing LNG facilities in

operation; KeySpan's Holtsville Site, KeySpan's Brooklyn site and Consolidated Edison's Queens site. These facilities, which liquefy gas off their own systems and store it in tanks for use on cold days, have been in service since the late 1960's and early 70's and provide about 15% to 20% of the companies' peak day supplies and, on average, about 1% of the winter season supply. The limited utilization on an annual basis is due to the inability to rapidly refill the tank with on system gas and the present prohibitions on trucking in LNG for all but supply emergencies.

The physical characteristics of LNG, such as flammability limit, autoignition temperature, vaporization rate and weight, make it no more dangerous, and in many cases less so, than other commonly stored and transported fuels like gasoline, diesel fuel and propane. A recent tanker crash and fire in Connecticut on I-95 involving home heating oil illustrates this point. The over 100 LNG facilities operating in this country for mostly peaking purposes, including the KeySpan and Con Edison facilities, have achieved an enviable safety record.

The production, storage, transportation and use of LNG are strictly governed by regulations at the Federal, State and New York City Level. The Department of Energy (DOE), the Department of Transportation (DOT), the Federal Energy Regulatory Authority (FERC), and the United States Coast Guard each have some regulatory responsibility for LNG, including jurisdiction over policy, safety, construction and transportation. Additionally, the National Fire Protection Association (NFPA), a not for profit organization without enforcement authority, has developed standards for LNG that have been adopted by various federal, state and local agencies. In New York State, the Public Service Commission (PSC), the Department of Environmental Conservation (NYSDEC), the Department of Transportation (NYSDOT) and the Department of State (DOS) also have regulatory oversight for LNG operations within the State. The regulations in place often overlap with the federal regulations and do not provide for the one stop licensing of new facilities, expanding existing ones or establishing transportation routes. In addition to the State, New York City has its own set of regulations pertaining to LNG operations and facilities within the City.

In spite of the positive operating experience of New York State's 3 existing LNG facilities, the State has been hesitant to aggressively embrace the expanded use of LNG, unlike other parts of the country. In fact a moratorium on the siting of new LNG facilities and the establishment of intrastate transportation routes was in place from 1973 to 1999. This moratorium was a result, in part, to the State's reaction to an earlier accidental fire at an LNG facility on Staten Island owned by the Texas Eastern Transmission Company. Investigations of that incident have revealed that cleaning agents being used were probably the cause of the fire not LNG. While the moratorium was allowed to expire, New York City regulations, which apply to KeySpan's Brooklyn site and Con Ed's Queens site, still restrict the use and transport of LNG within the City.

Based on forecasts by the National Petroleum Council, by the Year 2025 LNG could provide from 14-17% of the demand for natural gas. At the LDC level it will also continue to be significant part of the peak day supplies during the coldest days of the winter. If New York State gas consumers are to enjoy the economic and social benefits of an emerging LNG market, and continue to benefit from the operating efficiencies provided by LNG peak shaving, the State and New York City must reconsider present regulatory obstacles to the expanded use of LNG. The State should streamline its regulations, possibly in similar fashion to the Article X process that was in place for electric generation, for one stop licensing of new LNG facilities in compliance with applicable federal codes and standards. It should also develop a policy, based on Federal DOT regulations, to facilitate the intra and interstate trucking of LNG. In addition, New York City should establish rules to facilitate the necessary upgrades/refurbishment of the existing sites, allow the construction of new LNG facilities and create transportation routes, with the proper safeguards, for the routine transport of LNG. Over the longer term, the City and the State should jointly study the viability of either establishing LNG terminals within the State or pursuing other alternatives to gain access to an emerging LNG market.

THE ROLE OF LNG IN SUPPLYING THE NEW YORK AREA'S FUTURE DEMAND FOR NATURAL GAS

INTRODUCTION

Natural gas has come to be accepted as a vitally important energy source for the nation and the New York Area. In addition to its use for residential and commercial space heating and industrial applications, natural gas, due to its clean burning characteristics, more recently has become the fuel of choice for the generation of electricity. According to a recent study undertaken by the National Petroleum Council published in September, 2003, natural gas supplies about 25% of U.S. energy, generating about 19% of electric power with over 90% of all new generation gas fired, supplying heat to over 60 million households and providing 40% of all primary energy for industries.

