



ALL POWER LABS

**Carbon Drawdown Through Organic
Waste Management For Energy, Food and Water**



Problem

Climate change is creating existential stress on energy, food, and water systems globally

ENERGY

4 billion people live and work on energy systems that must be (re)built and decarbonized in next two decades.

FOOD

133 gigatons of carbon has been lost to atmosphere through topsoil depletion in agriculture.

WATER

25% of humanity does not have access to clean water, or has risk of watershed zero day in the near future.



Solution

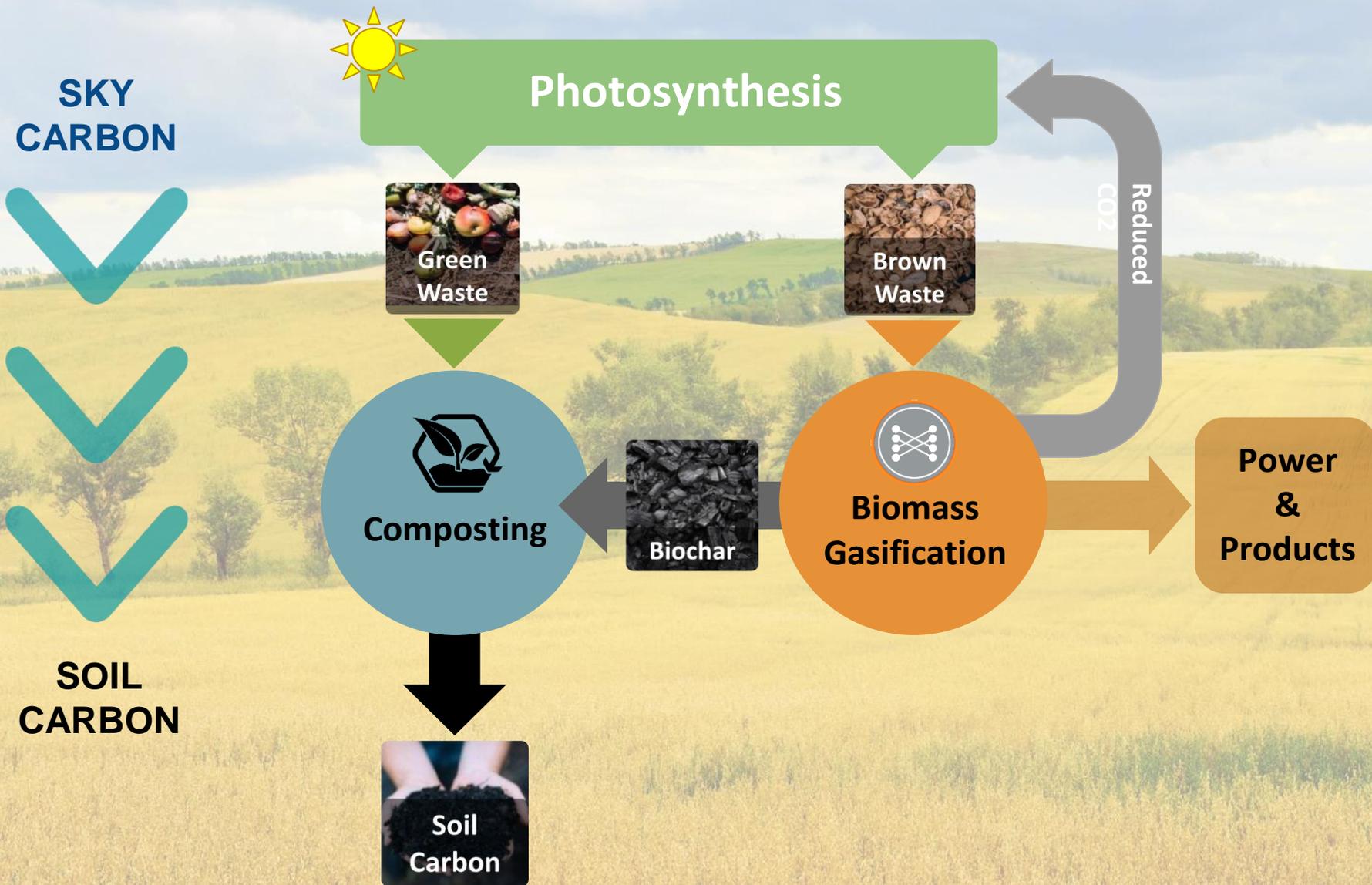
**Organic Waste to Useful
Power and Products
with Carbon Sequestration**





