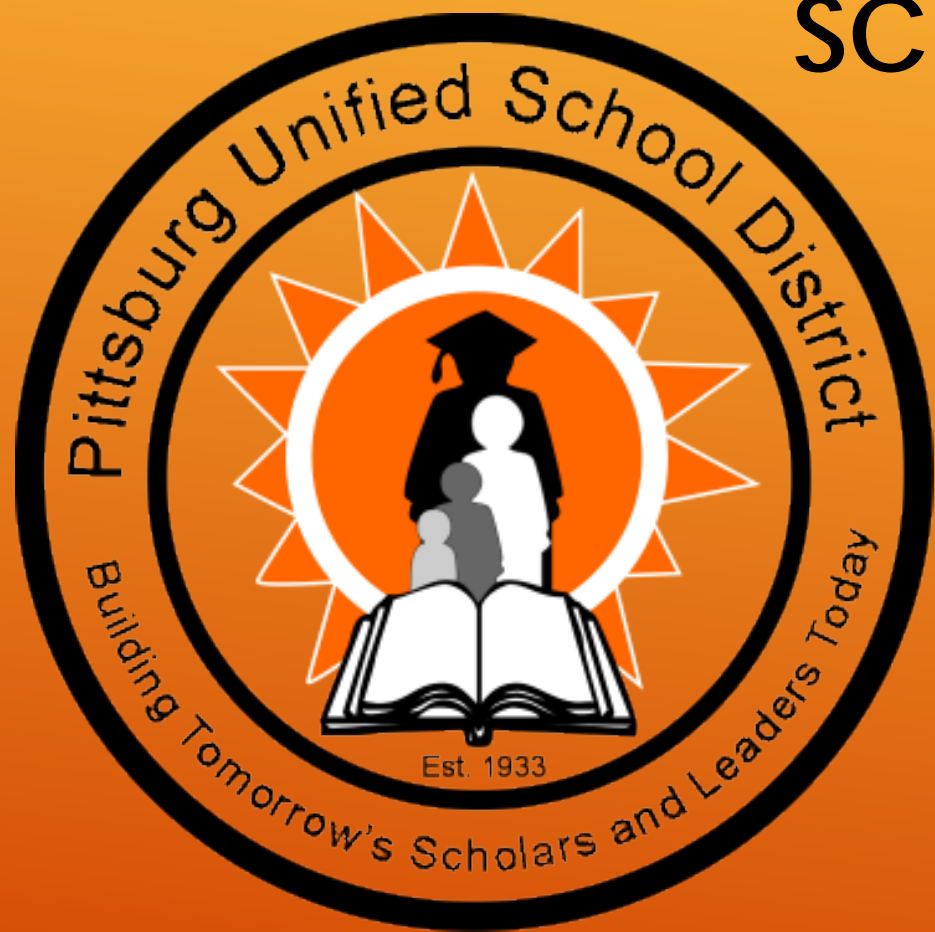


ARE WE BEING GOOD ANCESTORS? A LOOK AT PITTSBURG UNIFIED SCHOOL DISTRICT'S EFFORTS



Green California School Summit and Expo
Pasadena, California
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Presented by:

Alan E. Glass, Energy Supervisor
Matthew Belasco, Director, Maintenance,
Operations, and Transportation

WHO ARE WE?

ALAN GLASS AND MATTHEW BELASCO

Alan Glass – Energy Supervisor and Special Projects Accountant for PUSD

- ❖ Graduate of UC Berkeley and Teaching Credential from Cal State Hayward
- ❖ Was owner and C.O.O. of a fine jewelry manufacturing business for 31 years.
- ❖ Mt. Diablo Unified for 2 years, then Pittsburg Unified for past 9 years.
- ❖ No education or work experience with Sustainability and Energy Conservation.

Matthew Belasco – Director of Maintenance, Operations and Transportation, PUSD

- ❖ Worked in Food Service prior to coming to public education
- ❖ Was Child Nutrition Services Director at PUSD for five years before the retirement of previous MOT Director
- ❖ Was asked by Superintendent to take on new role, and now in current position for past two years.

WHO ARE WE?

