



NYSERDA: Financial Support and Capacity Building

The Distributed Generation (DG) and Combined Heat and Power (CHP) Program, run by New York State Energy Research and Development Authority (NYSERDA), provides funding for product development, feasibility studies, and demonstrations that contribute to the growth of DG and CHP stations in New York State (NYS). The program consists of two components: (1) a power systems, or product development, element that supports the development and commercialization of new, innovative power system technologies, including CHP systems and components, that are manufactured in NYS and (2) the demonstration and pre-deployment of available DG-CHP technologies in new, innovative applications that can be replicated throughout NYS. Activities focused on CHP include:

- Funding CHP demonstrations, site-specific feasibility studies, and technology transfer studies to document performance and show the effectiveness of new, innovative CHP applications. Projects funded under this program are selected competitively based on many factors, including their ability to reduce institutional barriers, improve grid reliability, use renewable resources, and produce immediate energy and cost savings through high efficiency systems.
- Providing outreach and disseminating information to stakeholders in the form of conferences, white papers, and web-based information.
- Coordinating with key policy makers and utility stakeholders to overcome critical market barriers and resolve other issues that prevent broad acceptance and installation of CHP systems in NYS. Issues of interest include understanding and support for uniform interconnection standards, establishment of favorable emission limits, and lowering standby rates.

Eligibility criteria:

Eligible technologies include steam and gas turbines, micro-turbines, internal combustion engines, and fuel cells. All systems must be located within NYS.

Budget:

During the six-year period commencing in 2000, NYSERDA provided over \$50 million to support 100 projects installing CHP equipment at end-user sites. The total project cost for all projects funded was \$273.5 million, with about 80% of this coming from private financing. A similar level of funding continues to be available at present and for the out-years.

Support is also available for sites interested in learning more about CHP. NYSERDA clientele can request a pre-screening study to determine whether they should hire a consultant to perform an investment-grade analysis of CHP applicability. NYSERDA also provides funding support for those sites interested in conducting such a detailed analysis.

A. Policy Context

Reason for adoption of the policy

This program has been developed largely to assist NYS in meeting its environmental targets and in recognition of the potential for CHP. A NYSERDA-commissioned study published in 2002 found that there is a technical potential for approximately 8 500 MW of new CHP in NYS (the state currently has 5 000 MW of installed CHP). The study found a vibrant marketplace for CHP systems sized 5 MW or less, with ample opportunities across the state.

Policy objectives

- To establish the framework for CHP investment in NYS that leads to significant CO₂ reductions and an increased uptake of renewable fuels.

- To reduce the market barriers to CHP installations, such as:
 - Interconnection agreements: Many CHP customers are still dependent on grid power during times of peak demand, making interconnection with the local utility a necessity (see Section 3.X for more on Interconnection).
 - Appropriate sizing and integration of equipment: The lack of factory-integrated packaged CHP systems in a wide range of sizes necessitates system engineering on a project-specific basis.
 - Misconceptions regarding natural gas: The predominant use of natural gas in CHP systems has led to a misconception among policy makers that CHP is an inefficient use of a costly resource. However, a NYSERDA analysis shows that on-site generation in NYS typically displaces grid-supplied electricity originating from natural gas fired power plants, which are less efficient than CHP. Furthermore, the occasional use of opportunity fuels in CHP systems enhances the notion that the development of CHP systems is indeed a natural gas conservation activity. Clearing up this confusion, especially among policy makers, would make it easier to obtain air emission permits for CHP plants and influence policy that encourages CHP integration into the marketplace.

Related Targets:

New York City aims to deploy 800 MWe of CHP by 2030.

B. Effectiveness

Impact of the policy

Because this program is limited to development and demonstration, its activities were not designed or expected to yield significant immediate energy, economic, and environmental benefits. The following accomplishments are presented with the understanding that they represent a pilot effort, and are documented and disseminated to promote replication and increased market penetration.