The ever-increasing demand for natural gas has resulted in the higher prices and volatility in pricing that now have become commonplace. As a nation the United States is rapidly moving to a point where it will no longer be self sufficient in meeting the growing natural gas needs without the introduction of new sources of supply. Unfortunately, while government policy has tended to encourage the use of natural gas, it has not completely dealt with the crucial issue of new supply, and that can only lead to undesirable economic impacts for the consumer.

This is a very complex issue and the solution requires the balancing of many elements including: increased energy efficiency, conservation, alternative energy sources for large end users, new sources of gas from North American reserves and, the subject of this report, the increased and more flexible use of Liquefied Natural Gas (LNG), the liquid form of natural gas cooled to a temperature of minus 265 degrees F.

The nation appears to be slowly recognizing the role that LNG can and will play in increasing natural gas supply. As the cost of natural gas continues to increase, the cost of imported LNG will become more competitive. While the expanded use of LNG in any fashion will continue to be hindered somewhat by concerns over safety and, more recently, by the threat of terrorism, when viewed in the proper context, LNG operations in this country have an exemplary safety record and certainly support the value and need for new facilities. Over the next few years a renewed interest will likely develop, at least in certain parts of the country, in the construction of new LNG import terminals and associated support and transportation facilities.

There are presently only 4 active terminals in the USA to import LNG, none of which are in New York State. Distinct from import terminals, starting in the late 1960's, LNG facilities have been primarily used by Local Distribution Companies (LDC's) of natural gas to liquefy gas off their own systems and use it as a peak shaving fuel to satisfy the maximum demand for natural gas during the coldest days of the year. Many LNG facilities are used only for a relatively short period of time during the year. LDC's and their customers have benefited from the use of LNG as an effective means of avoiding the annual cost and liability of contracting for additional pipeline capacity that might not be fully utilized throughout the year or, in some regions, not even available from the pipeline companies.

Acceptance of LNG by local and state governments as a viable fuel alternative has been mixed at best. While certain areas have been willing to license LNG facilities and have operated them without incident, other places in of the country have been much less willing to do so. Here in New York State, a moratorium was in place from 1973 until 1999 on the siting of new LNG facilities and intrastate transportation routes. This moratorium was a result in part to the State's reaction to an earlier incident at an LNG site on Staten Island owned by the Texas Eastern Transmission Company. The tank at this location, which was of an experimental design and totally different than those commonly used, had been emptied at the time to repair a suspected leak. An accidental

fire caused a pressure increase and the tank's roof to lift and then fall onto the workers who were in the tank. It was later determined that LNG did not appear to be the cause of this incident, but rather cleaning solvents that were being utilized.

While the moratorium was finally allowed to expire, at the State level there is still considerable uncertainty and an unclear and sometimes overlapping regulatory process associated with any new LNG construction and transportation or even significant upgrades to existing facilities. In addition, now that the State moratorium has been lifted, existing New York City regulations continue to govern and essentially prohibit any new use and transport of LNG in the City limits. Based on the apparent reluctance in New York to support the expansion of LNG utilization in general, it is also unlikely that a large import terminal will be proposed in the foreseeable future for the Metropolitan area. This is in spite of the future need of LNG to help meet the increasing demand for natural gas.

At present there are 3 LNG peaking facilities operating in the New York metropolitan area; KeySpan's Brooklyn and Holtsville sites and Consolidated Edison's Queens site. These facilities have been the models of safe operation and are expected to continue to be important elements of the peak day fuel mix for these companies. In recognition of the increasing role that LNG can play in providing local gas customers with an abundant gas supply on even the coldest days, New York State and New York City should both be encouraged to streamline existing regulations applicable to LNG operations and adopt the appropriate legislation. These actions, consistent with federal statutes, would facilitate the increased utilization and operating flexibility of existing plants and enable the construction of new facilities and/or transportation options necessary to allow New York's gas customers to tap into the future economic and social benefits of an emerging LNG import market.

DEMAND/SUPPLY BALANCE FOR NATURAL GAS

Based on the same National Petroleum Council study cited in the introduction, annual demand for natural gas has grown by more than 40% between 1986 and 1997, from 16 trillion cubic feet (TCF) / year to over 23 TCF. After 1997, in response to a tighter balance between supply and demand and the resultant price volatility, overall demand has grown less sharply and the market has fundamentally changed with natural gas being used for power generation and with residential/commercial consumption increasing while industrial use has decreased. Longer-term projections show that the demand for natural gas, due to limited supplies and higher prices, will remain relatively flat, increasing to about 28 TCF/year by 2020. This trend will continue until additional gas supplies are brought to market and more demand flexibility is achieved.