PITTSBURG UNIFIED SCHOOL DISTRICT

- ▶ K-12 School District located in East Contra Costa County, in the Bay Area of California
- ▶ Fourteen school sites, all located in the City of Pittsburg, including:
 - ▶ Eight (8) Elementary Schools
 - ▶ Three (3) Junior High Schools
 - ▶ One (1) Comprehensive High School
 - ▶ One (1) Continuation High School
 - ▶ One (1) Adult Education Center
 - ▶ Youth Development Center, District Office and Site Support Services Center.
- ▶ Current ADA is approximately 11,500
- ▶ Free and Reduced lunch students – 74% of total student population

Pittsburg Unified's Financing

The District's Deputy Superintendent is an out-of-the-box thinker and a supporter of alternative energy and sustainability.

- ❖ Much of the credit for what we have achieved is a result of the progressive leadership of Enrique Palacios, our recently retired Deputy Superintendent and Chief Business Official.
- ❖ Took the original District solar plan to fruition.
- ❖ Was open-minded to hear about "alternative" plans for energy efficiency projects, such as the new buses and the solar/wind project.
- ❖ Mr. Palacios saw the many needs of the District in regards to energy efficiency and sustainability, and in working with our banking partners, established a new COP.



Pittsburg Unified's Financing

What is a Certificate of Participation (COP)?

- ❖ As stated by the website Wikipedia: A Participation Certificate is a financial instrument, a form of financing, used by municipal or government entities which allows an individual to buy a share of the lease revenue of an agreement made by these entities.
- ❖ The 2017 COP took the balance of the 2010 COP and refinanced it, with better terms and conditions. In addition, we added another \$3.5 million to use for energy efficiency projects.

Foothill Elementary School



Hillview Jr High School



How did we get to where we are today?

Let's start by talking about solar energy:

- ❖ Pittsburg Unified School District made a commitment to renewable energy, paid for with a Certificate of Participation (COP) in 2010.
- ❖ Solar arrays at all school sites, with three meters at comprehensive high school. Solar also at one non-school facility and new array in construction at corporate yard.
- ❖ In calendar year 2017, PUSD generated 4,888,589 kWh in energy from our solar arrays, generating about 50% of total electrical needs of District.
- ❖ For the last 5 ½ years, generation of over 33GWh of electricity.
- ❖ At an average cost of \$0.19/kWh, cost avoidance of \$6,270,000.00 to date. We also received California Solar Initiative rebates of \$6,355,038 since building the first array.

Rancho Medanos Jr. High School



Pittsburg High School



Pittsburg Unified's Transportation Plan

As part of the plan for the new COP, the Transportation Department was a recipient of funding for a variety of energy-efficiency projects:

- ❖ In conjunction with a grant from EVGo, the District installed twenty-two (22) – Electric Vehicle (EV) charging stations in the District.
 - ❖ Ten are at the Site Support Services Center, which houses all support departments, including Maintenance, Operations, Transportation, Facilities, Child Nutrition Services, and Information Technology.
 - ❖ Two (2) - dual charging stations at the District Office
 - ❖ Eight (8) – EV chargers at Pittsburg High School.
 - ❖ Two (2) additionally added at one elementary school
- ❖ With the grant, we were able to get \$76K worth of infrastructure installed at a cost less than \$9,600.00.
- ❖ **Assembly Bill No. 2414** Approved by Governor August 19, 2014: The bill specifies that "... the use of electricity by state government and other government entities, state officers and employees, or other persons for the charging of an electric vehicle in a department maintained or joint use motor vehicle parking facility is not a gift of public funds that is prohibited by the California Constitution.
- ❖ **Employees charge for free, unavailable to general public.**

Pittsburg Unified's Transportation Plan (con't)

We also purchased our first six all-electric vehicles: Kia Soul EV's

- ❖ Two are used for the transportation of Special Ed students that attend NPR out of the area.
- ❖ One is used for our District courier
- ❖ One is used for our Gardening Supervisor
- ❖ Two are used for support staff as needed.
- ❖ Our yellow bus fleet was old, with some buses over 25 years old and with many thousands of miles.
 - ❖ We have bought, with assistance from a grant from Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), our first two all-electric full-size buses, 64-seaters.



