CHERP
San Bernardino – Locally Grown Power SM

Business Plan

CHERP, Inc. in Partnership with
Technical Employment Training, Inc.

"CHERP San Bernardino - Locally Grown Power SM

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1.1 Business Summary

Barely recovering from the effects the Great Recession, San Bernardino is now reeling from the economic devastation occasioned by the coronavirus pandemic. While it is early still to identify all the economic consequences of the Covid pandemic, this much is certain: unemployment has never risen as fast or as dramatically in response to any previous economic setback. With the loss of jobs come the loss of health insurance, food security, the means of paying rent and mortgages. We need pathways to employment and recovery.

San-Bernardino Locally Grown Power is ready to open the following operations in our city:

- An assembly factory that will manufacture next-generation photovoltaic panels.
- An assembly niche within that factory that will manufacture the control card—essentially the onboard computer for the solar panels we will manufacture here and with a supplemental capacity for panels manufactured at three other distributed factories that lack the capacity to produce these control cards.
- A second manufacturing niche for producing the junction box for these panels.
- A solar construction/installation division to install the panels in San Bernardino, particularly for the benefit of low-income households, municipal and county facilities, schools, and local resilience centers.
- Power purchase agreements for the San Bernardino International Airport and other facilities, allowing these sites to have solar at a cost below what it pays at present for power from SCE and that keeps profits within the community.

The solar factory is envisioned to be located on Leland Norton Way, at the San Bernardino International Airport, in the current location of the Technical

Employment Training (TET) center, with TET moved into the adjacent empty 20,000 sq. ft. building space.

TET will work together with CHERP San Bernardino-Locally Grown Power, offering workforce development tailored for long-term employment possibilities.

As businesses have shuttered across the city and county, creating new sources of employment is vital if we are to achieve economic revitalization. It is also critical that those planning to launch businesses in this risky climate have a carefully charted path forward. This business plan lays out the case for investment in CHERP San Bernardino-Locally Grown Power, describing the unique market opportunities, the path to job creation, the potential for local economic stimulus and the synergies between our project and government priorities at the local, county, state and federal level.

In short, this project will to create quality green manufacturing and construction jobs, stimulate local economic growth, and create a means of reducing greenhouse gas emissions through local solar panel deployment, while helping the city and county achieve its carbon reduction mandates as well as its environmental justice goals.

1.2 Cost

The total project cost for the CHERP San Bernardino-Locally Grown Power initiative, independent of the expansion of TET to meet the needs of this project, is $5.5 million and includes the following:

- The license to manufacture the world's most advanced solar panels.
- All of the state-of-the-art manufacturing equipment needed, including a tabber and stringer—vital for this form of assembly work—a laminator, laser cutters, and EL testing equipment. In short, a production-ready factory line capable of manufacturing 15 MW of solar per annum, or some 50,000 solar panels, with a retail value, of approximately $10.5 million per annum.
- A control-card assembly center manufacturing the onboard electronics for the world's first smart solar panel. The projected production, which could satisfy the needs of this factory and three others in the Local Grown Power network, is approximately 200,000 units per annum, for a retail value of approximately $10 million.
- A junction box fabrication center making 100,000 units per annum, for a retail value of approximately $500,000.
- Workforce training.
- UL certification for panels and the factory.
- The services of a director of manufacturing for six months.
- The services of a project engineer for six months.
- Support for planning tenant improvements, legal services, accounting, and business planning.
- Everything that is needed to manufacture the first 600 solar panels, junction boxes, and circuit boards, and assistance with deploying the first 30 residential or small commercial systems.
- Assistance with developing and planning a supply chain and inventory controls.
- Assistance with marketing and business development.

