



Schools & Energy Prop 39 & Beyond

*Bill McGuire
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Agenda

- Twin Rivers USD
- SEC Partnership
- CA's Energy Savings "Climate"
- Proposition 39 - Clean Energy Jobs Act
- Proposition 39 "1.0"
- Proposition 39 "2.0"
- School Bus Replacement Program
- Reporting and Metering
- Utility Tariffs
- Solar & Battery Storage
- Looking Forward ...
 - ✓ Other School Energy Issues
 - ✓ Water Conservation & Efficiency

Twin Rivers USD

- 27th Largest CA School District, encompassing 82 Sq. Miles
- Serving nearly ...
 - ✓ 27,000 Students
 - ✓ Speaking 46 different languages
 - ✓ With more than 3,200 Employees
- With 52 School sites, including ...
 - ✓ 4 Comprehensive High Schools
 - ✓ 5 Middle Schools
 - ✓ 29 Elementary Schools
 - ✓ 3 Charter Schools @ 7 Sites
 - ✓ 7 Alternative Schools



SEC Partnership



- Formed in 2011 to advocate on behalf of California's K-12 school's energy, water efficiency & management.
- Committed to ensure educational facilities are included in state & federal legislation/regulatory action providing funding and/or technical assistance in those areas.
- Believe schools should be a priority for project funding to reduce energy & water consumption and educating students about lowering our dependence on fossil fuels.
- Instrumental in moving Prop 39 energy program forward & its focus on K-12 schools – Continue to participate in program implementation by providing school's perspective on what is & isn't working.
- Actively involved in state agency discussions, such as CEC, CDE, DSA & ARB on important issues, inc'l water conservation & lower GHGs.

California's Energy Savings "Climate"

- Aging Schools / Large Footprint – Impact Climate Change
- Schools, IOUs & Utility Districts need to work together
- End of Proposition 39 ...
 - ✓ Changed whole dynamics
 - ✓ What we could do w/more \$\$\$
- SB110 – Builds on Prop 39 Success
- SB350 – Clean Energy & Pollution Reduction Act
 - ✓ Schools need to be 50% more efficient
- Impending Governor Change



Proposition 39 – Clean Energy Jobs Act

- Projects are Advancing!



Proposition 39 "1.0"*

- Prop 39 K-12 Appropriations →

Fiscal Year 2013/14	Fiscal Year 2014/15	Fiscal Year 2015/16	Fiscal Year 2016/17	Fiscal Year 2017/18	Five Year TOTAL
\$381	\$279	\$313.4	\$398.8	\$376.2	\$1.748 <i>(in billions)</i>

- EEP Final Deadline was February 26th, 2018
- Participation ...
 - ✓ 100% of State Special Schools
 - ✓ 98% of County Offices of Education
 - ✓ 98% of Public School Districts
 - ✓ 66% of Charter Schools
- How is it working ...
 - ✓ >90% of 5-Year Funding spoken for
 - ✓ Increased awareness thru audit process – Prop 39 expanded our knowledge & increased our awareness of potential energy savings.

Proposition 39 “1.0”

- What Twin Rivers has done

- Total Allocation = \$8.5M, including seven Charter Schools
- Average School Age = 45+ years – Oldest = 84!
- Lighting, HVAC & Controls Projects @ 22 Sites ...

- Completed: HVAC Upgrades @ Grant UHS
& Foothill Ranch MS



- Work In Progress:
 - ✓ Lighting Retrofits @ Harmon Johnson, Foothill Ranch & Foothill HS
 - ✓ HVAC & Controls Upgrades @ Del Paso Heights, Fairbanks, Foothill, Hagginwood, Hazel Strauch, Northwood, Woodlake & Ridgepoint
 - ✓ Lighting Retrofits, HVAC & Controls Upgrades @ 7 Charter Schools / 11 Sites
- Partnered w/SMUD & California Conservation Corps (CCC)

