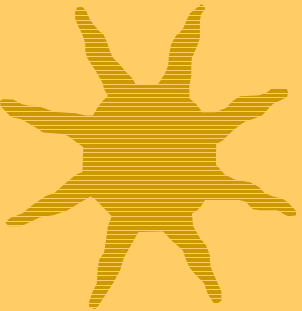


Energy Strategic Plan



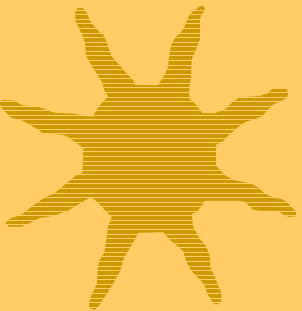
Los Angeles Community College District



Larry Eisenberg

Executive Director

Facilities Planning and Development





LACCD Comprehensive Energy Strategic Plan

A Paradigm Change:

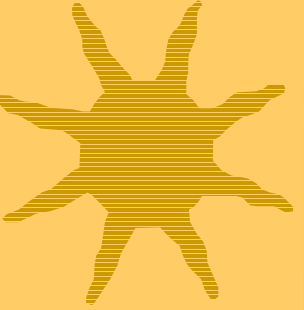
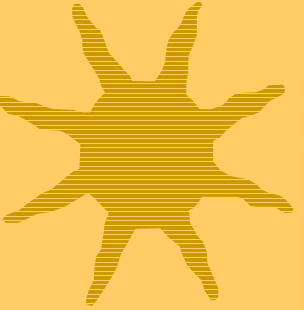
1. Efficient Renewable Energy Central Plants
2. Demand Management Through Performance Contracts
3. One MW Solar/PV per campus
4. Sustainable Curriculum Program



1. Renewable Central Plant

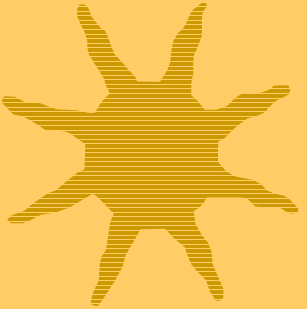


Objectives

- 
- 
- ★ One Central High Efficiency Sustainable Source for Hot Water and Chilled Water
 - ★ Meet current demand with expansion capability for future facilities and needs
 - ★ Provide power for clusters of buildings
 - ★ Digital Control System

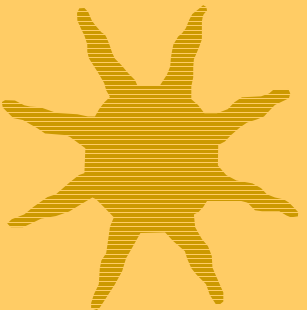


Central Plant Features



- ★ Solar Heat Tube

 - Hot Water – near steam



- ★ Absorption Chillers (Multiple Units)

 - Chilled Water for Air Conditioning



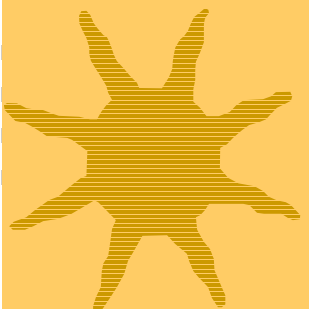
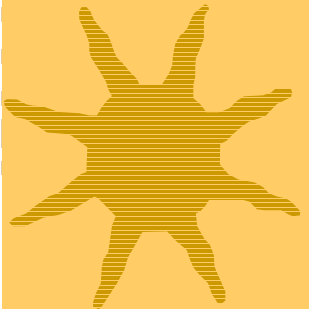
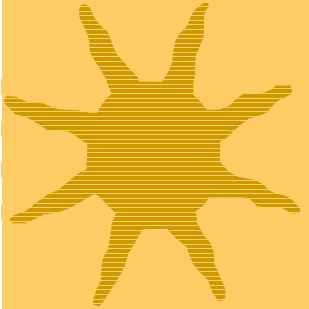
- ★ Thermal Storage – Ice

