

PEM Fuel Cells for CHP Applications

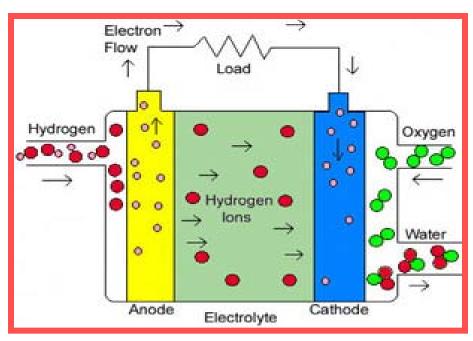
Richard Romer Plug Power Inc.



What is a Fuel Cell?

$$H_2 + O_2 -> H_2O$$

A fuel cell is a device that generates electricity by electrochemically reacting hydrogen and air.



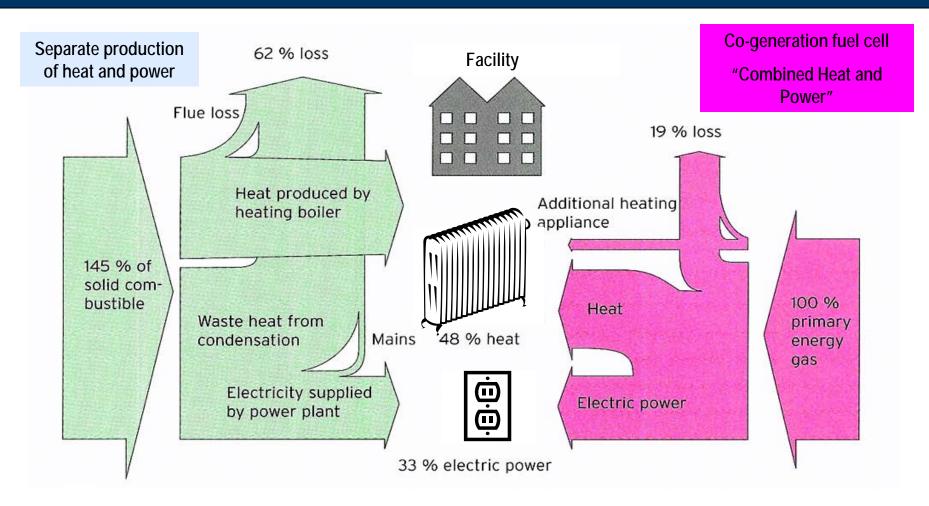


PEM Fuel Cell System





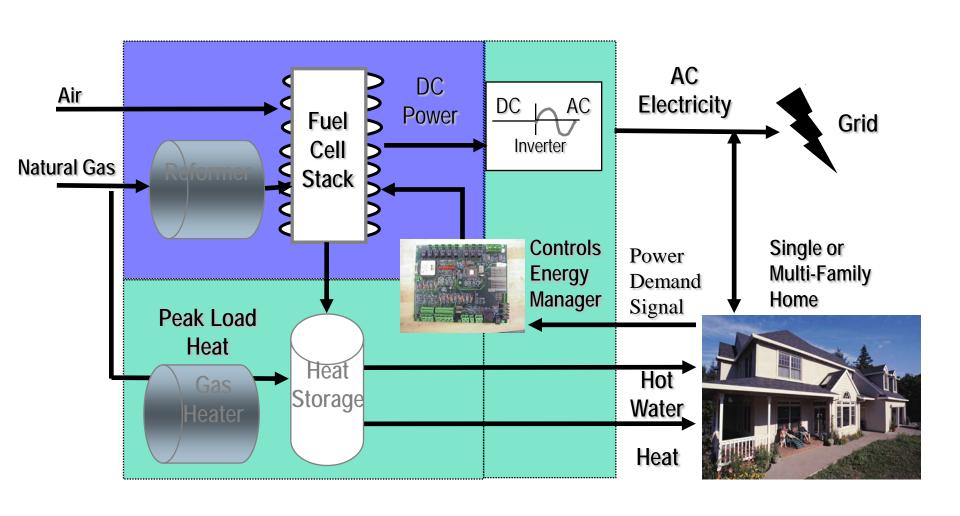
Co-generation



Save Energy and Reduce CO₂ by >30%

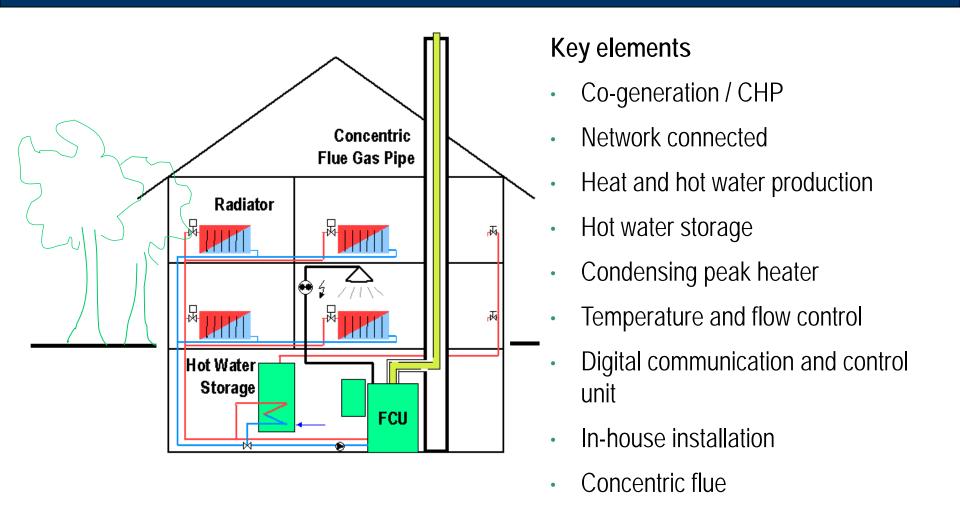