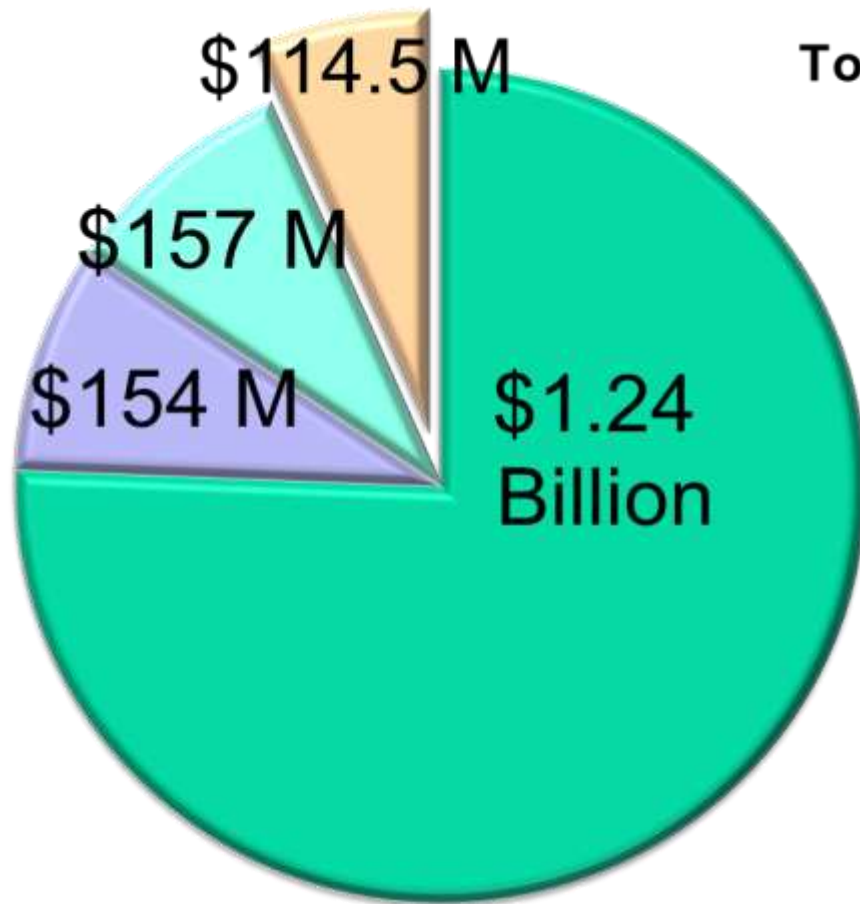
Proposition 39 "2.0"*

- Senate Bill 110 Builds on Prop 39 1.0 Success

- Objectives ...
 - ✓ Create energy efficiency and clean energy jobs.
 - ✓ New programs start fiscal year 2018/19.
- Addresses unexpended funds remaining after Prop 39 "1.0" encumbrance deadline (FY2017-18) ...
 - ✓ First \$75M in grants/loans for school bus retrofit or replacement w/clean energy buses.
 - ✓ Next \$100M for CEC's ECAA-Ed Competitive Loan Program.
 - ✓ Remaining funds (Est. = \$250M) for Prop 39 K-12 Competitive Grant Program.
- Combining future energy project funding with Prop 51 modernizations, creates an even bigger impact.



Estimated Remaining 114.5M*



**Total 5-Year Appropriation:
\$1.748 Billion**

- EEP Approved Funds
- Planning Funds Disbursed by CDE
- EEPs currently in Review (Inventory)
- Total Estimated Remaining Appropriation

School Bus Replacement Program*

- Program Goals & Objectives

- Follow SB 110 & Governor's Executive Order
- Children's health & safety
- Allocation scheme providing best level of funding equity
- Build future supporting network of advanced, next generation infrastructure
- Position as many schools with options to embrace next generation zero-emission vehicles
- GHG & air quality benefits



School Bus Replacement Program*

- Senate Bill 110

- Funding = \$75 Million
- Eligible applicants: School Districts & County Offices of Education.
- Priority should be given to ...
 - ✓ The oldest school buses or school buses operating in disadvantaged communities.
 - ✓ Schools with a majority of students eligible for free or reduced-price meals in the prior year.
- Any school bus replaced shall be scrapped.