1.3 Competitive Advantage

- The solar technology we will be manufacturing has undergone rigorous independent testing at Harvey Mudd College. The conclusion of the team of physicists and engineers that carried out the testing was that that these are the world's only solar panels that cannot develop hot-spots. Hot-spots, a problem that all other solar panels are susceptible to, reduce efficiency, present a safety hazard, and reduce durability. Overcoming the threat of hot-spots reduces production costs and complexity.
- Manufacturing of this patented technology has been restricted by the inventor to fabrication in a non-profit business model. In short, in manufacturing the world's most advanced solar panels, we would have no competition from for-profit manufacturers.
- Being manufactured in the U.S., our final assembled product is exempt from tariffs. The bulk of panels sold in the United States are not.
- The non-profit business model affords us a number of advantages:
    - For-profits, such as for-profit solar panel manufacturers, can donate redundant machinery, solar cells, and other items for a tax deduction (The CHERP-Locally Grown Power pilot factory in Pomona, for instance, was donated a laminator valued and $250,000.)
    - Free of any threat of hot-spots, our panels can perform equally well using B- and C-grade cells rejected by other manufacturers. In conventional panels minor defects such as shunts and micro-cracks provoke hot-spots. In ours, they are inconsequential. Thus, other manufacturers can donate their cells, which account for 50% of the cost of a panel, to us for a tax deduction.
    - As a social enterprise, we are well situated to win municipal, county, and state contracts.
    - Non-profit status is required for many forms of state and corporate funding.
    - Volunteers can donate labor and expertise.
    - The non-profit business model allows us to focus on what is best for a community, such as manufacturing cost-competitive panels while creating quality local jobs.

- Our parent organization, CHERP, Inc., was named a semi-finalist in the Department of Energy-sponsored American-made Solar Prize competition.
- The Southern California Association of Governments (SCAG) awarded CHERP the 2020 Outstanding Achievement in Sustainability Award (https://vimeo.com/415247758)
- CHERP has strategic partnerships with many regional workforce development programs, colleges and universities that help design job training programs and that offer assistance.
- CHERP-Locally Grown Power is receiving technical assistance from REDF, the country's premier venture philanthropy institution, to help it develop as a social enterprise and situate itself to win public contracts. All of these advantages will be passed on to CHERP San Bernardino-Locally Grown Power.

1.3 Competitors

Sun Spark, headquartered in Riverside, is the only for-profit manufacturer of solar panels in the LA area. In one sense, neither they nor any for-profit manufacturers are competitors. Existing manufacturers produce for a different market: households and corporations with the wealth to afford solar. Our panels will be sold on the open market and can handily compete based on quality and price. But our principal market is those who currently cannot afford solar, and the local community itself. **This in fact is a vast market.**

Most solar panels purchased in the United States are imported. Other US-based manufactures include Mission Solar in Texas, Tesla in New York, and the subsidiaries of a few foreign companies. No manufacturer anywhere fabricates with the express intent of meeting the needs of low-income communities.

THERE IS NO OTHER NON-PROFIT MANUFACTURER OF SOLAR PANELS OUTSIDE OF THE CHERP LOCALLY GROWN POWER NETWORK. AND NO OTHER MANUFACTURER WITH A NETWORK OF DISTRIBUTED MICRO-FACTORIES TARGETED FOR PLACEMENT IN DISADVANTAGED COMMUNITIES.
WE, THEREFORE, FACE NO COMPETITION ON THAT FRONT.

2. Operations Plan

Technical Employment Training, Inc., TET, is a high technology manufacturing and construction school in San Bernardino City. Founded in 2010 as a non-profit 501(c)(3), its mission is to build the regional economy through job placement and ensure career security and success for high school graduates. The technical school provides recognized industry credentials in both manufacturing and construction, with graduates finding ready employment in local industry.

TET will offer workforce development training for CHERP San Bernardino-Locally Grown Power. Students will be prepared in the skills, both technical and soft, required for success in a manufacturing environment.

The factory will begin with a single shift but has the capacity to run three weekly shifts, approximately tripling production and the number of jobs created.