Carbon Drawdown via the Carbon Cycle

using Biomass Gasification + Biochar + Compost



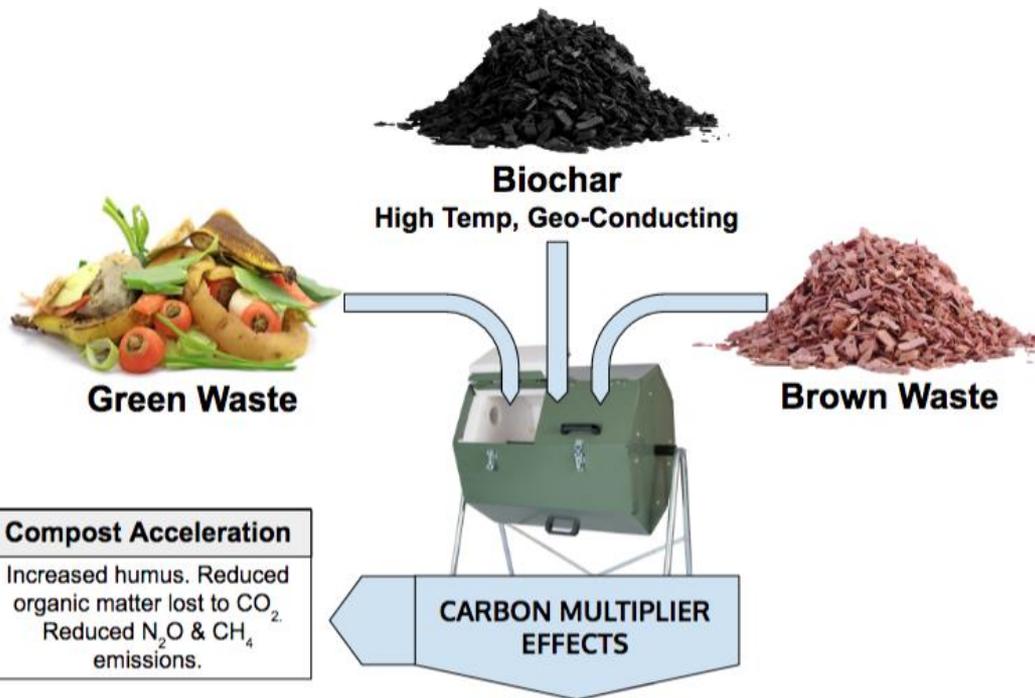


Carbon Drawdown with Multipliers



Active & Compounding Biological Sequestration

*1 unit biomass processed
= 2–8 units of CO₂e impact*



Direct carbon sequestration



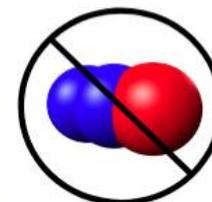
Standing Biomass
increased mass plant & roots



Organic Matter
Increased humus, plant exudates, fungal mycelium, glomalin, microbes.



Emissions
10–90% less N₂O & CH₄





Carbon Drawdown that Works at Scale

Using 10% of existing organic residues globally, we can eliminate 20–80 ppm CO₂e over the next century.

