CHERP
SOLAR WORKS

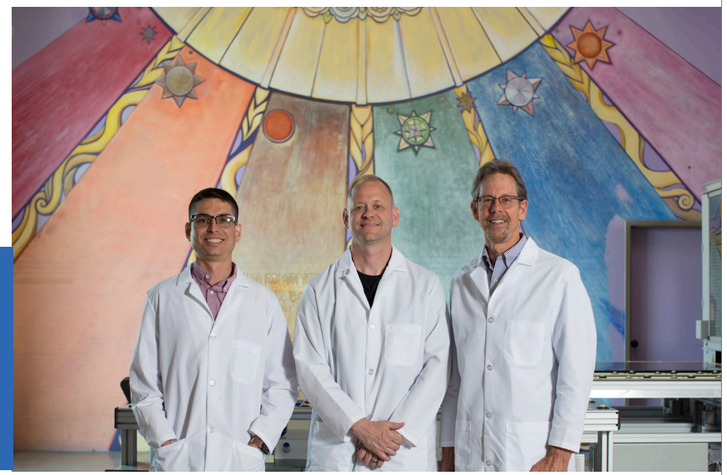
factory start-up handbook

CHERP Solar Works

An American Manufacturing Renaissance

We are creating the first nonprofit solar panel assembly factories in the world.

CHERP's Goal:
To help your community build its own Locally Grown Power™ factory and then provide ongoing, operations support to ensure your success.



who we are

We build solar factories

CHERP Solar Works is a project of CHERP Inc., a California-based 501(c)(3) non-profit, social enterprise. We prototype, design, build, and develop turnkey, solar factories for other nonprofit organizations across America.

our mission

Create a network of solar panel assembly factories across the country. We target hard-hit communities looking for jobs and economic recovery. We combine the most advanced solar technology in the world with a non-profit, social enterprise business model designed from the ground up to create maximum economic expansion in local communities while accelerating rapid scalability of solar manufacturing and deployment across the U.S.

CHERP, Inc.

The parent company of CHERP Solar Works. Since 2009, CHERP has been inspiring communities to take action on climate mitigation goals in the building sector.

CHERP Solar Works™

The division of CHERP that:

1. owns and operates the prototype Locally Grown Power factory in Pomona CA
2. designs and builds solar panel factories for other nonprofit 501(c)(3)s across America who want to be part of the national Locally Grown Power solar factory network.

Locally Grown Power™ (LGP)

The brand name of the national solar panel factory network. LGP is regulated for policy and technical quality control by a nonprofit technical oversight Board of Directors. LGP can not accrue value and cannot be sold.

idealPV™

idealPV is the owner and inventor of Forward Only Zero Hot Spot technology, a revolutionary improvement in solar panel efficiency that is licensed only to non-profits in the LGP factory network.

initiatives

Job Creation, Carbon Mitigation, Economic Stimulus, Enviromental Justice

CHERP is a 501(c)(3) public charity with the mission of reducing GHG, creating green jobs, stimulating local economies, and solidly addressing environmental injustice. CHERP Solar Works is our capstone project that completes our suite of projects, including public education, energy efficiency retrofits in all buildings, and creating social enterprise solar factories that provide opportunity employment for individuals, and that produces technologically advanced panels that are deployed for the benefit of your community.

All of CHERP's initiatives – community engagement/education, building retrofits, and solar factories – are designed to be replicable in cities across the U.S. as a complete suite of programs that help cities transition to net-zero energy, while increasing local quality of life and economic expansion.

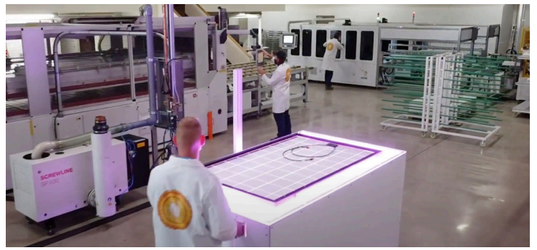
The idealPV technology used to build the panels may only be licensed to a nonprofit and dedicated to a specific locality.

