Energize Schools & Colleges: K-College Education
Audience Poll

Who is a:
• High school or district administrator?
• High school teacher?
• High school or district facilities staff or energy manager?
• Higher education institution administrator?
• Higher education institution faculty?
• Higher education institution facilities staff or energy manager?
Objective

Engage, Inspire & Train the Next Generation of Sustainability Leaders
Energize Schools & Energize Colleges

Program Elements

Conservation

Education

Facilities

Conservation
Education
SEI Curriculum

- High School Certificates
  - School Energy Audit
  - Zero Net Energy
  - Green Building
  - Green Transportation
  - Sustainable Enterprise
  - Solar
- Sustainability Assessments
  - Eco Audit
  - Home Energy Assessment
  - Home Solar Analysis
  - School Solar Analysis
  - Home Water Assessment
  - School Water Assessment
  - School Transportation Assessment
  - Energy and Solar Monitoring

- Sustainability Projects
  - Solar USB Charger
  - Solar Water Heating
  - Watersheds and Public Water Systems
  - Engineering Aquatic Ecosystems
  - Aquaponics: Sustainability and Design
  - Solar for Aquaponics
  - Biomimicry: Engineering Inspired by Nature

- Guides
  - School Energy Conservation Guide
  - School Water Conservation Guide
  - School Zero Waste Guide
  - School Policy Guide
  - Sustainability Fair Guide

- K-8 Curriculum
Solar USB Charger

- Students learn key solar concepts, understand electrical circuitry, and build a solar USB charger.
- Students develop STEM skills in:
  - Algebra
  - Physics
  - Electricity/Electronics
  - Soldering
Aquaponics: Sustainability and Design

- Students design, build, and maintain an aquaponics system.
- Students develop STEM skills in:
  - Computer Applications
  - Technical Drafting
  - Chemistry
  - Electricity/Electronics
  - Algebra/Geometry
  - Engineering
  - Machine Repair
Sustainability Education Programming

- Watersheds and Public Water Systems
- Air Quality Citizen Science
- Solar Certificate
Introduction to Green Technology Course Series

- Two-course series in the Energy, Environment, and Utilities Career Technical Education Sector
- Courses have UC A-G approval
- Expanding number of schools and districts implementing courses
Two-course series designed to prepare students for careers in the energy and power industry

**First Year Projects**
- Climate, Energy, and Electricity Fundamentals
- Energy Conservation Competition
- Wind Turbine Blade Design
- Solar USB Charger
- Solar Car Design
- Biodiesel Lab
- Geothermal Lab

**Second Year Projects**
- Zero Net Energy School
- Solar Installation
- Solar Water Heating
- Biomimicry Design Competition
- Aquaponics Design
Energize Colleges Academic Projects

- College of Marin Sustainability Degree
- Butte College Sustainability Degree
  - Articulated with universal CSU Sustainability Minor
- UC Bending the Curve Course
- College of the Desert Building Energy Services Professional Degree
- CSU Bakersfield Energy Engineering
- UC Merced Energy Storage, Fuel Cell Technology & LEED GA Course
- Southwestern Energy Management Certificate
- Mt. San Antonio & Orange Coast College Solar Degree
Impact Stories
“SEI has been a valued partner in reaching this milestone of an achievement. SEI has provided teacher support and training, student support and training, campus support and training and access to industry partners and networking opportunities for both our Green Technology & Energy Conservation program and participating students.”
This was one of the best trainings I have attended. If you want engaging lessons that will prepare students for jobs, careers, and education in the Green Economy, you need to attend this training!

With so much happening in the green-tech field, it can be overwhelming to present the topics accurately and in a meaningful way. SEI has made it possible to give my students a fantastic experience next year!

It was great overall. Exactly what I needed to teach the Intro to Green Tech course. Enjoyed walking through each unit and of course the project based learning!

This week of training was incredibly valuable, fun and filled with highly engaging activities. This information and these skills are so important for us as teachers to bring into our classrooms to prepare our students for their future. I highly recommend this course for all teachers no matter their subject!
Introduction to Green Technology graduates studying engineering at San Diego State
Goals

- Expand geographic reach
  - Equity, access and inclusion
- Increase curriculum accessibility and ease of use
- Diversify funding
- Increase summer teacher training institutes
- Increase Certificate & Degree programs and completers
The School of Environmental Leadership
Program Vision

The SEL’s mission is to engage students and create community leaders of tomorrow through a multi-disciplinary, project-based high school education with a focus on environmental issues.

