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## Ending Poverty in California with Solar (EPICS)

### The Watsonville EPICS Pilot Microgrid

#### A project of the Sustainable Systems Research Foundation and Its Partners

Every year, Alaskans get a check in the mail for state petroleum royalties. What if you could receive a “solar dividend” paid for by solar energy falling on the State of California? What if everyone in the state received a **universal basic income** funded by sales of solar electricity rather than tax dollars or billionaires’ foundations?

Sound crazy? Maybe not. In partnerships with non-profits, private companies and municipal governments, the Sustainable Systems Research Foundation is incubating a pilot project that would provide monthly stipends from solar energy to farmworkers’ families. These stipends would not substitute for higher wages or improved working conditions, but they could go a long way to improving farmworkers’ and their children’s lives.

How will the solar dividend work? A community, company or coop will set up an array of photovoltaic panels to generate electricity that can be sold to local customers *for a profit*. And those surplus revenues will fund the basic income program. So, instead of raising taxes to pay for basic incomes, we use an investment that pays monthly dividends.

As long as the sun continues to rise, those panels will continue to generate profits. Not only does this protect local tax coffers, the investment in renewable energy has huge side benefits, from cutting greenhouse gas emissions to supporting the local economy. The benefits of the program are multiplied many times over.

This solution can work almost anywhere because solar energy is everywhere, and because the need for renewable energy is universal. And, you can replicate this approach in every community across the state, the country and the world. Just as Alaskans share the benefits of their oil, so could everyone share the benefits of the solar energy that falls on the Earth. With Solar Dividends, we can build a permanent solution to economic inequality while saving our planet from global warming.

If this vision appeals to you, or you want to find out more about it, please continue reading.

## I. Introduction

An enduring problem across the United States and the world is endemic poverty. Notwithstanding rising incomes in China and India over the past two decades, 46% of the world's population lives on less than \$5.50 per day (or about \$2,000 per year). In the United States, almost 12% of the population (close to 40 million people) were living in poverty in 2018, on about \$17 per day (\$6,500 per year). In California, the poverty rate is between 12.8 and 17% (roughly 5-7 million people) depending on how the number is calculated. Note that official poverty rates are set fairly low in order to keep the picture from looking much worse, with those above the poverty thresholds hardly being that much better off.

Poverty is not something that people choose; it arises from a combination of factors that are extremely difficult to escape, especially for larger families. And poverty has proven to be surprisingly stubborn, notwithstanding many efforts to address it. One approach to ending poverty, proposed by both conservatives and liberals alike, is the “basic income,” which provides a fixed monthly payment to individuals and families who meet stipulated requirements and, unlike welfare or unemployment insurance, comes with no strings or requirements attached. A few experiments with basic incomes have been tried, but the high costs of comprehensive programs, which would have to come from the taxes of nonbeneficiaries, have prevented any large-scale testing.

*Ending Poverty in California with Solar*, or “EPICS,” is a program designed to provide every individual in California with a basic monthly income from the sale of the electricity generated by solar photovoltaic panels, from birth to death and regardless of wealth and income. This program is based on Robert Stayton's proposal in *Solar Dividends—How Solar Energy can Generate a Basic Income for Everyone on Earth* (Santa Cruz, Calif.: Sandstone, 2019). The EPICS program name is inspired by Upton Sinclair's 1934 California gubernatorial campaign and his plan to “End Poverty in California,” which would have created millions of jobs to employ those thrown out of work by the Great Depression. But whereas Sinclair saw state taxes as the funding source for EPIC, EPICS will be financed by the sale of a commodity: electricity.

## II. Is EPICS feasible? Proof of Concept through a Pilot Project in Watsonville, California

What is required to make EPICS work? To test the concept, the Sustainable Systems Research Foundation and a group of partner organizations is incubating a pilot project in Watsonville, California. The revenues generated by this solar project will fund a basic income program for selected farmworker households in the region. Most of the Central Coast's farmworkers are Mexican and more than half are undocumented. Eighty-nine percent rent housing. Median household income is around \$25,000. Households spend a large fraction of their income on utilities (up to \$2,000) and other necessities.

Every megawatt (1,000 kilowatts) of installed solar photovoltaic panels will generate about 1.5 million kilowatt hours per year. By comparison, a California home uses

about 6,000 kilowatt hours per year and a fairly typical rooftop solar installation is about 5-6 kilowatts and generates 7,500 to 9,000 kilowatt hours per year. Our pilot The proposed microgrid will sell solar electricity to industrial customers in south Watsonville, matched to their requirements. Its capacity will be roughly 1-5 megawatts and it will generate about 1.5 to 7.5 million kWh per year. So, the project should earn about \$70,000 to 350,000 annually, with about half of that going to the basic income program (the rest will cover administration and maintenance). If the monthly stipend to a low-income household is \$500 (or \$6,000 per year), the Watsonville pilot will support 6-30 households.

