

2004 INNOVATIONS AWARDS PROGRAM
Application Form

1. Program Name
Distributed Generation – Combined Heat and Power (DG-CHP) Program
2. Administering Agency
New York State Energy Research and Development Authority (NYSERDA)
3. Contact Person (Name and Title)
Nag Patibandla, Program Manager
4. Address
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www.nyserda.org
9. Please provide a two-sentence description of the program.
The program supports development of distributed generation and thermally activated (vis-à-vis, combined heat and power) technologies and sub-systems as well as their demonstration/use in a variety of CHP applications with a goal to make clean & efficient on-site generation (i.e distributed generation) a viable option for New Yorkers. The program showcases both emerging distributed technologies (fuel cells and microturbines) and conventional distributed generation technologies (recip engines and gas turbines) in various innovative, replicable CHP applications.
10. How long has this program been operational (month and year)?
NYSERDA initiated its DG-CHP program area in August 2000 by issuing its first CHP solicitation.
11. Why was the program created? (What problem[s] or issue[s] was it designed to address?)
Recognizing the need and an opportunity to improve the efficiency of power generation and to mitigate the associated air pollution, NYSEDA initiated a DG program that focused on CHP, considered the most viable and economic use of

distributed generation (DG-CHP offers many benefits: modern equipment is environmentally friendly; use of available heat (thermal energy) increases fuel-use efficiency; diversification of electrical supplies to the end-user; enhances energy security; and on-site generation alleviates T&D load pocket constraints.). A large number of New York State manufacturers could potentially participate in supplying emerging power generation technologies such as fuel cells as well as critical components and subsystems such as power electronics, heat exchangers, and gas compressors.

12. Describe the specific activities and operations of the program in chronological order. Since the inception, the program solicited DG-CHP projects through four rounds of funding, receiving nearly 400 proposals of which over 80 CHP demonstration projects and nearly 40 product development projects were selected for funding. The currently active demonstration projects are expected to install nearly 30 megawatts of new electricity generating capacity by the end of 2004 and add 30 MW more generating capacity per year in both 2005 and 2006. Also, commercialization of DG/CHP technology will lower installation costs, further reducing energy costs. To ensure synergy, a close collaboration between NYSERDA's CHP demonstration sub-program and distributed generation product development sub-program areas is emphasized.
13. Why is the program a new and creative approach or method?
NYSERDA's DG-CHP program is ahead of similar state- or national- DG programs in terms of both strategy and implementation in areas such as (i) monitoring the field performance in terms of electrical output, thermal utilization, and emissions, (ii) analyses of project development and installation hurdles (*siting and permitting and interconnection*) (iii) analyzing the project economics (*standby rates*) and CHP application suitability (*overall efficiency, E/T coincidence demands*) and operational reliability, (iv) technology transfer and replication, and (v) state-/system-wide impacts (*criteria pollutants, congestion effects, grid support, zonal pricing, etc*). NYSERDA is the only state entity to be included as a Founding Member of the US Environmental Protection Agency's CHP Partnership Program. NYSERDA is a leading participant in an effort with the US DOE to address regional issues with neighboring states through a Northeast CHP Initiative and is the recipient of the recently announced DOE award to initiate a Northeast Regional CHP Applications.
14. What were the program's start-up costs? (Provide details about specific purchases for this program, staffing needs and other financial expenditures, as well as existing materials, technology and staff already in place.)
The overall DG-CHP program budget is \$13 million per year. The program is part of New York's System Benefit Charge-II (a five-and-half years program to run from 2001-to 2006). The program budget adds a 7% administration cost for use by NYSERDA for staffing and other admin. Costs. The program currently supports four FTEs of professional staff (including management and support functions).
15. What are the program's annual operational costs?

The program budget adds a 7% administration cost (on a base of 13 million per year) for use by NYSERDA for staffing and other admin. Costs. The program currently supports six FTEs of professional staff (including management and support functions).

16. How is the program funded?

The program is a part of New York's System Benefit Charge (a five-and-half years program to run from 2001-to 2006).

17. Did this program require the passage of legislation, executive order or regulations? If YES, please indicate the citation number.

NYSERDA is the program administrator for New York's public benefit program established by the State's Public Service Commission as part of electric utility deregulation, with funds derived from an assessment on ratepayer. New York's System Benefits Charge (SBC) was enacted in 1998 for three years, and extended in 2001 for a five-year period through June of 2006. Our DG-CHP program is one 40 New York Energy Smart programs that are part of the SBC funding.