- ★ Co-Generation – Electricity and Heat

- ★ Hot Water Boiler / Heater

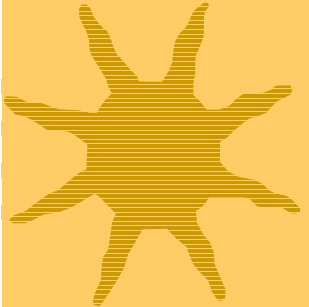


Vacuum Tube Heat-pipe Collectors and Architectural Design Possibilities





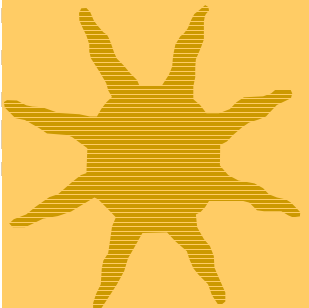
2. *Performance Contracts*



- ★ Retrofit all energy consuming elements for maximum efficiency

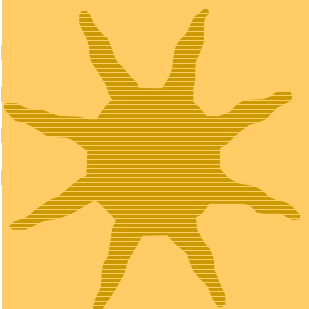
- ★ Install conservation features in all buildings

- Insulation
- Low-E Glass
- White Roof
- Green Roof



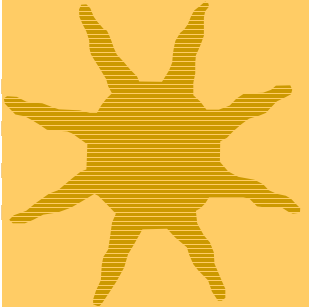
- ★ State of the art and new technologies

- ★ Metering and Monitoring Systems



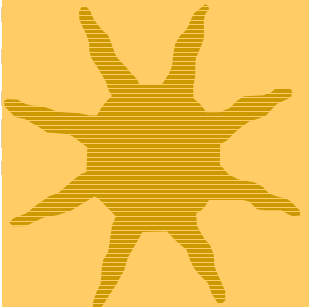


Performance Contract Arithmetic



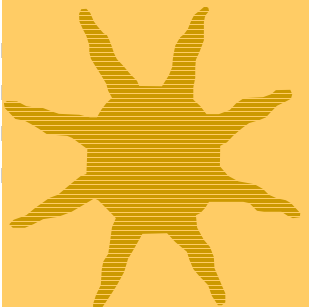
★ Electric / Gas Bill Before Energy Measures- Annual