Pittsburg Unified's Transportation Plan (con't)

In addition to the two EV buses we are currently operating, we have orders pending for six (6) additional buses, pending funding from the Bay Area Air Quality Management Board (BAAQMB).

- ❖ Two (2) will be 64-seat buses, two (2) will be 75-seat buses, and two (2) will be 25-passenger buses.

In addition to the EV buses, we also used the funds from the COP to refresh our yellow bus fleet with fourteen very low emission propane-powered buses.

- ❖ Most are smaller 25-passenger buses.
- ❖ The balance are 37-seater buses.
- ❖ Also used the COP funds to build a propane storage and filling area at the SSSC, in conjunction with the propane provider.



Pittsburg Unified's Newest Renewables Project

The PUSD Site Support Services Bioswale Solar and Wind Generation Project

- ❖ One acre of land bioswale – storm water retention area for drainage of five different properties on a corner block in Pittsburg.
- ❖ Bioswale requires natural vegetation on ground, to aid in absorption of water when heavy rains occur.
- ❖ Panels developed at UC Santa Cruz originally to use in agricultural fields.
- ❖ Built to allow red light to travel through to promote vegetation growth, while green light is captured by the photovoltaic cells to produce solar power.
- ❖ Panels are bright red with black cells
- ❖ Now allows for double use of land
- ❖ Solar will generate 166kW of energy with solar.



Pittsburg Unified's Newest Renewables Project



Pittsburg Unified's Newest Renewables Project

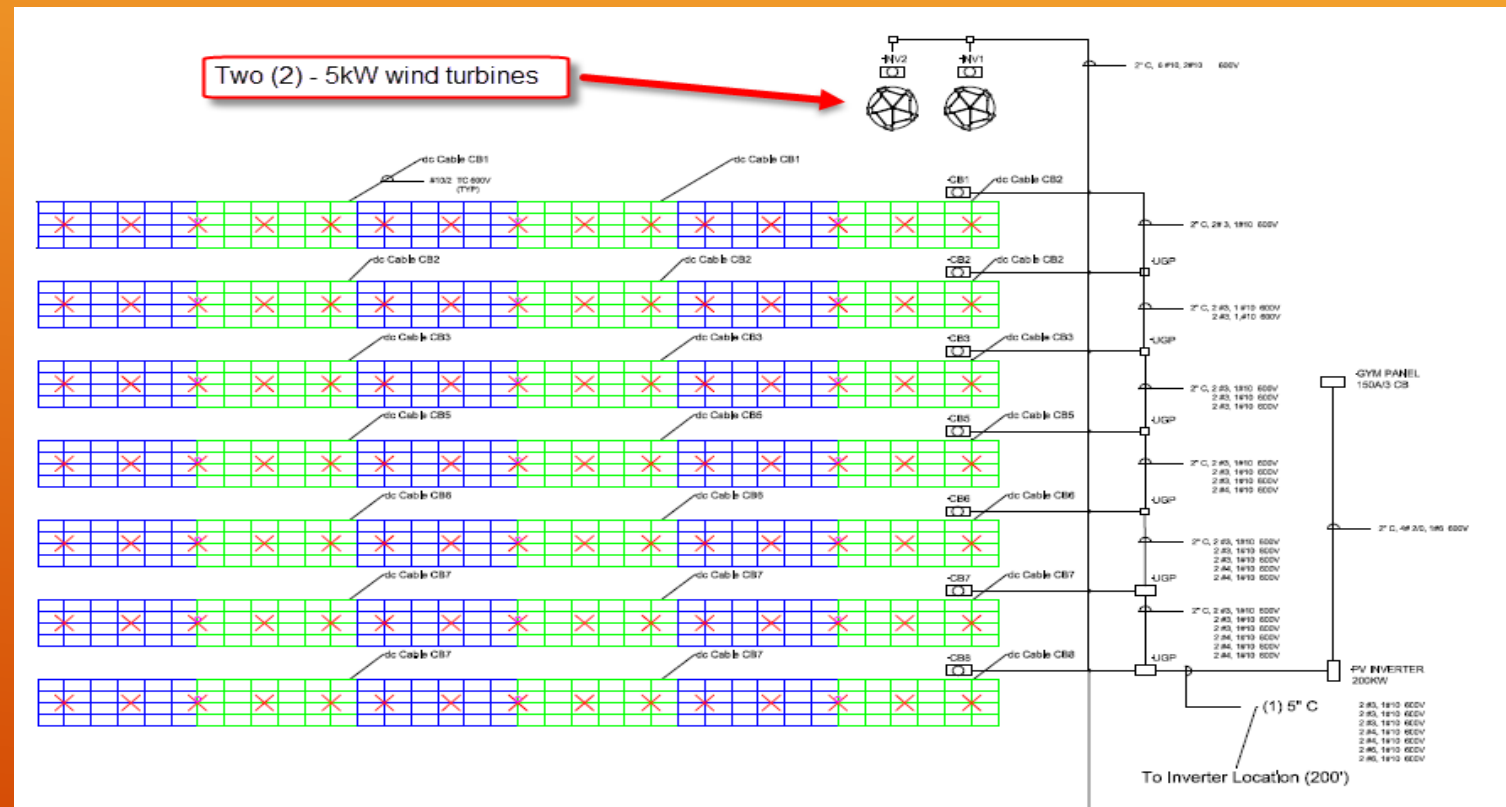
In addition to the solar aspect of this project, we have added a second dimension to the renewables here.