In the Metropolitan area, the demand for natural gas for power generation and in the residential and commercial sectors has increased significantly. This recent increase in demand, as well as what likely will be experienced in the future, is out of proportion to what has been the case in many other parts of the country. Most of the new electric generating capacity built in this area over about the last 5 years has been gas fired, including the recently completed 250 MW combined cycle KeySpan Ravenswood Plant. There are also several large generating facilities in the planning stage that will be gas fired. During the cold weather this January the gas sendout to residential and commercial customers was at record highs. On Long Island for example, KeySpan reported that consumers used 56% more natural gas than would normally be used during this time of year. On January 10, 2004 an all time high daily sendout of 733,260 Decatherms was experienced. Similarly high sendouts occurred in KeySpan's Brooklyn Division and in Consolidated Edison's gas system.

The lower 48 states currently supply about 80% of the natural gas consumed in this country. Imports from Canada provide about 19%, and imported LNG accounts for about 1%. Traditional North American reserves, while sizable will not meet projected

demand growth and new supply sources will be required. This new supply potentially will come from:

- Lower 48 resources that are currently restricted
- North American Arctic Gas
- Increased importation of LNG

Significantly, LNG provides access to the global supply of natural gas that, according to the National Petroleum Council Study, has been estimated to contain over 30 times the resource value of North America. By 2025 the National Petroleum Council estimates that LNG will comprise 14-17% of the U.S. natural gas supply.

CURRENT UTILIZATION OF LNG IN NEW YORK

The 3 existing LNG Plants operated by KeySpan and Consolidated Edison in the New York Area are all peak shaving facilities, providing additional gas supplies during high demand periods as temperatures approach the 0 degree “design day” for gas send out. This peak shaving reduces the need for additional interstate pipeline capacity and provides the companies with additional operating flexibility on the coldest days. The LNG is processed from on-system gas when gas is available during periods of reduced demand and stored in a tank. When required for operation, LNG is removed from the storage tank, vaporized and sent out to the gas system to meet customer demand. It is a very cost effective way of increasing the LDC’s peak day send out compared to other alternatives, such as contracting for additional annual pipeline capacity or off system storage. The economics of LNG peak shaving facilities improve as the number of days of utilization increase. As the KeySpan and Con Edison gas systems grow and peak day requirements increase, these existing LNG facilities will likely become even more important to each company’s gas supply mix.

According to the “Report on Issues Regarding the Existing New York Liquefied Gas Moratorium,” prepared by the New York State Energy Planning Board in 1998, LNG represents 23%, and 14% of the Design Day for KeySpan’s New York City and Long Island gas systems respectively and 18% for Con Edison’s. While the present LNG capacity for these companies makes up an appreciable portion of the peak day sendouts, in terms of annual volumes these plants only provide less than 1% of the winter season supplies. This is a result of significant restrictions on their use due to a present inability to rapidly refill the tanks with on system gas, and prohibitions on trucking in LNG from outside sources in all but gas supply emergency conditions. At the State level, the lifting of the moratorium in 1999 has opened the door to the possibility of establishing new dedicated routes for the highway transport of LNG to serve the existing LNG plants. On the other hand, New York City regulations still impose a ban on the transport of LNG within the City. Ironically even with these restrictions, during the State’s moratorium period, LNG from Massachusetts going to markets south of New York and from New Jersey for markets in New England has been transported on several Interstate Highways in New York. This movement of LNG through New York is authorized under provisions

of the Federal Interstate Commerce Law. It should also be noted that LNG has been transported into New York City on an emergency basis under very limited circumstances.

