

Prospectus

An E SOURCE Distributed Energy Multi-Client Study



Micro-CHP: Coming to a Home Near You?

For years, there has been a great deal of talk about household-scale combined heat and power (CHP) systems, but only now are they becoming a commercial reality. Based on Stirling engines and internal combustion engines, today's micro-CHP systems are being sold to homeowners in Europe and Japan. And in some markets, they are already competing effectively with retail-priced electricity.

Although most of the commercialization is taking place in Europe and Japan, the North American market offers tantalizing opportunities—particularly in areas with a long heating season. In California, 5-kW units have been recently introduced, their sales assisted by recent experiences of black outs and power shortages. Market activity around the globe includes the following:

- SenerTec has sold more than 7,500 5-kilowatt (kW) reciprocating engine units in Germany and the rest of Europe, and nearly a third of them have been purchased by households.
- Osaka Gas has sold more than 1,700 1-kW reciprocating engine units in Japan this year alone.
- Whisper Tech signed an agreement with UK utility Powergen for the commercial trial of 400 1-kW Stirling engine units this winter.
- BG Microgen is placing 45 1-kW Stirling engine units in the field in the UK as a commercial pilot for winter 2003-2004.

When sold as a heating appliance that generates electricity as a by-product, the effective generating cost of micro-CHP systems is essentially the incremental cost over a standard heating appliance. Customer interest in these systems is being driven by a mixture of economics, new technology, and environmental concerns. And for some customers, having the ability to generate power in the event of grid failure is also an important motivator. In addition, a gradual regulatory shift is making it easier to gain approval for distributed generation installations. As the technology continues to evolve, consumers will have an even wider range of choices, including CHP units based on fuel cells and rankine cycle technology.

Because micro-CHP is a potentially disruptive technology, utilities, heating companies, and related organizations need to understand its full potential, see how it is being deployed in early adopter markets, learn about the range of technologies and products available and under development, and develop strategies for capitalizing on this market. To help them get up to speed, Platts Research & Consulting is launching this study on micro-CHP markets and technologies up to 10-kW in electrical output, including internal combustion engines, Stirling engines, fuel cells and rankine cycle technology.

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Study Objectives

This study will provide readers with a nuanced understanding of the residential-scale distributed generation markets and technologies that are emerging in Europe, North America, and Japan. We'll find answers to such questions as these:

- What technologies are being offered and developed, and how are they being packaged?
- Why are customers buying micro-CHP products, and how are these products being brought to market?
- What are the key market, economic, and regulatory requirements for micro-CHP, and what can we learn from international best practices?

- What roles can utilities and heating companies taking in the micro-CHP value chain, and what business models are effective?

- Where are these markets heading?

Through analysis of utility involvement, early commercial sales, and technology status, study subscribers will be better able to assess opportunities for their companies, to recognize the strategies adopted by their competitors, and to take advantage of market conditions that support the commercialization of residential DG products.

Research Focus

- **How and where micro-CHP is being sold and applied.** We'll examine how companies have successfully brought micro-CHP products to market and explain how these products are being used by residential customers.
- **Why customers are buying micro-CHP systems.** Through around 20 one-on-one interviews with micro-CHP purchasers, we'll provide insight into why customers are choosing to invest in micro-CHP and learn what it's like to live with micro-CHP technologies in their homes.
- **Regulatory requirements for micro-CHP.** We'll find out how crucial issues such as interconnection are being addressed and identify international best practices that could benefit other market players.

- **Micro-CHP markets and economics.** In addition to assessing the economic case for micro-CHP, we'll identify potential markets and evaluate how they may grow.

- **Business models and strategies for micro-CHP.** We'll look at how utilities and heating companies are choosing their roles in the micro-CHP value chain and explore the different business models for entering this fledgling market.

- **Technology status.** Our assessment of leading technology developers will inform subscribers on the details and characteristics of existing products as well as products likely to be commercialized in the next few years, looking at the market challenges they will face.

Deliverables

- A final report.
- An interview notebook containing summaries of our interviews with early adopters.
- An online library of detailed descriptions of micro-CHP products already on the market or under

development, plus descriptions of utility initiatives in the micro-CHP arena.

- A live conference call to discuss study findings and the implications they have for subscribing businesses.

Quiet enough to be placed in a kitchen, Whisper Tech's Stirling engine-based micro-CHP product is being sold as a home heating system that also makes electricity. The UK utility Powergen has an agreement with Whisper Tech to place 400 units in the field the winter of 2003-2004. Powergen estimates households will save £150 (US\$233) by installing one.



Source: Whisper Tech

Close to 8,000 of these 5.5-kW gas engine cogeneration units from SenerTec have been installed in Germany and other parts of Europe. SenerTec is now owned by the Baxi Group, one of Europe's top four boiler manufacturers.



Source: SenerTec

Project Team

Jon Slowe, research manager with the *E SOURCE Distributed Energy Service*, will lead the team working on this study.

Other contributors will include:

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For More Information

Platts Research & Consulting provides information services focused on retail energy markets, services, and technologies. At our core is an exceptional team of research professionals whose technical and analytical skills and assimilation of real-world experience have earned us international acclaim.

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