School Bus Replacement Program*

- Electric School Bus Cost Savings

- Electric School Buses are an emerging technology ...
 - ✓ They have a higher up-front capital cost compared to mature technologies, but ...
 - ✓ A much lower annual Operation & Maintenance (O&M) costs!

Cost	Diesel	CNG	Electric
Maintenance	\$9,075	\$3,360	\$1,770
Fuel	\$5,930	\$5,000	\$2,714
Total	\$15,005	\$8,360	\$4,484

- This program will cover the up-front capital costs & pass on the annual O&M cost savings to the school districts, while replacing an older bus with a new clean one!

*Courtesy of CEC, Fuels & Transportation Dept.

Twin Rivers Transportation

- Zero Emission Bus Program

- Largest fleet (16) currently deployed in the nation.
- Funded in part by \$7.5M California Climate Investment grant, using proceeds from CA's cap-and-trade program.
- Routes primarily run through disadvantaged communities.
- Zero emissions equals clean air for improved student & community health.



Twin Rivers Transportation

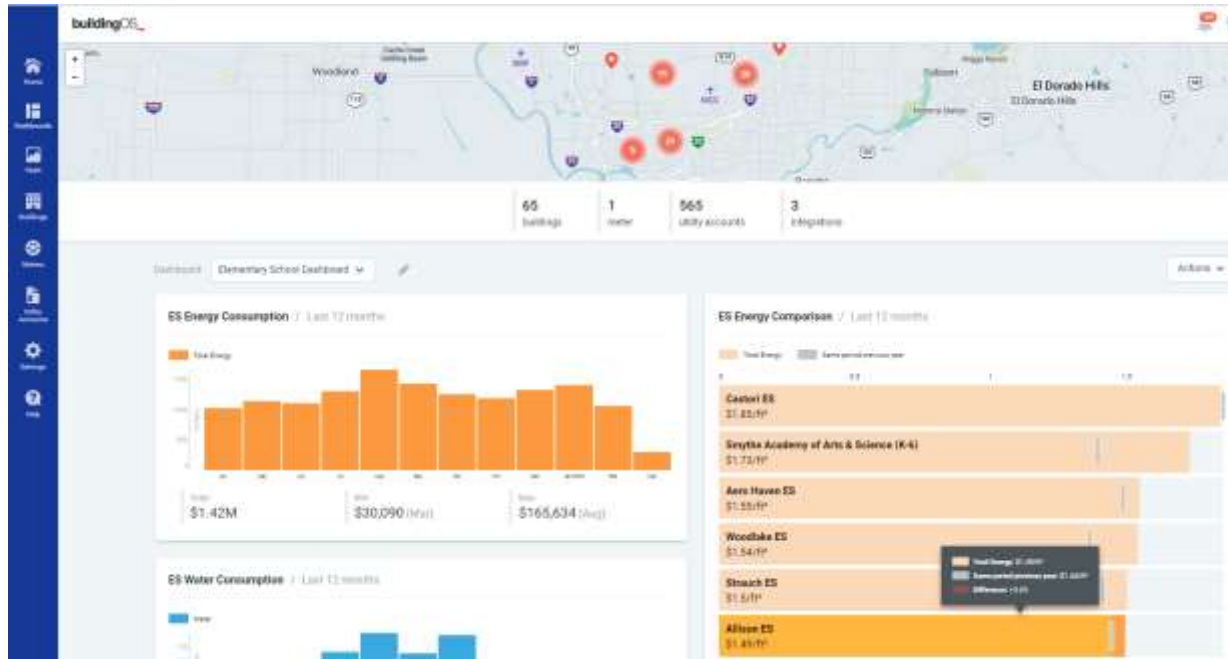
- Infrastructure



- Completed EV charging infrastructure with SMUD's \$92K funding assistance.
- Efficiency = 80% improved fuel savings.
- Reliability = 60% reduced maintenance.
- Complete fleet of alternative fuel vehicles.

