

Raising the Barn: Community School Partnerships



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School District

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The Irvine Unified School District

- 27,000 Students
- 38 Sites
- 2,500,000 square feet roof space
- 544 acres
- Approximately 2,000 employees



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IUSD's Energy Plan

- Reduce electrical usage by 15%
- Develop curriculum to enlist students as the catalyst for change
- Implement demonstration projects to link curriculum, facilities and usage
- Develop community and municipal partnerships to expand demonstration projects



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Ingredients for Success

1. District Vision and Leadership
2. Partnership between M&O, Facilities, Curriculum, and Business Services
3. Communication with Staff and Community
4. Start small; Existing contracts
5. Enlist support: What can you do to help?
6. Changing a culture of behavior
7. Students as a catalyst for change



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A Vision for Energy Self-Sufficiency

- 5 Components
 - Facilities
 - Grounds/Landscaping
 - District Vehicles
 - Curriculum
 - Corporate/Community Partnerships



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Current Usage (2007-2008)

- Electricity = \$4,003,098
 - \$1.58/square foot
- Gas = \$198,668
- Water = \$629,122
- Total = \$4,830,888
- \$1.91 per square foot annually for utilities



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Prior Efforts: Facilities

- To Date:
 - Envest: 1996-2009: \$9.4 Million
 - Kinetics: 2005: \$4.3 Million
 - Bright Schools Audit: 2008: No Cost
 - High Recovery Water Heaters/Boilers
 - Gas Audit: 2008: No Cost
 - Kiln Program: 2008: No Cost
 - IT Audit
 - Edison Current Rate Plan



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Facilities (Electrical): The Vision

- Photovoltaic/Concentrated Solar Collectors
 - 39 Sites, 2.5 Million Square Feet
 - IUSD's lowest demand is at the same time Edison experiences highest demand
 - Current programs require capital outlay
 - Limited or not available for most school districts
 - Vision:
 - Partner with Edison and/or negotiate Power Purchase Agreements through alternate energy firms to collaborate on cost/maintenance/savings for life of infrastructure



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Facilities (Gas): The Vision

- Replace outdated kilns
 - Rebate pays only a percentage of capital outlay
- Install solar panels or fuel cells for pools and replace outdated HVAC systems
 - Partner with Sempra and/or renewable energy firms to provide infrastructure
 - Collaborate on cost/maintenance/savings for life of infrastructure



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Prior Efforts: Grounds/Landscaping

- Synthetic Turf: 2004: \$940,000
- Water Audit: 2008: No Cost
- Smart Controller Program: 2008
- Trash Contract: \$241,000
- M&O Staff Assigned to Sectors



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Recycling Programs

- Trash and recyclable materials are separated at the collector's facility
- Separate contract with recycling company for paper, plastics, ink cartridges, etc.
- Cash for cans program in partnership with the City of Irvine
 - City-wide curbside recycling program
- Cafeteria programs:
 - Sunnyside Environmental School Portland, Oregon: <http://www.environmentalschool.org/>
 - Play, then eat!



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Recycling Reminders



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District Vehicles

- Currently all district vehicles run on either gasoline or diesel fuel (86 Vehicles at M&O)
 - Vehicles don't leave the district
 - Materials delivered by vendor
 - Monitor fuel bills monthly
- Trash contract requires use of alternate fuel vehicles



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District Vehicles: The Vision

- Goal: Reduce IUSD's carbon footprint:
- Cost of fuel has gone from \$40,000 to \$200,000 annually
 - Convert all vehicles to alternate fuels
 - Reduce daily district mail delivery to every other day
 - Require future student transportation contracts to use alternate fuel vehicles
- Walk-To-School Day: Year 2
- Link to curriculum



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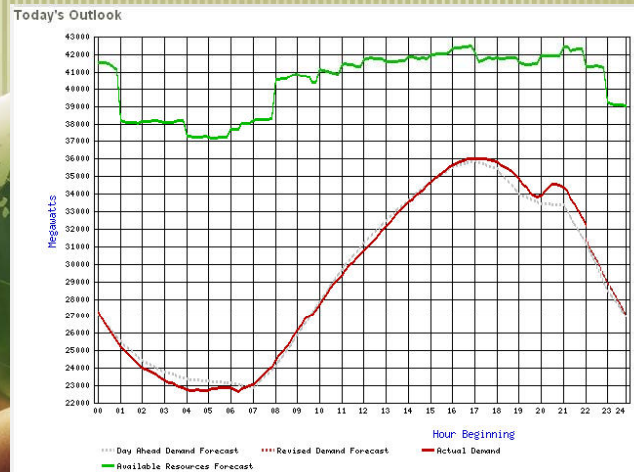
Frustrations