- ❖ When we originally planned this project, a two-year process before getting approval and financing established.
- ❖ The City of Pittsburg has a small horizontal wind turbine on the rooftop of main library and Mr. Palacios pointed it out to me one day and suggested I look at what we might be able to do with wind power.



Pittsburg Unified's Newest Renewables Project

- ❖ In working with our designer/contractor for the potential solar project, I suggested we add some wind power to the solar project. In the original plans, we added two – 5kW wind turbines to the north edge of the solar array. In doing so, our ROI was less than 13 years for the entire solar and wind project.



Pittsburg Unified's Newest Renewables Project

Upon recognizing we had additional funds to work with, we changed the plans to be four – 10kW wind turbines, with the ROI still staying under 13 years.

- ❖ Our turbines will have a vertical axis, which has great benefits:
 - ❖ Much safer speed controls, able to withstand winds of 110 mph
 - ❖ Greater durability
 - ❖ Bird friendly
 - ❖ Generates power at 5mph, with winds from all directions (360*)
 - ❖ Lower maintenance and prolonged lifespan



Pittsburg Unified's Renewables Project (con't)

Knowing that we were going to have at least eight or nine EV Buses, our Energy Efficiency representative from PG&E introduced us to the person in charge of finding school districts that have or will have EV buses for a test program to install EV charging stations for the buses.

- ❖ PUSD already had ownership of two EV buses, and plans for six or seven more
- ❖ A high free-and-reduced lunch percentage, which also helped qualify the District
- ❖ A renewable energy program that could provide energy to the new EV bus chargers.

