Eden Prairie Library Fuel Cell Project

Creating Power & Heat Where It's Needed

When the Eden Prairie Library reopened in August 2004, it not only serves as a gateway for our residents to valuable information, it serves as a demonstration of Hennepin County's Green Building and Energy Conservation Initiatives.

- The new library has a fuel cell creating power and heat on-site. It is the first public natural gas fuel cell in Minnesota.
- It generates 5 kilowatts of electricity – that's enough power to operate a typical home.
- The library's re-design incorporates sustainable architecture, efficient lighting and energy measures.

A thank you to our partners. *This project was made possible through technical and financial assistance from 3M, CenterPoint Energy and the Minnesota Office of Environmental Services. The fuel cell was manufactured by Plug Power.*

Eden Prairie Fuel Cell: Creating Power and Heat Where It's Needed

What is a Fuel Cell?

Fuel cells can provide pollution-free electricity for cell phones, laptop computers, cars, buses, trains, homes, large buildings or utilities.

Fuel cells use an electrochemical process to convert hydrogen into electricity without combustion. By-products are drinkable water, breathable oxygen and heat.

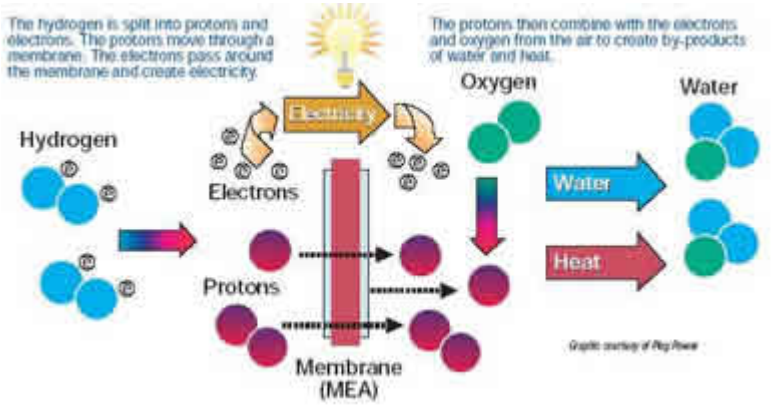
Image provided by Minnesota Office of Environmental Assistance

Sources of Hydrogen

Fuel sources are converted into a hydrogen-rich gas. The library's fuel source is natural gas. Fuel cells can also use hydrogen from renewable sources, such as wind, solar, and bio-based products. Hennepin County will continue to explore using renewable fuel sources. Currently there are technical and economic limitations that make it impractical for the County to be using renewable fuel sources.

How Does a Fuel Cell Work?

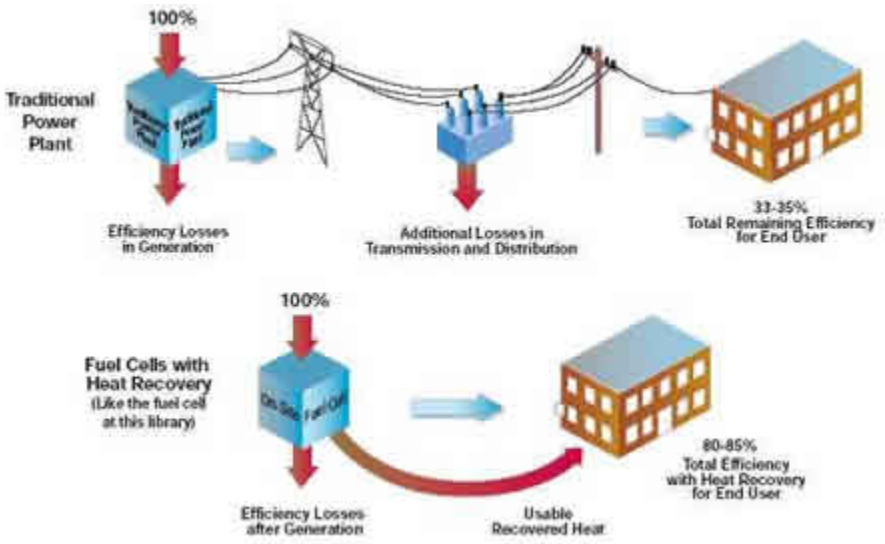
A fuel cell is an electrochemical engine that converts chemical energy directly into electricity by combining oxygen from air with hydrogen gas. Unlike a battery, a fuel cell does not require recharging. It will produce electricity as long as fuel, in the form of hydrogen, is supplied.