To facilitate and speed the deployment of any or all CHERP initiatives in your city, CHERP can engage with you in several simple ways:

now every city can create their own energy

Nonprofit Org

If your organization is already a nonprofit 501(c)(3) public charity, CHERP can contract with your organization directly.



For Profit Org

If your organization is not a nonprofit 501(c)(3) public charity or is not yet formally established, CHERP can add your organization to CHERP as:

- An affiliate that joins CHERP in a group exemption
- A subsidiary of CHERP
- Or as a fiscally-sponsored program of CHERP, which can be later transferred to a separate nonprofit 501(c)(3) public charity.

how to start

Bringing CHERP Solar Works to your city is easy: we can show you how one step at a time

1 Contact and Discuss

Contact Devon Hartman, President/CEO of CHERP Inc. Devon@CHERP.net and cc Megan Anderson manderson@CHERP.net . The CHERP team will run the subsequent meetings.

- Contact CHERP
- Discuss concept
- Evaluate opportunities for your community

2 Create a "Core Energy Group" (CEG)

Begin to form a Core Energy Group of 8-10 local business, political, and civic leaders commited to GHG mitigation, green middle-class manufacturing jobs, local economic revitalization, and environmental justice.

- Recruit for your CEG group
- The CHERP team will lead training workshops and educate your CEG
- Learn the technology, business model, and benefits of a factory in your municipality
- Discuss the organizational structure between CHERP and your organization/city.

3 Assign Roles to the Group

a. Identify possible factory sites
b. Identify all possible funding sources
c. Recruit all local Workforce Development agencies and resources

4 Build a Factory

Once resources are secured, CHERP will design and build the factory and obtain certifications for the panels and factory. CHERP will train you to manage the factory. Subsequently, CHERP will offer ongoing consulting and professional services as needed.

- Identify building location
- Secure funding
- CHERP will design and install the factory assembly line
- CHERP will provide ongoing professional services

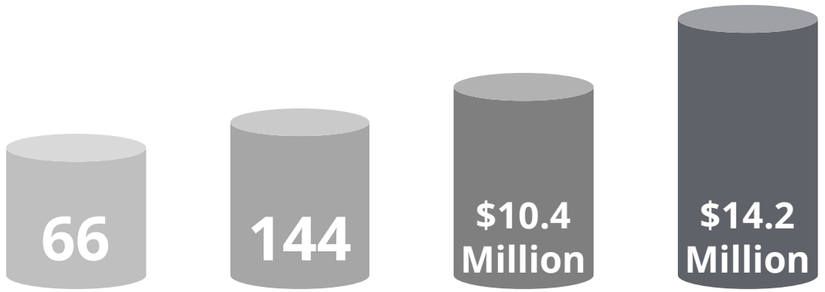
factory timeline

From start to finish, we are with you to make a plan, implement tasks, and help you hit all of the milestones to create a nonprofit solar panel factory in your city.

	months								
city milestones	1	2	3	4	5	6	7	8	9
1. Contact CHERP	■								
2. Create Core Energy Group	■								
3. Assemble Local Resources	■	■							
4. Secure Funding & Building	■	■							
CHERP creates factory									
1. Design Factory			■						
2. Order machine, tooling, materials			■	■	■	■			
3. Install Factory						■	■		
4. Produce panels for certifications							■	■	
5. Hire initial workforce and produce first panels								■	■
6. Install first solar system with local panels									■

what CHERP can do for your economy

factory production and jobs impact



Direct Jobs Created

By year two, the factory will be running three 22-person shifts to creat a total of 66 full time jobs.

Total Jobs Created

These direct jobs would create another 78 indirect jobs due to increased regional spending.