Data & Analytics Platform

- Lucid BuildingOS



- Allows School energy performance optimization.
- Supports data-driven energy management decisions.
- Enables Staff & Student engagement and communication.

Sub-Metering Key Facilities

- Grant UHS Pool

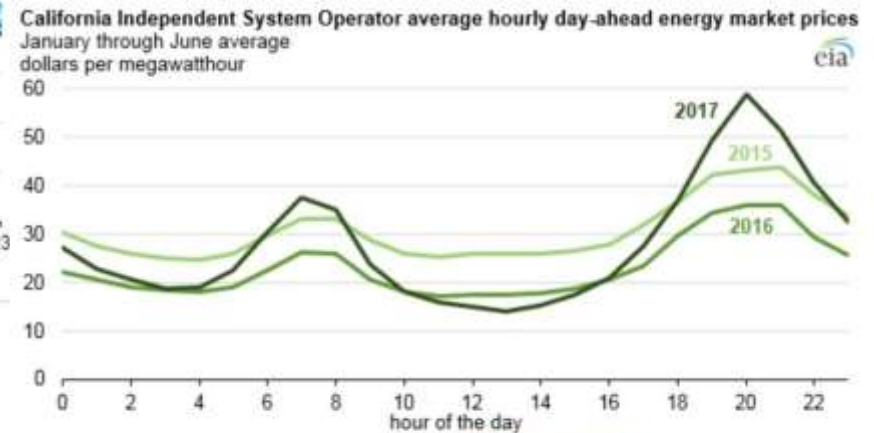
- Grant UHS Pool ...



Utility Tariffs*



Energy costs follow what's happening on the Grid!

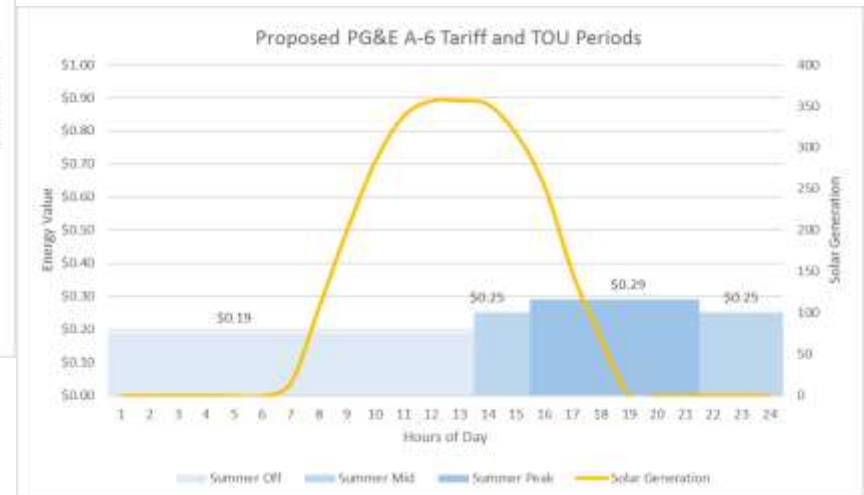
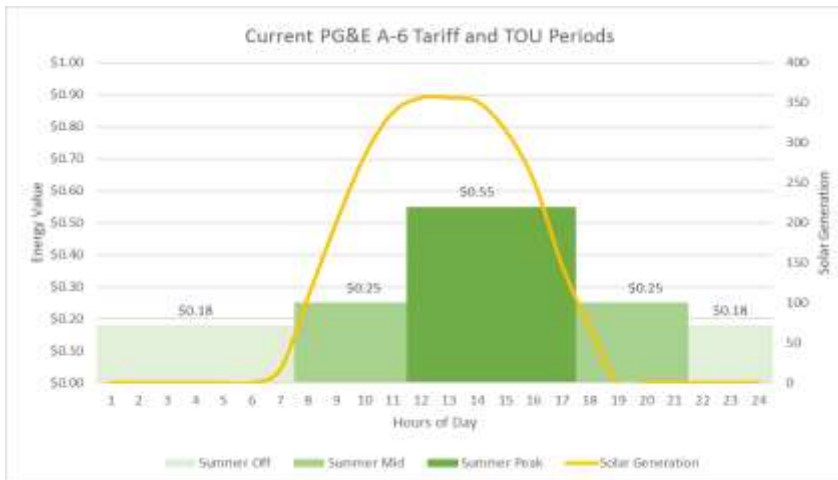