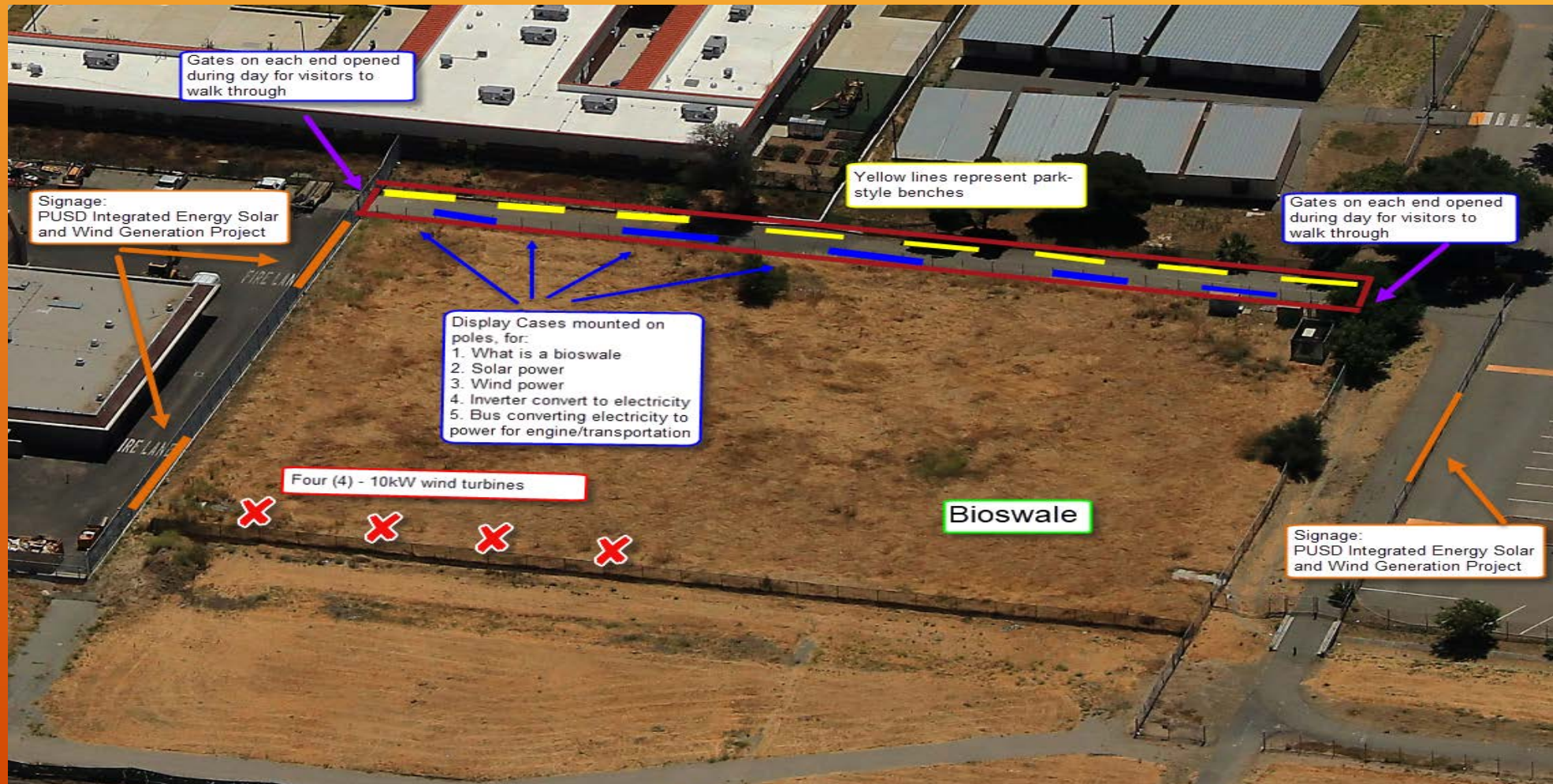
Originally, the program was only going to be for the two buses, but in discussions with PG&E, we informed them of our future commitment to EV buses; they agreed to do the entire infrastructure for nine EV bus charging stations. This included:

- ❖ All plans and design work, including customized software to track the data of input, output, timing, and other factors, valued at over \$2M.
- ❖ Provide a new transformer to handle the current load plus the new charging stations.
- ❖ Aggregate this new meter with the new solar/wind generation meter, to feed the chargers when we are producing a load beyond what our needs are for the SSSC.



Pittsburg Unified's Newest Renewables Project

In looking at this project, it was recognized that this provided a perfect learning and teaching opportunity! We are now in development of the Bioswale Solar and Wind Generation Teaching Center.



PUSD and Sustainability – Parkside Elementary School

The Pittsburg community has been very supportive of the Pittsburg Unified School District. We have passed five bonds and two parcel taxes since 1995. We are currently have plans at the Division of State Architects (DSA) for an elementary school to replace a school built in the late 1950's.

In the early stages of planning, it was proposed to build the school be designed to be a Zero Net Energy school.

- ❖ A ZNE school is defined by Wikipedia as "... a building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site."

Parkside Elementary School,
current layout/location on
property



PUSD and Sustainability – Parkside Elementary School

ZNE was proposed to the Deputy Superintendent and discussed with the Board. The new school will be built to have enough solar, as well as energy reducing features, to have zero net energy and a carbon-neutral school site.

