



The Department of General Services

## Grid Neutral Schools

Division of the State Architect,  
Department of General Services,  
State of California

STATE OF CALIFORNIA



DIVISION OF THE  
STATE ARCHITECT

DEPARTMENT OF GENERAL SERVICES

# “Grid Neutral” defined:

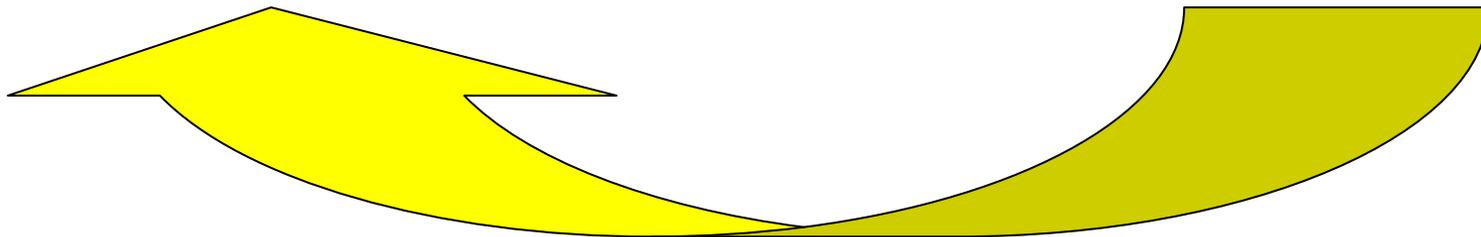
*HISTORICAL  
BENCHMARKED  
ELECTRICITY USE*

*– ELECTRICITY  
ENERGY  
EFFICIENCY  
GAINS =*



*IMPORTED  
ELECTRICITY  
FROM THE GRID*

*– EXPORTED  
ELECTRICITY  
THRU ON-SITE  
GENERATION*



OR:

“A site that produces at least as much electrical energy as it uses in a year”



# Grid Neutral compared with Zero Net Energy (ZNE) Schools

per CHPS 2009 criteria

## Grid Neutral

- “A site that produces at least as much electricity as it uses in a year”
- May use electricity from the grid
- Energy used from the grid is balanced at the end of the year with on-site energy production
- Not allowed to use outside sources such as propane or natural gas for uses such as cooking, water heating, space heating, or backup generators
- Strategies should be available for the life of the building

## Zero Net Energy (ZNE)

- “A site that produces at least as much energy (electricity, natural gas, propane, etc.) as it uses in a year”
- ZNE schools may not use sources of energy produced off-site such as propane and natural gas
- Need to use a combination of strategies to both conserve energy use and find alternatives for supply
- Strategies should be available for the life of the building

# Six Components to achieve a grid neutral school:

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**Comprehensive Planning**

***Energy Efficient Design***

**Energy Generating  
Technology**

***Innovative Funding***

***Energy Use Management***

**Operations & Maintenance**



**Some of the questions and issues to be discussed at each focus group's workshop?:**



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# Comprehensive Planning

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***Who are the members of the “Dream Team” to plan the grid neutral school construction project?***

***How can this team be incorporated into the different delivery methods?***

***What is the critical path in the planning process?***



# Energy Efficient Design

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*What energy efficient measures in new schools have the highest return on investment?*

*What renovations are necessary to offset the need for on-site electrical generation?*

*What are the benefits and obstacles of some of the HVAC systems available for improving energy efficiency?*



# Energy Generating Technology

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- ***What are the pros and cons of:***
  - ***Photovoltaics (PV) systems***
  - ***Building Integrated Photovoltaics (BIPV)***
  - ***Small wind applications***
  - ***Other***
- ***Are Solar or Wind farms relevant for school /community college districts?***
- ***What are the current case studies at K-12 schools and community colleges that have installed on-site generation?***
- ***Educational Opportunities of installing solar/wind at schools***



# Innovative Funding

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- ***Identify current funding sources.***
- ***What other funding means are available?***
- ***What are the big opportunities for change?***
- ***How to evaluate the appropriate funding mechanism.***



# What is the compelling business case for Grid Neutral Schools?

Annually (in 2007)

- \$5 Billion Spent on New/Renovation Construction
- 15 Million Square Feet Affected
- \$21.5 Million/Year after 10-year Payback
- Save 30 Thousand Tons CO<sub>2</sub>/Year



# Energy Use Management

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- *Identify the need for measurement, database, and reporting.*
- *What are the systems or tools that we can use to meet these needs?*
- *What measurement tools should we consider for:*
  - *New construction*
  - *Existing buildings*
  - *Statewide monitoring?*



# Operations & Maintenance (O&M)

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***What decisions by a School Board or Superintendent affect the O & M staff's effectiveness in managing the energy efficiency of a campus?***

***What evaluations of the existing schools need to be done?***

***What type of training needs to be provided to the O & M staff to better the energy management of the campus?***



# Final Workshop: October 20<sup>th</sup>

## GRID NEUTRAL SCHOOLS WORKSHOPS

*To solicit comments on the cross-cutting issues of all the six workshops*

*Related Topics for New and Existing Schools:*

Improvement Planning Energy Use Measurement  
Energy-Efficient Designs Operations & Maintenance  
Energy-Generating Technology Innovative Financing



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The outcome of this workshop will be a guidebook detailing a "set of solutions" to communicate to stakeholders and school boards the recommended means, methods, and economics on how to become grid neutral.

**Monday, October 20th, 2008**  
**8:00am to 4:30pm**



Department of General Services Headquarters  
707 3rd Street  
West Sacramento, CA 95605  
Auditorium, 1st Floor

# Outcome of Workshops

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***Guidebook for K-12 School Districts and Community College Districts Board Members and Superintendents:***

***“How to Achieve a Grid Neutral School”***

***to be presented at the Green Schools Summit,  
December 8-10***

***Anaheim, California***