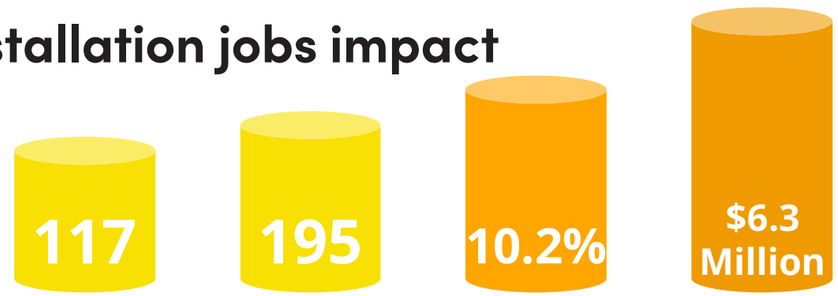
Year 1 Economic Growth

The region surrounding the factory would see $10.4 million dollars in economic growth.

Economic Growth Going Forward

Employment through the facility leads to a $14.2 million increase in the size of the local economy.

installation jobs impact



Direct Jobs Created

By year two, installing the solar panels on the households would create an extra 117 jobs.

Total Jobs Created

These direct jobs would create another 78 indirect jobs due to increased regional spending.

Increase in Construction Jobs

This bolsters an integral part of the local economy.

Total Economic Impact

Employment through installation leads to a $6.3 million increase in the size of the local economy.

solar energy impact for your city

solar energy reduction impact

Low-income households - Advancing Environmental Equity and Justice

The Phase I goal of each new factory is to provide solar energy for 6,000 low-to-middle income (LMI) households, saving them $90.00 per month on average.

- Just Phase I of your new factory will divert $6,500,000 directly back into the local economy *every year for the next 30 years*
- This increased local spending will grow the local, regional, and state tax revenues. The increase in tax revenues to the state equals any amount expended by the state in less than 5 years.

Municipal, school district, non-profit, corporation, airport and warehouse buildings

Along with the focus on LMI households in your community, we will provide the pro-forma business models for addressing all other business and building types. Solar sales to other organizations will help provide the revenue needed to offer LMI households solar energy for free.

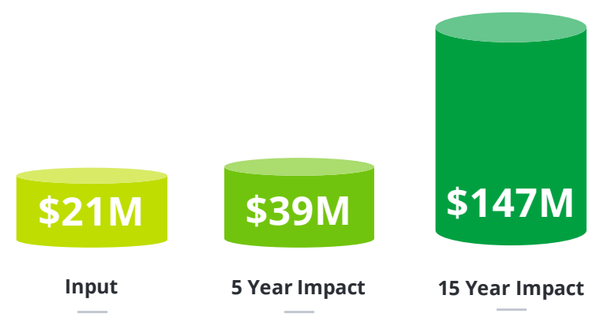
Total Local Impact:
Factory + Installation + Solar = 700%

After 5 years

- $39 million in regional economic growth
- 418 jobs in the local economy

After 15 years

- For each $1 spent on CHERP LGP, the economy in the city grows by $7 (700% growth)



Input

5 Year Impact

15 Year Impact

what we offer

WE PROVIDE ALL machines, tools, equipment and materials for factory set up and certifications.

Included

ALL THE ESSENTIALS

- **All Machinery**, tools & materials to set up 30MW solar panel factory capable of producing 100,000 panels per year (enough to supply energy for 6,000 households)
- **Entire factory line set up,** qualified and tested
- **Materials and Labor** to make 540 panels for testing, NTL approvals, and 30 solar system installations
- **Training procedures**, in-depth procedures and training videos or each workstation
- **Licensing fees** to manufacture the world's most advanced solar panels
- **Consulting and fees for ETL qualification and certification** for both the panels and the factory
- **Implementation Package -** identification of local program resources for Workforce Development
- **In-house training and certification** procedures and job descriptions for Workforce Development
- **BOM** for first year of production with specs and manufacturers
- **Management/Employee hiring and training**
- **Bookkeeping systems installed**
- **Legal Services** for social enterprise organization
- **Payroll Services Organization engaged**
- **Inventory and Supply Chain software** implemented
- **Factory Employee Handbook**
- **Factory efficiency and timing parameters**
- **Maintenance schedules for machinery**
- **Quality control specifications/procedures**
- **Website** creation/graphics/social media strategy and execution

* Every community is likely to want something slightly different. We'll work with you to help you define your local opportunities and the best size for your factory.