18. What equipment, technology and software are used to operate and administer this program?

Fuel-based distributed generating options include turbines (steam, combustion, micro); reciprocating engines; and fuel cells (phosphoric acid, molten carbonate, solid oxide, alkaline, proton exchange membrane (PEM)). One of the main advantages of a DG system is that it can be integrated with a variety of commercial, institutional, and residential applications to provide both electrical and thermal energy, i.e., *Combined Heat and Power (CHP), or cogeneration*. CHP units co-located with a paper mill, hospital, or large residential building use the waste heat for space heating, process steam, or even air conditioning. Fuel use efficiencies of over 60% are achievable. (twice as high as usual central power and transmission).

19. To the best of your knowledge, did this program originate in your state? If YES, please indicate the innovator's name, present address, telephone number and e-mail address.

No! Providing incentives for small-scale (i.e onsite/distributed) generation has been known for decades (ex: PURPA).

20. Are you aware of similar programs in other states? If YES, which ones and how does this program differ?

California has a self-generation incentive program (which is compared to the New York's program below) and New Jersey is in the process of establishing one.

New York DG-CHP Program

NYSERDA's DG-CHP program is a solicitation based - demo program and offers cost-share to the projects (30%-60% of the project costs). It supports innovative (one of a kind) applications at end-use sites operating on fossil and renewable-fuels.(landfill gas, anaerobic digester gas, etc). Renewable generation technologies

(i.e. PV, wind, etc.) are supported via a separate and distinct program. All programs are central not-for-profit administered with active staff involvement and strong project management and support. The program enjoys a strong regulatory support from New York's PSC. NYSERDA committed \$40 million to date in support of nearly 80 CHP projects with 20 in operation at all end-use sectors (industrial, agriculture, institutional, commercial and multi-family residential) and representing various prime-mover technologies (engines, turbines, and fuel-cells).

California Self-Generation Incentive (CSGI) Program:

Subscription based - deployment program with predefined qualification requirements. It offers a tiered approach with renewables (i.e. PV and wind). The program targets cost-effective installations and offers \$/kw with technology bias. CSGI is utility administered and enjoys support close-collaboration with California Energy Commission's DG programs.

21. Has the program been fully implemented? If NO, what actions remain to be taken?
The SBC-II funded DG-CHP program will need to be broadened in SBC-III to support development, demonstration and wide-spread use of Distributed energy resources (DER). DER systems range from distributed generation (DG) technologies to energy management and storage that support and strengthen the central-station model of electricity generation, transmission, and distribution.
22. Briefly evaluate (pro and con) the program's effectiveness in addressing the defined problem[s] or issue[s]. Provide tangible examples.
NYSERDA's DG-CHP program is adding about 30 MW of new DG-CHP capacity each year, with a total of about 120 MW expected by 2006. The potential in New York is much greater, perhaps 2,000 MW by 2012. CHP, as we are doing it in New York, is another example of winning on all dimensions, energy, environmental, and economic. And, importantly, DG-CHP and broadly DER can provide a new level of power security and grid reliability. Broadening of the SBC-II funded DG-CHP program to cover the full CHP potential as well as other DER opportunities will require significantly more funds.
23. How has the program grown and/or changed since its inception?
The program as defined in the SBC order has not changed in its scope. However, minor modifications have been made to solicitations (PONs) that are used in selecting projects suitable for NYSERDA funding. Here is an excerpt from a process evaluation report NYSERDA had done by an outside contractor recently:
 - some differences in wording between the PONs, suggesting ongoing efforts to clarify the kinds of projects eligible for funding or the criteria for project selection. These differences seem both to broaden and to narrow the scope of the eligible projects, but make little, if any, substantive difference in the fundamental thrust of the PONs regarding the development and demonstration of CHP technologies. A discussion of some specific differences between the PONs follows.

- Based upon the foregoing comparison of differences between PONs 554, 536, 669, and 750, it is concluded that their evolution has been primarily one of semantics, syntax, and style.

