



Distributed Generation

Our electric utility infrastructure in this country is based on a system of large power plants feeding power to customers through a vast transmission and distribution system, collectively known as “the grid”. Distributed generation is a concept where smaller, highly efficient power plants would be built along the existing grid, close to the end-user customer. It is similar in concept to the move from large central computers to desktop computers on a network.¹ Minnesota, with our strong renewable energy capabilities, is ideally suited to take advantage of distributed generation across the state.

What are some of the technologies used for distributed generation?

Technologies include small combustion turbine generators, internal combustion engine/generators, photovoltaic solar panels, wind turbines, and fuel cells.

Can you describe a unit to me? The physical appearance varies by technology, but a typical gas turbine used in distributed generation would have a footprint as small as an office, and enclosed in an acoustic brace to minimize sound. Sizes range from 30 kilowatts to 50 megawatts.²

What are some of the benefits of distributed generation? Distributed generation offers a variety of advantages for many perspectives. Energy consumers, power providers, and other stakeholders all have their own reasons for wanting greater adoption of distributed generation. Distributed power generators are small compared with typical central station power plants and provide unique benefits that are not available from centralized electricity generation. Many of these benefits stem from the fact that the generating units are inherently modular, which makes distributed power highly flexible. It can provide power where it is needed, when it is needed. And because they typically rely on natural gas or renewable resources, the generators can be quieter and less polluting than large power plants, which makes them suitable for on-site installation at some customer locations.

¹ Text used comes from the Fuel Cell Energy’s Frequently Asked Questions link. Retrieved on February 10th, 2005, from: <http://www.fce.com/site/misc/faqs/faqs4.html>.

² The two questions and answers listed above come from the Distributed Power Coalition of America’s Frequently Asked Questions link. Retrieved on February 10th, 2005, from: <http://www.distributed-generation.com/dpca/faq.html>.

What are the kinds of fuels used for distributed generation? The primary fuel for many distributed generation systems is natural gas, but hydrogen may play an important role in the future. Renewable energy technologies—such as solar electricity, solar buildings, biomass power, and wind turbines—are also popular.³

What is combined heat and power, CHP? Combined heat and power refers to recovering waste heat when electricity is generated and using it to create high temperature hot water or steam. Steam or hot water can then be used for space heating, producing domestic hot water, or powering dehumidifiers and water chillers for air conditioning.

Is CHP the same as cogeneration? CHP and cogeneration are basically the same thing, although cogeneration has been identified with district heating and large utility owned power plants or industrial power production and plant operation. CHP is generally a smaller scale, privately owned operation. It frequently refers to generation of heat and power for university campuses, military bases, hospitals, and hotels. New technologies for small scale power production are opening opportunities for CHP in medium and small sized buildings.⁴

Links:

U.S. Department of Energy: http://www.eere.energy.gov/de/basics/der_basics.shtml.

Distributed Power Coalition of America: <http://www.distributed-generation.com/dpca/faq.html>.

Distributed Generation: <http://www.distributed-generation.com/>.

California Distributed Energy Resource Guide: <http://www.energy.ca.gov/distgen/>.

National Rural Electric Cooperative Association:

<http://www.nreca.org/nreca/Policy/Regulatory/dgtoolkit/index.html>.

New Rules Democratic Energy: <http://www.newrules.org/dgtariff/>.

Minnesotans for an Energy-Efficient Economy: <http://www.me3.org/issues/dg/>.

³ The questions and answers listed above come from the U.S. Department of Energy's Energy Efficiency & Renewable Energy (EERE) website. Retrieved on February 10th, 2005, from: http://www.eere.energy.gov/de/basics/der_basics.shtml.

⁴ The two questions and answers listed above about CHP come from the Department of Energy's Cooling, Heating, and Power for Buildings' website. Retrieved on February 10th, 2005, from: <http://www.bchp.org/library-faq.html#1>.