

Award Winning Technology: ecopower™ Micro Combined Heat and Power Demonstrates Savings in New York City

Installation of new technology in a New York City apartment building shows that Micro Combined Heat and Power (Micro-CHP) can **save almost \$13,000 in building energy costs and reduce CO₂ emissions by almost 94,000 lbs annually.**

What is Micro-CHP?

Micro-CHP is a hybrid technology that provides heating to the home while simultaneously co-generating electricity on-site. While this technology has been used for years in Europe and Japan, it is a fairly new concept to the U.S. market.

What is the ENERGY STAR® Emerging Technology Award?

The ENERGY STAR Emerging Technology Award recognizes innovative products like Micro-CHP that have the potential to significantly reduce greenhouse gas emissions but face certain barriers to U.S. market penetration. EPA's intent in promoting award winners is to raise the profile of the technologies, helping to build demand so cost may ultimately be reduced and availability broadened.

One of the technologies chosen for the 2011 ENERGY STAR Emerging Technology Award is the ecopower™ Micro-CHP manufactured by Marathon Engine Systems.

Case Study Results: Micro-CHP Benefits and Savings

Through assistance from the New York State Energy Research and Development Authority (NYSERDA), the Melrose Five Project was organized to demonstrate the savings from Micro-CHP. A 63-unit multi-family apartment building located in the Bronx, NY was chosen to install two ecopower™ Micro-CHP systems, each providing domestic hot water heating and 4.7 kWh of electricity at the same time. At the end of one year of monitoring, the ecopower™ systems combined:

- Saved \$12,936 in building energy costs;
- Avoided 93,607 lbs of CO₂ emissions (equivalent to almost four average U.S. homes);
- Generated 74,100 kWh of electricity for common areas (87% of common area electricity demand); and
- Supplied 574 MBtu of hot water heating and supplemented building space heating (25% of total building heating needs).



The Eltona (The Bronx, New York)

Figure 1 shows the two ecopower™ systems as installed in The Eltona apartment building basement.

Figure 2 presents the annual cost savings and payback for the Micro-CHP installation at The Eltona.

Figure 1: Installation of the ecopower™ systems



Figure 2: Annual Cost Savings and Payback Period of ecopower™ Systems

Annual Savings	
Avoided Electric Use	\$18,012
Avoided Natural Gas Use	\$8,021
Net Operating Cost Savings	\$12,936
Payback Period	
Based on \$95,000 Initial Cost of Units	7.3 years*

* Install cost and amount of electricity generation will vary. Payback periods on the order of 4.5 to 7 years are common.

How the ecopower™ Works

The ecopower™ Micro-CHP system uses heat generated by a reciprocating engine to produce between 29,000 to 43,000 BTU/hr of heat while simultaneously co-generating 4.7 kWh of electricity. Ecopower™ is a thermally-driven system and the greatest savings coincide with higher heating loads (e.g., buildings with pools). Apartment buildings present a great opportunity for a system like the ecopower™ because: (1) there is a year-round need for hot water, thus maximizing runtime, and (2) the units can be multiplexed (up to four) allowing for a range of heat output from 20,000 Btu/hr to almost 160,000 Btu/hr.

The two systems installed in New York City were natural gas-powered *hydronic systems* with modeled system efficiency of 90%. The ecopower™ systems each operated for over 7,500 hours, without failures. It's important that the consumer follow the manufacturer recommended 4,000 running hour maintenance plan (e.g., spark plug, oil, and filter changes) to optimize the performance of the Micro-CHP system. This must be done by a Marathon-approved dealer.

For More Information:

This pilot study was fully successful in demonstrating that Micro-CHP is a viable solution for reducing electricity demand and greenhouse gas emissions, providing for environmentally-friendly solutions that many apartment building tenants seek, as well as providing reliable water heating and energy savings to the building owner and tenants. For more information contact or visit:

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