1 GT Biomass/yr = 0.2–0.8 ppm CO₂e/yr

120 GT/yr

Biomass
Global Production

60 GTc/yr

Biomass
Carbon Capture

10 GT/yr

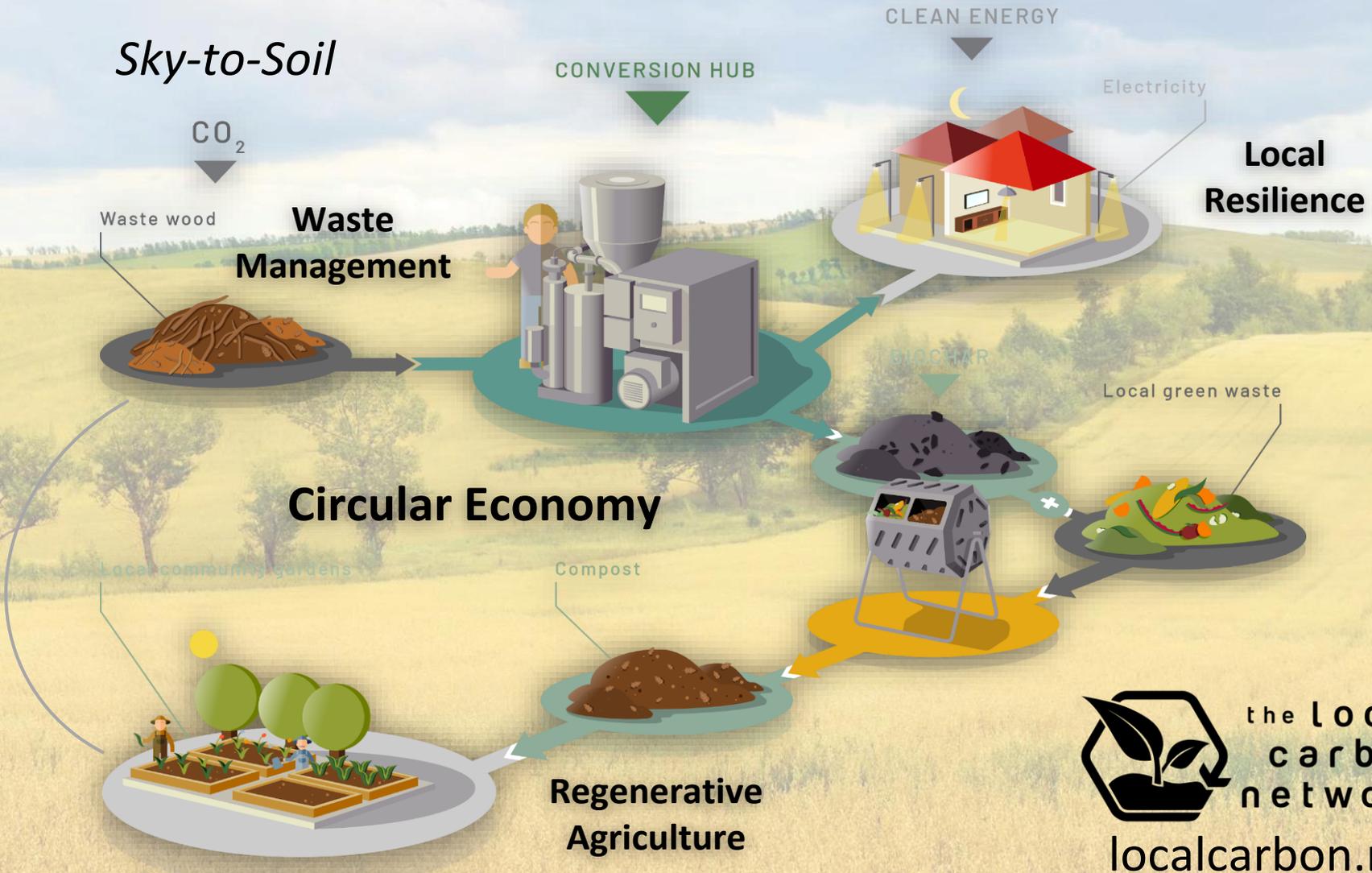
Biomass Residues
Available

1 GT/yr

Residues
Engaged



Carbon Drawdown that Deploys Locally





All Power Labs

“All Power Labs is the global leader in small-scale gasification”

APL engineers and manufactures next generation biomass gasification and pyrolysis systems in Berkeley, California. Since 2008 we’ve delivered hundreds of our products to dozens of countries around the world.



Product

25–200 kW biomass gasifiers, engineered and built in Berkeley, CA

People

35 FTE (5 mgmt, 15 eng, 8 production, 4 sales & support.)

Funding

Self-funded by sales, founder equity & grants

Intellectual Property

11 international patent applications (5 US issued)