★ \$1,000,000



★ Electric / Gas Bill After Energy Measures - Annual

★ \$ 800,000

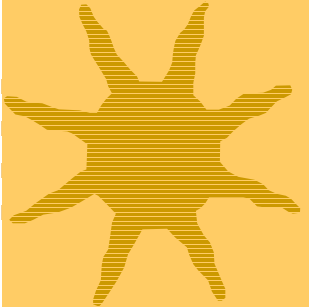


★ Difference (Amount Available for Payback) - Annual

\$ 200,000

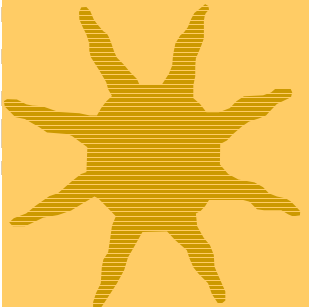


3. One Megawatt Solar / PV



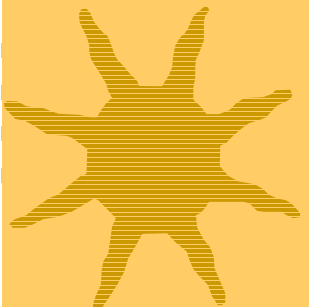
★ Private Sector third party to install

★ Parking Lots and Roofs



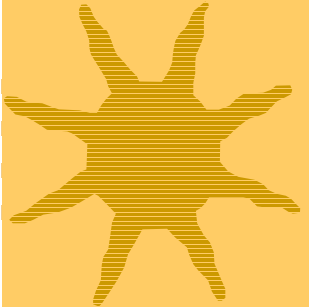
★ Hybrid systems with storage

★ Future technology innovations





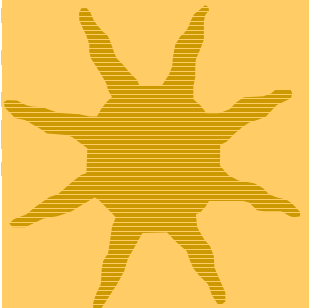
Photovoltaic 3rd Party Arithmetic



★ Federal Energy Credit – 30%

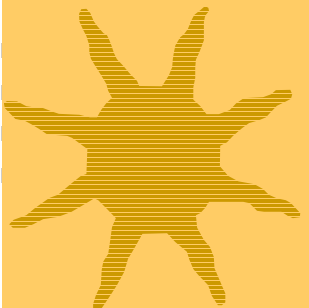
★ Rapid Depreciation – 25 %

★ Utility Incentives – 20 %

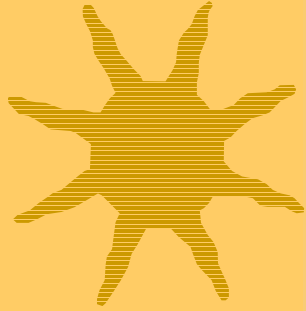


★ Green Tag Sale – 5% (?)

★ Bulk Procurement – 10 % (?)



★ 10 Cents on the Dollar !!!

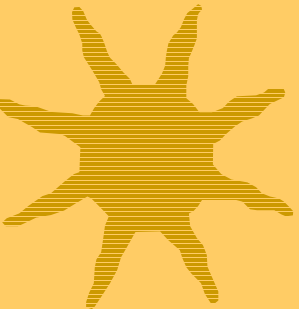


4. Sustainable Development Curriculum

- ★ Use Green Buildings at each Campuses to teach construction and technology
- ★ Certificates, licenses and advanced degrees
- ★ Career opportunities and training for jobs, new companies and advanced degrees



