TODAY

Hydrogen fueling station
Penn State is the home of the first commercial hydrogen production and fueling station in Pennsylvania. This station is operated through Penn State’s Hybrid and Hydrogen Vehicle Research Laboratory. www.vss.psu.edu/GATE/gate_h2vrc.htm

Penn State’s hydrogen fueling station is used for experimental fleet vehicles and buses

TOMORROW

Hybrid Car-Home Energy System
A hybrid energy system combining wind, solar, and hydrogen fuel cell technologies is planned for an experimental residence built at Penn State’s Center for Sustainability. www.engr.psu.edu/cfs

- Solar powered hydrogen production
- Smart metered grid connection
- Predictive energy demand and production controls

The MorningStar Home planned at Penn State will feature a hybrid solar-wind energy system and car-home hydrogen interface

Current Sponsors
U.S. Department of Energy (NREL)
National Electrical Contracting Association
West Penn Power Sustainable Energy Fund
Sustainable Energy Fund of Eastern PA
AccuWeather
Automated Logic
BP Solar

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Penn State Center for Sustainability
Greening Campus, Community and Curriculum

www . engr . psu . edu/cfs
HyRES Laboratory

**Hybrid Energy System Design and Building-Vehicle Interface (BVI).**

Advanced control system strategies for solar, wind, and fuel cell energy systems will be explored in the MorningStar home and HyRES lab. Located on Penn State’s campus near world famous Beaver Stadium, the HyRes Lab will be open to public tours as a functioning renewable energy residence.

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**Competition Mode:**
MorningStar Home is powered by 100% solar energy and is off-the-grid. Surplus power used to charge an electric vehicle during the 2007 Solar Decathlon competition in Washington D.C.

**Power System Features**
- 8.5 KW roof mounted PV array
- 60 SF Solar Thermal panels

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**Operation Mode:**
MorningStar Home is powered by a redundant hybrid system including solar and wind power, and is grid connected. Net metering is used to balance energy use, and surplus power used to make hydrogen for a fuel cell vehicle.

**Power System Features**
- Whisper 500 wind turbine
- Hydrogen Electilizer
- Net metered grid connection

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**Back-up Mode:**
In rare cases when the sun, wind, and grid power are unavailable, the MorningStar Home will be powered through a vehicle possessing a fuel cell power system.

**Power System Features**
- 25kW fuel cell (vehicle)
- External hydrogen fuel sources back-up

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[www.solar.psu.edu](http://www.solar.psu.edu)