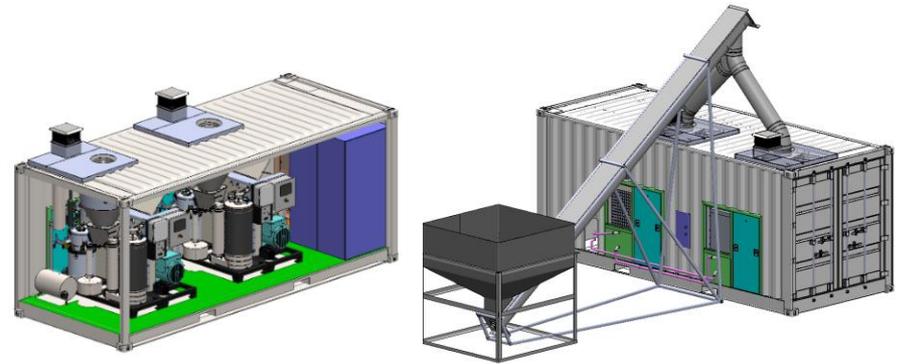


Product Platforms



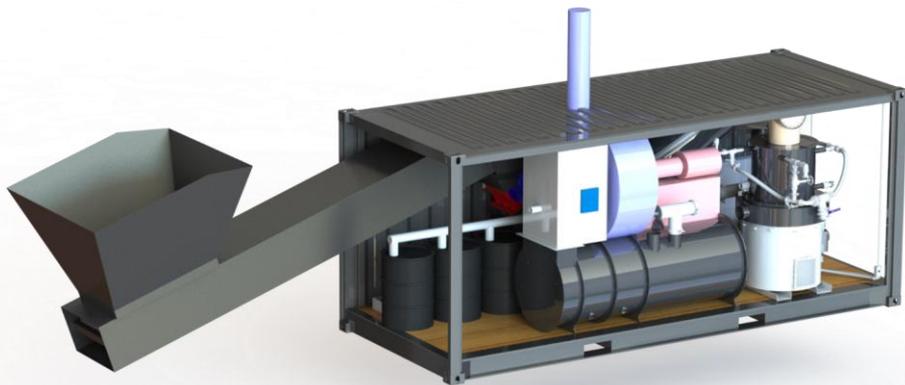
Power Pallet

Biomass to electricity, heat & biochar.



Hybrid Biomass Microgrid

Biomass to electricity, heat & biochar.
Inverter and battery storage. Microgrid control.



Chartainer

Biomass to biochar & heat.



Watertainer

Biomass powered atmospheric water generator with biochar & heat.



Market Opportunity

Waste



California Forestry and
Fire Prevention

Crop Residues

Nut Processing

Energy



Microgrids

EV Charging

Diesel Genset Replacement

Electricity FIT and NEM

CCHP

Food



Regenerative Ag

Family Farms

Community Gardens

Water



Drinking Water

Distilled Water for Industry

Reclamation

Carbon Markets

Carbon

Biochar Sales



Business Model

NOW

Direct Equipment Sales and Projects
Regional Partner Sales and Projects
Retail Biochar Sales

MID

Biomass Waste-to-Value Services

- Biomass feed-in tariff and net energy metering
- EV on-demand charging
- Microgrid base load generation
- Ag/Food processing waste to CCHP

Local Carbon Network

- Biochar and soils product subscriptions
 - LCN franchise sales
 - App-based carbon offset sales
-

FUTURE

OEM Strategic Partnerships

- Manufacturing, marketing, and licensing
- Acquisition



Climate Products

Energy	Carbon	Water								
<ul style="list-style-type: none"> Carbon Negative Electricity & Heat (FIT, NEM, Off-Grid) 	<ul style="list-style-type: none"> Sky Carbon Biochar Sales & Subscriptions 	<ul style="list-style-type: none"> Carbon Negative Water Products 								
		<table border="1"> <thead> <tr> <th data-bbox="1302 558 1557 605">Bulk</th> <th data-bbox="1561 558 1808 605">Tote</th> </tr> </thead> <tbody> <tr> <td data-bbox="1302 608 1557 772">  </td> <td data-bbox="1561 608 1808 772">  </td> </tr> <tr> <th data-bbox="1302 808 1557 855">Bottle</th> <th data-bbox="1561 808 1808 855">Single</th> </tr> <tr> <td data-bbox="1302 858 1557 1022">  </td> <td data-bbox="1561 858 1808 1022">  </td> </tr> </tbody> </table>	Bulk	Tote			Bottle	Single		
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Bottle	Single									
										
<h3>Biomass Waste Disposal</h3>	<h3>Carbon Markets</h3>	<h3>Other</h3>								
<ul style="list-style-type: none"> Forest Management Ag/Food Waste Nutshell Producers 	<ul style="list-style-type: none"> Carbon Offsets Carbon Removal Certificates 	<ul style="list-style-type: none"> LCN Franchise LCN Community Carbon Platform 								