Turnkey factory installation and operations

$ ~ 6.25 M

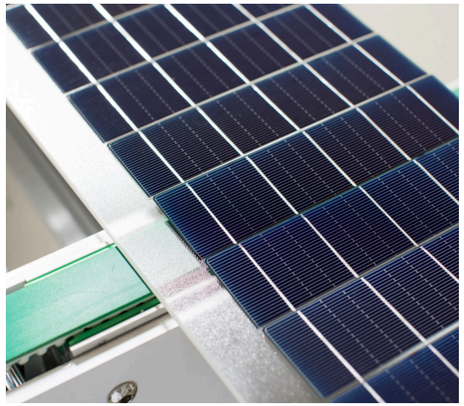
Ongoing

CONTRACT SERVICES

- **Dir of Mfg** supervision and training
- **Ongoing Senior Equipment and Assembly Line Engineer** supervision and training
- **Ongoing Materials, Shipping, & Supply Chain support**
- **Ongoing R&D development and improvement**
- **Ongoing Third Party Ownership (TPO) services**
- **Ongoing system monitoring for carbon credit sales**
- **Ongoing Sales and Contract Negotiation support**
- **Ongoing Marketing/Social support**

Under Seperate Contract

Contract Services



where can we find the money?

Sources of funding

We will guide your Core Energy Group in an exploration to uncover the many possible sources of start-up funding in your area. Your Locally Grown Power factory addresses many top priority issues - local, regional and state - for which there are many possible sources of start-up funding available:

- **Federal, state, and local opportunities for stimulus, jobs, climate change, equity and justice**
- Funding opportunities for local resiliency/adaptation projects
- Incubation funding from start-up tech and energy accelerators
- Climate change/GHG Mitigation mandated under AB32
- Workforce Development – green sector, middle class manufacturing/construction jobs focusing on at-risk populations as well as middle and upper management positions
- High tech innovation and start up grants in solar PV physics and advanced electronics
- Technical manufacturing and business model innovations
- Local/regional economic development departments
- Community Choice Aggregation (CCA)
- Environmental justice/disadvantaged communities (DACs) as defined by CalEnviroScreen 3.0 in California (SB535 and AB1550)
- Cap and Trade funding
- Local private and corporate donations
- Government and foundation grants
- Community Colleges and Universities
- Local developer funds/contracts
- Pre-purchase solar panel sales and PPAs for municipal/school/corporate/airport buildings

for example

The $~5M for our first factory in Pomona was funded by a combination of:

- Large and small local **private donations**
- Assistance from hundreds of **volunteer** and college interns from 8 local colleges and universities,
- **Pro bono work** and donations from our Board of Directors and Board of Advisors,
- **Grants** from the Southern California Association of Governments (SCAG), the U.S.DOE, and The John Randolph and Dora Haynes Foundation,
- **Manufacturing equipment and construction materials donations**,
- **Pro bono technical prototype testing** and factory design by Harvey Mudd College,
- **Rent relief** from the Pomona Unified School District
- Line-item **budget allocation** out of the General Fund from the State of California for $2.1M.

how to fund ongoing operations

Solar panel sales in the next decade is projected to be a multi-billion dollar market – all of which, currently, is going overseas because we have no solar manufacturing left in the United States. The Federal Government and the U.S.DOE now want to stimulate an American renaissance in solar panel manufacturing.

government funding revenue

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

- **Annual cap and trade revenues**
  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.
- **State funding for green sector jobs**
  The state needs shovel-ready projects that create green-sector jobs and extend the reach of renewable energy in DACs. We have a competitive advantage in securing public funding for these deployment initiatives.
- **Federal opportunities**
  Economic Development Administration, the Department of Energy, and other federal agencies support projects consistent with our work and goals.
- **City funding for projects**
  Every city seeks social enterprises that can respond to calls for proposals for manufacturing and solar deployment projects such as our own.
- **Workforce development agencies**
  These agencies seek training programs that are paired with employment opportunities like those we offer.

solar panel sales revenue

As a social enterprise, the income and profits funnel back into the non-profit entity to be used in the service of our charitable mission – that of providing free energy for LMI households.

