



**GRID NEUTRAL:**  
Electrical Independence for California  
Schools and Community Colleges


**Green California Schools  
Summit & Exposition**  
December 10, 2009

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The Department of General Services  
The Division of the State Architect

## The Goal: Grid Neutral



**Definition:**  
A site that produces at least as much  
electricity as it uses in a year.



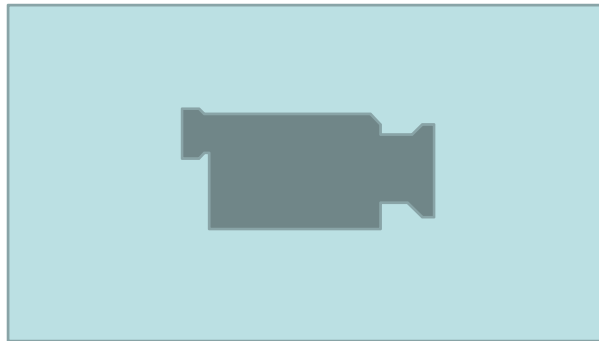
## How to Get to Grid Neutral



- DSA's Grid Neutral Guidebook is Available at: [www.dsa.dgs.ca.gov/OtherProg/gridneutral.htm](http://www.dsa.dgs.ca.gov/OtherProg/gridneutral.htm).
- Topics include:
  - Comprehensive Planning
  - Energy Efficient Design
  - Energy Generating Technologies
  - Energy Measurement
  - Maintenance & Operations
  - Innovative Funding



## Grid Neutral Video



Available on YouTube at:

<http://www.youtube.com/califdgs#p/u/6/hLdMBYOzz0>



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## An Attainable Goal



## Comprehensive Planning



- Assemble the right team
  - Sponsors
  - Beneficiaries
  - Implementers
- Project delivery methods
  - Integrated Project Delivery (IPD)
  - Building Information Modeling (BIM)



## Energy Efficient Design



- Program & Planning
- Site Selection
- Building
  - Building Envelope
  - Day-Lighting
  - Cool Roofs
- Building Systems
  - HVAC
  - Lighting
  - Transformers
  - Building Control Systems
  - Commissioning
- Furnishings, Fixtures, and Equipment



## Case Study: Chico USD Retrofit



- Removed existing fluorescent lights based on CHPS recommended lighting levels.
- Installed Super T8 28-watt fluorescent lamps and high efficiency electronic ballasts.
- Replaced all outside lighting with Compact Fluorescent Lamps (CFLs).

### RESULTS:

- \$150,000/year in savings!
- Anticipated pay back of 1-2 months!
- Emissions reduced by 900,000 lbs. of CO2/year!



## Energy Generating Technology



- Photovoltaics (PVs)
- Solar-thermal
- Ground source heating pumps
- Wind Energy



## Butte College Program



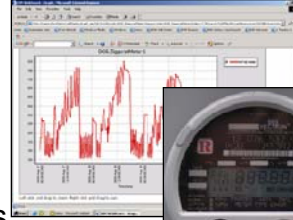
- Goal: Grid Neutral by 2015.
- Phase 1: one-megawatt field that generates **1.6 million** kilowatt hours annually.
- 25% of the college's total energy.



## Energy Measurement



- Benchmarking
  - Monthly usage
  - Seasonal trends
  - Peak demand
  - Load isolation and profiles
- Utility bill analysis
- Problem identification & correction
- Conservation program persistence




## Maintenance & Operations



- Involve maintenance & operations from the start
- Perform facility and energy evaluations
- Provide education & training



## Innovative Funding



**"Free-Money" Programs**


- Office of Public School Construction (OPSC) and the State Allocation Board (SAB)
- California Energy Commission Bright Schools Program
- Utility Rebates and Incentives
- Savings-By-Design
- Mello-Roos
- California Solar Initiative
- Energy Efficiency Rebates
- California Energy Commission Emerging Renewable Program
- Flex Your Power
- Individual Grants and Donations

**Borrow-to-Buy Programs**


- Tax-Exempt Financing
- California Energy Commission's (CEC) Energy Efficiency Financing Program
- Qualified Zone Academy Bonds (QZAB)
- Federal Clean Renewable Energy Bonds (CREB)

**Self-Funding Options**

- District General Fund
- Third-Party Power Purchase Agreement (PPA)
- Third-Party Financing (Energy Service Company)



## Self-Funding Options



**How Power Purchase Agreement (PPA) Works**

District (client)

PPA and Site Lease

PPA Provider

Tax Equity Investor


- Federal ITC
- Federal Accerated Depreciation
- State Incentives

Subcontractors

- Solar module supply & warranties
- Design & Permitting
- Construction
- Commissioning

Operation & Maintenance Provider(s)

- Metering & monitoring
- Maintenance & cleaning
- Management reporting
- Billing
- Reporting for State rebates



## National Development Council



- The National Development Council (NDC) has launched a new financing program to assist school districts
- Modeled after PPAs; key differences:
  - Under the NDC program, the district is required to make an initial investment
  - Under the NDC program, the district will automatically assume ownership of the system rather than having to purchase it from the PPA provider
- For more information, visit NDC's website: <http://nationaldevelopmentcouncil.org/>



## Chartwell School



LEED Platinum & CHPS Certified



Using life cycle cost analysis, the high performance, green features of our new campus will more than pay for themselves.

—Douglas Atkins,  
Chartwell Executive Director



- Return on Investment
- Life Cycle Cost Analysis



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## DSA Grid Neutral Design Awards



### Who Should Enter?



- K-12 schools
- Charter school entries will be welcomed
- The jury will review the entries and will select projects for innovative solutions for each of the award categories
  - Comprehensive Planning
  - Energy Measurement
  - Energy Efficient Design
  - Energy Generating Technology
  - Maintenance & Operations
  - Innovative Funding



## Outcomes for Award Program



- A platform to create awareness for grid neutral
- DSA will use information from the entries to develop case studies that can be shared with others striving for grid neutral
- The awards can lead to a healthy competition between schools to become grid neutral



## More Information to Come



- Awards to be presented at the 2010 Green California Schools Summit & Exposition
- Honorable Mentions may be given at the discretion of the jury
- More information will soon be made available on the DSA website:  
[www.dsa.dgs.ca.gov](http://www.dsa.dgs.ca.gov)





*THANK  
YOU!*



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