Fuel Cell CHP Technology



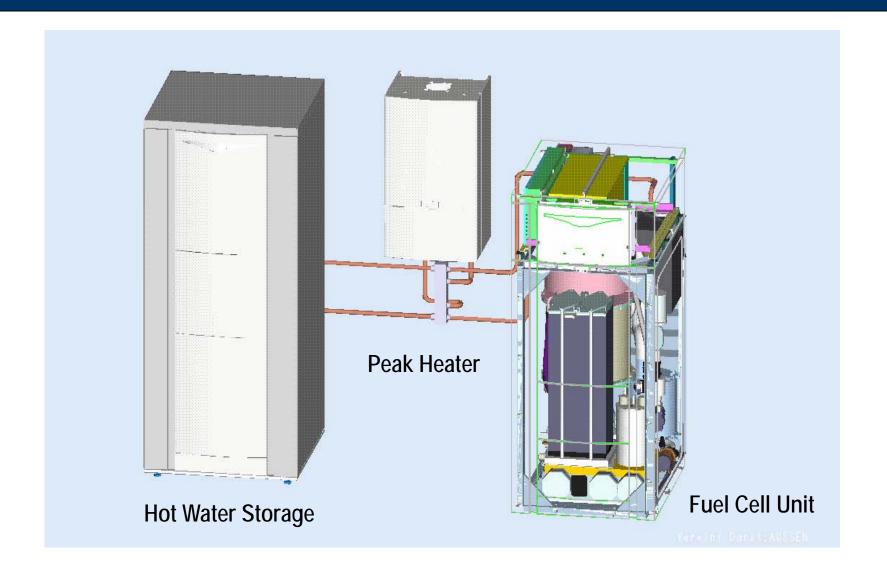


European Domestic Fuel Cell Application





Fuel Cell Heating Appliance





Partner - Vaillant

North Rhine-Westphalia Program



Essen - 40 People

<u>Partners</u>

Vaillant

Ruhrgas

E.ON Engineering

ELE

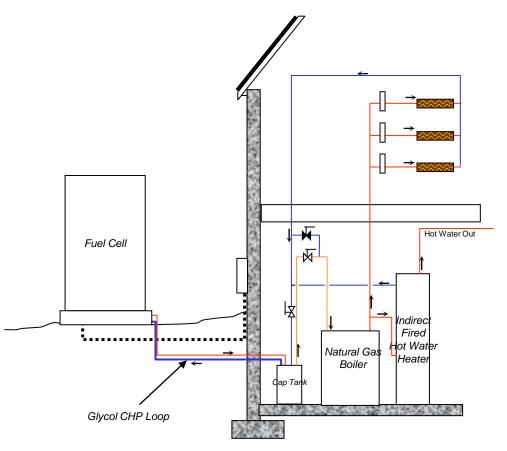
EUS



CE certified Fuel Cell Heating Appliances installed to provide heat, hot water and electricity for two German multi-family homes.