- Operational projects are currently producing 20 MW of electric power; when all 100 projects become operational this portfolio will produce 100 MW.
- The program has supported efforts to improve the reliability of New York's electric transmission and distribution system. Approximately 43% of the CHP capacity has been installed in New York City and Long Island, which are considered key in terms of congestion and system reliability.
- System owners and developers estimate the non-energy benefits from CHP projects from between 64-128% of the annual net energy savings for the projects. The benefits recognized by participants include environmental benefits, reductions in transmission and distribution losses, and decreased load pockets.
- Electricity generation at additional sites, such as waste water treatment plants, are powered fully or partially by digester gas produced on site. Such fuel switching achieves natural gas conservation above and beyond the savings achieved through efficiency alone.
- Innovative electrical interconnection designs have been developed, including the first installation of a synchronous interconnection system in New York City.
- Innovative third-party financing for CHP is being demonstrated (e.g. New York City, 230 Park Avenue).
- A 2004 analysis illustrated that CHP installations are occurring outside of the program, which can be attributed to the work of the NYS program. The extent of the spill over was estimated to be 16% of in-program accomplishments.

Other important trends that have been observed include:

- **Larger systems:** Recent trends show that CHP developers are pursuing larger and larger-sized projects, indicating a growing comfort among marketplace participants with this technology. Furthermore, CHP developers, having gained valuable experience, are now starting to identify

and pursue projects which are feasible without government subsidies, and investment firms are starting to provide financing for such projects.

- **Stand-alone capability:** A larger percentage of proposals received in recent rounds of the program represent projects that can operate in parallel with the grid as well as during power outages. Heightened interest in stand-alone capability is a result of the August 2003 blackout and also from improvements in grid interconnection technologies. All six NYSERDA projects that were operational, and designed to operate independently from the grid, continued to operate during the regional blackout.
- **Better quality proposals:** In recent rounds of the program, the number of proposals received has decreased, but the percentage of technically meritorious proposals has increased, indicating that project developers are working harder to find viable candidates for CHP systems.
- **Increased use of renewable fuels:** In recent rounds of the program, the number of proposals that use renewable resources has increased. Approximately 25% of the electricity generated through this program is fuelled by renewables.

C. Lessons & Replication

Key lessons

- Knowledge gained from this program has confirmed that certain mature technologies (i.e. natural gas-fuelled engines, steam turbines, etc.) are now ready for mass-market deployment. The CHP Demonstration program will continue to evaluate emerging technologies (i.e. Micro-CHP, Stirling engines, etc.), and advance the understanding of CHP development business models.
- A recent survey of participants in the CHP marketplace, including project developers and site owners, has recognized that NYSERDA provides many valuable contributions aside from financial assistance. These include the credence of its project review and selection process, its assistance with interactions among stakeholders (i.e. utility companies, the Public Service Commission), and through ongoing coaching by NYSERDA staff during project design, construction, and commissioning.
- NYSERDA staff anticipates that this program will lead to: supportive DG-CHP policies and standards; increased recognition of the value and benefits of DG-CHP systems by policy makers, developers, and facility owners; and replication of proven DG-CHP applications at facilities across the state. In fact, a NYSERDA survey indicates that market barriers to CHP, as described above, have been decreasing as a whole.

Potential for replication

This projects coming from this program can be applied widely across NYS, and the program itself can be replicated nationally and globally.

D. Resources

- Program's home page, including information on eligibility requirements, program benefits, and application procedures for funding: <http://www.nyserda.org/programs/dgchp.asp>
- DG-CHP Integrated Data System, which presents monitored real-time data from CHP demonstration projects: <http://chp.nyserda.org>

E. Case Study Written and Submitted by:

Dana Levy, Project Manager, NYSERDA

DLL@NYSERDA.org

For More Information about the IEA's International CHP/DHC Collaborative: Contact Tom Kerr, email tom.kerr@iea.org.



The International CHP/DHC Collaborative

The International Energy Agency launched the International CHP/DHC Collaborative in March 2007 to help evaluate global lessons learned and guide G8 policy makers, industry and other nations as they attempt to assess the potential of CHP and district energy as an energy technology solution.

The Collaborative includes the following activities:

- collecting global data on CHP/DHC
- assessing growth potentials for key markets
- developing country scorecards with data and relevant policies
- documenting best practice policies for CHP and DHC
- convening an international CHP/DHC network, to share experiences and ideas

Participants in the Collaborative include government and industry Partners, as well as over 300 government, industry and non-governmental organizations that provide expertise and support via the Network.

If you are interested in participating in the Collaborative or want more information, please visit www.iea.org/G8/CHP/chp.asp.