- Three big Tariff changes coming ...
 - ✓ Shorter summer seasons – 4 months vs. 5-6
 - ✓ TOU Peak Periods later in day – 4-9 pm vs. 12-6 pm
 - ✓ Flatter rate differentials – lower summer peak values

Impact of Tariff Changes*

- TOU Grandfathering for Solar Customers

10 years or until December 31, 2027



- Schools who had ...
 - ✓ Operational solar PV by 12/31/17
 - ✓ Interconnection applications by 12/31/17
- TOU Periods grandfathered, NOT rate tariffs ...
 - ✓ Legacy rate tariffs for grandfathered customers changing significantly
 - ✓ Rate tariffs remain the same until 11/1/2020
 - ✓ Then step down for three years through 2023

Impact of Tariff Changes, cont'd*

- Less Risk!

- ✓ Net Energy Metering (NEM) projects subject to tariff risk
- ✓ Reduce incentives built into tariffs = reduced returns risk



- Less Returns!

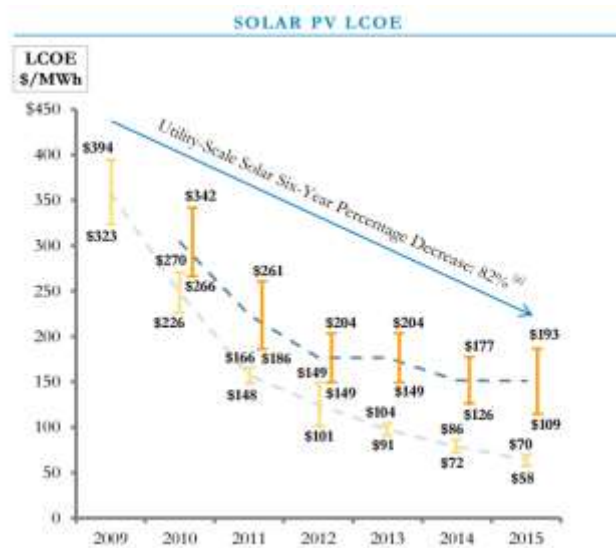
- ✓ Solar energy value loss of 10-40%
- ✓ 10-year TOU grandfathering will see losses of 5-20%
- ✓ Greater losses in PG&E territory, lesser in SCE and SDG&E



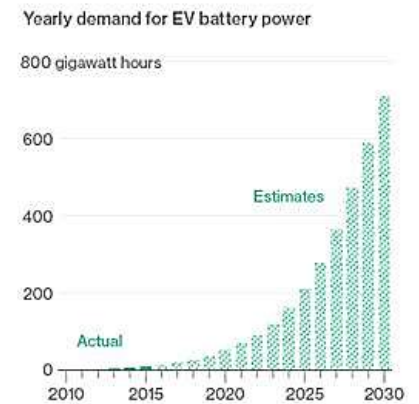
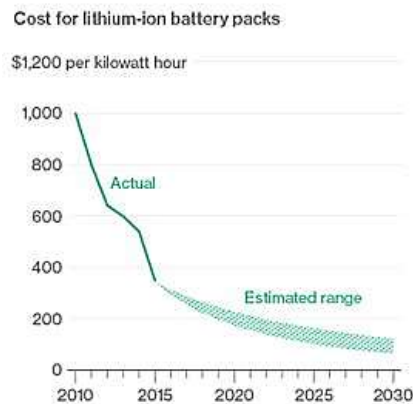
Solar & Battery Storage Markets*