24. What limitations or obstacles might other states expect to encounter if they attempt to adopt this program?

Among the states that have deregulated their electric utilities, most have funding streams similar to New York's SBC funds. In these states, the issue is the scope of such funds and inclusion of fuel-based DG-CHP programs. For example, California and New Jersey have included DG in their program scope where as Massachusetts and Connecticut have not. (Note Connecticut does support fuel cells based DG). In other states where electric utilities continue to be regulated no such funding exists but DG-CHP may need to be integrated into utility planning.

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CSG Innovations Awards 2004

The Council of State Governments

2760 Research Park Drive, P.O. Box 11910

Lexington, KY 40578-1910

innovations@csg.org

DEADLINE: All original applications must be received by April 20, 2004, to be considered for an Innovations Award for 2004.

ApplicationForm04.doc

APPENDIX

Synopsis of NYSERDA's Distributed Generation and Combined Heat and Power Program.

Combined Heat and Power (CHP), or cogeneration, is the coincident production and use of electrical or mechanical power and thermal energy. The recovered thermal energy may be used for industrial process/space heating and/or refrigeration/space cooling via an absorption chiller. CHP, considered the most viable and economic use of distributed generation (DG), offers many benefits: modern equipment is environmentally friendly; use of available heat (thermal energy) increases fuel-use efficiency; diversification of electrical supplies to the end-user; enhances energy security; and on-site generation alleviates T&D load pocket constraints.

Recognizing the opportunity to improve the efficiency of power generation and to mitigate the associated air pollution, NYSERDA initiated a CHP Applications program area, in the year 2001, to demonstrate the use of DG technologies in a variety of CHP applications with a goal to make clean & efficient on-site generation (/DG-CHP) a viable option for New Yorkers. The CHP Applications program area is stimulating the DG-CHP marketplace in New York State by demonstrating high-efficiency CHP systems in industrial, agricultural, institutional, commercial, and residential applications which serve as models for others to replicate. The program is active with DG/CHP stakeholders on local, statewide, and national fronts in addressing hurdles to widespread deployment of CHP imposed by disjointed siting and permitting regulations, utility interconnection rules, and standby service tariffs.

A large number of New York State manufacturers could potentially participate in supplying emerging power generation technologies such as fuel cells as well as critical components and subsystems such as power electronics, heat exchangers, and gas compressors. Also, commercialization of DG/CHP technology will lower installation costs, further reducing energy costs. To ensure synergy, a close collaboration between NYSERDA's CHP demonstration program and distributed generation product development program areas is emphasized.

NYSERDA's DG-CHP solicitations have been highly successful. In the past two years, NYSERDA has solicited DG/CHP projects through four rounds of funding, receiving nearly 400 proposals of which over 80 CHP demonstration projects, nearly 40 product development projects were selected for funding. The currently active demonstration projects are expected to install nearly 30 megawatts of new electricity generating capacity by the end of 2003 and add 30 MW more generating capacity per year in both 2004 and 2005.

NYSERDA's DG/CHP Program is recognized as a national leader. The program will show-case both emerging distributed technologies (fuel cells and microturbines) and conventional distributed generation technologies (recip engines and gas turbines) in various innovative, replicable CHP applications. The program is far ahead of any other state or national DG programs in terms of both strategy and implementation in areas such as (i) monitoring the field performance in terms of electrical output, thermal utilization, and emissions, (ii) analyses of project development and installation hurdles (*siting and permitting and interconnection*) (iii) analyzing the project economics (*standby rates*) and CHP application suitability (*overall efficiency, E/T coincidence demands*) and operational reliability, (iv) technology transfer and replication, and (v) state-/system-wide impacts (*criteria pollutants, congestion effects, grid support, zonal pricing, etc*). NYSERDA is the only state entity to be included as a Founding Member of the US Environmental Protection Agency's CHP Partnership Program. NYSERDA is a leading participant in an effort with the US DOE to address regional issues with neighboring states through a Northeast CHP Initiative and is the recipient of the recently announced DOE award to initiate a Northeast Regional CHP Applications.

The future program activities will be geared towards rounding out the portfolio of technologies and end-use sectors, and focusing on projects that specifically address one or more hurdle in a way not already represented by an existing project. The intent of this strategy is to expand the opportunities for a variety of solutions to be evaluated and highlighted. Reducing product costs and improving product performance can have expanded influence on the DG/CHP marketplace beyond the localized benefits achievable at sites where NYSERDA-supported CHP gets installed.