Market Traction

Sales

\$10M
Equipment
Sale
Revenue To
Date

200+
Power
Pallets
Shipped To
Date

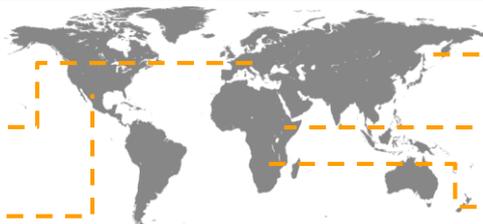
80%
Power Pallet
Booking
2020

5 MW
Supply MOU
Signed Since
2018

Regional Commercial Partners



APL Italia



Grants & Awards

\$6M
Grants
Awarded



Investment to Date

\$11M
Founder
Funding

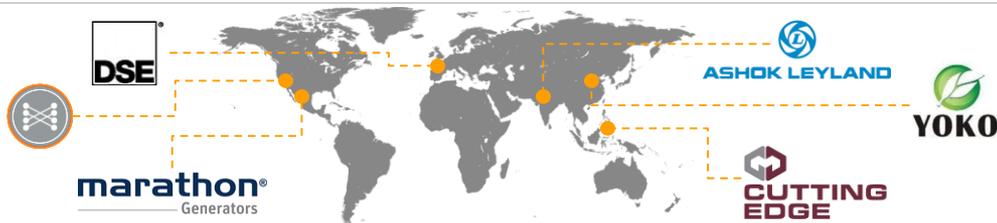
\$2M
Convertible
Equity



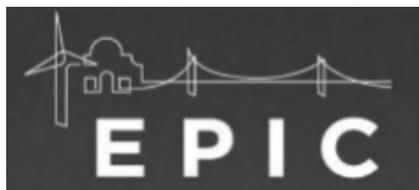
Collaborating Partners

Supply Chain

India
China
Philippines
United States



Resiliency & Environment



Forest Residues



Regenerative Agriculture



Research





Team



Jim Mason – Recognized as one of the world’s experts in biomass thermal conversion technologies. MA Stanford.



Tom Dinwoodie – Founder PowerLight Corporation, which later merged with SunPower, where he served as CTO. Board chair, Rocky Mountain Institute.



Ali Abalos – 20+ years leading manufacturing operations. Led growth at Power-Light, SunPower, and GreenVolts.



Dan Kammen – Founding Director, Renewable and Appropriate Energy Laboratory, UC Berkeley. Lead author, IPCC report, 1999–current. Shared 2007 Nobel Peace Prize



Bear Kaufmann – Chief Scientist. 2008 All Power Labs co-founder w/ BS in Earth System Science.



Tom Miles – Founder, TR Miles Consultants. World recognized expert on biomass gasification.

BOARD



Press

“THE MOST IMPORTANT AND TRANSFORMATIVE ENERGY PRODUCT THAT NO ONE HAS HEARD OF”

“You take the waste of photosynthesis, which is abundant and free, and convert it to a form compatible with internal combustion engines, which are abundant and very cheap.... In terms of lean manufacturing and design, we’ve figured out how to do this as a Zen fasting retreat.”

FAST COMPANY

“CARBON-NEGATIVE ENERGY, A REALITY AT LAST -- AND CHEAP, TOO”

“In Berkeley, Calif., All Power Labs is turning out machines that convert cheap and abundant biomass into clean energy and rich, efficient charcoal fertilizer.”



“CAN ENDING ENERGY POVERTY ABROAD CREATE JOBS AT HOME?”

“...All Power Labs has... turned existing ideas about development aid and manufacturing jobs on their head... there’s one thing we know for sure: it’s companies like these that can and will help lift hundreds of millions out of energy poverty -- if they receive investment”



San Francisco Chronicle

SAN FRANCISCO CHRONICLE AND SFCHRONICLE.COM | Monday, November 30, 2015 | Section D

All Power Labs has a green-hot idea



“THIS BERKELEY STARTUP & ITS ENERGY MACHINES ARE ABOUT TO TAKE OFF”

“...they have the enthusiasm, momentum, & innovative thinking rarely seen in such an organically-emerging startup. And if their gasifiers are ever able to reach any substantial scale, they could have a profound effect on the emergence of off-grid power in the places that need it most.”

GIGAOM

The world's biggest problems.
The world's biggest opportunities.

Join us.



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