MarinSEL at Terra Linda HS

- Started in 2011
  - 68 Alumni
    - 118 students enrolled
Transforming Education
Vision for SEL

- Expand to create new ‘schools within schools’ in California.
- One new SEL in the Fall of 2018 and two additional SELs in the Fall of 2019.

Districts currently in process for 2018

- Montgomery HS, Santa Rosa, CA
- El Camino Real Charter HS, Woodland Hills, CA
Moving Forward
Successes

- Successful model
  - Curriculum with college credit and UC A-G approval
  - In depth tracking and process documents
  - Good sense of budget to run program
  - Great testimonials

- Interest from schools

- Good press and notoriety, used as local example
  - Sierra Magazine, national visibility

- Great network
Challenges

- **Funding**
  - SEI’s conventional methods have not been successful

- **Marketing**
  - Developing collateral appropriate to a variety of audiences with varying populations

- **Formalizing agreements**
  - Moving relationships with district to MOUs

- **Sustainable model**
  - Understanding best translation of MarinSEL model to other institutions
Behavior Change & Resource Reduction Programs
Conservation – Behavior Change

Support communities in implementing behavior change programs to reduce resource usage, including energy, water, and waste, to help schools, businesses, and communities in achieving their sustainability goals.
Behavior Change Programs

• Identify leaders
• Educate leaders
  – Class, club, property manager
• Train leaders in identifying opportunities and designing behavior change campaigns
• Support continuous implementation of resource reduction campaigns
Energy Conservation Competitions

• During the 3-week competition, Oct 26 – Nov 15, student teams work together to reduce their electricity usage.

• Energize Schools Energy Advisors work with student teams to:
  – Identify what uses energy in their school
  – Conduct a walk-through energy audit of the school
  – Develop a conservation action plan for projects students plan to implement to save energy

• During the competition, students work in teams to implement their energy saving projects
The Clubs incentivized students with “Powerbucks” that students earned for completing energy-saving actions, like making sure the lights and other devices were turned off at the end of the day.

Yosemite culminated their Competition efforts with a Halloween carnival. The carnival had energy themed games like solar panel cornhole.

- Fall 2016 ECC winner
  - 15.7%, saving over 8,000 kWh
- Spring 2017 ECC Winner
  - 13%, saving over 27,000 kWh
Since 2014, Energize Schools has hosted six Energy Conservation Competitions, resulting in:

- 391,383 kWh saved
- 192,884 lbs CO\(_2\) emissions avoided
- $58,883 saved
Water Contest

• During the 3-month contest, Sept 1 – Nov 30, EAH residents work to reduce their water usage.
• SEI trains EAH Resource Coordinator in supporting behavior change at their sites:
  – Training webinar
  – Kick-Off Event to launch competition
• During the contest, residence can track their progress on the Drip Board
Zero Waste Marin School Program

- School year green team support to increase waste diversion
- SEI trains school green team in waste sorting monitoring and conducts school-wide presentations and assembly
Successes

• Successful model
  – Measured success at engaged schools
  – Good sense of budget to run program
  – Great testimonials

• Benefits to all types of clients
  – Building users
  – Building managers
  – Building owners
  – Utilities

• Programs for resource reduction
  – Energy
  – Water
  – Waste
Challenges

• Diversify funding
• Creating sustained savings & recognition of long-term savings
• Sharing the value of savings with all client types
Workforce Development: Cultivating Future Climate Leaders
Energize Colleges: Year 2

Program at a Glance

12 Energize Colleges Campuses → 300 Student Internships + Campus & Community Projects → 36 Faculty Partnerships on Energy Curriculum Design & Innovation Projects

Participating Campuses: Butte College, College of Marin, Skyline College, University of California Merced (UC Merced), California State University Bakersfield (CSU Bakersfield), Claremont Colleges, Mt. San Antonio College, Orange Coast College, UC Irvine, College of the Desert, UC San Diego, Southwestern College

7 Community College • 3 UC • 1 CSU • 1 Private
Energy Career Preparation

Energy Internships

- **Workforce Development**
  - 1 Dedicated Climate Corps Fellow per campus
  - A minimum of 10 paid student interns

- **Energy Projects**
  - Conduct campus & community energy saving projects, identified by program staff, facilities, and other stakeholders

- **Community**
  - Connections with high schools: Interns provide energy instruction and inform students about college programs and careers

