



Advanced Research Projects Agency • ENERGY

FIRST OPEN SOLICITATION

SUN CATALYTIX

ENERGY FROM WATER AND SUNLIGHT

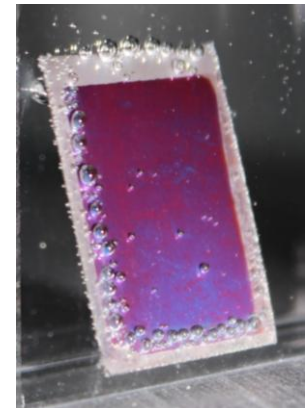
PROJECT TITLE:	Affordable Energy from Water and Sunlight		
ORGANIZATION:	Sun Catalytix	LOCATION:	Cambridge, MA
PROGRAM:	FOA1	ARPA-E AWARD:	\$4,085,350
TECH TOPIC:	Direct Solar Fuels	PROJECT TERM:	1/1/10 – 8/31/12
WEBSITE:	www.suncatalytix.com		

CRITICAL NEED

Our national electric grid has limited ability to store excess energy, so electricity must constantly be generated to perfectly match demand. Though wind and solar power are promising clean alternatives to fossil fuels, their natural unpredictability and intermittency make them incapable of delivering the power on-demand necessary to operate today’s grid. The U.S. needs technologies that can cost-effectively store renewable energy for future grid use at any location. Flexible, large-scale storage would create a stronger and more robust electric grid by enabling renewables to contribute to reliable power generation.

PROJECT INNOVATION + ADVANTAGES

Sun Catalytix is developing wireless energy-storage devices that convert sunlight and water into renewable fuel. Learning from nature, one such device mimics the ability of a tree leaf to convert sunlight into storable energy. It is comprised of a silicon solar cell coated with catalytic materials, which help speed up the energy conversion process. When this cell is placed in a container of water and exposed to sunlight, it splits the water into bubbles of oxygen and hydrogen. The hydrogen and oxygen can later be recombined to create electricity, when the sun goes down for example. The Sun Catalytix device is novel in many ways: it consists primarily of low-cost, earth-abundant materials where other attempts have required more expensive materials like platinum. Its operating conditions also facilitate the use of less costly construction materials, whereas other efforts have required extremely corrosive conditions.



IMPACT

If successful, Sun Catalytix would generate stored solar energy that is cost competitive with the current price of gasoline or diesel fuel.

- **SECURITY:** Increasing renewable energy storage could help increase the reliability of the electric grid.
- **ENVIRONMENT:** Electricity generation accounts for over 40% of U.S. carbon dioxide (CO₂) emissions. Enabling large-scale contributions of wind and solar power for our electricity generation would result in a substantial decrease in CO₂ emissions.
- **ECONOMY:** Decreasing demand for fossil fuels would help reduce fuel prices and stabilize electricity rates.
- **JOBS:** Advances in energy storage would result in new high-paying jobs in supporting sectors such as manufacturing, engineering, construction, transportation, and finance.

CONTACTS

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