- Complex set of rebate programs, that constantly change from our energy providers
 - Staying informed
 - Difficult to pull together a comprehensive energy reduction plan with a “piece-meal” approach
- California Division of the State Architect
- Southern California Edison and Sempra Utilities



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California's Daily Usage



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Changing the Culture

- Removing from Classrooms:
 - Aquariums,
 - Pets,
 - Personal Refrigerators, Microwaves, Coffee Pots
- Automatic Computer Shut Down
- Combining Sites for Summer School
- Collecting Keys in the Summer
- Classroom Inspections/System of Notices
- E-Green Newsletter



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IUSD Energy Management Procedures

- Handout



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Everyone Doing Their Part

Please Help Us to Save Energy

This appliance is in violation of line 9 of the District's energy conservation measure which states,

"Remove personal refrigerators, space heaters, coffee mug warmers, microwaves, toasters, fans, air purifiers and any other unapproved energy using appliance."

If you have any questions or concerns, feel free to contact Joe Hoffman, Director, Maintenance and Operations, 949-337-5159.

IRVINE UNIFIED SCHOOL DISTRICT
MAINTENANCE AND OPERATIONS

WARNING
NOTICE TO COMPLY
WITH DISTRICT ENERGY CONSERVATION MEASURE

THIS VIOLATION IS PROVIDED IN AN EFFORT TO ENHANCE ENVIRONMENTAL AND UNAUTHORIZED USE OF ELECTRICITY

SITE	DATE	LOCATION
UNAPPROVED LEFT ON	COMPLIANCE LEFT ON	
AIR CONDITIONING LEFT ON	UNAPPROVED APPLIANCES	

DESCRIPTION

**THE ITEMS LISTED ABOVE ARE UNAPPROVED ELECTRIC APPLIANCES THAT ARE IN VIOLATION OF THE DISTRICT'S ENERGY CONSERVATION MEASURE.

THE STAFF MEMBER IN POSSESSION OF UNAPPROVED APPLIANCES WILL BE RESPONSIBLE FOR REMOVAL ON OR BEFORE _____

DISTRICT COMMENTS: _____



THIS UNAUTHORIZED ELECTRIC APPLIANCE IS IN VIOLATION OF THE DISTRICT'S ENERGY CONSERVATION MEASURE



Please Remove By: _____

Curriculum: The Vision

- Students as a catalyst for changing human (adult) behavior
 - Develop curriculum for grades 4, 5, 6, and 8
 - Augment existing Elementary Science Specialist program
 - Focus in all grades is to provide opportunities for students to learn about energy self-sufficiency through a hands-on, inquiry-based model.



Progress on Curriculum

- Summer Committee:
 - Met 6 Days
 - Identified Key Concepts for Grades 4, 5, 6, and 8
 - Identified Hands-On, Inquiry-Based Materials for each of those grade levels
 - Incorporate Product Life Cycle Information:
 - What happens to the product after we are done with it?
- Handout: Resource List



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Curriculum Implementation

- Implement 2009-2010:
 - 4th Grade: Incorporate into existing units. Create new lessons with energy focus.
 - 5th Grade: Incorporate into existing units and utilize instructional time from mid-May to end of school (after CST testing)
 - 6th Grade: Incorporate into existing curriculum. Build upon standards that discuss natural resources.
 - 8th Grade: Utilize instructional time from mid-May to end of school (after CST testing)



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Summer PEAK

- Prototype for curriculum innovation
- 4-week, 2-hour per day, summer school experience
- Students develop understanding of how to lower PEAK demand, use innovative technology, and explore renewable and sustainable energy sources



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Measuring Electricity



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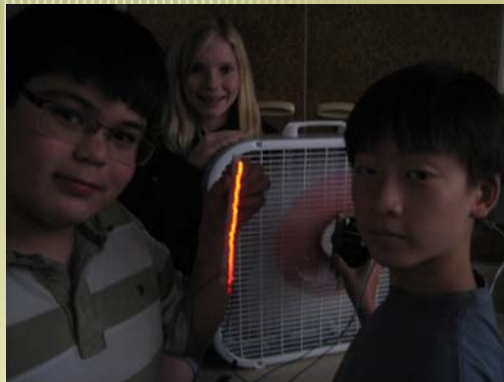
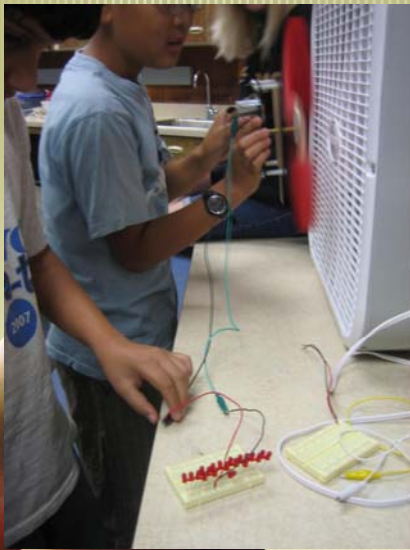