- ❖ As we were already planning on having solar on the property, the additional cost to insure it being a ZNE school was not a significant increase. The total ROI on making the school a ZNE site, with adding 376kW of solar production is less than 13 years.
- ❖ Other measures were added to insure lower energy use:
 - ❖ Special tinted large, double-pane windows, large enough to provide additional daylight, to eliminate the use of overhead lighting
 - ❖ No equipment run on natural gas; all ovens, water heaters, and such will be all-electric, to take advantage of renewable energy production.
 - ❖ Building is situated to maximize available daylighting for classrooms.
 - ❖ VRF (variable Refrigerant Flow (HVAC) systems throughout, with overhead fans to compliment comfort.
 - ❖ A self-generating power traction elevator, all ENERGY-STAR appliances, including all-electric induction cooking appliances to reduce carbon emissions, and reclaimed, recycled water for irrigation.

PUSD and Sustainability – Parkside Elementary School



PUSD and Sustainability – Parkside Elementary School



Teachers can utilize hallways for learning spaces for small or larger groups

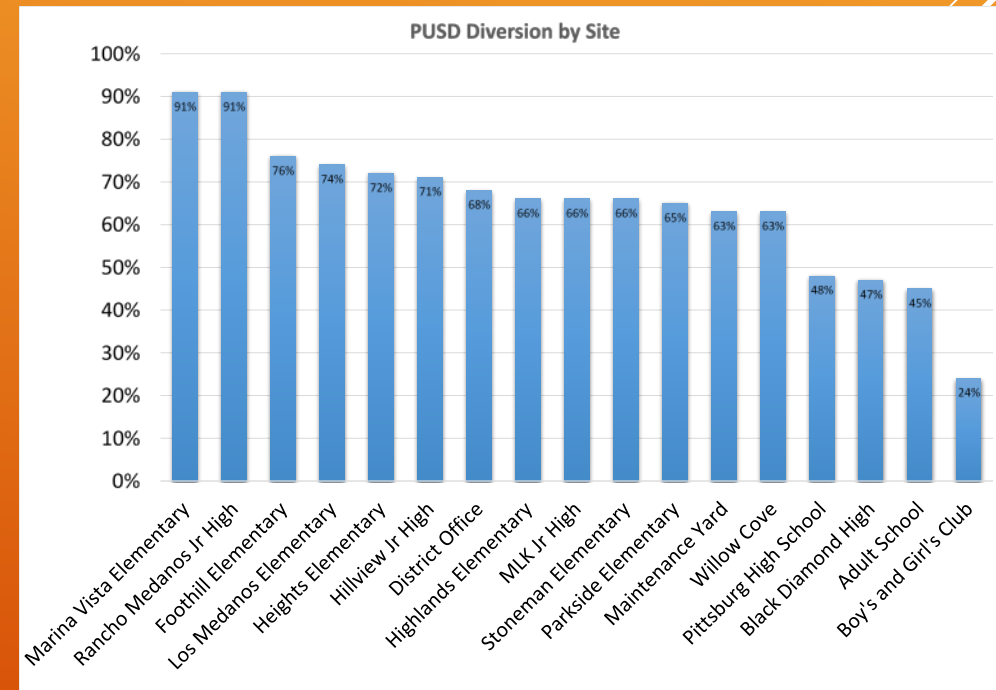
Learning spaces in the wider hallways, with natural lighting a priority.



PUSD and Sustainability – Recycling

PUSD has taken great strides in our recycling and composting program throughout the District

- ❖ All schools have a program to sort landfill, recyclables and composting. Custodians work at every lunch time to assist and teach students on how to separate each type of waste.
- ❖ Some elementary sites have leadership groups or sustainable clubs to assist in recycling and composting on campus.
- ❖ In 2015, Rancho Medanos Jr. High School was third nationally in the Recycle Bowl Competition, sponsored by Keep America Beautiful.
- ❖ Rancho was the only school in California to be awarded.
- ❖ Foothill Elementary School was awarded in 2014 for its high recycle to landfill ratio, at over 84%.
- ❖ From graph on right, you can see the landfill diversion percentages for each school or location. Marina Vista Elementary and Rancho Medanos JHS lead with almost 90% diversion of waste, from landfill to recycling and composting.