- **Solar panel sales to local installers:**
  All the local installers we've contacted are eager to offer locally made panels that are also proven to be of superior quality to those manufactured overseas.
- **Energy Service Contracts for (CCA) Community Choice Aggregation cities**
- **Energy Service Contracts and (PPA) Power Purchase Agreements to:**
  airports, municipalities, schools and businesses
- **Partnerships with local housing developers**
- **CHERP's Places of Worship Initiative**

summary & faq

Today, nearly all solar panels are made in highly automated mega-factories abroad. The assumption is that, in the absence of cheap labor, lax environmental laws, and a vast economy of scale, cost-competitive manufacturing at home is wishful thinking.

But what if the world's most advanced solar panels could be made in your own city?

What if the first step in the journey to reducing your carbon footprint were creating quality green-sector jobs at home-rather than sending capital out of your community, and even out of our country? What if power could be literally locally grown?

CHERP Solar Works manufactures next-generation solar panels in a factory of just 7,000 square feet in Pomona, California. We can coach you through every step it takes to create a non-profit solar assembly plant in your city, offer state-of-art machinery, train your workforce, and provide you with a business plan to succeed.

1 Why would a city want to host its own solar panel factory?

Cities across the country are aiming to reduce their carbon footprint and, at the same time, revitalize their local economy. Solar is one effective route for achieving that. But today, the first step to going solar implies sending investment capital out of the community (and even the country!) to buy the solar panels. Consider the advantages of local manufacturing:

- Green-sector jobs where they are needed, in the heart of your community
- Local economic stimulus
- Keeping profits local
- Increasing local revenue for cities
- A home-grown solution for massive greenhouse gas reductions
- Local resiliency and control over a basic necessity – energy

2 Can solar panels really be built in my city, in a small factory?

Our technology represents an exponential improvement in solar panel energy production, safety, and long-term reliability. And it does so by radically simplifying the panel architecture and assembly process. This eliminates components such as bypass diodes and complex string wiring that not only saves on cost but makes the manufacturing process simpler – placing it squarely within the capabilities of your local labor force. Combining our patented solar technology, state-of-the-art machinery, and meticulous workforce training, we'll show you how your city can build and run a successful solar panel factory.

3 Will the panels be inferior in quality to imported panels?

The panels you would be licensed to manufacture are the first and only panels in the world to overcome a problem know as hot-spots (see our White Paper on Our Technology). That unleashes enhanced efficiency, unparalleled safety and durability, and reduces costs in manufacturing. These are the first upgradable, smart panels in the world and completely eliminate the possibility of producing hot spots – a fundamental problem throttling solar technology today. We will put you on the path to fabricating panels superior in quality to any you could purchase from competing manufacturers anywhere in the world.

4 Why would we want to manufacture under a non-profit business model?

The non-profit, social enterprise business model allows us to focus on what is best for a community, such as manufacturing cost-competitive panels while creating quality jobs that benefit the immediate community and local economy. Non-profits can leverage local community resources while avoiding outside investment that drains profits out of the local economy. In addition, for-profits can donate essential machinery and materials, volunteers can donate labor and expertise, and public grants and private donations are available. We will help you to access all of this. Electricity is an essential service, and communities can make it for themselves without the need to hand over all the profits to distant corporations and shareholders. The aim is to create local control and the opportunity to recirculate dollars locally as many times as possible. Our goal is to help as many cities as possible create their own, wholly owned, distributed micro-factories throughout the country - not to own a centrally aggregated, behemoth factory serving the entire country.