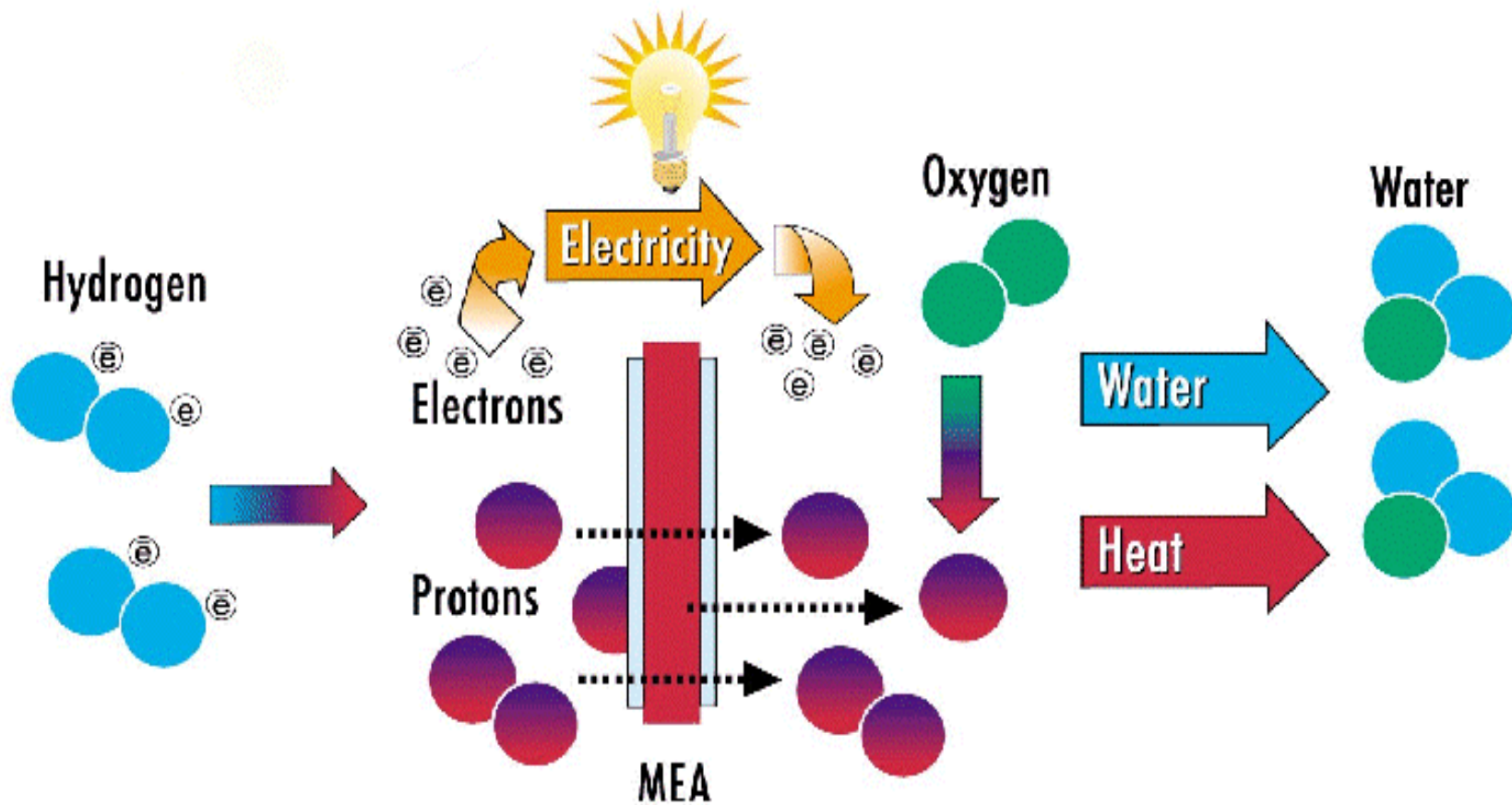
-
- ★ Collaborate with unions, private businesses, public, government and non-profit sectors
 - ★ Sustainable Development Curriculum: solar, wind, geothermal, hybrid technologies, economics, new businesses, life cycle accounting, investment, operations and maintenance
 - ★ Climate Change -- the solutions are available today





Fuel Cell Basics

A fuel cell is a device that generates electricity by a chemical reaction

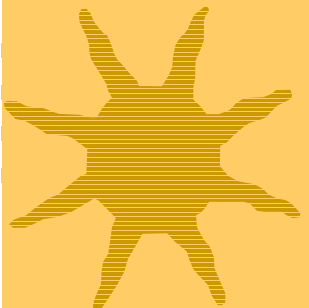
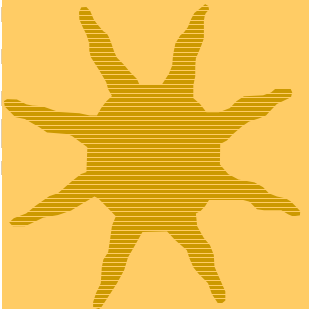
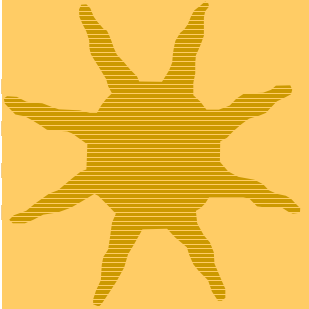