8 Career Pathways:
- Energy Engineering
- Environmental Controls Technology
- Solar Design, Sales and Estimation
- Installation and Maintenance
- Energy Auditing
- Energy Storage
- Energy and Environmental Management
- Building Construction and Architecture
Climate Corps Fellowships

- SEI’s bridge-to-career workforce development program that prepares early-career professionals to launch into climate change and sustainability field.
  - Turnkey, cost-effective capacity builder for partners
  - Dedicated role (10 month as standard) with significant projects
  - Monthly Peer Trainings, Professional Certificate
  - Senior Fellow track successfully piloted, expanding
Since 2010:

- 300 Fellows placed planning/ implementing over 400 projects
- 2017 Largest cohort to date (75), placements statewide and across sectors
- 80% of Fellows progress into environmental careers or graduate degree programs within one year of completing their Climate Corps fellowship
- Currently working towards expansion into Pacific Northwest
Impact Stories
Program Synergies: Bridges and Webs

Jahnavi Kocha

Energy Generation & Storage Intern
Los Angeles CleanTech Incubator (LACI)

Project Descriptions

Project: Stakeholder Matrix
Project overview, photos and graphics.
- Project of LACI fulfilled the Regional Energy Innovation Cluster in partnership with the CA Energy Commission
- Goal is to find common resources available, share amidst the cleantech community, and find funding to create resources where needed
- LACI’s role is as a liaison and connector or mediator in the industry between VCs, government, entrepreneurs, colleges, etc
- Created a research document with companies, non profits, corporations, research groups, incubators, facilities, funding sources, policy organizations, government groups, and all those involved in the CleanTech industry
- Learned about the different ways that one can contribute to the larger industry, created my own network, and found contagious passion in a lot of leaders of the industry

Achievements / Results / Outcomes

Project: Stakeholder matrix
Project qualitative and quantitative results and outcomes, photos and graphics.
- High school and GCM students made aware of careers in science and energy
- Created stakeholder matrix with condensed information
- Created events matrix
- Gave suggestions to LACI for potential partners and event scope
- Presentation to Board members
- Connection to SC and pomona network

Lessons Learned / Intern Experience

Overview of lessons learned...

Successful Strategies:
1. Asking for help (creating the tempate)
2. Good questions (know where to research information)
3. Teamwork / communication (when many people work remotely)

Recommendations for Improvement / Program Expansion:
1. Try going to campus more, there is so much going on always!
2. Try keeping one day for all work to try and be more efficient
3. Meet team in person for a human connection

Intern background: Science Management major with an environmental sequence at CMC, interested in environmental consulting, environmental law and environmental business. Previous experience building solar panels, clean campaigns and Biomimicry and pale soil research.

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Alison Erlenbach, PG&E Senior Program Manager
Increased program budget to current cap with increased Fellow stipends for facilities-focused PG&E territory program. Gained approval to include CSU and UC campuses in our program, and connecting us to other utility partners to expand program.
Moving Forward
New Initiatives: SB 379

• Proliferation of Climate Corps Pathways, with variations in emphasis and price point: AmeriCorps, FiCCS, Emerald Corridor, and now SB 379
• Proven model at CSU Chico with Dr. Mark Stemen, potential to grow statewide
Policy, Government & Community Engagement
The goal of the SEED Fund is to provide technical assistance with no up-front cost for agencies to evaluate, purchase and install renewable energy to reduce utility costs and contribute towards environmental goals.

- **SEED Fund Round 1 North Bay**
  - 13 Agencies in RFP
  - 32 total sites
  - 4.3 MW constructed
  - >$62,000 returned to fund

- **SEED Fund Round 2 Monterey Bay**
  - 8 Agencies in RFP
  - 34 total sites
  - Over 12 MW in consideration
  - ~$300,000 expected return
Solar In Your Community Challenge

• The Solar in Your Community Challenge is a $5 million prize competition from the Department of Energy’s SunShot Initiative that aims to expand solar access.

• SEI is a Coach that supports 5 teams

• Optony is a Consultant

• Sierra Business Council is a Team
SEED Fund Round 3 - Sierra Mountains

- Sierra Business Council as the convener
- Amador County as the lead agency
- Municipalities with solar pre-screens completed:
  - Amador County
  - Jackson
  - Sutter Creek
  - Plymouth
Thank you!

Together we can, engage, inspire and train the next generation of sustainability leaders.
Questions?

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