5 Why weren't the patents for the world's most advanced solar technology simply sold to venture capital?

Inventors who patent new technology can decide how their products are manufactured. When Kent Kernahan patented the world's first smart panel, he could have sold the rights to the highest bidder. That would have resulted, no doubt, in the panels being manufactured overseas, where labor is cheapest. Instead he determined that the world's most advanced panels would be manufactured in a non-profit business model, in distributed factories, in economically disadvantaged communities. He preferred to see this cutting-edge technology produced in the U.S. for the benefit of our communities that need solar the most.

6 Will these panels be more expensive than imported panels?

The technology you will be licensed to produce reduces much of the complexity in manufacturing. The non-profit business model reduces overhead by leveraging local resources. The panels require simpler wiring and less expensive balance of system costs. The panels produce more energy per panel and do not require optimizers or micro-inverters. All this makes the panels cost-competitive with today's world-wide panel market, and provides an added array of technical benefits, while the business model enriches the communities where they are produced. Technologically advanced solar panels combined with an enlightened business model - an extraordinary leap forward in harnessing the power of the sun.

CHERP SOLAR WORKS

Carbon Mitigation · Job Creation · CHERP · Economic Stimulus · Environmental Justice

CHERP Solar Works is Addressing California's Top 4 Priorities

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

1 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

2 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

3 economic stimulus

Expand City and State Income

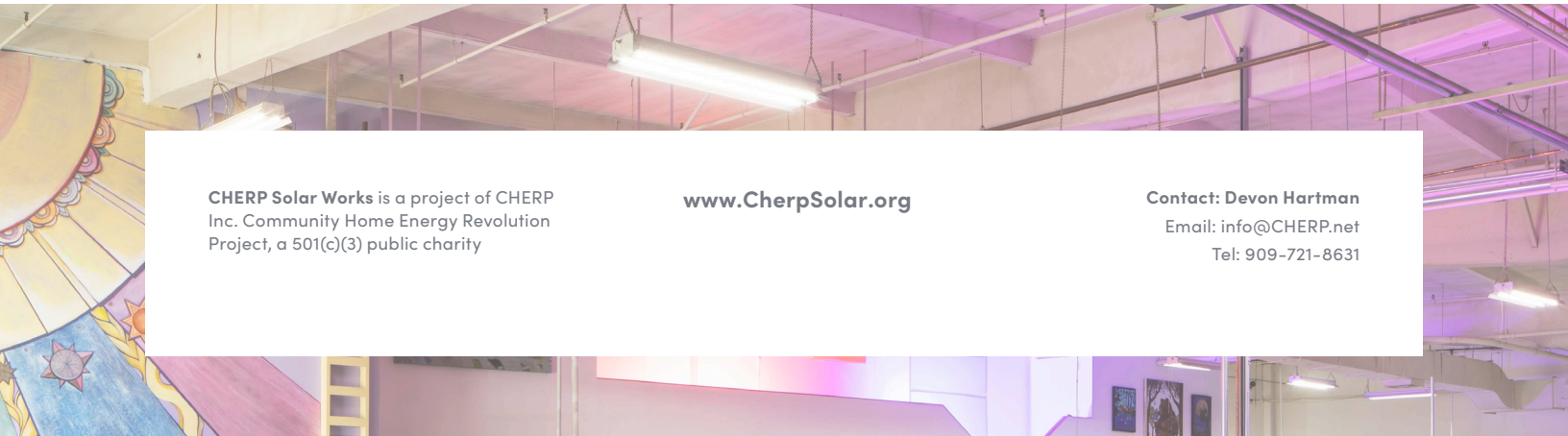
- $6,500,000/yr increase in DPI for LMI Households in the City
- $29,360,000/yr added to local retail economy
- $900,000/yr additional sales tax revenues to the City
- Local Economic Expansion
- $5,500,000/yr sales tax revenue to State of CA

2:1 Revenue Return to the State

4 environmental justice

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

- CHERP 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



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