REGULATORY OVERSIGHT

The production, storage, transportation and use of LNG is strictly governed by regulations at the Federal and State levels and, in the case of KeySpan's Brooklyn Site and Consolidated Edison's Queens site, New York City level. (See Appendix A for a list of the applicable regulations) The Department of Energy (DOE), The Department of Transportation (DOT), the Federal Energy Regulatory Commission (FERC) and the United States Coast Guard each have some regulatory responsibility for LNG, including jurisdiction over policy, safety, construction and transportation. Additionally, the National Fire Protection Association (NFPA) has developed standards for LNG that have been adopted by various federal, state and local agencies. In New York State, the Public Service Commission (PSC), the Department of Environmental Conservation (NYSDEC), the Department of Transportation (NYSDOT) and the Department of State (DOS) also have regulatory oversight for LNG operations within the State. In addition, New York City has its own set of regulations pertaining to LNG operations for facilities located within the City Limits. More specifically:

Federal Regulations

- The DOE controls the import and export of LNG, but has no direct role in the construction or operation of LNG facilities.
- FERC has the authority to approve or reject any site proposed for an LNG import/export facility. Section 7 of the Federal Natural Gas Act also authorizes FERC to approve the construction, replacement or abandonment of facilities such as peak shaving facilities used in interstate service. FERC prepares an Environmental Impact Statement in accordance with the National Environmental Policy Act as part of the process to construct or decommission LNG facilities that come under its jurisdiction.
- The DOT plays a role in ensuring the safe operation of LNG facilities. Section 60103 of the Pipeline Safety Laws provides the Secretary of Transportation the authority to prescribe safety standards on the location, design, construction, initial inspection and testing of facilities built in 1980 or after. The DOT oversees the safety standards for LNG facilities that are covered under 49CFR Part 193

related to siting, design, construction, equipment, operations, maintenance, personnel qualifications and training, fire protection and security.

- The U.S. Coast Guard has authority over the design, construction, staffing and operations of vessels that transport LNG and the marine transfer area associated with import/export terminals.

National Fire Protection Association

The NFPA is a not for profit organization that develops fire safety codes and standards to protect people and property from destructive fire. NFPA has adopted two comprehensive standards, NFPA 59A and NFPA 57, that relate to LNG. NFPA is not empowered to enforce compliance with its codes and standards. Generally regulatory bodies with enforcement authority adopt NFPA standards by reference into their own codes.

- NFPA 59A Standard for the Production, Storage, and Handling of Liquefied Natural Gas contains the basic methods of equipment fabrication, as well as installation and operating practices for the production, storage and handling of LNG that provide protection of persons and property.
- NFPA57 Standard for Liquefied Natural Gas Vehicular Fuel Systems applies to the design, installation, operation and maintenance of LNG engine fuel systems for vehicles of all types, and to their associated fueling stations.

New York State

While the federal standards clearly address all aspects of LNG construction and operations, New York State regulations presently focus more on safe operations at existing sites and less on establishing criteria for siting new facilities.

- The PSC acts as an agent of the Federal DOT in carrying out a pipeline safety program for intrastate facilities, as well as interstate facilities located within the State. The Commission has promulgated rules and regulations, 16 NYCRR, which

allow it to carry out its responsibilities in this regard. Part 259 deals with LNG and prescribes safety standards for all LNG facilities in the State except for those which would be under FERC's jurisdiction. The primary provision of Part 259 is its incorporation of the Federal DOT code (49CFR Part193) by reference.

- The DEC has the authority to issue environmental and safety permits for the construction of LNG storage or conversion facilities under Title 17, Section 23 of New York State Environmental Conservation Law. Also, the legislation required the DEC to adopt criteria for the siting of LNG facilities and prescribe the form and content of the environmental safety permits for the construction of new facilities. The DEC has never promulgated such regulations and if it did so, these regulations would very likely overlap/conflict with federal regulations as well as the authority of the PSC, potentially creating significant roadblocks to the future LNG licensing process. Relative to facilities in operation as of September 1, 1976, which includes the 3 existing New York State LNG facilities, an exception was made for compliance with the DEC's regulations. Those facilities were instead subject to the legislature's provisions for non-conforming facilities, whereby the DEC issued orders permitting the plants to continue operation subject to certain conditions including the need for filing an annual report with the DEC and additional training of fire department personnel who would respond to fires at these sites.
- The transport of LNG in New York State is regulated by the NYSDOT using the applicable federal regulations contained in Part 49 CFR that deal with proper shipping name, registration of the transporter, financial responsibility of motor carriers, authorized packaging, material identification, emergency response information, placards, drug and alcohol testing and driver training.
- The DOS designates the procedures for the development and maintenance of a New York State Uniform Fire Protection and Building Code for all subdivisions with a population of less than 1 million. This code would not apply to New York City. Its provisions are spelled out in 9NYCRR, Subtitle S, Subchapters B and C covering building construction and fire prevention, respectively. Part 1003

essentially requires that storage tanks for LNG be in accordance with NFPA 59A standards.