North American Stationary Fuel Cell Application



Key elements

- Co-generation / CHP
- Networked
- Hot Water Production and/or Heat
- Electric Load Following
- Outdoor Installation
- Increased Power Security
- Environmentally Friendly



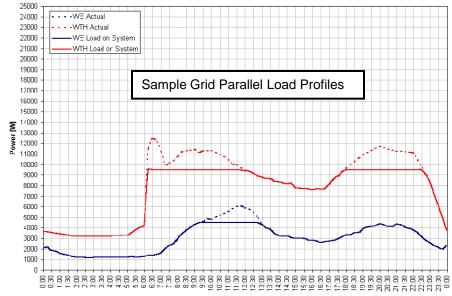
NYSERDA

Partners - NYSERDA & National Fuel



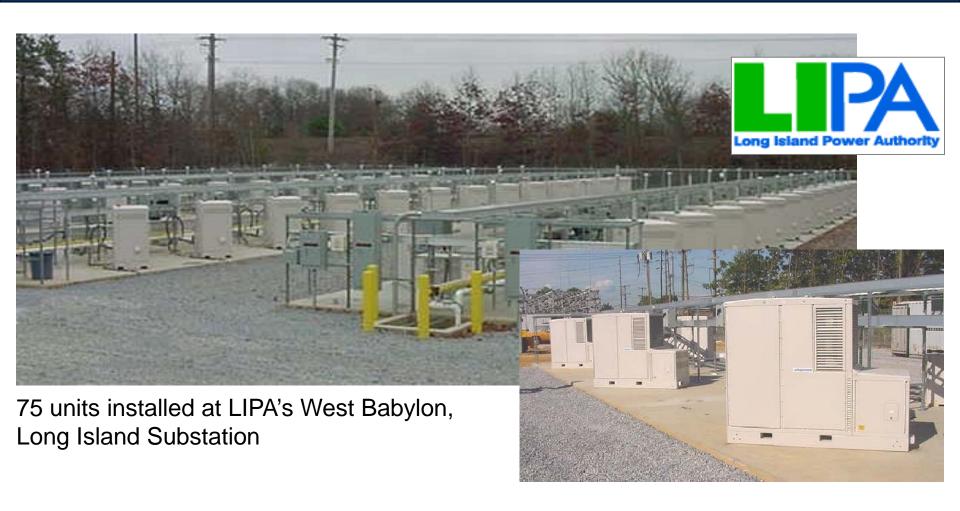
Western NY program to analyze installation and operation grid connected residential fuel cell systems





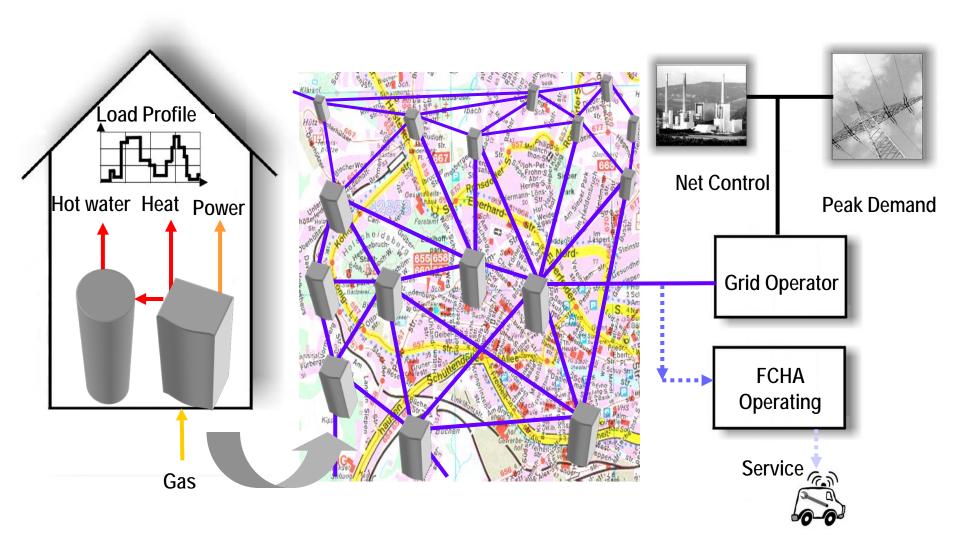


Partner - Long Island Power Authority





Next Step: The Virtual Power Plant





Combined Heat and Power Fuel Cell Systems





Developing reliable, cost effective and environmentally friendly distributed power generation systems.