3. Marketing Plan

Market analysis suggests that American consumers prefer US manufactured solar panels over those imported from China and other countries. We believe the market is ripe for cost-competitive US-based manufacturing of next-generation solar technology.

While we will sell panels on the open market, we are aiming for large-scale contracts that would take two forms. The first is with programs such as SOMAH (California's Solar on Multifamily Affordable Housing) and institutions such as Habitat for Humanity, National CORE and others who build affordable housing. The second is with local projects on schools, municipal and government buildings, and local commercial enterprises. We believe the local market is large enough to

absorb most of our production capacity and that the incentive for local purchasing will be robust.

If a community can choose between purchasing solar panels from a foreign country or those made at a plant creating local jobs, the incentives for purchasing close to home are extraordinary. **The locally made equipment creates employment, stimulates tax revenue, and supports the creation of indirect jobs.**

Technical Employment Training, Inc. will also offer training in solar installation. By installing locally, retaining ownership of the systems, and selling power through power purchase agreements, we create an ongoing revenue stream for the business. Consider what this could mean for the Airport Authority itself. At present, the airport purchases all its power from an investor owned utility. All that money leaves the community. **If the Airport Authority were purchasing power at an advantageous price from a local non-profit business that produces solar panels locally, investments *and* profits would be kept within the community.**

One of our main targets in deployment is solar for places of worship. The strategic reasoning is that this is major underserved niche has significant revenue potential. In Southern California Edison territory, places of worship are subject to demand charges, which tend to affect them much more than businesses that draw a constant amount of power. The requirements of places of worship fluctuate; often they draw almost no pawer until suddenly all the air-conditioning and appliances are switched on in preparation for a service. The result is that, based on cost per kWh, no one pays more for energy than they do. Yet they tend to lack the capital for solar and the know-how required to pair it with measures that lower demand charges, such as storage and power management. **When places of worship combine solar with storage, they can then also be equipped as local resilience hubs**, for use during power failures and other emergencies. Establishing more such hubs is a major resilience priority in California, in preparation for power outages, earthquakes, and heat waves—not to mention pandemics.

We aim to democratize access to renewable technology among the lowest-income households in the community. Our goal is to offer renewable energy to 6,000 households over a two-year period. If this can replace a $90 monthly electric bill, it results in savings of $6.5 million annually, for the next 30 years, money that is redirected from the utilities and back into the local community. And low-income households are those most likely to spend extra money locally. This, in turn, stimulates the local economy**.**

4. Ongoing Funding

Local manufacturing and job creation in the wake of the Covid outbreak is a top priority for government at every level. We are confident that the combination of municipal, county, state, and federal opportunities can complement the self-sustaining properties of the business model.

The state of California expects annual cap and trade revenues in excess of $2 billion annually. One quarter of this is reserved for use in environmentally/economically disadvantaged communities (DACs) as defined by the CalEnviroScreen 3.0 - places like San Bernardino. The state needs shovel-ready projects that create green-sector jobs and extend the reach of renewable energy in DACs. Once established, we will have a competitive advantage in securing public funding for these deployment initiatives.

Federal opportunities through the Economic Development Administration, the Department of Energy, and other federal agencies support projects consistent with our work and goals.

San Bernardino County seeks social enterprises that can respond to calls for proposals for manufacturing and solar deployment projects such as our own.

Meanwhile, workforce development agencies seek training programs that are paired with employment opportunities like those we offer. CHERP Claremont/Pomona-Locally Grown Power was able to secure $900,000 in workforce development funding for training, an encouraging precedent as we plan for a plant in San Bernardino.

GRANTS

ECONOMIC DEV FUNDING

PRE-PURCHASE CONTRACTS

DONATION

5. The Five-Year Plan

YEAR 1 In the Year 1 we aim to prepare the site, order equipment, establish supply chains, and train workers.

YEAR 2 By Year 2, we expect to be generating revenue. During that second year, we would run a single shift in the factory, producing approximately 16,500 solar panels and four times the number of control cards and junction boxes.

