# INTRODUCTION

This report documents the results of CRA's analysis of the ability of the natural gas delivery system to meet future electricity generation requirements in New York State. The analysis, which has been undertaken as part of the NYSERDA/NYISO Gas and Electric Study, integrates the modeling of the gas demands of New York electric generators, with the modeling of available gas supply and delivery capacity to the State. By integrating gas demand estimates from a detailed model of the electric system with a characterization of gas supplies from a detailed model of the gas delivery system, we are able to characterize the location, extent, and duration of New York gas and oil use under a variety of conditions.

The study was initiated to address concerns about the adequacy of the New York gas delivery infrastructure for simultaneously meeting traditional gas demands and future gas demands for electric generation. These concerns have stemmed from existing delivery constraints in the downstate region, forecasted demand growth among traditional gas consumers, and the expectation that gas demands among the electric generation sector will grow rapidly as new gas-fired power plants are built to support increasing electric demands.

- Prior to autumn 2001, no substantial pipeline expansions had been built in New York since the Iroquois addition in 1991. The Energy Information Administration (EIA) has noted that, as a result of this limited supply expansion and substantial gas demand growth, downstate gas deliveries in the New York City area have approached their throughput limits.[9]

- At the same time, substantial amounts of new gas-fired electric generation capacity have been proposed for New York; complete applications for siting approval have been filed for new generation projects totaling almost 10,000 MW.[10]

In light of the potential mismatch between total gas demands for electric generation and the adequacy of the gas delivery infrastructure for meeting those demands, this study has examined the ability to meet electric loads under a range of gas pipeline expansion and new electric generating capacity scenarios.

The report begins with a discussion of the conceptual framework for assessing pipeline adequacy. The discussion focuses on the determinants of generators' gas demands, the determinants of the gas supply available to meet those demands, and the potential causes of gas shortages stemming from supply and demand imbalances.

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[9] "Status of Natural Gas Pipeline System Capacity Entering the 2000–2001 Heating Season," EIA *Natural Gas Monthly*, October 2000; *Natural Gas Transportation—Infrastructure Issues and Operational Trends*, EIA Natural Gas Division, October 2001.

[10] New York Department of Public Service, Summary of Article X Cases, 7 June 2002. Available at http://www.dps.state.ny.us/xtable.PDF

The integrated electric and gas modeling approach is described in the second chapter of this report. Our approach utilizes separate models for the electric and gas systems. Consistent equilibrium solutions are obtained by iterating between the two models. The third chapter contains a detailed discussion of the basic factors that drive our integrated modeling efforts. The scenarios are defined along with the institutional and regulatory structure that provides the basis for the analysis.

The fourth and fifth chapters present the results of the analysis. The total fuel demands by gas capable electric generating capacity are outlined in chapter four. These total fuel demands represent the initial outputs from the electricity model and were calculated assuming no restrictions on gas deliveries. As such they represent the maximum potential gas demand for electric generation and are inputs to the gas system model. Chapter five presents the results of the integrated gas and electric modeling. Gas and oil use for electricity generation is presented for each of the cases and years analyzed. Historical usage patterns are presented as a reference point and reliability considerations are identified.