New York City

New York City in Title 3, Chapter 23, Section 23-03 of the Rules of the City Of New York, regulates the manufacture, storage, transportation, delivery and processing of LNG. These regulations apply to all LNG installations connected to a natural gas pipeline constructed and operated after April 1977 and extend to the operating safety and alteration of existing facilities in service before the date of promulgation. The regulations are also applicable to the waterborne transportation and delivery of LNG for storage at land based facilities. Even though the moratorium on new LNG construction was not extended by New York State, these existing New York City regulations continue to govern and restrict the use and transport of LNG in NYC.

THE PROPERTIES OF LNG AND SAFETY CONCERNS

LNG is a clear odorless liquid at a temperature of – 265 F under atmospheric pressure. Methane is the major component of LNG along with small amounts of ethane and trace quantities of propane, butane and nitrogen. Since it is about 60% less dense than water, it floats. As a liquid, LNG is highly concentrated as compared to natural gas. A cubic foot of LNG has over 600 times the energy of a cubic foot of gas. This considerable concentration of energy is the primary justification for liquefaction, since it allows a large volume of gas to be stored in a much smaller space and transported more easily.

When assessing the relative safety of a particular fuel, consideration must be given to its flammability limit, autoignition temperature, vaporization rate and weight. The flammability limit refers to the concentration of fuel by volume that must be present in air to support combustion. The upper and lower flammability levels of LNG are about 5% and 15%, respectively. This means that in a closed storage tank the LNG can not ignite because of a lack of oxygen. A leak from a storage tank to a ventilated area would cause rapid mixing and quickly dissipate the mixture of LNG to below the 5% lower flammability level. The flammability level of other fuels that are commonly stored such as gasoline, liquid propane and diesel fuel are much lower, making them more prone to ignition in the event of a leak. The recent crash in Connecticut involving a 9,000-gallon tanker carrying home heating oil makes this point. The tanker hit a concrete barrier and split open, spilling its cargo. The fuel ignited and partially melted the steel girders holding up Interstate I-95.

The autoignition temperature corresponds to the minimum temperature of the ignition source required to ignite a particular fuel. LNG has an autoignition temperature of about 1000 F which is twice that of gasoline and about 400F higher than diesel fuel.

In the event of a spillage of LNG to the ground or on water, absent a source of ignition it will vaporize into the atmosphere. At a temperature of -265°F , the LNG is denser than air. As the cloud drifts downward it mixes with air, and eventually dissipates.

The processing, storage and transport of LNG, due to its physical and chemical properties, inherently poses no more serious safety threat, and in many instances less of one, than competing fuels that are routinely accepted by society. If an accidental release of LNG occurs at a transport or storage facility, the potential hazards result from direct exposure to fire, the thermal radiation generated from ignition of the LNG, or the formation of a vapor cloud. However, adherence to applicable regulations in 49CFR 193 and accepted industry practice as contained in NFPA 59A standards reduces the hazards of this to an acceptably low level. Extremely favorable operating experience at over 100 LNG facilities in this country and in the transport of LNG support this contention.

The incident in 1973 at an LNG facility on Staten Island referred to earlier has influenced the public's perception of LNG safety and was a major factor in New York's decision to enact an LNG moratorium. The Staten Island facility was constructed by Texas Eastern Transmission Company as a peak shaving facility to serve its regional customers. The tank, which was of an experimental design, was essentially built below grade. After suspecting a leak the operators emptied the tank and took it out of service. Inspection showed that tears had developed in the Mylar liner. During the repair operations a fire started which created enough internal tank pressure to lift the roof. As the roof lifted and relieved the internal pressure, it fell back into the tank resulting in the death of 40 workers. No explosion was involved in this incident. While the investigation of the cause of this accident was inconclusive, it does not appear to be associated with LNG but, instead, with cleaning solvents being used. According to details contained in the "Report On Issues Regarding the Existing New York Liquefied Natural Gas Moratorium" issued by the New York State Energy Planning Board, government regulations and industry operating practices now in place would prevent a repeat of such an incident. The fire involved combustible construction materials and a tank design

that are now prohibited. It is apparent that LNG was not involved in the accident and the surrounding areas outside the facility were not at risk. The moratorium enacted in New York appears to have been an extremely cautious reaction to the perceived dangers of LNG.

