

Fuel Cell Demonstration with Onsite Generation of Hydrogen

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This presentation does not contain any
proprietary or confidential information



NC Solar House and AFV Garage



State Energy



www.energync.net

1-800-662-7131

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"Ensuring a sustainable energy future"



AFV Garage



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Objectives

- Education and outreach
- Baseline demonstration of hydrogen fuel with zero emissions from source to sink
- Supplemental and backup electrical power for operational purposes
- Core facility for hydrogen-related research at NC State University.

Budget

- DOE Contribution: \$100K
- Project Partners' Contribution: \$100K

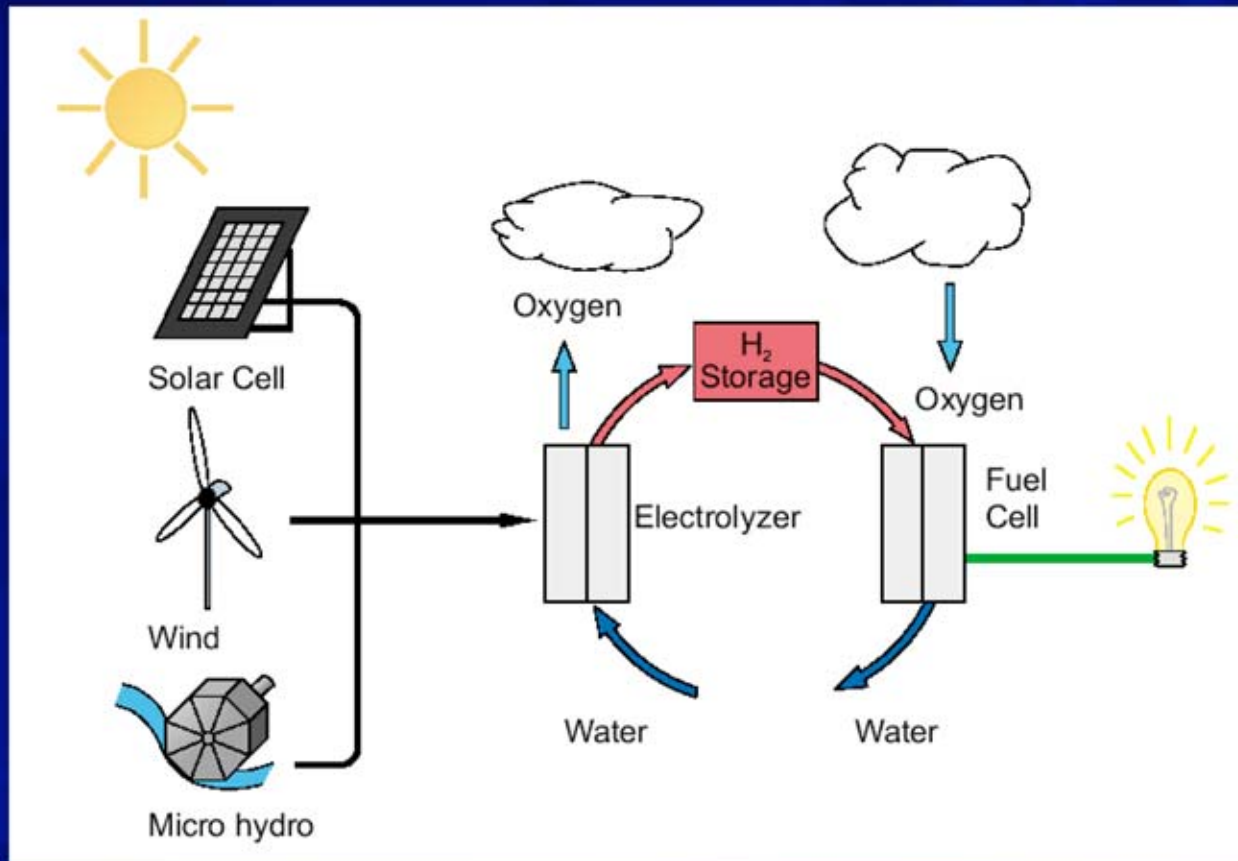
Technical Barriers and Targets

- Educational barriers
 - A. Lack of awareness
 - B. Lack of demonstrations or examples of real-world use
 - C. Institutional barriers and access to audiences
- Educational targets
 - 3. Build presence of hydrogen in K-12 education programs
 - 7. Develop public education campaign

Approach

- Photovoltaic-powered electrolysis of water
- Low-pressure storage of hydrogen
- 3 kW PEM fuel cell: electricity on demand
 - Charging electric vehicles
 - Backup power for AFV garage

System Concept



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Hydrogen Demonstration

- Building-integrated PV panels
- Hogen 40 RE Electrolyzer
- Low-pressure storage tank
- Avista Labs Independence 1000 Fuel Cell



Project Safety

- Contract is not yet in place
- Developing the safety plan will be the first task of the project
- NC Solar Center will develop the plan in consultation with the Safety Office of NC State University
- The safety plan will follow DOE guidelines

Project Timeline

Mos 1-3

Mos 4-9

Mos 10-36

1 2,3 4 5 6,7

Phase 1 Design

- Safety plan 1
- Systems design 2
- Facility design 3

Phase 2 Purchase and Install 4, 5

Phase 3 Outreach

- Performance monitoring 6
- Education programs 7

Technical Accomplishments/Progress

- As of 23 April 2004, contract was not yet in place

Interactions and Collaborations

- Avista Labs provides fuel cell, engineering time
- Proton Energy Systems provides electrolyzer, engineering time, equipment cost share

Future Work

- Sign contract
- Develop safety plan
- Purchase and integrate system components
- Perform education and outreach
- Log and analyze system performance