Anaerobic Phased Solids Digestion Technology



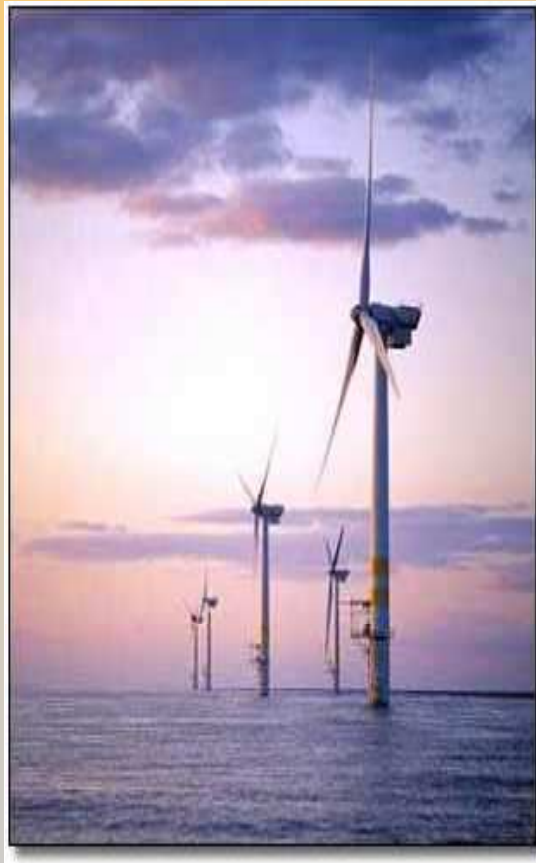
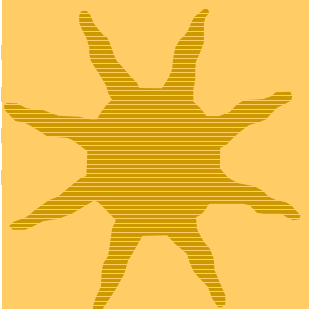
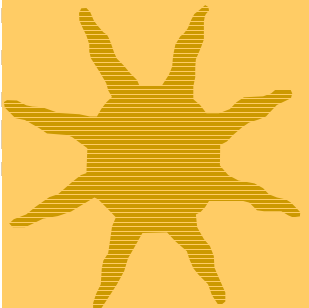
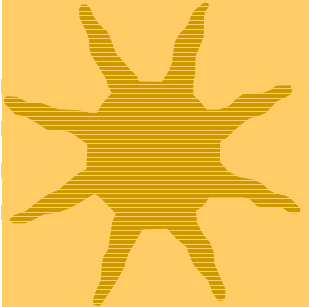
**An advanced and technically validated approach to the
problem of handling a wide variety of problematic organic
waste materials**





Wind Mill Power

Costs are competitive with natural gas

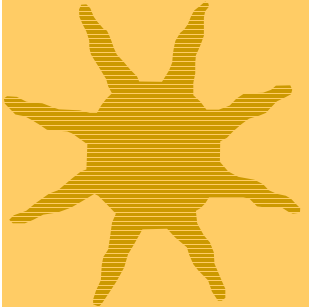


- ★ Wind Power uses wind to create electricity
- ★ Accounts for around 1% of California's electricity supply
- ★ On-site wind power
- ★ Case in point: farms and town in N. Europe
- ★ The turbine technology and costs have changed.
- ★ Hybrid Systems and Integrated
- ★ On-site Generation

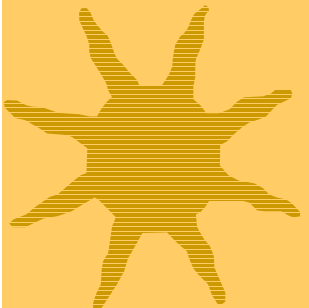
★ *Courtesy of California Energy Commission and Distributed Energy Systems 2006*



Off The Grid !!



★ Using current and future Proposition 39 bond resources

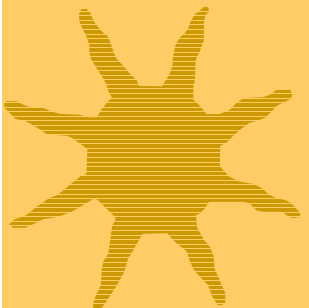


★ Buy Out

– Central Plant Loans

– Performance Contracts

– Photovoltaic / Fuel Cell Installation



★ No Future Energy Cost !