Solar Energy



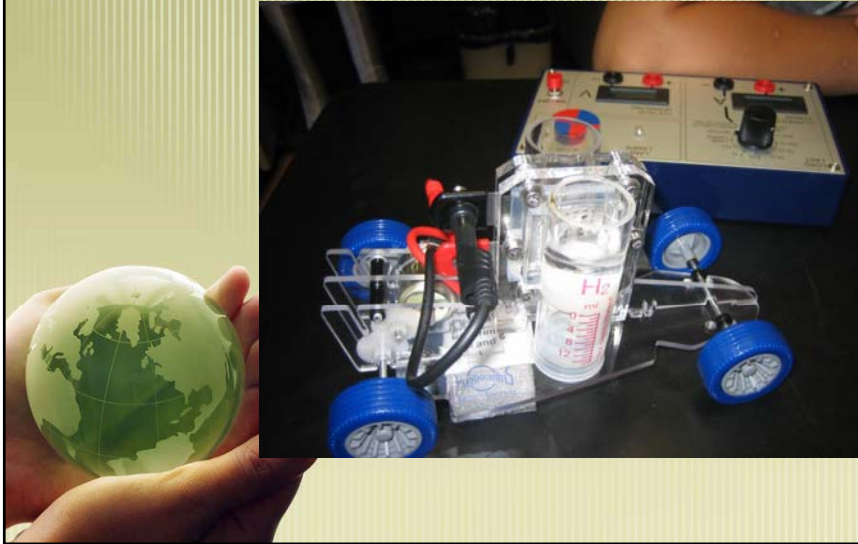
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Wind Turbine Power



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Hydrogen Fuel Cell



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School Green Teams

- Students conduct an electrical energy audit of the school site. Use a light meter to determine the light level (footcandle) in classrooms, hallways, restrooms, office, teacher lounge, library, auditorium, etc.
 - Ballasts
 - Incandescent light bulbs
 - Compact fluorescents
 - Exit signs and outdoor lighting
 - Opportunities for LEDs



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Standby Power: Phantom Loads

- Kill A Watt Meter (Volt Meter)
- The Cost of Technology
 - Computers
 - Printers
 - LCD Projectors
 - Approximately 290 Watts On
 - Approximately 30 Watts Off
 - Copy Machines
 - TV/VCR/DVD



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The NEED Project

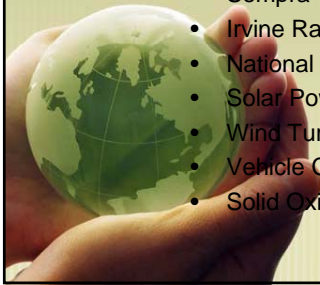
- National Energy Education Development Project:
 - <http://www.need.org/>
- Resources:
 - Saving Energy: School Energy Survey
 - Curriculum: Blueprint for Success
 - Energy Info Books for Elementary, Intermediate, Secondary
 - Schools Going Solar
 - Energy Kits



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New or Existing Corporate/Community Partnerships

- The Energy Coalition
- The City of Irvine
- The Irvine Company
- Irvine Public Schools Foundation
- The Arnold and Mabel Beckman Foundation
- Irvine Valley College and the University of California, Irvine
- Edison
- Sempra
- Irvine Ranch Water District
- National Fuel Research Center (UCI)
- Solar Power: SPG Solar; Solar Integrated (San Diego Schools)
- Wind Turbines: WindTerra
- Vehicle Conversions: Fuel Systems
- Solid Oxide Fuel Cells: Siemens SOFC



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Progress to Date: Solar

- Met with Solar Contractor
 - Site visits
 - Series of Demonstration Projects at Various Sites
 - District Office
 - M & O
 - Schools
- Future meetings with:
 - Chevron
 - Edison
 - Power Purchase Negotiations



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Electrical Savings

	July	August	September
07-08 KWH	1,725,558	1,891,866	2,392,663
08-09 KWH	1,443,667	1,616,329	2,365,486
Total KWH Saved	281,891	275,537	27,177
Total % Saved	16.336%	14.564%	1.136%
Total \$ Saved	\$ 55,984	\$ 54,722	\$ 5,397
YTD Saved	\$ 55,984	\$ 110,706	\$ 116,103



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Summary

- District leadership and vision is essential
- Communicate with staff the following:
 - Utility costs will continue to rise
 - Every dollar saved is an additional dollar for other uses
 - Talk the talk and walk the walk
 - Imperative to educate students about the future
 - Develop student green teams
 - Find a project to link facilities with curriculum



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Additional Information or Questions

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949-936-5058



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