PUSD and Sustainability – Recycling

PUSD has taken great strides in our recycling and composting program throughout the District

- ❖ PUSD works with Commercial Industrial Waste Applications, Inc. (CIWA) to increase our recycling and composting and lower our landfill waste.
- ❖ CIWA has installed in every waste bin on all properties sensors that allow us to have real-time data on how full our dumpsters are, to compare to what the disposal company bills for, and for us to have up-to-the minute data available for monitoring and measuring our waste.
- ❖ Budget for waste disposal in 2015-2016 was \$257,973. With the use of the sensors, we were able to reduce our budget numbers for waste disposal in 2016-2017 to \$171,544, a 33.5% cost reduction, as well as reduction of our landfill waste to recycling.



PUSD and Sustainability – Recycling

PUSD has taken great strides in our recycling and composting program throughout the District

- ❖ Working with Recycle Across America, we were able to standardize our labeling of all landfill, recycling and composting bins District-wide. Every bin in the District has been labeled to have the same labels for all cans.
- ❖ Originally met at the Green California Conference last year!



PUSD and Sustainability – Gardening Program

PUSD has developed school gardens at every school site in the District.

- ❖ Produce grown in gardens is served in the site cafeterias, used as examples to students as to what the foods they eat look like while they are growing and before processing.
- ❖ In the winter of 2014, ten 4th graders from Willow Cove Elementary School were invited and went to the White House to work with Michelle Obama in the White House garden for the Winter harvest, only one of three elementary schools nation-wide invited for this special event. <http://www.cbsnews.com/videos/michelle-obama-leads-children-in-white-house-garden-harvest/>
- ❖ The District has been awarded the Golden Bell Award by the California School Board Association (CBSA) for our gardening program.



PUSD and Sustainability – Reclaimed Water

Pittsburg Unified School District buys its water from the City of Pittsburg, through the Contra Costa Water District. The District spends over \$575,000 annually on water, the majority of it being used for irrigation purposes.

- ❖ During the height of the California drought, we approached the local sanitation district, inquiring about reclaimed recycled water.
- ❖ The reclaimed water was primarily being used for industrial cooling and to irrigate a local golf course.
- ❖ There is a single line running through the City, that ran close enough to two schools that we now use for irrigation. The third site is at DSA right now, and will be irrigated with reclaimed recycled water as well, once completed.
- ❖ Because there is a monthly service fee of over \$350/month for each site, the savings for reclaimed water is not significant; it is basically cost neutral. However, it does eliminate the need for potable water for irrigation, which benefits the community.

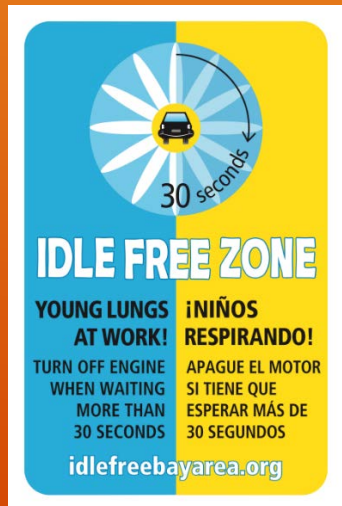


PUSD and Sustainability – Custodial Supplies and Idle-Free Program

All custodial supplies used in the District are Green products or Green-certified. Nothing is used that is not a sustainable product!

Pest control is done with all Green products as well, as part of our contract with pest control company.

Maintenance, Operations, and Transportation Departments have teamed to develop an Idle-Free Program.



- ❖ Signage placed all around District.
- ❖ Students, staff, and volunteer parents letting those that are waiting, if you are waiting for more than 30 seconds, turn off your engine, create a healthier environment for the “young lungs’ at work at our schools.