The 3 existing KeySpan and Con Edison LNG plants are of a totally different and proven design as compared to the experimental Staten Island plant. In terms of facility safety these plants have double walled steel tanks specially designed to operate at cryogenic temperatures, automatic emergency shutdown capability and dikes around each tank sized to contain its full volume in the event of a loss of LNG. In addition there are three major safety systems at each of these plants to address fire protection, gas detection and plant security in compliance with applicable federal state and local requirements. Over the 30 to 36 year period that they have operated, these plants have achieved an exemplary safety record with no LNG-related incidents resulting in injuries, fatalities or significant spills of LNG occurring.

OBSERVATIONS

The U.S. is continually increasing its reliance on natural gas as the preferred fuel for residential and commercial space heating, industrial applications and, more recently, to generate electricity. To meet today's more stringent environmental standards over 90% of new generating capacity is gas fired. This trend will only increase as older generating units are retired or re-powered. All of the new generation being proposed for our region will be gas fired.

The use of gas in the United States varies considerably by region. In the Northeast, for instance, there is a large residential/commercial heating component, a high utilization for power generation, and a smaller industrial use. In the Southwest an extremely large percentage of the gas used goes to the industrial sector.

As the demand for natural gas continues to grow, traditional North American producing areas will no longer be able to meet all requirements and alternative sources of supply will be needed. One probable source of new supply will be the use of imported LNG. According to the study by the National Petroleum Council previously cited, LNG could conceivably provide for 14-17% of increased demand by 2025. There is some question, however, whether or not the U.S. is ready to embrace the use of imported LNG as a viable option for increasing natural gas supplies and as a means for LDC's to increase peak day gas supplies. Also in question is whether LNG used by LDC's as a peak shaving fuel will be encouraged to grow.

Presently, the use of LNG by LDC's is nothing new. Since the late 1960's and early 1970's, LNG processed from on system supplies has been used in the New York area by both KeySpan and Consolidated Edison as a means of reducing peak day demand. LNG, in fact, comprises about 15-20% of the send out on the coldest days of the winter for these companies. Absent the ability to supplement gas supplies with LNG the LDC's would be forced to contract for additional pipeline supplies or off system storage.

The economic impact of this would accrue to the end users, primarily residential and commercial heating customers.

The acceptance of LNG as an alternative fuel supply by regulators and state and local governments has been mixed. While certain parts of the country appear ready to license new import terminals and the necessary support and transportation facilities, New York State is reluctant. In fact, as previously indicated there was a moratorium in place for the State for over 25 years on the siting of new LNG facilities and establishing intrastate transportation routes. New York City Regulations still govern and essentially prohibit the use and transportation of LNG within City limits on a regular basis.

The storage and transport of LNG, due to its physical and chemical properties, does not pose any more serious threat than competing fuels. At the federal level there are comprehensive regulations in place that govern all aspects of LNG processing, storage and transport. In addition, the NFPA has developed a series of standards that apply to equipment fabrication and operating practices that have been adopted by both federal and state regulatory agencies. At the State level, the PSC, DEC, DOT and DOS all provide oversight, sometimes working with federal agencies, on the operation of the existing LNG peaking plants within the State. The 3 existing LNG plants in New York State have operated for between 30 and 36 years with an exemplary safety record and in strict compliance with the comprehensive codes and regulations in place to ensure public safety.

While it is unlikely that a major LNG terminal would be proposed for the Metropolitan area, the patch work of State regulations and the absence of clear criteria for siting any new facilities or designating transportation routes will continue to discourage any expanded use of LNG even for local peak shaving in New York. No new LNG facilities have been constructed in New York since the early 1970's.

LNG is a viable source of natural gas that can be processed, stored and transported with an acceptable level of safety. If future forecasts are correct, LNG will

become an increasingly important part of the nation's gas supply mix and markets will emerge for the use of LNG beyond its present use as a source of peak shaving fuel for LDC's. While public safety must continue to be the most important criteria in evaluating any LNG utilization options, overly restrictive criteria for the appropriate utilization would deprive New York's gas customers of any future benefits that will come from an emerging LNG market.