YEAR 3 Production can potentially be tripled by Year 3, by running three shifts.

YEAR 4-5 From that point on, the combined annual retail value of production is $21 million.

Beyond the sale of panels, circuit boards, and junction boxes, we have several means of increasing revenue and investment:

1) Local installs will focus on extending the benefits of solar energy to low-income households. This type of program is a prime target for California state funding. For example, the Strategic Growth Council has sponsored the Transformative Climate Communities initiative that has funded projects in Watts, Ontario, Fresno, and other cities that, like San Bernardino, score high on CalEnviroScreen 3.0. These have brought in funding for these cities ranging from $35 million to $70 million. Our initiative could serve as the centerpiece for such an application, as well as for a variety of other grant programs. California anticipates more than $2 billion annually in cap and trade revenue, with a quarter of that reserved for investment in economically disadvantaged communities. San Bernardino, given all the variables that place it at the top of CalEnviroScreen 3.0, is a perfect target for a variety of state investments.
2) Power Purchase Agreements with the Airport Authority, schools, municipal and county buildings are a significant potential source of recurring revenue that will help us to grow a self-sufficient enterprise with long-term viability.

6. Summary

San Bernardino went into the pandemic with health and educational challenges, high rates of poverty, hazardous air quality conditions, and a population typically forced to travel long-distances to find work. This initiative brings the jobs right to a community that needs them now and provides a pathway to meeting state goals of greenhouse gas reductions.

One of the greatest challenges in job creation is offering a path to employment for those with significant barriers to entry in the labor force. Finding jobs is especially difficult for those with a prison record, intellectual or physical challenges, or who have experienced homelessness. TET has a solid record of finding employment for people facing barriers to entry in the labor force, and CHERP San Bernardino-Locally Grown Power would provide ready-made opportunities in our community. For example, the control cards for the solar panels were designed specifically for easy assembly by intellectually challenged workers.

This initiative aligns with city, county and state goals of creating green-sector jobs, lowering our carbon footprint, extending the reach of renewable energy to economically disadvantaged communities, and stimulating a fragile economy. CHERP's economic modeling indicates that for every public dollar invested in the initiative, two dollars are generated in tax revenue.

San Bernardino needs shovel-ready projects that can create employment, stimulate the local economy, grow green-sector jobs, and reduce carbon emissions. We have one.

7. Benefits at a Glance

CHERP
Locally Grown Power SM

CHERP LGP SM is Addressing California's Top 4 Priorities

PHASE I of each factory will create enough energy for 6,000 households

CARBON MITIGATION

26,700 TOTAL Metric Tons (MT) of Carbon Offset per Year

- CITY Buildings: 2,600 MT/yr
- HOMES (Solar): 22,300 MT/yr
- HOMES (Retrofits): 1,800 MT/yr

Least expensive Carbon Mitigation program of its kind in California

ECONOMIC STIMULUS

Expand City and State Income

- $6,500,000/yr increase in DPI for LMI Households in Claremont
- $29,360,000/yr added to local retail economy
- $900,000/yr additional sales tax revenues to City of Claremont
- 12% Local Economic Expansion
- $5,500,000/yr sales tax revenue to State of CA

2:1 Revenue Return to the State

JOB CREATION

763 Direct/Indirect Jobs created for Phase I of project based on RIMS II model (U.S. Bureau of Economic Analysis)

- 91 Factory/Manufacturing Jobs
- 122 Construction Jobs
- 550 Indirect Jobs

128 On-going indirect, permanent retail jobs for 25+ yrs

ENVIRONMENTAL JUSTICE

Low to Middle Income (LMI) households are being left out of the solar PV revolution.

- CLGP will install the first 6,000 solar PV systems on LMI households, saving them $6.5 Million/yr in DPI
- Increasing LMI household DPI is the fastest, most powerful local economic stimulus