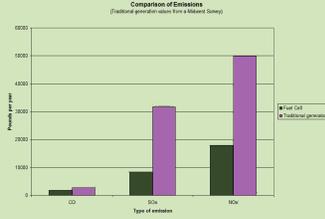


Why Should You Care?

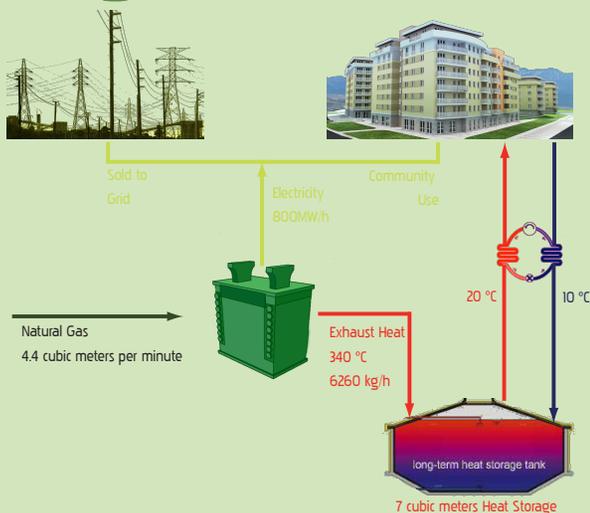
- Global warming is increasingly becoming an environmental and political issue.



- ⇒ Fuel cells can reduce CO₂ Greenhouse Gas emissions by up to 50%
- The \$12 billion Sustainability market is a rapidly growing industry with much untapped potential.

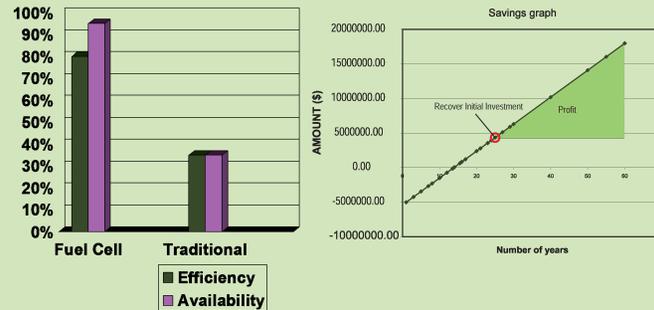
- ⇒ Fuel Cells can use the by-product of many agricultural processes as their fuel source
- ⇒ Additional energy and environmental savings are gained by storing otherwise wasted heat and reusing it for heating in buildings

Design



Economics

- Initial Costs
 - ⇒ Fuel Cell Cost: \$5,300,000
 - ⇒ Heat Recovery Costs: \$120,000
 - Total System Cost: \$5,420,000
- Annual Costs
 - ⇒ \$15,000 maintenance
 - ⇒ Fuel and Production: \$750,000
- Annual Earnings: \$175,000
- Annual Savings: \$230,000
- Simple Payback Period: 13.5 years



- Take advantage of government subsidies and grants to lower initial costs.
- Offer commercial facilities: stores, restaurants, and offices to attract buyers. These will also use electricity more efficiently, increasing cost-effectiveness of the system.
- Provide facilities to charge hybrid electric vehicles at night, and other incentives to use electricity at off-peak hours.
- Sell Extra electricity during Peak Hours for maximum Profit

Program

Data Input:

IF specific data is not known, the user imports the area of the surfaces to be considered.

IF The user has specific knowledge the program can take the following values:

- ⇒ Location of Project
- ⇒ Electrical Power
- ⇒ Max Heat
- ⇒ Number of Buildings
- ⇒ Type of Buildings
- ⇒ Other Values

Results: The Program sizes the System
Gives Heat Pump and Fuel Cell Configurations
Optimizes Cost

- For Future Semesters

- ⇒ Gather Climate, Energy, and Law/Economic data from other locations around the world
- ⇒ Continue Developing a more in-depth algorithm
- ⇒ Focus more on the software side of the project
- ⇒ Test Software against Real-World Projects