The Federal Government has extensive regulations in place for all aspects of LNG operations. In many cases these regulations are already incorporated by reference into the regulations of the State and New York City for LNG. Dating back to the 1950's and 60's, over 100 LNG plants have safely operated in this country. New York State and New York City, while allowing the continued operation of the 3 existing LNG peak shaving facilities in the Metropolitan area, have been hesitant to adopt regulations that would facilitate the increased use of these existing sites or allow for the construction of new facilities. It has been projected that LNG will become a significant part of the nation's natural gas supply mix within the next 20 years. LNG will also continue to be an important way for LDC's like KeySpan and Consolidated Edison to supplement gas supplies on the coldest days of the year. In view of this it may be appropriate at this time for both the State and the City to reevaluate regulations dealing with LNG.

New York City presently has extensive regulations governing the manufacture, storage, transportation, delivery and processing of LNG. The only instances where LNG has been transported within City Limits have been on an emergency basis for a limited period of time. With the State Moratorium no longer in existence, New York City regulations continue to govern and restrict the use and ban the transport of LNG. As such, there is a need for the City to revisit its overly restrictive regulations and put rules in place to facilitate the necessary upgrades/refurbishment of existing facilities and permit the transport of LNG on a non-emergency basis using the necessary safeguards. This would allow increased utilization of LNG with added flexibility, and also provide metropolitan area gas customers with better service.

Similarly, New York State should streamline its regulations and develop clear criteria for the licensing of new LNG facilities in compliance with applicable codes and regulations. Perhaps this could be accomplished through a one stop licensing procedure that parallels the Article X process developed for electric generating facilities. At present 4 State agencies have jurisdiction over certain aspects of LNG operations and no lead agency has responsibility to coordinate licensing at the State and local levels and interface with federal agencies. New York State should also develop a policy, based on Federal DOT regulations, for the establishment and maintenance of transportation routes to facilitate the intra and interstate trucking of LNG.

Over the longer term, New York State and New York City should jointly study the viability of either establishing LNG terminals within the State or pursuing other alternatives to ensure its residents access to the benefits of LNG. With the outlook for natural gas production in the U.S. lower 48 flat to declining, new sources of supply will be required to meet projected growth in demand. LNG from the emerging global market, already a significant supply source for many countries, appears to be a very effective means for satisfying at least a significant part of this demand.

APPENDIX
SUMMARY OF REGULATIONS/CODES

Federal

- Section 7 of the Federal Natural Gas Act authorizes the FERC to approve the construction, replacement or abandonment of LNG peak shaving facilities used in interstate service.
- National Environmental Policy Review Act of 1969 requires FERC to prepare an Environmental Impact Statement as part of the certification process to construct or operate LNG facility.
- Section 60103 of the Pipeline Safety Laws authorizes the Secretary of Transportation to prescribe minimum safety standards concerning the location, construction, initial inspection and testing of a new LNG facility.
- 49 CFR Part 193 establishes LNG facility standards for the DOT's Office of Pipeline Safety including requirements for siting, design, construction, equipment, operations, maintenance, personnel qualifications and training, fire protection, and security.

National Fire Protection Association

- NFPA 59A Standard for the Production, Storage, and Handling of Liquefied Natural gas applies to LNG facilities and its use and covers the basic methods of equipment fabrication as well as LNG installation and operating practices that provide for the protection of persons and property.
- NFPA 57 Standard for Liquefied Natural gas Vehicular Fuel Systems applies to the design, installation, operation and maintenance of LNG engine fuel systems on vehicles of all types, and to their associated fueling facilities.

New York State

- Part 259 of 16 NYCRR enables the NYSPSC to carry out its responsibilities regarding LNG facilities and prescribes safety standards for all LNG facilities within the State except for those subject to the jurisdiction of the FERC.
- Title 17, Section 23 of the New York State Conservation Law gives the NYSDEC the authority to issue environmental safety permits related to the preparation of a site, or for the construction of a liquefied natural gas or cryogenic petroleum gas storage or conversion facility. It does not apply to LNG facilities in service prior to September 1, 1976. This regulation also requires the DEC to adopt regulations establishing criteria for the siting of LNG and LPG facilities and to prescribe the form and content of the environmental safety permits for construction of these facilities.
- 9 NYCRR, Subtitle S, Subchapters B and C.
 - Part 1003 requires storage tanks for LNG to be in accordance with generally accepted standards contained in NFPA 59A. Not applicable to applications within New York City.

New York City

- Title 3, Chapter 23, Section 23-03 of the Rules of the City of New York regulates the manufacture, storage, transportation, delivery and processing of LNG.