This project will benefit low-income households much more than rate discounts. A low-income household on PG&E's CARE program (California Alternate Rates for Electricity) sees a reduction of about \$450 per year from the full retail cost of power, or \$5,500 less than the basic income stipend. Through EPICS, energy justice and equity are better served by solar microgrids combined with a basic income program than by electricity discounts offered by investor-owned utilities. And it provides spendable money rather than just savings, without raising taxes to pay for it.

### **III. Is the pilot project scalable?**

According to current state estimates, there are roughly 2 million households in California with incomes of \$30,000 or less. To provide a basic income stipend of \$6,000 per year to these households would cost \$12 billion annually, or the sale of almost 50 billion kilowatt hours of electricity. This might sound like a lot, but in 2019, California generated almost two *trillion* kilowatt hours. To provide the required volume of electricity would require about 13,500 megawatts of solar generating capacity statewide. This should be compared to the state's current electric generating capacity of about 80,000 megawatts, a number that will only rise as the state becomes fully electrified.

The Watsonville pilot project is small by comparison with a state-wide basic income program, but it will provide an important financial test case for EPICS. We anticipate startup in 2025, with project development, community engagement, financing and other essential elements being addressed in the interim. Projects of this scale and up to 10 times as large are feasible for most communities and could provide resilience in the event of wildfires, power shutoffs and the growing vulnerability of the state's transmission system.

### **IV. Who are we?**

**Sustainable Systems Research Foundation (SSRF;** <https://sustainable-systems-foundation.org/>) is a Santa Cruz-based green think tank and incubator of community-based projects that can be duplicated and scaled-up elsewhere. SSRF is incubating such projects in the areas of energy, housing and agriculture.

**Center for Farmworker Families (CFF;** <https://farmworkerfamily.org/>), a non-profit organization that works in south Santa Cruz County to promote farmworker financial

and nutritional well-being and independence. CFF manages food distribution, education and other services to the farmworker community and works closely with other local organizations. It regularly identifies and veterans' households for rental assistance.

**Clean Coalition** (<https://clean-coalition.org/>) which designs and stages cutting-edge Community Microgrid projects that can be replicated in any utility service territory.

**Our Energy** (<http://www.ourenergyco.com/>) which works with public and private clients to implement renewable energy and sustainable development projects from concept to completion.

**S. Martinelli & Co.** (<https://www.martinellis.com/>) producer of apple juices and ciders with properties in Watsonville (see figure below).

**Environmental Innovations** (<https://environmentalin.com/>), which works actively on community engagement and projects in Santa Cruz, Monterey and San Benito Counties.

**Cal Poly University, San Luis Obispo** (<https://afd.calpoly.edu/sustainability/faculty-staff/research-centers-institutes>), whose new Institute for Climate Leadership and Regional Resilience and individual department faculty work with students on project design and development.

**In 3 Capital Partners** (<http://in3capital.net/>) which specializes in project finance for renewable resources – clean energy, food, water, and materials and other projects that deliver social and/or environmental benefits.



The EPICS Pilot Site in south Watsonville, California

# Watsonville EPICS: What would it cost?

**DRAFT**

Solar capacity (kW)	5,000
Battery storage capacity (MWh)	8,000
Annual generation (kWh)	7,500,000
Microgrid Lifetime	25 yrs.
Total project cost	\$22,640,000
Tax credits, depreciation, battery rebates	\$11,600,000
<b>Net project cost</b>	<b>\$11,040,000</b>
Interest on green bonds @ 2.5% for 15 years	\$2,210,000
Operating & maintenance	\$150,000
Annual cost of loan & operation (years 1-15)	\$1,033,000
Total cost over project lifetime (principal, interest, O&M)	\$15,500,000

# Watsonville EPICS: What would it generate?

**DRA**

Annual generation (kWh)	7,500,000
Lifetime generation (kWh)	187,500,000
Cost of electricity years 1-15 (annual cost divided by annual generation)	13.8 ¢/kWh
Net annual revenue years 1-15 (PPA cost @ 20¢/kWh)	\$465,000
Cost of electricity years 16-25 (annual cost divided by annual generation)	2 ¢/kWh
Net annual revenue years 16-25 (PPA cost @ 20¢/kWh)	\$1,350,000
Levelized cost of electricity over 25 years (total cost over total generation)	8.3 ¢/kWh
Net revenue over project lifetime	\$20,475,000
Number of families served @ \$500/month years 1-15	77
Number of families served @ \$500/month years 16-25	225