- Renewable Energy & Storage Costs Declining Rapidly

- PV panel price declined 50% from 2015-2017 (GTM)

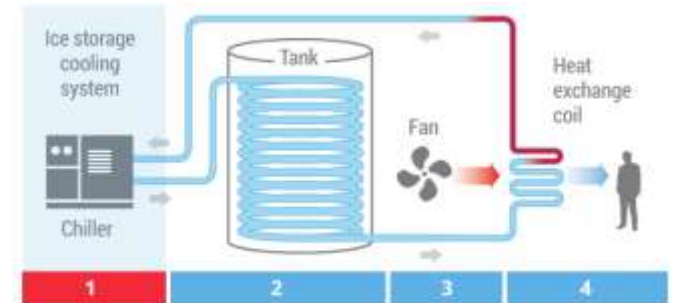


- Li-Ion battery & BOS cost expected to decline 50% over the next 5 years (GTM)



Energy Storage Tech for Schools*

- Lithium-ion (Li-ion) ...
 - ✓ Predominant technology for consumer scale storage
 - ✓ Phones, cars, home and commercial battery systems
 - ✓ 10-year typical lifetime
 - ✓ High density
- Flow batteries ...
 - ✓ Predominately for larger commercial scale systems
 - ✓ Longer life, larger physical area
 - ✓ Stationary
- Thermal Storage ...
 - ✓ HVAC energy offset, low temp water/ice
 - ✓ Commercial scale buildings



*Courtesy of Sage Renewables

A Look At The Future* ...



- Today's problems ...
 - ✓ Too much solar on the grid without storage.
 - ✓ Storage cost too high, given current utility tariffs.
- Tomorrow's solutions ...
 - ✓ Utility rates that encourage installation of energy storage
 - ✓ Grid resiliency – demand response, stabilization, backup
 - ✓ Cost of PV+storage together competitive with retail conventional energy
- What we can do today ...
 - ✓ Storage-ready designs (put in the infrastructure now)
 - ✓ EV charging infrastructure – cars & buses

Looking Forward ...

- Other School Energy Issues

- Title 24 Building Codes Standards Upgrades ...
 - ✓ Upgrades to Sections on Energy Code (Part 6) & Green Construction (Part 11) in 2013 & 2016 will likely have an impact on School Facilities Programs (SFP) project costs, including new Prop 51 projects.
 - ✓ Working with other school groups to advocate for 6% adjustment to new construction per unhoused-pupil grant amounts allowed under current regulations, Ed Code 17072.11(b).
- ZNE (Zero Net Energy) ...
 - ✓ State agencies seeking to build toward ZNE under Executive Order B-18-12 addressing climate & environmental concerns ...
 - ✓ ZNE is perfect vs. “Green” Schools – May seek deeper retrofits building on Prop 39 “1.0” work.
 - ✓ Continue to work with Utilities to advance pilot programs, incentives, rebates etc.

Looking Forward ...

- Other School Energy Issues, cont'd

- School Electricity Rate – Different / lower rate reflecting true cost of service.
- Transmission Regionalization – Encourage CA to participate with other Western States and export excess solar generation.
- Resiliency – Microgrids and other strategies allowing school campuses to continue to function during of power outages, wildfires, or other natural disasters.
- Intervener Compensation – Reimbursing Districts when they formally participate in a CPUC rate proceedings.

Looking Forward ...

- Water Conservation & Efficiency for CA Schools

- Water Supply ...
 - ✓ Dry winter and continuation of conservation mandates.
 - ✓ Monitor state's long-term view on addressing water supply issues.
 - ✓ Will Conservation Regulations Continue?
- Drinking Water ...
 - ✓ Quality continues to be a concern from parent & community groups. Bills addressed this last year.

Contact Information

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