



**COMBINED HEAT AND POWER
MARKET POTENTIAL FOR NEW YORK STATE**

FINAL REPORT 02-12

OCTOBER 2002

**NEW YORK STATE
ENERGY RESEARCH AND
DEVELOPMENT AUTHORITY**



The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation created in 1975 by the New York State Legislature. NYSERDA's responsibilities include:

- Conducting a multifaceted energy and environmental research and development program to meet New York State's diverse economic needs.
- Administering the **New York Energy SmartSM** program, a Statewide public benefit R&D, energy efficiency, and environmental protection program.
- Making energy more affordable for residential and low-income households.
- Helping industries, schools, hospitals, municipalities, not-for-profits, and the residential sector, including low-income residents, implement energy-efficiency measures.
- Providing objective, credible, and useful energy analysis and planning to guide decisions made by major energy stakeholders in the private and public sectors.
- Managing the Western New York Nuclear Service Center at West Valley, including: (1) overseeing the State's interests and share of costs at the West Valley Demonstration Project, a federal/State radioactive waste clean-up effort, and (2) managing wastes and maintaining facilities at the shut-down State-Licensed Disposal Area.
- Coordinating the State's activities on energy emergencies and nuclear regulatory matters, and monitoring low-level radioactive waste generation and management in the State.
- Financing energy-related projects, reducing costs for ratepayers.

NYSERDA administers the **New York Energy SmartSM** program, which is designed to support certain public benefit programs during the transition to a more competitive electricity market. More than 2,700 projects in more than 30 programs are funded by a charge on the electricity transmitted and distributed by the State's investor-owned utilities. The **New York Energy SmartSM** program provides energy efficiency services, including those directed at the low-income sector, research and development, and environmental protection activities.

NYSERDA derives its basic research revenues from an assessment on the intrastate sales of New York State's investor-owned electric and gas utilities, and voluntary annual contributions by the New York Power Authority and the Long Island Power Authority. Additional research dollars come from limited corporate funds. Some 400 NYSERDA research projects help the State's businesses and municipalities with their energy and environmental problems. Since 1990, NYSERDA has successfully developed and brought into use more than 141 innovative, energy-efficient, and environmentally beneficial products, processes, and services. These contributions to the State's economic growth and environmental protection are made at a cost of about \$.70 per New York resident per year.

Federally funded, the Energy Efficiency Services program is working with more than 540 businesses, schools, and municipalities to identify existing technologies and equipment to reduce their energy costs.

For more information, contact the Communications unit, NYSERDA, 17 Columbia Circle, Albany, New York 12203-6399; toll-free 1-866-NYSERDA, locally (518) 862-1090, ext. 3250; or on the web at www.nyserdera.org

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NOTICE

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ABSTRACT

Businesses and industry in New York State that employ on-site power generation with heat recovery can dramatically reduce both energy consumption and its associated environmental impacts. This approach, called *combined heat and power* (CHP – also known as cogeneration), is already an important generating resource in New York with approximately 5,000 MW of capacity installed at 210 sites. The industrial sector accounts for 78% of the existing CHP capacity in the State and is represented by a few facilities that have very large CHP systems. Important questions include: how much new CHP could be installed in the next decade in New York State, what benefits would this yield, and what actions can policymakers and planners pursue in order to promote market penetration of clean and efficient CHP?

The technical potential for new CHP is an estimation of the remaining market size constrained only by technological limits—the ability of CHP technologies to fit existing customer energy needs. This report evaluates the technical potential for new CHP in commercial, institutional, and industrial sites by screening a comprehensive facility database according to size and application criteria that would allow for operation of a CHP system which employs both a high-load factor and high-thermal utilization. The report identifies nearly 8,500 MW of technical potential for new CHP in New York at 26,000 sites. While existing CHP in New York is concentrated in very large plants, only 16 sites remain that could support a plant size greater than 20 MW for internal power consumption. Close to 74% of remaining capacity is below 5 MW and is primarily at commercial and institutional facilities.

Market penetration of CHP will depend on the degree of economic advantage for CHP compared to separately purchased fuel and power, the prevailing size of the CHP market, the speed with which the current market can ramp-up in the development of new projects, and the sites remaining with economic potential. These factors were combined into a simple market-estimating model that show in the *Base Case* scenario an estimated 764 MW of CHP will be installed by the year 2012, whereas in the *Accelerated Case* scenario market penetration reaches nearly 2,200 MW during the same timeframe.

Penetration of CHP into the commercial/institutional and light industrial markets has been minimal to-date. This is likely due to a combination of factors: Deficiencies in small CHP technologies and systems, lack of an adequate sales and service infrastructure for small systems, low familiarity of users and building owners of CHP systems and benefits, and a number of critical market and regulatory hurdles. These hurdles encompass a variety of concerns that typically face new entrants offering competing products and services in markets with well-established incumbents. Implementation of CHP creates a complicated interaction between the user and the local power distribution utility. The CHP system must meet interconnection regulations and requirements that are, in some cases, not well defined and costly to meet. The tariffs for backup and supplementary power services are higher in New York than in other large states where CHP has

made an impact – such as California, Texas, and Illinois. Securing the necessary permits for a CHP system can be an expensive and time-consuming process. Local building codes often don't adequately address the needs of CHP systems, creating delays, expense, and uncertainty for project developers. Financing capital-intensive CHP processes is also a hurdle. There are perceived risks that limit the availability of capital for these projects and also make the financing cost more expensive.

To support the widespread adoption of CHP and clean distributed generation technologies, public policy should focus on a greater degree of uniformity, transparency, and simplicity to these processes, while at the same time protecting the public interest in air quality, safe and secure operation of the electric network, and genuine local safety and land use issues. There are specific areas where policy decisions can promote CHP market penetration. The dialogue regarding the appropriate regulatory treatment of CHP/ Clean Distributed Generation (DG) has only recently been initiated. The issue areas covered in this report are a select subset that are offered as potentially productive topics for ongoing inquiry and study by regulators and policymakers - this report provides data and analysis to facilitate such a dialogue.

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A Project Advisory Board, comprised of State regulatory, policymaker, and business communities, familiar with the benefits of and hurdles to Combined Heat and Power (CHP - also known as cogeneration) in New York State, helped develop the methodology used in the assessment of NYSERDA's CHP initiatives.

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