Benefits of Fuel Cells

Improved Energy Efficiency

Fuel cells are significantly more energy efficient than traditional power plants that use combustion to generate electricity.



Reduced Air Pollution – when compared to Minnesota's traditional energy production.

- Greenhouse gas emissions from burning fossil fuels are significantly reduced
- Toxic air pollutants are almost eliminated
- No mercury is released

Good for Minnesota's Economy

- Market potential for fuel cells is estimated to be $1.7 trillion per year by 2020
- Minnesota businesses are supplying leading edge technology and products for this industry
- As the market grows,these companies will be increasingly important contributors to the state's high-paying job market and economy

Fuel Cell Market Potential
2000 $218 million
2005 $2.4 billion
2009 $7 billion
2020 $1.7 trillion

Source: MN Office of Environmental Assistance

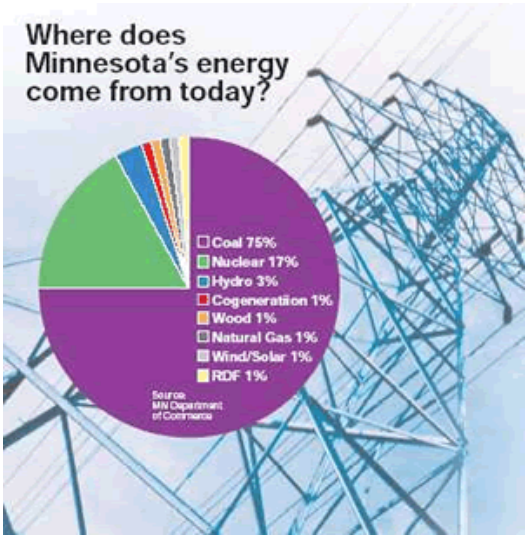
Energy Security & Infrastructure

Fuel cells will:

• Strengthen our national energy security by reducing our dependence on foreign oil
• Provide reliable power and heat where it's needed
• Help meet our growing demand for energy

Fuel Cells — A Critical Component to Meeting Minnesota's Future Energy Needs

Where Does Minnesota's Energy Come From Today?



Minnesota's goal is to move to renewable hydrogen as an increasing source of energy.

Currently fuel cells are not commercially viable for homeowners but should be within this decade.

In the meantime, what can you do to help?
• Educate yourself about energy issues
• Communicate your support of renewable energy resources to your elected officials

Eden Prairie Library Green Building Components

The Minnesota Sustainable Design Guide was used in the design of the building, a few of the sustainable components include:

- Reuse of an existing building. The building was formerly a grocery store.
- Designed for adaptability and disassembly.
- Use of low emitting VOC materials (Volatile Organic Compounds). VOCs impact indoor air quality, and contribute to air pollution when emitted outdoors.
- Recycled content carpet tiles.
- Use of daylighting controls. Daylighting means drawing more natural sunlight into the building which can save energy and improve worker productivity.
- Use of efficient lighting and lighting controls.
- On-site management of rain water. Rain water runoff sent directly into storm sewers can deliver
  pollutants straight to our rivers and lakes.
- Use of sustainable landscaping, including native prairie plants.

Eden Prairie Library Energy Conservation Measures

Conservation measures in conjunction with the Xcel Energy Design Assistance Program will provide:

- 80 kilowatts of annual peak electrical demand savings.
- Annual electrical savings of 236,000 kilowatt hours, or about the electrical demand of 30 homes.
- Heating savings of 560 MCF (1,000 cubic feet) of natural gas. That is enough savings to heat 7 homes.
- Annual utility savings of $82,000.

Hennepin County Commissioners Mark Stenglein, Penny Steele, Randy Johnson, and Peter McLaughlin celebrated the installation of the first public natural gas fuel cell in Minnesota at the Eden Prairie Library on September 29, 2004.

Eden Prairie Resource Library
565 Prairie Center Drive, Eden Prairie, MN 55344
For directions call: 952-847-5376