PUSD and Sustainability – Other Areas of Green

- ❖ Every school has at least two bottle-filling stations. These stations have saved the environment thousands of plastic bottles annually. The District Office, Site Support Services Center and warehouse all have bottle-filling stations
 - ❖ In 2016, the City of Pittsburg supplied every 7th grade student with a stainless steel 24oz. Refillable water bottle.
- ❖ There are 145 waterless urinals throughout the District, saving up to 40,000 gallons each = 5.8 M gallons of water saved annually @ \$5.75/CCF = \$44,500 in savings per year in potable water costs (less the cost of filters 3 times a year), or a net savings annually of \$27,000.00 per year, plus no potable water used for urinals.



PUSD and Sustainability – Other Areas of Green

- ❖ Pittsburg Unified School District, in 2016, was awarded the California Department of Education Green Ribbon School Award with Gold Distinction; only four districts in all of California were awarded this designation that year.
- ❖ Even the copier/printer paper we buy is a better product for Sustainability. The paper uses 30% more of the tree in its production, meaning the paper requires less trees to produce a truckload of paper, meaning we use less natural growth in our paper consumption.



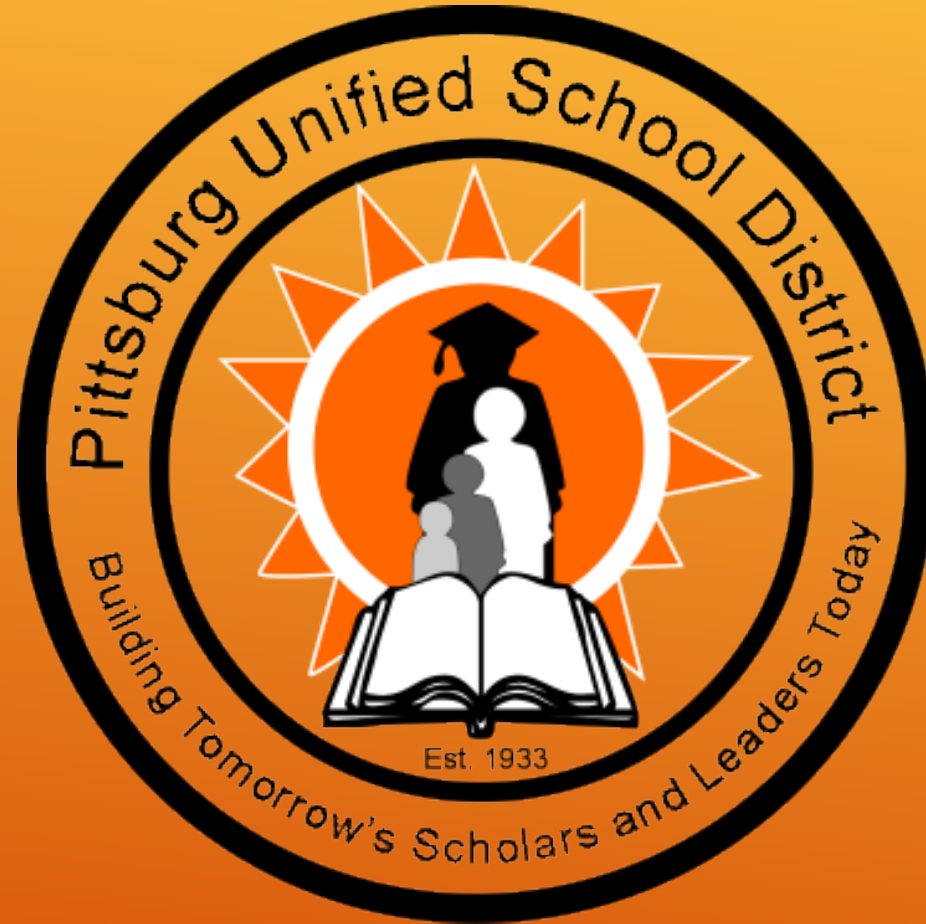
So Are We Being Good Ancestors?

What does this quote really mean?

- ❖ Are we leaving the District, the Community, the City, State, Country a better place environmentally than how it was passed on to us?
- ❖ What are we doing to help make this a better place to live for our students, our children, the generations that follow us?
- ❖ What can we do that we still haven't done to leave things better for those that come after us?



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